

REPORT  
AGRICULTURAL SECTOR ASSESSMENT  
BURUNDI

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I. OVERALL VIEW OF THE AGRICULTURE SECTOR

A. National Economic, Social and Political Setting

Burundi is a small landlocked country located in central Africa, 1400 km. from the nearest port, Dar-es-Salaam, on the Indian Ocean. It has a total land area of slightly over 25,000 square kilometers,<sup>1/</sup> a population approaching 4 million and a GDP of about \$400-\$500 million.<sup>2/</sup> This makes it one of the most densely populated countries in Africa, and one of the world's poorest countries in terms of per capita income (150 people per square km. and per capita income in 1979 of about U.S. \$125.00).

Burundi is well suited to agricultural production and is capable of growing a wide variety of crops. The climate is tropical (between 2° and 5°S latitude) with temperatures moderated by altitude.

There are three principal ecological zones. The most densely populated and economically important area is the Central Plateau, which ranges from 1500 to 1900 meters altitude, has rainfall of 1000 to 1200 mm. annually, and temperatures averaging 19-20°C. The second includes the plains and intermediate zone with altitude of 700 to 1500 meters, rainfall from 800 to 1200 mm. and temperatures averaging 20-25°C. The third is the high Zaire-Nile Crest

<sup>1/</sup> About the size of the state of Maryland.

<sup>2/</sup> The IBRD estimated 1976 GND at \$462.3 million. Economic Memorandum, Burundi, April 25, 1978.

with altitude of 1900 to 2500 meters, rainfall from 1300 to 1600 mm. and temperatures averaging 17 to 19°C. There are 4 seasons - a short dry season in January, followed by the major rainy season in February to May. The major dry season usually lasts from May to September, followed by a light rainy season.

The only urban area in Burundi is the capital, Bujumbura, which has a population variously estimated at 100,000 to 175,000. It is also the center for manufacturing, principally food processing, and for trade.

Of the total area of 2.7 million hectares, about 200,000 are lake, about 1.4 million are considered suitable for cropping, 0.8 to 0.9 million for permanent pasture, and the remainder for forest waste, or urban and village residential use. Of the potentially arable area, about 50,000 hectares are in export crops (coffee, tea, and cotton), about 1.2 million in food crops, and about 150,000 uncultivated.

The economy is predominantly agricultural. The primary sector - crops, livestock, fisheries and forestry - accounts for about 65 percent of GDP, and about 90 percent of the population is dependent directly on the agriculture for a livelihood.

1. Economic Development Trends

a. GNP/GDP level and trends

Very little reliable data are available about Burundi, and as yet few statistical series have been constructed to show trends. However, estimates have been made by various specialists, and the Burundi Planning Ministry included in the 1978-82 plan document a macro-economic framework for the years 1970 through 1976. See Table VII.

The macro-economic framework shows GDP rising 14 percent over the six year period, 1970-76, or roughly at the rate of 2 percent per year compounded. Population during the same period has been variously estimated to have risen at a rate of 2.1 percent to 2.6 percent per year. Given the margin for error in these figures, it is probably safe to assume that the country has shown little, if any, increase in per capital GDP during the decade of the 1970's.

Population was estimated by the IBRD at 3.8 million in 1976.<sup>1/</sup> At current rates of growth, it is expected to reach 7million by the year 2000.

Over the six years covered by this macro-economic framework, domestic savings ranged from a low of 1.7 percent per year to a high of 7.3 percent, and consumption from 91.8 percent to 96.9 percent. No trend is discernible in the figures, but obviously savings have been very low and consumption high.

<sup>1/</sup> An actual head-count has never been taken.



While population has been increasing at a fairly rapid rate, agricultural production appears to have stagnated during the last few years. Visual evidence and such data as are available lead to the conclusion that the pressure of population on available resources is becoming increasingly severe, nutrition levels are deteriorating, and that the land is being over-exploited.

While the agriculture sector accounts for 90-95 percent of the population, it generates only about 65 percent of the gross domestic product. Except for a few export crops (coffee, tea and cotton), the agricultural sector produces almost entirely at the level of subsistence. Scattered income studies show that the per capita income of the urban population is about five times that of the rural population. Thus, although average per capita income for the country is in the neighborhood of \$125, income for the rural population is below that figure.

Between 1970 and 1977, the output of major crops (maize, beans, cassava and sweet potatoes) increased very slowly while the population grew 17 percent. This resulted in a decline in per capital production of those products by 6 percent. See Table I.

Agricultural yields also show substantial declines in recent years, presumably as a result of the decline in the use of fertilizer, the degeneration of seed material, and other factors. See Table II.

TABLE I

Production de l'agriculture (en tonnes)\*

	1970	1971	1972	1973	1974	1975	1976	1977
Café (mar.)	22.044	25.145	19.348	21.495	28.139	16.929	21.200	21.400
Thé (sec)	148	322	485	657	906	787	1.136	1.470
Coton (grain)	8.750	8.709	5.150	4.680	4.525	3.818	3.010	5.160
Haricots	278.700	284.831	256.348	291.097	232.078	294.008	300.478	307.000
Petits Pois	30.100	30.762	27.686	31.439	25.151	31.753	32.515	33.000
Bananes à légumes	440.507	450.198	405.178	460.102	462.000	464.703	474.926)	
Bananes à bière	756.522	773.166	695.850	790.176	780.000	798.078	815.636)	1.320.000
Manioc	370.300	378.446	340.601	386.772	389.418	390.640	393.374	396.000
Pommes de terre	34.000	34.748	31.273	35.512	28.410	35.867	36.584	37.000
Sorgho	20.040	20.481	18.433	20.931	16.745	21.140	21.457)	
Eleusine	8.800	8.994	8.095	9.192	7.354	9.284	9.423)	32.000
Colocase	96.200	98.316	88.484	100.479	80.383	101.484	103.412)	
Igname	5.750	5.876	5.288	6.005	4.804	6.065	6.180	111.500
Patate douce	381.600	389.995	350.995	398.575	318.626	402.561	411.417	420.500
Mais	130.000	132.860	119.574	135.782	108.860	137.140	138.500	140.000
Froment	5.000	5.110	4.599	5.122	4.098	5.173	5.500	6.000
Riz	5.017	4.277	4.785	4.800	6.186	6.730	6.705	7.000
Fruit de palme	11.600	11.600	8.900	9.400	10.500	11.600	11.600	11.500
Arachides	6.200	7.000	7.200	7.800	8.400	9.000	9.225	9.500
Autres (fruits, légumes, courges, tabac, feuilles)	97.746	99.900	89.900	103.000	82.400	105.770	108.100	105.000
Production vivr.	2.678.082	2.736.560	2.463.189	2.796.184	2.565.413	2.830.996	2.885.032	2.936.000
Pertes 20%	535.661	547.312	492.638	559.236	513.082	565.200	577.006	587.200
Production disp.	2.142.421	2.189.248	1.970.551	2.236.948	2.052.331	2.265.796	2.308.026	2.348.800

\*Ministry of Agriculture and Ministry of Planning - Annexes

Table II

Yield Levels 1959\*) and 1979 in kg/ha

	<u>1959</u>	<u>1979</u>	<u>% Decline</u>
Beans	750	650	15
Maize	1.000	800	20
Rice	3.500	2.500	28
Sorghum	1.200	550	54
Millet	600	450	25
Wheat	750	500	33
Peas	800	350	56
Peanuts	600	500	17
Cassava	13.000	7.500	43
Sweet potatoes	7.500	4.000	47
Irish Potatoes	7.000	5.000	29

\*) P. Leurquin: Change in Ruanda-Urundi 1945 - 1960

The 1978-82 plan visualized a growth rate in GDP of 4 percent per year, which would mean an increase of about one percent per year in real income per capita. Between 1970 and 1976, while the overall growth rate in GDP was about 2.0 percent annually, the growth in agriculture was only about 1.2 percent per year, with the production of export crops actually declining.

b. Sectoral composition

Food crop production accounts for about 50 percent of the domestic product, and cash crops, livestock, fisheries and forestry another 15 percent. Total production figures for 1970 through 1977 for food and cash crops are shown in Table I.

In the agricultural sector, cash export crops (coffee, tea and cotton) amounted to about 8 - 10 percent, by value of total production, while subsistence crops accounted for 70-80 percent and livestock products 5 to 10 percent. Forestry accounted for about 3 percent and fisheries less than 1 percent. More detailed figures are given in Table III.

Table III  
Gross Domestic Product by Sector Origin  
 (based on 1970 constant prices)

	<u>Share of GDP at factor cost</u>		<u>1970-76 Average</u>
	<u>1970</u>	<u>1976</u>	<u>Annual Growth Rate</u>
<u>Primary sector</u>	<u>66.6</u>	<u>64.0</u>	<u>1.2</u>
Agriculture foodcrops	55.3	53.6	1.3
Agriculture export crops	5.4	4.4	-1.5
Livestock, fishing, forestry	5.9	6.0	2.2
<u>Secondary sector</u>	<u>11.3</u>	<u>13.5</u>	<u>4.8</u>
Food industry	6.4	8.2	6.1
Construction	2.6	3.0	4.1
Other	2.3	2.3	1.8
<u>Tertiary sector</u>	<u>22.1</u>	<u>22.4</u>	<u>2.1</u>
Transport, Commerce and other private services	12.7	12.0	0.9
Private non-profit institutions	2.2	3.3	8.7
Public services	4.0	3.6	0.0
Foreign aid	3.2	3.5	3.3
<u>GDP at factor cost</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

Source: IBRD, Economic Memorandum, Burundi, April 25, 1978.

c. Exports, imports and balance of payments

Practically all of the exports of Burundi are farm derived. Even before the recent upsurge in coffee prices, coffee alone accounted for about 85 percent of all export earnings, and tea, cotton and hides together for 6 to 9 percent.

The balance of payments, foreign exchange receipts, various government revenues, GDP and cash from sales all received a major boost as a result of the steep rise in coffee prices beginning in 1976. Coffee prices, which had been around .50 to .55 cents per pound in 1973/4, reached a peak of \$3.42 per pound in April, 1977. Coffee's share in foreign exchange earnings, GDP and farm income also rose dramatically. The value of coffee exports, which in prior years had been running about \$20 million per year, jumped to over \$50 million in 1976 and nearly \$90 million in 1977, equivalent to almost a fourth of total GDP and over one-third of agriculture-generated GDP. The volume of coffee exports did not rise with the increased prices, however. Rather it has tended downward.

Future export earnings and Burundi's balance of payments clearly will be heavily dependent on future coffee prices. They are not expected to be sustained in the foreseeable future at anywhere near the 1977 levels. IBRD in its October, 1977, price forecast suggested as guidance for use of its planners, coffee prices of \$2.25 for 1977, \$1.75 for 1978, \$1.61 for 1979 and \$1.44 for 1980.

declining thereafter by 1.6 percent per year to 1982. It appears at this writing that their price guidelines may be unduly low for 1979 and 1980. At the same time, world inflation and consequently prices of Burundi's imports are rising more rapidly than was expected a year or two ago.

One result of the declining coffee price is that the government will be unable to sustain the sharp increase in the coffee export tax, which went from 23,900 BuF<sup>1/</sup> per ton in 1975/76 to 59,800 in 1976/77 to 274,100 in 1977/78. If average FOB export prices drop to the expected \$1.61 per pound for 1979, tax receipts from coffee exports probably will drop from 5,400 million BuF to perhaps 2,000 million BuF, based on exports of 20,000 tons.

The government's expenditures, both in the ordinary and extraordinary budget, have increased sharply in recent years, and imports have tripled in value (Table IV). Despite this increase in imports, a small foreign exchange surplus was achieved in 1976, and net foreign exchange reserves jumped in 1977. The growth in reserves also will be reversed by the decline in coffee prices. Some of the decline undoubtedly will also be reflected in lower farm prices, reducing the stimulus to rural development brought by high farm coffee prices.

<sup>1/</sup> Burundi francs.

TABLE IV: Imports and Exports, 1973-1977

	1973	1974	1975	1976	1977
	(value in millions of Burundi francs)				
<u>IMPORTS</u>					
Of Interest to Agriculture					
For Agriculture	57.3	98.3	127.1	110.9	140.4
For food industries	207.2	367.2	475.5	509.0	679.0
For textile industries	28.6	44.3	58.0	24.7	62.2
For forestry industry	1.1	13.1	10.4	7.1	18.7
For paper industry	13.3	14.3	46.0	16.5	30.7
For leather industry	1.2	1.7	0.5	0.6	0.2
For construction industry	93.6	91.5	196.8	220.7	296.7
Sub-total	402.3	630.4	996.8	889.5	1,227.9
Others (for metal industry, chemicals, solid combustibles, mineral oils, etc.)	2,092.7	2,765.6	3,859.2	4,137.5	5,450.1
Total Imports	2,495	3,396	4,856	5,027	6,678
<u>EXPORTS</u>					
Coffee (Thousand tons)	(23)	(21)	(26)	(22)	(17)
Coffee, value	2,014	1,963	2,213	4,835	8,023
Cotton	127	142	57	202	7
Hides	143	149	60	92	45
Tea	35	72	65	103	236
Minerals	32	37	20	19	10
Manufactured goods					
principally fibrocement	26	22	39	42	32
and bottled drinks	15	10	-	-	-
Other	52	46	64	127	158
Total Exports	2,444	2,440	2,515	5,420	8,511
Negative Balance on imp-exp.	-51	- 956	-2,341		
Positive Bal. on import-exp.				393	1,835

Source: 1977 Annual Report, BRB (Bank of the Republic of Burundi)

The significantly increased levels of imports and of ordinary and extraordinary budgets expenditures are expected to continue to grow. Alternative exports (except for modest increases in coffee and tea volume) do not seem likely, and prospects for significantly increased tax revenue also seem unlikely in the foreseeable future. The consequence will be an increased need for foreign assistance to help finance the foreign exchange deficit and domestic investments. If coffee prices decline by U.S. \$1.50 per pound from the postulated planning levels, this would mean a decline in foreign exchange earnings of \$20-25 million, a nearly equal decline in GDP and government revenues, and a need for that amount of additional donor assistance.

Such a decline from planning levels for 1981-82 is quite possible. GDP in the 1970's grew at about the same rate as population, largely because of stagnation in the rural sector. The increase in coffee prices resulted in a major increase in cash earnings from coffee sales by small farmers, which were estimated to be up 125 percent in 1976 and another 72 percent in 1977. The total value of farm coffee sales grew from 800 million BuF before the price rise to 3,800 million BuF by 1977. At that time they probably accounted for 60-70% of the total cash sales by farmers. The increase in value of coffee sales would have meant an increase of 12-14 percent in total farm income.

In contrast with the sharp increase in the value of coffee, cotton production has declined and prices have not increased sufficiently to offset the decline in volume. In fact, cotton

prices, after rising sharply, have now fallen almost to the previous level. Tea, in contrast with coffee and cotton, enjoyed sharp volume growth in exports through the 1970's. However, the starting base was very small (100 tons in 1970).

Increasingly serious balance of payment problems are seen for Burundi after the current 1978-82 plan period. The debt service ratio will continue to rise, and coffee prices are expected to decline substantially relative to the prices of goods Burundi must import. Further, unless something significant is done to reverse the declining production of food per capita, the country will soon be faced with the prospect of diverting substantial foreign exchange to imports of basic foods, or see increasingly severe malnutrition for large numbers, and possibly starvation for a significant part, of its population. This argues for greater efforts in food crops and less, or at least no more, effort in coffee. It also signifies an increasing need for outside assistance.

d. Prices, wage rates and productivity

The Ministry of Planning has estimated the value of production per farm unit in Burundi from 1970 through 1976, as shown in Table V. Value of production per day was equivalent to about U.S. 30 cents for most of the period (in 1970 prices). For contrast, the wages of government workers are expressed in percentage figures based on the 1970 government salary as 100. Government salaries have been

readjusted to compensate for inflation on several occasions. Production per farm worker per day in real terms was slightly lower in 1976 than in 1970.

Table V

<u>Year</u>	<u>Average Production, in 1970 francs</u>			<u>Salaries of Govt. workers</u>
	<u>per farm unit</u>	<u>per adult worker</u>	<u>per day</u>	
1970	24,500	7,500	28.9	100%
1971	24,900	7,600	29.4	106
1972	21,900	6,700	25.9	127
1972	23,900	7,300	28.3	128
1974	22,400	6,900	26.5	147
1975	23,100	7,100	27.4	147
1976	23,400	7,200	27.7	175

(Source: Ministry of Planning, quoted in AGCD Report, Annex 8, page 14)

Average farm income has also been estimated by the Ministry of Planning, as shown in Table VI.

Most farm food production is consumed by the farm family, with only 5-7 percent reaching the market. For cash income, farmers depend on sales from a few coffee trees, from occasional surpluses above family needs of dry beans, peas, manioc and grains, or from off-farm employment when they can obtain it. About half the farm population raises some coffee, which has recently been a particularly lucrative source of income. Cotton and tea are also sold for cash, but in small volume.

Table VI

Plan Estimates of Average Income to Farmers, 1970-76

	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
Number of farms thousands)	548	552	571	582	594	605	616
Average income per farm (in thousands BuF) <sup>1/</sup>	24.5	24.9	21.9	23.9	22.4	23.1	23.4
Equivalent in U.S. Dollars (to support a family of 4 to 5 persons)	\$270	\$275	\$241	\$263	\$246	\$253	\$257
Average income per "adult worker equivalent"	\$83	\$84	\$74	\$80	\$76	\$78	\$79
Income received by the adult equivalent worker, per day worked, BuF.	28.9	29.4	25.9	28.3	26.5	27.4	27.7
Equivalent in U.S. Dollars	32¢	32¢	28¢	31¢	29¢	30¢	31¢

Source: Plan, Annex to Sec. 4.1.4.2. Value figures in 1970 francs.

<sup>1/</sup> Value of products sold and consumed on the farm.

Comments: The number of farms might be much too high. They were estimated from the arbitrary population estimates for each year, which are probably too high. This might have biased the income figures downward. The figure utilized for the 1970 population was 3,207,974 persons on 548,372 farms. One farm consisted of 1.3 families, or about 4.5 persons. 2.5 adult male equivalent workers were estimated to work on each farm. A year was considered to have 260 work-days for each equivalent worker.

Case studies of farm operations in two communities near the town of Karuzi in East Central Burundi, carried on by University of Burundi economists, found that expenditures for food took about 35% of the cash income available to the small farmers in Bugenyuzi and Buhiga. Other family needs took 49 percent; about one-half of this was for cloth and clothing. Farm production absorbed only about 15 percent of the total cash income, and no fertilizer or pesticides were purchased; the small amounts spent went for tools and sometimes for seed. Total cash sales and amounts obtained from sales of beer are both impressively high - about \$200 and \$70 respectively. Cash sales were about 50 percent of total face value of farm production.

Highlights of data about the average farms in each of the two communities follow below:

	<u>Bugenyuzi</u>	<u>Buhiga</u>
Area in farmland available for family use	1.66 Ha	1.7 Ha
Area in marshland available	<u>.62</u>	<u>.38</u>
Total land available	2.28 Ha	2.08 Ha

Total Cash receipts for the year:

Crop sales for beer	5,150 BuF	7,448 BuF
Coffee	2,284	4,016
Other farm products	3,800	5,164
Off-farm work	<u>2,578</u>	<u>6,436</u>
Total Cash Receipts	13,812	23,064

Cash expenditures for the year

were reported as	13,229	18,901
Savings were reported as	583	4,163

If to these cash incomes are added approximately 11,000 BuF for food produced and consumed on the farm, the Bugenyuzi farm with 24,800 BuF production is about "average" and the Buhiga farm is somewhat above the national average.

The SEDES<sup>1/</sup> study, published in March, 1973, indicates that the average Burundi farm family earned about 713 francs from selling foods and coffee in 1970-71 and spent about 329 francs on food products, more than half of which was for drinks (beer and bottled beverages). Other expenses were for salt and spices, plus small amounts of other foods during periods when the farm supply had been exhausted.

<sup>1/</sup> Societe d'Etudes pour le developpement economique et social.

Information on wage rates other than for civil servants is hard to come by. Civil servants have received increases in the last few years well in advance of the rise in the cost of living. In contrast, earnings of farmers, except for coffee growers, at best only kept pace with prices.

Coffee farmers, as noted earlier, have obtained major increases in earnings as a result of receiving a large part of the increase in world prices. The people in the province of Ngozi, which produces about 40 percent of the coffee but has only about 20 percent of the population, have probably benefitted disproportionately from the coffee price rise. They are likely also to suffer disproportionately with the decline in prices. The increase in income, however, does not reflect an increase in productivity. Labor productivity of both the subsistence and export crop farmers has declined slightly with the substantial increase in rural population, a smaller increase in food crop output and an actual decline in export crop output. One may hypothesize that with the rapid increase in coffee prices, more labor, not less, went into less coffee production.

Since September 29, 1976, the government has decreed a minimum wage: 80 francs per day in Bujumbura, 60 in Gitega and Ngozi, and 50 in the remainder of the country. There is a 10 percent supplement decreed for heavy physical labor.

Very little information is available on employment by sector. Fragmentary information puts farm employment at about 90 percent of the labor force, urban employment at 5 percent and hence, rural non-farm employment at about 5 percent.

The Ministry of Planning estimates total wage employment in 1975 at 121,000, with 18,000 of this in agriculture and fisheries, 20,000 in trade, 35,000 in service and another 48,000 salaried in the rural sector.

Burundi has suffered from inflation in the 1970's as have other countries, but not extremely so. The price index (1970 = 100) was only 160 in 1976. Prices of some food items apparently increased substantially during the period up to mid-1977 as indicated by data in Tables VIII and IX. This was particularly the case with charcoal, fresh vegetables, fresh milk, beer, and most imported items. Except for charcoal, these are mostly on the luxury side. In contrast, prices of many of the principal staples consumed by low income people apparently were fairly stable or even declined, especially from early 1976 to mid-1977, e.g., rice, potatoes, manioc, sweet potatoes, beans, and peas.

The sharp and continued rise in the price of charcoal is a matter of special concern, probably reflecting the destruction of forests and woodlands. A continued rise in prices of charcoal, and probably other forest products, is likely to assure the early licit and illicit destruction of the remaining forests unless very decisive measures are taken to prevent it.

e. Employment and unemployment

There are no data regarding rates of employment and unemployment in Burundi, and even the concepts themselves are hardly applicable in the situation which prevails.

The vast majority of the population is farmers, subject to the fluctuations in employment which accompany farming. Women do most of the work in the fields, although men work there as well. Various sample surveys show that about one household in three is headed by a woman. It is fairly common for the man to leave the household after children are born and seek paid employment elsewhere.

Opportunities for off-farm employment are limited, however. Foreign missions and agricultural projects employ some labor, and there are a few jobs in the urban areas. Basically, employment is provided by the farm and perhaps by some effort at marketing. Should new farm technologies be adopted which released labor, underemployment and unemployment might become a serious problem. At present, traditional practices are serving to keep the bulk of the labor force occupied, although there are signs that young people are becoming dissatisfied with rural life and are seeking an escape to the cities, where they face a dismal future at best.

f. Savings and investment rates

Capital formation in Burundi is low in general, and it is particularly low in the agriculture, fisheries and livestock sector. Although the sector contributes about 65 percent to GDP, it accounts for only about 20 percent of total capital formation. This level (about \$10 million a year) would be only 3-4 percent of the value of sector production.

Over the 1970-76 period, domestic savings limped along at a rate of 2 to 6 percent of GDP and investment was 6-10 percent of GDI (excluding changes in coffee stocks). In the early part of the 1970-76 period, private investment made up about 60 percent of the total, but by 1976 had fallen to about 35 percent. Private investment in real terms was about constant. The difference was a 150 percent increase in public investment levels in real terms (Table VII).

Both savings and investment rates increased with the rise in coffee prices beginning in 1976. The level of domestic savings is expected to decline with the drop in coffee prices. Whether investment levels are maintained will depend largely on the amount and terms of foreign assistance. This in turn will depend largely on availability of funds and availability of projects acceptable to donors. Funds are likely to be less of a problem than availability of projects, given donor standards and the ability of GOB to implement projects of the complexity required to deal with its more intractable problems, especially in rural areas.

The IBRD estimates the investment rate (in 1970 dollars) to have been U.S. \$35 million in 1977, and projects U.S. \$68 million in 1982, a 14 percent growth rate for a deficit resource balance in 1982 of U.S. \$37 million (at 1970 prices), about 10 percent of GDP.<sup>1/</sup>

<sup>1/</sup> IBRD, Tables 5.1 and 5.7, Economic Memorandum, Burundi, Report No. 1838-BU; April 25, 1978.

Table VII

	1970	1971	1972	1973	1974	1975	1976
<b>BURUNDI: Macro-Economic Framework (1970 Prices), 1970 - 76</b>							
		Expenditures in Gross Domestic Product (in millions of Burundi Francs)					
<b>Gross Domestic Product</b>	21,749.4	22,217.3	21,322.1	22,712.6	22,476.0	22,909.1	24,844.6
Gains from terms of trade	-	-649.9	-326.9	-285.6	-525.0	-1,163.7	439.2
<b>Gross Domestic Income</b>	21,749.4	22,267.6	20,855.4	22,427.0	21,951.0	21,745.4	25,303.8
<b>Consumption</b>	20,369.0	21,299.3	20,494.3	21,312.2	20,644.2	22,122.7	23,462.8
Public	2,073.4	2,200.2	2,222.7	2,113.1	2,033.3	2,048.2	2,790.8
Private	18,495.6	19,099.3	18,271.6	19,199.1	18,611.0	20,164.5	20,672.0
<b>Gross Investment</b>	1,379.2	2,166.4	988.2	1,374.9	2,240.8	1,619.7	2,364.7
Gross fixed capital formation	1,264.9	1,502.6	1,474.3	1,667.7	1,782.1	2,422.2	2,564.7
Private	(720.3)	(828.8)	(774.3)	(738.3)	(772.6)	(875.8)	(873.3)
Public	(344.6)	(673.8)	(701.2)	(909.4)	(1,009.5)	(1,557.4)	(1,491.4)
Change in coffee stocks	113.4	663.8	-487.6	-90.8	578.7	-802.5	-
<b>Resource Gap</b>	-197.9	-1,172.8	-316.9	-222.1	-24.0	-2,129.4	-1,167.2
Imports	2,468.1	2,940.6	2,833.3	2,639.3	2,832.7	3,626.7	3,313.4
Imports capacity	2,270.2	1,762.3	1,203.3	1,197.4	1,778.6	1,379.7	2,789.7
(Exports)	(2,270.2)	(2,212.2)	(2,742.4)	(2,483.0)	(2,303.6)	(2,723.4)	(2,330.3)
<b>Domestic Savings <sup>1/</sup></b>	1,180.4	266.1	261.1	1,114.8	1,306.7	-622.2	1,861.0
<b>Availability and Use of Real Resources (in % of G.D.P.)</b>							
<b>Gross Domestic Product</b>	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gains from terms of trade	-	-2.0	-2.3	-1.3	-2.3	-3.0	1.8
<b>Gross Domestic Income</b>	100.0	98.0	92.3	98.7	97.7	92.0	101.8
<b>Consumption</b>	94.6	92.8	92.8	92.8	91.8	95.9	94.2
Public	9.6	9.7	10.4	9.3	9.0	9.0	11.3
Private	85.0	84.1	83.4	84.5	82.8	87.9	83.2
<b>Gross Investment</b>	6.2	9.3	4.4	7.0	10.2	7.1	10.2
Gross fixed capital formation	5.8	6.6	6.9	7.4	7.9	10.4	10.3
Private	(3.3)	(3.6)	(3.6)	(3.4)	(3.4)	(3.8)	(3.5)
Public	(2.3)	(3.0)	(3.3)	(4.0)	(4.5)	(6.8)	(6.8)
Change in coffee stocks	0.5	2.9	-2.3	-0.4	2.6	-3.5	-
<b>Resource Gap</b>	-9.9	-3.2	-3.2	-2.0	-4.7	-8.9	-2.9
Imports	11.3	13.0	13.2	11.7	12.6	13.8	14.1
Imports capacity	10.4	7.8	10.3	9.7	7.9	4.9	11.2
(Exports)	(10.4)	(9.7)	(12.8)	(10.9)	(10.2)	(11.9)	(9.4)
<b>Domestic Savings as % of GDP</b>	5.4	4.2	1.2	2.0	6.0	2.0	7.3
<b>For reference:</b>							
Gross National Product	21,097.6	21,967.6	20,324.3	22,164.8	22,001.2	22,317.2	24,334.1
Gross National Income	21,097.6	21,317.7	19,987.4	21,879.2	21,476.2	21,373.3	24,793.3
National Savings <sup>2/</sup>	328.4	218.2	-306.9	587.0	831.9	-819.2	1,330.3
National Savings as % of GNI	1.5	1.0	-2.3	2.6	3.9	-3.8	5.4

Source: Ministère du Plan

<sup>1/</sup> Gross domestic income minus consumption.

<sup>2/</sup> Gross national income minus consumption. This figure differs from that of Table 2.3 by the terms of trade adjustment.

## 2. Demographic and Social Trends

### a. Demographic characteristics and social structure

The population of Burundi is composed of 3 principal ethnic groups and the history of the country and the present political situation are in large measure centered on the conflicts of these groups. The first people to occupy the area were the hunter/gatherer culture known as the Twa. They were displaced by the Hutu, an agricultural and goat herding culture who began to clear the forest. They were dominated in turn by the Tutsi, a tall nomadic herder culture, of Hamitic origin, which came on the scene about the 12th century and eventually extended control over the area. They maintained political, military and economic power by a feudal lord/vassal arrangement which made the Hutu dependent and subservient. The Twa, which now make up about 1 percent of the population, are mainly potters by occupation. The Hutu, which make up about 85 percent of the population, are mainly farmers. The Tutsi, traditionally herdsmen and landlords, now dominate the government, military and police and continue also to be the principal cattle owners.

The present Tutsi domination grew out of a violent power struggle in 1972 which resulted in the death or expulsion of vast numbers of Hutu who had achieved a degree of power and prestige - particularly the educated Hutu. Fear between the tall Tutsi and distinguishably shorter Hutu is a major social factor and an important constraint on development progress. The Hutu are afraid to become too prominent, or to be grouped together (e.g. in a village) or otherwise to make themselves a target for persecutions

such as took place in 1972. The Tutsi for their part are afraid of the consequences for them should the Hutu gain power. The implications of such a situation to donor supported development activities are real and must be considered carefully in any assistance strategy. For example, a concentrated pilot project aimed at subsistence farmers (Hutu) in a small, clearly defined area which became an impressive success probably would not be pleasing to either group - appearing as a potential nucleus of strength to the one and as a potential target to the other. At the same time a project to improve livestock of the dominant and higher income Tutsi would scarcely conform to AID's congressional directives.

Burundi is a nation of poor pasants. The poor peasant includes Murundi<sup>1/</sup> men, women, and children -- both Hutu and Tutsi and a Hutu-Tutsi admixture. In the aftermath of the Spring 1972 inter-ethnic civil war the poor, underproductive largely Hutu tiller has withdrawn into the colline,<sup>2/</sup> into his or her family in the rugo-homestead. The elite class that rules from Bujumbura is heavily dependent on the Murundi peasant for its own and ultimately the nation's very survival. The ruling class is fully cognizant of the risk of not pushing forward the development of the colline. For their own self-interest, if nothing else, then, the leaders will be compelled in the long run to take actions to increase productivity of the masses of small, predominantly subsistence farmers.

<sup>1/</sup> Name by which people of Burundi are known.

<sup>2/</sup> Literally, hill. Used to describe village or collection of villages.

Burundi society cannot be understood simply as a three-part ethnic or caste system -- Tutsi ("tall ones"), Hutu ("short ones"), and Twa ("outcastes"). It is a more subtle organization in which there is a cross-cutting of social class and ethnic lines. Over time, as the poverty of the average Murundi peasant increased and introduction of cash crops helped some of that poor majority to rise above the absolute poverty line, the caste division began to blur. Considerable intermarriage between Hutu and Tutsi has blurred it even more. To be sure, Tutsi continue to rule, with a small presence of Hutu in high Government positions, but beneath that line drawn by the power elite, there is mostly poverty and limited social mobility -- shared by Hutu and Tutsi.

On the colline level Hutu and Tutsi peasants often live side by side, intermarry and drink the favored banana beer together. The mistrust and suspicion stemming from past inter-ethnic hostilities have not disappeared, but the main preoccupation is coaxing sufficient productivity from a rapidly exhausting land base to stay alive, while unsuccessfully coping with the environmental degradation caused in part by their own farming and pastoral practices.

Most Burundians express a preference for a poor family with many children to a rich family without off-spring. This telling value is matched by the natural population growth rate of about 2.5 percent,<sup>1/</sup> which in itself is not so high. But, considering the

<sup>1/</sup> Other estimates place the growth rate at anywhere between 2.1 and 2.6 percent.

continuing reduction in available resources per person and the resultant degradation of the environment, this figure indicates a potential ecological disaster.

The average number of persons per square kilometer is high for Africa, about 150, reaching a high of 262 per square kilometer in the northern province of Ngozi. In the next several years pressure on the land will increase drastically, particularly given the present lack of any clear population policy. What is more distressing is that of several high fertility countries sampled, Burundi is the only one where the desired number of children exceeds the actual number. Thus, while having on average 6 children per family, Murundians actually desire 8.

A central value of Burundi family life, then, is to have many children -- that accomplishment conveying to the parents no small honor.<sup>1/</sup> That the value of a woman as derived from the consequences of her motherhood greatly complicates the work situation of the female peasant.<sup>2/</sup> Often left by herself to work the fields, the woman obtains some of the assistance she requires from her children. In time, however, the more children she brings

<sup>1/</sup> And also no doubt contributing negatively to the just over 45 and 50-year life expectancy of males and females, respectively.

<sup>2/</sup> In one sample of small farmers the head of the rugo was a woman in almost 1/3 of the cases. That is the result primarily of widowhood and male out-migration for work. Additionally, the general census shows women as having an almost 2% greater representation in the population. Such a condition is related to heavy male migration to nearby states for work, and to the refugee outflow and elimination of males in 1972.

into the world, the less effort she is able to render to far productivity. And, though seeming to be an illogical trap, the Murundikazi (or Murundi woman) has in fact minimized some of the risk by "investing" in the future labor potential of her children. In so doing, of course, there are also that many more mouths to feed, more child care to provide and, ultimately, greater pressures on the land.

The strong individualism of the family in Burundi society is a central fact which must shape any attempt at project intervention on the level of the colline. The Murundi see power as a steady diminution from top to bottom, with those at the bottom perceiving the arbitrary and emotional use of personal power as the major force shaping their lives. Political power and authority are central values, and Murundi are characterized as all being busy at politics, rich and poor, men and women, leaders and followers. But power is enacted in a fatalistic mold, because the poor peasant sees those at the top as possessing an innate sense of intelligence (ubgenge) and a total superiority (mukuru) over him/her. Such a personal and arbitrary exercise of power over the "inferior" can be seen as productive of a constant instability: first between those on top and those on bottom and second between those on the bottom who are competing for the favor of the "superior."

This same conception of power has its equivalence in the domain of the sexes. A decided male bias exists in Burundi society. In addition to ethnic differences which already divide the Murundi

people into groups, there are other forces which divide men and women. That, coupled with the heavy work role of women mentioned earlier, strongly points to the necessity of any project intervention in the agricultural sector to serve better the interests of the female peasant.

Along with a poor life-quality index (poor nutrition, low literacy, lack of medical care, lack of clean water, etc.) rural Murundians, especially women, work relatively hard for what little they get in return. Of the total active population, 85-90 percent is working in agriculture. That figure represented about 1.8 million persons in 1970, supposedly increasing to 2.2 million by 1980. This agricultural work force is said to be working at about 80 percent of capacity.

Because men often migrate to cash crop work in and out of the country, women are left behind to till the soil, performing up to an estimated 80 percent of the agricultural workload. The woman's role is not only fundamental in the production sector, but also in the sphere of shaping her children's attitudes and behavior, for it is she, in the main, who conditions the child's intellect, psyche, and subjectivity. It is from that conditioning that the rural family social security "system" has stemmed, in which there is strong mutual help between parents and married children in times of sickness, in caring for children, and providing counsel, food, and financial assistance.

b. Nutrition levels

Subsistence production and the Burundi diet are made up primarily of legumes, root crops, coarse grain, cassava and bananas. There is evidence that nutritional levels are low in terms of total energy, and that there is a deficiency in certain amino acids, vitamins and minerals. Further, evidence from production data and GDP indicates that levels are declining. We can conclude that nutritional intake is directly correlated with farm size and level of per capita income.

Intakes are seasonal, especially for lower income groups which often must sharply curtail consumption just prior to harvest when their stocks are running low. Food intakes were estimated nationally to average about 1900 calories per capita compared with need of 2,100 to 2,200.<sup>1/</sup>

There are several inconsistencies in the data. A 1971 study estimated caloric intake at 1900 calories per capita, per day, and a 1976 study also put levels at 1900. Yet food output is estimated to have grown at less than 1 percent per year while population grew at 2.2 percent (or 2.5 percent according to other figures). Thus, we would expect food availability in 1976 to be 6 to 7 percent less per capita than in 1971. A sampling error in the estimates might explain this discrepancy. That is, the 1971 intake might have been a bit higher than estimated, growth in

<sup>1/</sup> SEDES, Enquete statistique alimentaire et budgetaire 1970-71, March 1974.

production a bit higher than one percent and 1976 intake below the estimated 1900 calories.

Data supported by judgements of informed observers indicate that land availability per capita is declining, and soil fertility and crop yields also are declining with the increased population density and serious soil erosion. Thus it is evident that per capita food production is declining and, with insignificant imports, per capita intake also must be declining. Further, the smaller farms and the poor farmers in the Central Plateau get less than the average. Certain groups in the family also fare relatively less well.

Separate nutrition data are not available for individual provinces, much less for groups within the provinces. Little information is available on relative food intake of different members of the family, but indicators such as malnutrition clearly point to the relative disadvantage of women and children. The poor peasant families of the Central Plateau and especially the more vulnerable members of the family are an appropriate AID target, but a difficult one to reach.

### 3. Political Trends Since Independence

Burundi became independent in 1962, under a constitutional monarchy. In November, 1966, the monarchy was overthrown and a republican government proclaimed. In 1972 and 1973 a violent internal struggle for power took place between the two principal

tribes - the Tutsi and the Hutu. This civil strife produced profound economic dislocation and disrupted Burundi's relationships with its neighbors.

In 1973 civil order was restored, but only after many of the Hutu intellectuals had been eliminated. The Tutsi emerged as the dominant national group, and now control the government, the military and the police despite the fact that in terms of numbers they are clearly a minority.

Burundi is governed by a military group which took power by coup in September, 1976. Military offices are located in each of the eight provincial town centers for administrative purposes. There is only one political party - UPROHA.

B. Potential of the Agriculture Sector

1. Demand For Agricultural Products

a. Growth of the national economy and exports

As noted earlier, until the sharp upsurge in coffee prices in 1976, the economy was growing at a rate less than the rate of growth in population. The primary sector was growing at less than 1 percent per year in real (value) terms and the export sector not at all. The increase in coffee prices channeled a large amount of cash into the country and the countryside, but there was little to buy with the increased income. A reservoir of that cash influx may still remain, but inflation has eroded its value. Meantime coffee prices have been declining.

The national plan calls for a 4 percent annual rate of growth in the 1978-82 period, with the primary sector growing at 3 percent (in real terms). However, there is little prospect for a reversal in the near future of the virtual stagnation in the production of non-export crops. Further, while expansion in the production of coffee, tea and cotton for export is possible, and even probable (at least for coffee and tea), prices for the output are expected to be lower. Hence, income even from an expanded volume of production and export may be less than in 1977-79. The prospect then is for declining per capita production in the primary sector (of subsistence crops, livestock, fish and forest products) and a decline in current dollar value of even an increased output of export crops.

Off-farm employment opportunities in Burundi are likely to grow very slowly, and for the near future, provide employment for only about 10 percent of the total work force (equal to the estimated percentage of the work force now employed in both rural and urban off-farm jobs). Total income for the primary sector may continue to grow at a rate of about 1 percent per year, but per capita income will decline over the next several years except possibly for an occasional year of unusually good weather.

A rapid rate of growth in the secondary and tertiary sectors, if adequately stimulated by financial resources (e.g. foreign assistance), might result in an overall increase in average per capita income. This would require a sufficient increase in income for the 10 percent of the population which is non-agricultural to more than compensate for a decline of about 1 percent per year in the incomes of the 90 percent dependent on the

primary sector - unless more effort on income redistribution occurs than now seems likely. The 1978 IBRD report states that if all the presently identified projects were implemented, they would create only 6,800 new jobs.<sup>1/</sup> A decline in incomes of the predominantly low income primary sector population can be expected to result in some shift to basic subsistence foods from expenditures on items not essential to survival. It probably will also mean a disproportionate decline in living conditions of the vulnerable groups in the poorest families (women and children).

If income growth in real terms among the already affluent, non-primary sector population is rapid, there is likely to be a small but real increase in the demand for luxury goods and higher value or higher status domestic goods. Imports of consumer non-production goods likely will increase. This would imply some increase in demand in urban centers and towns for farm produce, such as animal products, fruits, and vegetables, but probably not enough to make a significant impact on rural poverty. Further, farm families will likely have less available for sale. Market towns, other than Bujumbura and Gitega, scarcely exist, and to the extent vestiges exist, they can be expected to suffer from the general rural stagnation and not offer profitable outlets for farm products.

A rudimentary distribution system for farm products to off-farm consumers does function, but the volume of trade in this impoverished, subsistence economy is small, particularly trade

<sup>1/</sup> IBRD, Economic Memorandum, Burundi, 1978, page 20.

outside the immediate production area.<sup>1/</sup> Modernizing inputs are scarcely used and where used are restricted to export crops. Still this rudimentary system might be developed as a basis of a modernized agriculture carrying farm products out and imports and consumer goods to farms - if other needed measures are taken.

b. Marketing and distribution

Market facilities are well-developed for the export crops of coffee, tea, cotton and hides. Facilities for handling other agricultural production are primitive.

A central market exists in Bujumbura, and in a few of the other larger towns. Small local markets, on an open plot of land, are gradually being established. The farmers who can take their produce to any of these markets are those who can walk, with their goods on their heads, or can afford to take a jitney-truck which carries both passengers and cargo for a fee which depends on distance and the amount of cargo. Most farmers are at the mercy of merchants. Few of them possess the equipment or the knowledge to store their goods on their own farms in good condition. At the time of harvest, when the crop is plentiful everywhere, farmers must take very low prices if they need cash. If they later find they have not saved enough for food or seed, they must go into the market and pay much more than they initially received for the crop. The price differences between farm gate and city market

<sup>1/</sup> The exceptions are, of course, the cash crops of coffee, tea and cotton.

undoubtedly are high, but very little information is available about them.

Data collected in the two cities of Gitega and Bujumbura in 1976 and 1977 show large differences in prices. For some products, such as green bananas, potatoes, manioc, vegetables, fresh milk and some types of meat, prices were 50 to 100 percent higher in Bujumbura than Gitega at about the same time. Part of the spread could represent differences in quality, of course. For a few products, as one might expect, prices were lower in Bujumbura, e.g., sugar, primus beer, wine, coca-cola, clothing, appliances, and petroleum products.

If large price differentials exist between the two principal market areas, only about 125 km apart and connected by a good road, one can imagine what kind of price differentials are likely to exist between more remote farms and market towns such as Gitega, or between the farm and Bujumbura (Tables VIII and IX).

While the lack of competition among market intermediaries is most often cited as the reason for the substantial price differentials between farm and market, high transport and storage costs and losses also play an important role.

There are few market outlets for the Burundi peasant; rural markets are held infrequently and often a great distance separates the peasant from the nearest periodic market. Those peasants in the interior of the country usually install themselves along

**Table VIII BURUNDI - Market Prices of Consumer Goods**  
**In Bujumbura, first Half 1976 and 1977**  
(In Burundi Francs, quarter averages)

	Unit	1976		1977	
		1st Qtr.	2nd Qtr.	1st Qtr.	2nd Qtr.
Green Bananas	Kg	11.8	10.6	10.7	10.0
Rice	"	66.8	45.9	66.7	50.6
Potatoes	"	20.2	22.4	17.6	23.2
Manioc Flour	"	23.2	22.8	21.4	17.4
Bread	Loaf	25.0	25.0	25.0	25.0
Manioc	Kg	12.3	11.7	9.2	8.3
Sweet Potatoes	"	13.3	11.2	7.3	6.9
Dried Beans	"	29.1	29.6	27.4	25.3
Dried Peas	"	42.7	48.4	38.0	36.5
Tomatoes	"	29.7	36.5	42.6	52.3
Leeks	"	25.4	25.5	38.7	37.4
Onions	"	38.6	41.1	58.0	71.5
Other Vegetables	"	13.8	14.4	13.1	16.4
Fruits	"	17.2	15.7	14.2	13.5
Domestic Meat	"	120.0	120.0	120.0	120.0
Chicken	"	77.8	94.5	97.0	88.0
Fish	"	59.5	75.4	72.4	69.1
Fresh Milk	Lt	30.0	31.3	40.0	40.0
Palm Oil	75 cl.	44.9	51.8	47.4	49.5
Sugar	Kg	72.5	70.0	72.5	73.9
Salt	"	32.0	37.2	41.8	35.5
Beer, Primus	Bottle	33.5	33.5	35.0	35.8
Banana Beer	75 cl.	8.1	8.5	9.9	14.7
Ordinary Wine	Bottle	160.0	160.0	200.0	200.0
Coca-Cola	"	12.8	12.8	12.9	13.1
Imrutano	4 m	1,264.5	1,234.7	1,453.6	1,745.3
Suit, men	Unit	9,920.8	9,060.8	9,575.0	10,239.2
Pants, men	"	1,993.2	2,031.3	2,087.5	2,087.5
Shirt, men	"	660.0	660.0	660.0	660.0
Shoes, men	Pair	1,411.3	1,755.5	2,120.0	1,931.2
Shoes, ladies	"	911.1	1,379.5	1,179.2	1,191.2
Shoes, children	"	689.8	637.8	691.5	713.9
Blankets	Unit	220.0	222.9	230.0	250.0
Rent	Apt.	1,100.0	1,100.0	1,100.0	1,100.0
Charcoal	Kg	7.7	7.9	10.9	13.0
Electricity	Kwh	4.5	4.5	4.5	4.5
Water	m <sup>3</sup>	13.0	13.0	13.0	13.0
Kerosene	lt	24.0	31.9	30.0	25.3
Refrigerator	Unit	23,500.0	23,500.0	28,500.0	36,720.0
Radio	"	6,000.0	6,000.0	6,000.0	6,200.0
Oil burner	"	750.0	750.0	1,000.0	1,000.0
Soap	300 grs.	18.8	18.0	18.0	18.0
Houseboy	-	825.0	825.0	825.0	825.0
Bus	Ticket	8.0	8.0	8.0	8.0
Bicycle	Unit	12,000.0	12,000.0	12,000.0	11,800.0
Motorcycle	"	72,420.0	72,420.0	72,420.0	72,420.0
Gasoline	lt	23.6	24.9	27.5	27.5
Football	seat	30.0	30.0	30.0	30.0
Cinema	"	125.0	125.0	125.0	125.0
Tax	-	5,392.0	5,392.0	5,392.0	5,392.0
Cigarettes	Packet	27.0	37.3	20.9	20.0

Source: Department des Etudes et Statistiques.

Table IX BURUNDI: Market Prices of Consumer Goods in Gitega, 1974-76  
(In Burundi Francs)

	Unit	Monthly Average		
		Oct. 74	Oct. 75	Oct. 76
Green Bananas	Kg	3.4	4.7	5.9
Rice	"	49.5	44.1	48.8
Potatoes	"	18.5	15.1	14.9
Manioc Flour	"	10.2	16.5	18.6
Bread	"	20.0	25.0	25.0
Manioc	"	4.1	6.6	6.5
Sweet Potatoes	"	2.4	4.6	4.1
Dried Beans	"	24.2	25.2	25.3
Dried Peas	"	33.8	27.4	32.0
Tomatoes	"	16.8	11.8	17.2
Leeks	"	10.9	8.3	17.5
Onions	"	30.8	28.8	52.0
Other Vegetables	"	10.9	8.4	8.8
Fruits	"	13.5	11.9	11.3
Domestic Meat	"	82.5	80.0	80.0
Chicken	"	62.6	48.8	66.7
Fish	"	104.2	62.6	80.5
Fresh Milk	Lt.	10.0	17.0	18.0
Palm Oil	75 cl.	64.0	43.2	45.0
Sugar	kg	70.0	95.0	88.7
Salt	"	25.4	14.6	35.7
Beer, Primus	75 CL	40.0	40.0	40.0
Banana Beer	"	10.0	10.0	12.5
Ordinary Wine	Bottle	140.0	160.0	180.0
Coca-Cola	"	15.0	15.0	15.0
Imvutano	4m	1615.0	2041.1	2250.0
Suit, men	Unit	6866.7	8750.0	9833.3
Pants, Men	"	1750	2083.3	2337.5
Shirt, men	"	625	800.0	800.0
Shoes, men	Pair	-	-	1998.7
Shoes, ladies	"	-	-	1146.7
Shoes, children	"	-	-	770.4
Blankets	Unit	204.8	210.6	246.6
Rent	Apt.	-	-	1100.0
Charcoal	kg.	4.3	4.6	6.5
Electricity	kwh.	5	4.5	4.5
Water	m <sup>3</sup>	8	13.0	13.0
Kerosene	lt.	19.2	20.9	21.7
Refrigerator	Unit	-	-	28560.0
Radio	"	3200	4752.0	3500.0
Heating Oil	"	-	-	1000.0
Soap	300 grs.	20.0	20.0	16.5
Houseboy	-	-	-	825.0
Bus	Ticket	-	-	8.0
Bicycle	Unit	9000	10000	11250
Motorcycle	"	-	-	72420.0
Gasoline	lt.	24.0	24.8	28.7
Football	Seat	-	-	30.0
Cinema	"	120.0	120.0	125.0
Tax	-	5392	5392.0	5392.0
Cigarettes	Packet	29.4	25.0	35.6

Source: Departement des Etudes et Statistiques

These data imply that little new land is available, and hence, major increases in production must come (1) from increased cropping intensity and increased yields mainly of subsistence crops, which occupy the major part of the crop land, and (2) from increases in the productivity of pastures and livestock. Yields are low, typically 20-25% of yields feasible under prevailing climate and soil conditions. Furthermore, yields are declining and the land resource base is being reduced by erosion.

Cultivation techniques are rudimentary. Intercropping frequently is followed to reduce the risk of a complete crop failure and in the hope of increasing total output. Commercial fertilizer is not used except occasionally on export crops. Organic fertilizer traditionally was used on subsistence crops, but with the decline in the availability of wood, animal manure is being used increasingly for fuel.<sup>1/</sup>

Major improvement is possible in food and forage crop yield, the application of commercial and organic fertilizers, and better soil tillage methods. In some areas irrigation may be possible. Such changes on a large scale would require a massive information program to teach farmers how to farm better, price incentives, an expanded system for the supply of inputs at reasonable prices, a

<sup>1/</sup> Commercial fertilizer is being used currently at the rate of about one kilogram per hectare - equivalent to 0.25-0.50 kilogram of nutrients. This must be one of the lowest usage rates in the world. Most imported fertilizer is used on export crops. Use on food crops is almost zero.

principal highway and await one of the travelling traders who frequent the route by truck. In the ensuing bargaining between the peasant and trader/trucker, the peasant is relatively disadvantaged. He does not want to return home without having sold his product. Further, he does not know when the next trucker will be coming through the area. Presumably, this scenario represents the uncompetitiveness referred to above. Further, with gasoline selling at about \$3.50 per gallon legally, when available, and reaching \$8.00 per gallon on the black market, the relatively high cost of transport in Burundi and its inclusion in the trader's margin cannot be ignored.

Coffee is also collected by truckers, who theoretically pay the farmer the official government producer price; again, claims of trucker noncompliance and underpayment to the producer are common.

## 2. Supply of Agricultural Products

### a. Physical and human resources

Land use by major subsistence crops in 1976 was as follows (in thousand hectares): beans 527, sorghum 111, maize 305, cassava 206, sweet potatoes 247. Permanent pasture accounted for 880,000 hectares, coffee 30,000, tea 4,000 and cotton 8,000. (Production is shown in Table I). Only about 150,000 hectares not now in use are considered suitable for cropping.

marketing system to permit farmers to sell their surplus to pay for inputs and other needs, and an efficient credit system at least on a modest scale. It will also require tenure security and confidence.

The number of livestock on farms is not known, but cattle are estimated at about 750,000 head, and sheep and goats almost a million. Livestock are considered more a store of wealth and a status symbol than an important productive asset. Production and offtake for slaughter are low, and death losses high. The production of pasture lands has been severely reduced by past overgrazing and from what are essentially open (communal) and uncontrolled grazing systems. Livestock yields can be increased by a variety of measures such as better pasture management and stall feeding, but whether such changes would be acceptable is questionable.

Small size of farms, lack of alternative employment, and low and generally declining subsistence crop yields combine to hold income to the barest subsistence level for the vast majority of rural families. Health and education facilities are grossly inadequate and other amenities such as electric power and running water are virtually unknown outside Bujumbura, the capital.

The production of food and export crops is carried out on large numbers of very small farms. The notable exceptions are a few government farms of 200-300 hectares mainly growing tea. Farms in the densely populated Zaire-Nile Crest and Central Plateau are

mostly below one hectare in size, with only a few above 2 hectares. In Gitega, practically all are below 0.5 hectare. In the plains area, farms tend to be somewhat larger, but even there the number above 4 hectares is small. Four hectares is the amount allocated by the government per family in its successful settlement program in the plains area.

Farming is a family affair with little outside hired help and with production limited mostly to subsistence crops. Though most farms are small, a wide variety of crops is grown (bananas, beans, cassava, potatoes, coarse grains and vegetables), some (usually small) ruminant livestock are kept, beer is brewed for sale, and handicraft work is performed. About 50 percent of the 700 to 800,000 farms produce some coffee, cotton or tea, but for the most part it is a miniscule quantity; and not all producers, by any means, produce these products under modern methods.<sup>1/</sup> Only about 10 percent of the value of subsistence crops produced (mainly cereals, bananas, root crops), are marketed, and most of this small percentage is consumed nearby. Banana beer or bananas for beer make up a major part of the non-export crop sales.

It is difficult to be optimistic about the future of the primary sector. The resource base is substantial measured in terms of climate, soil, and terrain, but environmental degradation, particularly loss of soil fertility, erosion, cutting of forests

<sup>1/</sup> Most farmers producing coffee have only about 100-200 coffee trees. Tea which is grown on private farms is carried to one of the government tea estates for processing. Cotton production is limited to those farmers who have access to a cotton gin.

and overgrazing are expected to continue. The real question is whether it is already too late to reverse this now accelerating process. One continuing question is the willingness and ability of the GOB to formulate and implement sound projects, especially projects aimed at the lower income groups in society, such as the subsistence farmers.

This is not to suggest that the potential does not exist. There is a great potential for an increase in cropping intensity and yields. Two crops per year are possible in most areas compared with an average now of about one. Some new land could be opened up for cultivation, adding about 10 percent to existing hectarage. Yields could be increased two- to four-fold on cropland, and yields of livestock products even more. These changes, however, would require a complete restructuring of the farming and livestock systems; major inputs of improved livestock, seeds, fertilizer, and pesticides; and organized marketing and farm supply systems. It would require major investments both on and off the farm.

In summary, the basic climate, land and water resources are there. The rest is up to mankind. The human capital will require major investments both in developing new capabilities and in motivation. A large-scale program will be needed to train people in the use of more productive and resource-conserving methods, and to stimulate and motivate individual and joint efforts. Some cultural constraints must be overcome. A key actor in the dramatic change must be the peasant family and within that family

both men and women - women as principal crop tillers and men as the likely dominating power in the family structure.

While the full implementation of such an effort should be viewed as a matter for several decades, its initiation should be viewed as the most pressing and immediate priority.

b. Economic resources

Improved seed, fertilizer and pesticides are not generally available in Burundi, and the GOB does not appear to see the crucial importance of making them available, (e.g., imports of fertilizer in 1978-79 totalled only 483 mt).

In research tests all crops except sorghum returned more than double the amount invested in fertilizer. Potatoes produced an additional yield six times as high as the fertilizer cost. The data reflect the effectiveness of fertilizer on crops planted in lines but without mechanized cultivation (Table X).

Table X  
Comparative Benefit/Cost Ratios, 1973-77, for Selected Crops

Crop	NPK-kg/ha	Benefit/Cost Ratios*					Average
		1973	1974	1975	1976	1977	
Maize	40-60-0	2.4	1.7	1.3	2.1	5.7	2.7
Wheat	30-55-30	2.5	1.4	1.6	2.5	2.6	2.3
Irish Potatoes	40-40-60	8.6	2.9	5.0	6.3	7.2	6.0
Beans	17-57-30	1.7	0.8	1.9	3.3	3.2	2.2
Peas	17-57-30	3.2	1.1	2.1	2.7	4.1	2.7
Rice	20-45-40	-	-	0.8	3.6	-	2.2
Sorghum	25-30-30	-	-	-	2.2	1.1	1.7

\* Value of the incremental product yield increase divided by fertilizer cost.

Despite these favorable results, fertilizer consumption in Burundi has remained stagnant as reflected by the practically unchanged and lately declining import volume:

<u>Fertilizer Imports in MT*</u>	
1970-71	1,368
1971-72	1,309
1972-73	1,412
1974-75	2,809
1975-76	1,668
1976-77	798
1977-78	1,842
1978-79	463

\* Source: Banque de la Republic du Burundi

Although fertilizers imported by the government enjoy a 50 percent price subsidy, fertilizer use by small farmers has remained insignificant. This must be ascribed mainly to the lack of forceful field extension, the absence of an efficient fertilizer procurement and distribution system, and the fact that most fertilizer imports are allocated directly to special project use.

The distribution of available farm supplies is restricted largely to government organization with no concept or plan for use of the city, town and village tradespeople to provide linkages to the 700,000 or 800,000 small farmers who must have these inputs. The distribution is clearly beyond the capacity of government agencies, and to the extent it is undertaken, it is a diversion from the information dissemination which the government should be performing.

As one grave consequence of the failure to apply fertilizer, per hectare yields have continued to decline to an alarmingly low level as is illustrated by the comparison in Table II.

Research and extension organizations exist, but up to now, they have concentrated almost exclusively on export crops and to some extent on livestock. An extension for subsistence crops must be built almost from scratch, including research facilities and staff development, mobilization and training of extension workers and their effective deployment into remote rural areas.

Most storage facilities at the farm level are believed to be inadequate; consequently, product losses are high. The where, when and how much of these losses are unknown.

Identification and quantification of both production and post-harvest losses and the development of an appropriate remedial program are needed. More needs to be known about the seriousness of transport and marketing as constraints on modernization of production and conservation of resources. The view commonly encountered that subsistence farmers cannot afford inputs because they have little to sell, and in fact are frequently net food buyers, must be set aside. The fact, of course, is that it is generally more economic for the net food buyer to buy and use fertilizer than for the commercial producers. He is in effect substituting the fertilizer purchase for food purchases which he otherwise would make at the high between-harvest retail prices. The commercial grower is likely to sell his incremental product at much lower farmgate, harvest-time prices.

Major efforts are needed to develop public institutions which can and will support development of low income farmers. Existing institutions and additional needs are described in detail in individual reports. Recommendations to AID are outlined in Chapters IV and V.

## II. THE RURAL POOR MAJORITY

### A. Distribution by Geographic Area

Burundi differs from the common pattern of income and asset distribution in less developed countries where a few rich, landed families live in relative luxury amidst the masses of landless, or virtually landless and desperately poor. Burundi has desperately poor families in large number, but there are no rich landholding families and very few of the poor are completely landless. Practically every farm family has at least a small plot on which it can grow some food.

The typical size of farms is about 1 hectare. In three of the four provinces on which data are available, about one-fifth of the farms are below 0.5 hectares, and about 10 percent above 2 hectares, but large holdings are virtually non-existent except for some government operated tea plantations of up to 200-300 hectares in size. In the fourth province, Gitega, 100 percent of the farms are reported to be below 0.5 hectares.

#### 1. Urban Areas and Growth Centers

If there is a relatively affluent elite in Burundi, it is to be found in non-agriculture (urban) sectors, primarily in the capital city of Bujumbura where trade, a small amount of industry, and the substantial bureaucracy are concentrated. While 90 percent of the population is classified as directly dependent on farming and 95 percent is rural, the attribution to GDP of agriculture (crops,

livestock, forestry and fisheries) at present prices is only about 65 percent of the total. The attribution of the small urban population is disproportionate to its size. If the 90 percent of the population assumed to be directly dependent on farming produces 65 percent of GDP and the 10 percent non-farming produce 35 percent, the ratio of contribution is about 5 to 1. If we assume that the contribution of the rural non-farm group, per capita, is essentially the same as the farm group, then the 95 percent rural population would account for about 68 percent of GDP and the 5 percent urban population for 32 percent of GDP, a ratio of urban income to rural of about 9 to 1 in favor of urban areas.

Even if these figures are somewhat exaggerated, it is clear that the rural areas are much worse off than the urban areas. There probably are some very poor in the urban areas, especially among recent migrants, but the number necessarily must be small. The capital is the only real urban area. It is the center of trade and most of the industry, including food processing. It is the principal "growth center" and only market town of note. Gitega might also qualify as a market town with its 25,000 population, and each of the other provincial capitals is a very small market center.

Farm families who are well situated with respect to production and marketing of the principal cash crops (coffee and tea) generally are better off as measured by income than other farmers. Illustratively, in Ngozi, the main coffee area, cash incomes of

\$78 per capita were reported in 1971.<sup>1/</sup> According to this report, 36 percent of the cash income came from coffee, 19% from sale of bananas for beer, 21% livestock and 14 percent food crops. Nationally about 8-10 percent of production (by value) has typically been accounted for by the principal export crops, mainly coffee.

## 2. Principal Ecological Zones

There are three principal ecological zones with significantly different types of agriculture and somewhat different socio-economic conditions. The most densely populated and economically important is the central plateau area which ranges from 1500 to 1900 meters in altitude; rainfall averages 1000-1200 mm. and temperature 19-20°C. This is the principal coffee area of Burund and arabica coffee is the principal cash crop. Farms are small and intensively farmed; yields and incomes are low and probably declining.

The second most important area is the plains and intermediate zone where altitudes range from 700 to 1500 meters, temperatures average from 20° to 25°C and rainfall ranges from 800 to 1200mm. This area is generally much less densely settled than the central plateau area, farms are larger and incomes somewhat higher. Robusta coffee, rice and cotton are important cash crops.

<sup>1/</sup> USAID, Coss, page 14. Original source 1971 SEDES report on Muyinga and Ngozi.

The third zone is the high altitude zone - 1900-2500 meters. In this area precipitation averages 1300-1600 mm and temperatures 17-19°C. This is the major tea, wheat and Irish potato growing area.

There are important cash crops in each area. In all three areas, however, subsistence crops occupy the major part of the cropped area.

### 3. Hillside Versus Valley of Plains Area

The hillsides versus valleys was suggested as a possible basis for delineation of areas for attention. However, examination of the terrain and farm organization indicated that this distinction is unlikely to be operationally useful. The socio-economic distinction between hills and valleys in the Central Plateau is blurred by the common ownership by families (in a colline) of land in the valley and up the hillside.

The true plain, as noted elsewhere, is restricted to a small area along Lake Tanganika and the Ruzizi River which is generally not densely populated.

### 4. Export Crop Zones Versus Subsistence Crop Zones

Another possible basis for classification is export crop zones (mainly coffee) versus subsistence crops and livestock. This too is blurred by the large percentage of farms with both subsistence

and cash crops and the high percentage of farmers who possess some livestock, usually sheep and goats. Cattle ownership tends to be more concentrated than land crops or small ruminants. A recent survey in Kirindi Province found that 27 percent of the land owners owned 50 percent of the land, but 5 percent of families owned 50 percent of the cattle.

Export crops have received much greater attention than subsistence crops from the government in the form of marketing help, price guarantees, research, and extension. They have also received most of the little chemical fertilizer available.

Cattle also have received relatively more attention from the government than subsistence crops. This would argue for subsistence crop emphasis within a zonal orientation, with activities in urban areas only to the extent essential to provide support for basically rural activities. Of the three principal ecological zones, the Central Plateau should be the primary candidate in any program aimed at the poor majority, and the Zaire-Nile Crest second. Within the plateau, there are significant differences in population density as illustrated below:

Density of Most Highly Populated Provinces of the Central Plateau

<u>Province</u>	<u>Population</u>	<u>Inhabitants/Km2</u>	<u>No. of Collines</u>
Muranuya	429	258	216
Gitega	650	178	385
Muyinga	462	120	326
Ngozi	749	<u>262</u>	<u>581</u>
	Average	= 204.5	Total = 1,508

These population density figures would seem to suggest a major concentration of effort in Ngozi. Based on farm size, however, more emphasis should be placed on Gitega, where all farms were reported to be below 0.5 hectares compared with only 20 percent below 0.5 hectares in Ngozi. Further, Ngozi is a more concentrated coffee growing area and has received considerable assistance for that reason. Population and density by province are shown in Table XI.

B. Sub-groups

Three candidate sub-groups have been suggested for major concentration. These are rural landless laborers, traditional farmers, and rural women.

1. Landless Laborers

Figures vary on the amount of off-farm employment that is available. Ten percent is the figure usually used to represent that part of the labor force working in non-agricultural jobs. Of that 10 percent, about half belong to the relatively affluent urban work force. A small percentage find work in the larger agricultural projects, and some are employed as farm labor by other farmers during planting and harvesting seasons, but opportunities are quite limited. The principal factor in low levels of employment outside of family farm labor is the very limited opportunity either on farms or elsewhere.

TABLE XI

## POPULATION IN BURUNDI 1976 AND DENSITY BY PROVINCE

<u>Arrondissement</u> <u>Province</u>	Population	Area Km.2	Density Pop./Km.2	Communes	Hills
Bubanza	115,000	1,190	97	2	60
Cibitoke	115,000	1,480	78	2	38
<u>Bubanza, province</u>	230,000	2,670	86	4	98
Bujumbura	115,000	270	426	2	15
Mwisale	230,000	985	234	6	135
<u>Bujumbura, province</u>	345,000	1,255	275	8	150
Bururi	235,000	2,240	105	6	165
Makamba	162,000	2,440	66	5	108
<u>Bururi, province</u>	397,000	4,680	85	11	273
Bukirasazi	225,000	1,025	220	4	155
Kitega	240,000	1,065	225	4	123
Karuzi	151,000	1,230	123	3	107
<u>Kitega, province</u>	616,000	3,320	185	11	385
Muramvya	193,000	665	290	4	91
Mwaro	214,000	845	253	5	125
<u>Muramvya, province</u>	407,000	1,510	270	9	216
Kirundo	240,000	2,060	116	5	151
Muyinga	199,000	1,435	139	5	175
<u>Muyinga, province</u>	439,000	3,495	126	10	326
Kayanza	418,000	1,330	314	8	315
Ngozi	293,000	1,265	232	7	266
<u>Ngozi, province</u>	711,000	2,595	274	15	581
Cankuzo	84,000	1,815	46	2	122
Rutana	125,000	1,395	90	3	102
Ruyingi	146,000	2,235	65	5	174
<u>Ruyingi, province</u>	355,000	5,445	65	10	398
Burundi	3,500,000	24,970	140	78	2,427

There is a considerable amount of adult male absence attributed to outside work or search for work. One study put this at 30 percent of the adult males in one area. The small farm size and substantial amount of adult and juvenile labor per family lead to the conclusion that underemployment or unemployment must be very commonplace through out most of rural Burundi. Add to this the number of young people reaching working age each year (about 100,000) and an unemployment/underemployment problem of major proportions is in prospect. Small farms too small to support a family exist, but landless families are almost non-existent. Thus, the excess labor in the family (i.e., the man) may search for outside employment, but in an emergency the strong family tie will bring him home and give him some employment.

## 2. Traditional Farmers

Practically all can be classed as traditional farmers. There are a few modernized government tea plantations, and some farms have modernized small sections of their crop land for export crops. (The Graetz report presents data on percentage of modern versus traditional farm activities by major zones.) The central plateau has a very high percentage of traditional farm activities. In general, traditional farm activity is concerned with subsistence crops plus livestock. This type of farming accounts for about 90 percent of the total primary sector contribution to GDP. These two subsectors should be primary candidates regardless of area selected.

### 3. Women

The role of various members of the family, particularly women, in farm activity has been discussed at length in the Mason Report and in somewhat less detail in Chapter I and other individual reports.

In addition to the responsibility for home and children, women play an important role in Burundi, both in decision making (e.g. one-third of the farm households are headed by women) and in farm work, where they generally contribute substantially more time to farming than men. There has been practically no official effort to improve their lot. Nutrition data leads us to conclude that they suffer more than adult males from inadequate food intake. We do not know the cultural problems that might be encountered in a program directed to them, but their needs certainly justify the effort. Side benefits in terms of a reduced population growth rate also may be significant.

In Burundi society, the Murundikazi (Murundi woman) is accorded a social position inferior to the male. She has little political power, few legal rights, cannot inherit land or cattle, and has virtually no right to independent action outside the house. Thus, women must attain their goals by means of men, essentially men in whose favor they happen to be. But, and this is no small condition, in the absence of men, women often direct the life activities of family ruge and fields. In that sense, women have liberated the man to pursue other activities, including crop work, schooling, and some not-so-productive diversions. In doing so, however, the men have invented for women a socio-economic role which weds them to the hoe.

Despite the claim that men possess more physical energy than women, the woman on average works more in making the production unit productive. One study depicted an average of 1.1 male and 1.6 female work units per production unit. Further, the woman puts in considerably more time in the fields than her husband, when he is present: 8-1/2 vs. just of 5 hours per day. For the week (seven days), she averages 59-1/2 and he 37 hours. The absence of the male from production tasks, where it occurs, may go on for several months at a time or even years.

The one-third of males who are absent from the rugo leave their families shortly after marriage. This means the woman is left to fend for her family, aged women often tilling the soil while the younger ones do child care and other household work. The women must endure the fact of polygyny (a man with 2 or more wives), though it is reported to be numerically "marginal". What is not so marginal, however, is an increase in the number of "liaisons." Men migrate to settlement projects, or to other paid labor such as in Bujumbura, on a tea or coffee estate or even in a neighboring state, leaving their families behind to keep a hold on the rugo property. Because of the need or desire for assistance in keeping a second household, the man will find a woman, sometimes formalizing the tie in a polygynous marriage but often as not just keeping her on hand through a casual liaison. The inevitable children follow.

Spacing of births is partly a function of when the last infant is weaned, a point when so many die of malnutrition. Obviously, project intervention should have some impact on these life areas

within which the Murundi peasant and his/her children are seen to be at best just scraping by. In fact, many simply don't make it childhood.

C. Socio-Cultural Characteristics of the Rural Population

The poor peasant family necessarily will play the leading role in increasing production in the agricultural sector. It will share the stage with those who orchestrate the sector: Government administrators, from Minister of Agriculture down to provincial agricultural officers who send too few and too poorly-trained extension agents to the countryside to work with farmers.

While the greater part of the problem of access to the poor peasant is human in nature -- including social, political fiscal constraints -- a certain part is of a geographic, logistical nature. The peasant lives in the rugo or homestead, which is usually fenced in and surrounded by banana trees. This is the human settlement of the family whose land surrounds it. It may comprise several generations, including a man, his wife, their married children, and grandchildren. Limited availability of surrounding fields shapes the size and composition of the rugo family. The Murundi peasant prefers to be close to his land; four-fifths of the fields are on the same colline as the rugo which exploits them.

The average number of persons per rugo is reported to be 5.7, sometimes divided among two households, i.e., two separate hut within the compound. Most rugos share the same fields but in

about one-fourth of the cases different households work separate fields. Rugos are combined into collines of about 150 to 200 rugos each. There are some 2,400 individual collines or hills in the country, that being the principal habitat of the Murundi peasant. Seventy-eight percent of all productive fields occupy collines. Most of the other 22 percent lie in flatlands.

The Central Plateau, one of the three major ecological zones, rising between 1,500-2,000 meters, includes the most typical colline, peasant habitat.

Bujumbura is the only true urban zone in the country. It has seen a continuing growth in its population without, however, a commensurate increase in jobs.

Each of the eight administrative provincial town centers comprises a minor service center, governed by a military officer. Although a case has been made elsewhere for designating several of these provincial centers plus others as poles of development, it is doubtful that the organizational capacity or infrastructure will be present in the near future to carry out systematic planning and development through these centers. Until the existing market system (if indeed it can be called that), including commercial, wholesale, and collection centers, expands and draws into it a much higher level of peasant production, no truly balanced regional development can take place.

On the average, one in three males is absent from the rugo according to reports. This suggests considerable migration and

off-farm (sometimes seasonal) work. Eleven percent was the rate of off-farm employment found for one part of the country. Many agricultural projects can only keep workers for part of a season, the men often returning to the rugo during January-March to work their own fields. This suits some projects and other producers well, since they require temporary labor only in the harvest seasons, January and June, and the seeding time, October.

It is clear that some peasants, especially men, are being simultaneously pushed and pulled off their land and leave it to other family members. However, it is not clear exactly how that land is held. The problem is partly one of record-keeping, since even today land ownership, except in towns, is set by oral traditions. Verification of land tenure is provided by witnesses of one kind or another, neighbors or a colline elder; boundaries are marked by planting trees, erecting fences, or simply placing of stones. There is an obvious need for some form of land ownership record-keeping, a task that could well be done by a future local, self-governing body made up of colline members.

Most land in Burundi is obtained through inheritance or purchase, followed by gifts or State allotment. Land provided by the State as part of a resettlement program is often given only provisionally, with use rights. A study done in Kirundo province found that 27 percent of the landowners owned 50 percent of the arable surface, while 50 percent possessed only 28 percent. For cattle, 5 percent of the producers owned 50 percent of the supply. The status quo of such an unbalanced distribution (of livestock) would have to be carefully researched prior to project intervention in an area showing similar imbalances.

The presence of incomplete or dislocated household production units has had its harmful effects on such conditions as nutrition and education. The average Murundi household is just at the subsistence level, requiring one active unit to feed one household. When the male is absent, that 1.0 work unit must be made up by some combination of women and children. But when the household is getting just enough food to stay alive, it is not always in a position to spare children for such benefits as even basic schooling. In rural areas only about 16 percent of the under fifteen year of age has been educated, and only about one-quarter of the children are attending schools.

D. Areas and Groups to be Emphasized

In summary then, it is the recommendation of the team that primary emphasis should be on:

1. Rural in contrast with urban areas.
2. The Central Plateau where population density is high, farms in general are very small and incomes are relatively low. A second priority would be the Zaire-Nile Crest.
3. Within this general area, those areas with the smallest cropped areas per farm family and the lowest incomes such as Gitega.
4. Primarily subsistence food crops which are cultivated under traditional methods without purchases of yield increasing inputs, such as improved seed, fertilizer and pesticides. Integration of crops and livestock should be part of the activity.

5. Women as a primary target in the family and through them more vulnerable young people.
6. Other areas, groups and institutions only to the extent they are essential vehicles for aiding the target areas and groups, e.g. settlement areas for excess population from target areas, off-farm employment, plus institutions to assist and service target groups.

### III. PROFILE OF THE TARGET GROUPS AND TARGET AREAS

#### A. Target Areas and Population Groups

##### 1. Basis for Selection

In the previous chapters, the principal criteria for selection of target areas and groups were outlined as follows:

- a. Rural in contrast with urban areas.
- b. The Central Plateau where population density is high, farms are small, and incomes relatively low. A second priority would be the Zaire-Nile Crest.
- c. Within the general area, those provinces with the smallest cropped areas per farm family and the lowest incomes, such as Gitega.
- d. Primarily subsistence farms with food crops which are produced under traditional methods without purchases of yield increasing inputs such as improved seed, fertilizer, and insecticides, where yields are low and, in general, erosion a serious problem. Integration of crops and livestock should be part of the activity.
- e. Women as a primary target in the family and through them children in the vulnerable age groups.
- f. Other areas, groups and institutions only to the extent they are essential vehicles for aiding the target areas and groups, e.g. settlement areas for excess population from target areas, off-farm employment, plus institutions to assist and serve target groups.

## 2. Candidate Area for Concentration

Price, wage and income data by area and sector are not available, but it is apparent that per capita income of the 5% of the population classified as urban averages 5 to 10 times that of the rural population. It is about 5 to 1 for non-farm versus farm population, and the ratio of urban to rural farm incomes attributed to GDP is probably higher.

U.S. assistance interventions should aim at areas where small-farm families earn a living under the most disadvantageous circumstances. Such conditions, characterized by high population pressure on the land resource, steep slopes, eroded soils, limited production of cash crops, lack of animals, backward technology and low income, are typical of the center and southern portion of the Central Plateau. In that area, which is suggested as a target area, development project activities are still very limited and government support services are sporadic and rudimentary at best.

About one-sixth of the country's population lives in the center and south of the Central Plateau and is almost entirely occupied with small-scale farming. In an average peasant family of 5.7 persons, 3.6 are active members working the land. Ngozi (also in the Central Plateau) is the most populous province, but probably enjoys a higher income per capita than some other areas because of the greater density of coffee production. Ngozi has about 20 percent of the country's population but produces about 40 percent of the coffee. A high percentage of all farmers in that province produce some coffee

In general, farmers who have the least opportunity to produce export crops have lower incomes. All families find they must have some cash income, and for most subsistence crop growers that means either selling some of their food crops, or working at one of the scarce low paying jobs on other farms. The return to adult work on farms is about U.S. 30¢ per day.

Reliable data are not available on incomes and land availability per capita for different sub-regions in the target area. Hence, before deciding on specific areas for activities such as intensive or integrated area development programs, it will be necessary to collect and analyze the data necessary to identify accurately the more depressed areas on which to concentrate.

Some data available indicate major variations in per capita food availability among provinces, but these data are restricted to legumes and cereals. They fail to include bananas, root crops, and animal products, which are very important. (See Table V in Annex III). The data indicate variations in availability from 65 kg. per capita in Ruyigi to 256 in Bubanza. Ngozi was one of the lower (127) and Gitega one of the higher (207) in availabilities. Errors and oversights in the data raise some question as to the usefulness as a basis for selection of areas, but the figures may be indicative.

Nutrition varies with the agricultural season, but tuber crops like cassava or sweet potatoes and bananas are usually available throughout the year. Seasonal food products such as maize, sorghum, millet, beans and peas are commonly consumed, but between harvests (especially December to March) increasing proportions of starchy

crops characterize the diet. Meat consumption is minimal and the availability of milk has progressively decreased as a result of the declining number of cattle and overgrazing of pastures. With two meals a day that run heavily to carbohydrates, the diet is deficient in proteins, fats, vitamins and minerals.

The daily caloric intake amounts to about 1900 calories per person, about 90 per cent of the real needs. Banana and sorghum beer, of which about 240 lts. are consumed per adult per year, is an important nutritional component. Unfortunately, it contributes to the overall imbalance of the diet.<sup>1/</sup> Dietary deficiencies are the cause of a number of health problems which especially affect the newly weaned and young children.<sup>2/</sup>

Gitega is the only urban community in the Central Plateau offering some employment possibilities in government administration, marketing, building construction and trade. Gitega people from the rural hinterland seeking services and employment opportunities (though limited) and serves as a market place. The influx, however, compared to Bujumbura is less permanent and the relationship between growth of population and existing jobs less of a problem.

<sup>1/</sup> Beer production from sorghum and bananas represents a major loss of calories and other nutrients which might otherwise be available to the more vulnerable groups. It is estimated that conversion of sorghum and bananas to beer represents an energy loss of 50 percent or more.

<sup>2/</sup> Figures published in 1976 by investor in "Etude sur quelques parametres demographique et sanitaires au Burundi" indicate that 28 percent of the deaths in children 2-4 years of age are the result of malnutrition.

Communal administrative posts also act as minor service centers, but they are of secondary importance for trade and farm produce collection. Their role as possible poles of rural development will remain doubtful without improvement in the governmental and commercial infrastructure.

Employment opportunities for part-time jobs exist in agricultural schools, research stations, mission centers, development projects, road construction and maintenance, and reforestation programs, but they are rare. Where they exist, daily wages range from U.S.¢ 56-89.

There are a small number of communal and small market centers, which offer some low paid off-farm employment, but the bulk of the rural population earns its livelihood almost entirely from farming. Food crop production is the domain of rural women; men and boys take care of the cash crops and animals. Off-farm employment when found is restricted to males.

An all-weather road (Bujumbura-Gitega) connects the proposed project area with the capital of the country. Unpaved roads connect Gitega with other communal centers, but communication and transportation are often difficult or impossible during the rainy seasons. Inter-rugo and inter-colline linkages are by mountain trails which also lead to the closest country roads. These trails, which are usually steep and narrow, are unfit for vehicle traffic, so the transportation of goods has to be by headloads.

Social services in the fields of health and education are concentrated in Gitega, where there is a hospital with a maternity center, primary and secondary schools, and extension, cooperative training and social education facilities. In the communal administrative centers, medical dispensaries and 1-2 class primary schools are also found.

The geological base of the area is that of the Great East African Plateau. Most of the countryside is densely covered with small farms extending over rolling hills with an average elevation of 1500-1900 meters. This altitude moderates the tropical climate to a cooler, rainy environment that is suitable for coffee and food crop production and more comfortable for human beings than the other ecological zones.

Two types of parent soil materials dictate the land use of the hillsides. These are a schist formation with basalt intrusions and a metamorphic conglomeration of schist and granite-gneiss. Hilltops frequently also expose outcrops of quartzite. The hillsides are quite steep and intensively farmed, often up to their highest sections. The hill soils over the course of time have become degraded through erosion and depletion of organic matter. The valley alluvial soils are fertile but require drainage if they are cultivated during the rainy seasons.

The harsh conditions of traditional mountain agriculture as practiced in this area require the concerted efforts of adult and teenage family members of both sexes to secure their livelihood and existence. The agricultural labor force is said to be working at

about 80 percent of capacity. Because men often migrate within and outside the area in search of paid employment, women and children are left behind to carry an estimated 80 percent of the agricultural workload. As elsewhere in Burundi, women in this area play a fundamental role in the small farm production sector.

### 3. Population Groups for Concentration

Groups which should be primary candidates for AID assistance are women and children, as the most vulnerable groups in the family. Both suffer nutritional deprivation. Women and older girls have primary responsibility for production of basic food crops and usually put in substantially more hours of farm work than do males of similar age. They should be the target for educational programs covering improved farming methods, nutrition, health, and sanitation. They also should be the main beneficiaries, along with young children, of direct interventions aimed at improving food supply and health conditions.

Though difficult, it would be desirable to encourage a renewed interest among males in food crops and a willingness to share more of the work. Efforts to create additional markets for food crops might help achieve this objective. As noted earlier, females generally are in an inferior authority relationship to males. As a result, their efforts to improve productivity may be constrained by male priorities or the use of resources for other purposes.

Children, especially young children, particularly suffer from a variety of nutrition-related problems and from infectious diseases and parasites. Infant mortality is very high, related largely to the latter.<sup>1/</sup> Nutritional deprivation is severe at weaning time when children typically are fed a bland diet high in carbohydrates (such as cassava) and low in protein, minerals and vitamins. The problem is partly lack of knowledge and partly lack of food.

These groups deserve attention in rural areas nationwide and specifically in target areas where conditions are worse.

## B. Development Constraints

### 1. Farm Level Constraints

The capital and economic resources of the typical farmer are extremely small, especially where no coffee is cultivated. The cash earned from limited food crop sales and off-farm activities seldom is sufficient to meet the most basic needs for food, clothing and other essential items (kerosene, candles, matches, spices, hand-tools, etc.) In view of this, investment in production inputs and other improvements will remain impossible for the farmer unless:

- arrangements are made for agricultural credit or delayed payment for inputs to enable subsistence farmers to increase yields.

<sup>1/</sup> According to Wiesler, "Etude sur quelques parametres demographiques et sanitaires au Burundi," 1976, 17 percent of male babies and 15 percent of female babies die before reaching the age of one.

- a secure land tenure system is provided which will permit small farmers to borrow and capitalize toward intensified agriculture and provide more incentive to preserve and develop land resources.
- marketing organizations and marketing pre-cooperative groups and cooperatives are available which will enable peasant farmers to purchase inputs and market food crop surpluses at reasonable prices.
- government institutions provide technical assistance.

More production can only be attained through specific assistance interventions to broaden the productive resource base which at present is restricted to family labor and some improved seed supplied by the MOA. Institutional support at farm level is inadequate to say the least. This reflects the disinterest and neglect of the food crop sector by the GOB.

The risk factor present a formidable obstacle to development. What cash income the farmers have is usually committed. Living as they do on the margin of hunger, farmers can ill afford to risk investing scarce cash in inputs that may provide little return. Further, the need to hedge against crop failure leads farmers to plant many crops and restrict specialization, even though specialization might provide much more income. Uncertainties in the market create additional risks in spending cash to produce a surplus. The

distribution system does not permit the purchase of foods produced elsewhere should a few specialized crops fail, even if money were available.

Steep topography, small farm size and land fragmentation militate against the rationalization of food crop cultivation. Soil degradation, manifested by erosion and nutrient depletion caused by a reduction of fallowing, non-use of fertilizers and the declining availability of manure,<sup>1/</sup> represents another serious natural production constraint. Real income is reduced by post-harvest losses to insects and rodents.

The low rate of literacy among farmers and the socio-geographic fragmentation of the rugo-colline are both formidable obstacles to the delivery and implementation of techniques and services by the government. While the government's administrative structure is theoretically present to deal with the approximately 400 collines and 120,000 families in the area recommended for concentration, there are organizational and motivational deficiencies on both sides.

As in other areas of the country, food consumption in peasant households needs improvement in regards to caloric as well as protein, fat, vitamin and mineral intake. Improvement in cattle and goat productivity and the promotion of fruit and vegetable production and consumption on small farms might help to overcome these nutritional constraints.

<sup>1/</sup> As the availability of wood for fuel declines, farmers use manure as fuel for cooking.

## 2. Marketing System Constraints

Insufficient supplies of modern inputs to production (fertilizer, pesticides, small farm equipment), inconsistent price policies, lack of credit and a malfunctioning marketing system have been identified as major factors in the low utilization of modern inputs on food crops. The government currently imports and distributes fertilizer and pesticides and fixes prices. SOBUCOV, as the GOB food crop purchasing and storage organization, is supposed to purchase from farmers at reasonable prices in sufficient volume to provide incentives, but it is unable to do so.

Private traders usually offer better prices than the government but the volume purchased is too small and sales too uncertain to stimulate overall surplus production. Thus far, the GOB has not developed a price and marketing program which will provide the incentive needed to support anticipated production programs. There is presently lacking in Burundi the tradition of periodic local markets, but this is expected to evolve as purchasing power and demand increase.

Marketing possibilities for arabica coffee are well developed, while the prospects for a commercialization of food crops are much less favorable. Such market possibilities will develop only if surpluses over and above subsistence needs can be produced and stored on farms, and if a functioning marketing system can be developed to ensure product off-take at reasonable prices. The establishment of a revolving national food grain reserve and price

stabilization buffer stock (possibly with the help of international food donors) would greatly improve the chances for profitable production and marketing of food crops.

The rural people of Burundi are living in a subsistence economy. Only 50 percent generate any cash income from coffee cultivation, while the other half depends on occasional sales of food crops and banana beer. Sporadic food shortages occur as a result of localized crop failures that cannot be offset by supplies from surplus areas, because of the lack of a functioning marketing and distribution system. Market and distribution limitations also severely restrict the potential for specialization. Growing population pressure on the impoverished land will further reduce income and standards of living unless rapid and enduring production improvements can take place.

### 3. Institutional Constraints

The five-year plan announced for 1978-82 gives heavy emphasis to agriculture, with the poor sectors given first priority. However, government performance to date has been disappointing. Total financial commitments to agriculture have been insufficient to the task; the regular budget goes largely to pay the salaries of officials in Bujumbura, with most of the burden of development in the low income subsistence sector being borne by donations and loans from foreign agencies. No provision has been made for the agricultural credit needed to enable subsistence units to move to higher-value production and market their products at reasonable

prices. Insecure land tenure makes it impossible for the small farmer to borrow and capitalize his land. The formation of community organizations and cooperatives is difficult, both for legal reasons, e.g., lack of a proper cooperative statute, and for reasons of fear and mistrust.

However, the institutional framework through which services can be provided to farmers already exists in form of the provincial and communal branches of the Ministries of Agriculture, Social Affairs and Labor, as well as the administrative centers and field stations of the church missions. MOA's main functions are to provide cooperative and extension training, field extension, and sporadic input provision and product purchasing. Agricultural research is not a function of the Ministry.

The Ministry of Agriculture (MOA) particularly needs strengthening of those sections dealing with planning, training, extension, research, marketing and supplies, and to improve its overall administrative and service capacity. The weakness of the MOA in designing and executing government policies and plans is apparent at the lower organizational levels. As a consequence, the "Regional Development Society" (SRD) concept is being promoted. In the target area and elsewhere the SRDs are expected to operate under the MOA but independent of the local agricultural administration. They will be available to act as the GOB agricultural development and counterpart agencies to foreign assistance projects and programs.

The MOA now employs over 2,000 people and is growing. There are 25 expatriate and 60 Burundian professionals working in the different

departments of the ministerial headquarters in Bujumbura; 64 local professionals hold administrative/extension positions in the provinces and 51 expatriates and 145 Burundians occupy technical or management posts in agricultural development projects. Government services to the small-farm sector through MOA are very modest despite increases in recurrent (35 percent) and extraordinary (65 percent) budget allocations to agriculture between 1970 and 1976 (in current BuF values).<sup>1/</sup> Nearly all these funds are used to support the MOA infrastructure and to provide governmental contributions to foreign-financed projects.

Farmers living outside the project areas have almost no chance of receiving any kind of ministerial support. Administrative and managerial shortcomings in the MOA are attributed to the complicated, unbalanced organization, poor inter-sectional communication and cooperation, the absence of a statistical service and information base, and the lack of transport especially at provincial and lower levels.

In the field of agricultural training and education there is some genuine effort. Apart from the academic education at the Faculty of Agronomy of the University of Burundi, the responsibility for agricultural training rests with the Planning Division of the MOA. It is responsible for the administration and operation of the national training institutions at Gitega (I.T.A.B.),<sup>2/</sup> Karuzi (E.P.A.)<sup>3/</sup> and Kihanga where students are trained for Extension

<sup>1/</sup> IBRD Economic Memorandum, Burundi. April 25, 1978.

<sup>2/</sup> Institute of Technical Agriculture in Burundi.

<sup>3/</sup> School of Agriculture.

Technician, Assistant and Monitor positions. Field monitors at post are re-trained in refresher courses organized by the MOA Department of Agronomy at provincial level.

All these institutions offer general courses (mathematics, physics, history, religion) as well as training in agricultural technology. However, the curricula generally show (1) an imbalance between classroom lectures and practical field work, (2) a lack of small farm orientation, and (3) the absence of important complementary subjects dealing with the application of knowledge and skills and the change of attitudes and behavior.

A common weakness of the training is the almost total lack of an experimental approach. The main emphasis is still on lecturing, and interaction among participants, and between trainers and participants, hardly takes place. In view of these shortcomings, technically competent agriculturalists capable of planning and managing the transfer of knowledge and motivation are not being turned out.

Agricultural research is conducted by the Institute of Agricultural Sciences of Burundi (ISABU), mostly through applied field trials. ISABU operates 4 main and 4 sub-stations in the west and southwest parts of the country, leaving the center and northeast uncovered. Field experimental work puts major emphasis on variety testing, selection, and multiplication with cultivation, fertility and rotation trials ranking second.

There is almost no research done on farmers' fields; mixed vs. pure cropping is not under test and there is no comparative evaluation of traditional and improved farming systems. Field experiments are mostly conducted in plains areas, with mechanized soil preparation and costly imports such as fertilizer and pesticides, and hence not relevant to the real needs of the small farmer. No low cash, low risk food crop cultivation packages have been developed and the linkage between research, extension, training and government administration and planning is minimal.

There is no organized system for agricultural extension and outreach. A number of extension workers are attached to foreign-financed development projects, mainly in the fields of livestock and export crops, while the extension staff in non-project areas works under the Agronomy Division of MOA. The extension workers on these projects support cash crop production with noticeable results while the extension personnel outside the project areas are considered to be interpreters of government policy rather than supporters of small farmers in their efforts to produce cash and especially food crops. In general, these latter extension agents have inadequate training, little supervision, and no transport, supplies or equipment to help them in their work.

The absence of a well-defined organization for planning and executing effective small farm extension is a severe problem. It results in extremely weak lines of communication between administrative and field levels, and poor management and motivation of the extension staff in the provinces.

The lack of rural organizations, cooperatives, and suitably structured community groups in most parts of the country is a strong obstacle to small farm sector development, making the task of reaching peasant producers with credit and modern techniques almost impossible. At the present time, less than 10 percent of the food crops produced enter the market. The production and marketing of larger quantities will take place only if groups of farmers can (1) purchase inputs and sell products at reasonable prices and (2) obtain credit, learn to repay it on time and borrow again for higher production investments in subsequent seasons. Cooperatives might be one route, but in the cooperative field government support is badly lacking. The modest start already made with the formation of food crop cooperatives is the result of church mission initiative and assistance.

GOB so far has not analyzed the financing needed to support agricultural progress in the small farm sector. The credit needed for subsistence farm development and production intensification, along with the necessary supervision and marketing and technical assistance, has been neither evaluated nor considered. Only SRD-administered irrigation settlements in the western plains now obtain government credit, and these farmers represent only 2 percent of the total number of Burundi's peasant families. No general effort has been made to provide credit for modern inputs and the supervision required to ensure their proper employment.

It is true that traditional production habits, inconsistent price policies, the lack of credit and an inferior marketing system have considerably restricted the demand for modern inputs. However, even

the small demand which does exist cannot be met since the GOB has been providing foreign exchange only for imports required by the export crop and processing industry while small farm demands (e.g., resulting from assistance project activities) are neglected.

Although fertilizers imported by the government enjoy a 50 percent price subsidy, this has not shown any stimulating effect on the food producing sector since almost all fertilizer is distributed by the growers' associations affiliated with the coffee, tea and cotton marketing boards. Import licences for small quantities of agricultural chemicals are granted to one or two private firms which, however, are excluded from the price subsidy and therefore can only sell to home garden owners and vegetable growers in and around urban centers.

In the socio-political sector, institutional constraints result from weak administrative and infrastructural links to and among the rural poor.

Responsible institutions are the Ministry of Social Affairs and Labor (MSAL) and the Ministry of Health, which are responsible for providing development services in home economics, child care, hygiene, nutrition, education of women, farmer cooperation and in settlement projects and programs. If effective, they would be able to define policies and strategies to reduce disparities in the development of the rural population, meet the material and social needs of peasant families and create new and durable social structures to support occasional or organized migration and settlement in less densely populated areas.

MSAL operates the "Foyer Sociales" which, through their adult training of rural women, have had some impact on farm life and agricultural production.

There are 13 Catholic and 4 Protestant mission centers in the area, which, besides evangelization, education and health care, are also engaged in the promotion of crop cultivation and small animal production. Missions and missionaries through their unselfishness and idealism have gained wide respect and confidence among the peasant population.

#### 4. Policy Constraints

It is clear from the earlier analysis that the GOB will be under considerable monetary constraint if coffee prices continue the downward trend as expected. The government may be able to fund ordinary costs despite a substantial drop in coffee prices, plus some increase in public sector employee income, but the funding of its extraordinary (investment) expenditures at proposed levels will be almost entirely dependent on a continued substantial flow, on concessional terms, of development assistance.

The government appears prepared to increase the amounts budgeted for development, but past experience has shown that draw down rates are usually below projections. To what extent this shortfall represents conservativeness in release of funds rather than institutional incapability is not certain. Fertilizer is a case in point. While there appears to be a latent interest among farmers in using fertilizer, actual imports have varied by 4 or 5 fold from year to

year from a very low base. Whether these variations reflect objective appraisals of needs, or the penuriousness of the monetary authority, or plain lethargy should be appraised.<sup>1/</sup>

Another matter of concern on the policy front is the apparent discrepancy between words and action with respect to agriculture and the rural poor. Policy statements give high priority to the poor and subsistence crops along with export crops and livestock, but in practice, export crops and livestock have gotten the bulk of the support. Further, public and private investment rates in agriculture and budget support have not been adequate to even make a dent in the food crop problem.

Looking ahead, the GOB apparently sees achievement of its planned 4 percent growth rate coming mainly from growth in the export sub-sector and possibly in livestock. This does not portend well for the rural poor concentrated in the subsistence crops sub-sector. One might reasonably ask what the increased (export crop) earnings will buy if there is little or no increase in subsistence crop output. Given the low levels of income in rural areas, one would expect a high income elasticity of demand for food crops and hence that most of the increased income would be spent for basic foods if they become available. Price policy, however, seems more oriented toward consumer costs than to producer price incentives. This must be carefully examined if modern production-increasing inputs are to be applied to subsistence crop production.

<sup>1/</sup> Fertilizer application rates now average only a fraction of a nutrient kg. per hectare.

Nutritional deficiencies seem to be recognized only in a rather abstract way, though studies indicate they are widespread and serious. Since the country probably cannot afford direct intervention (feeding) on a meaningful scale, emphasis needs to be placed on producing more basic foods. A policy which the GOB seems to have adopted of not encouraging large-scale feeding or other such programs seems appropriate, given the resource limitations, but if basic food production, which has nutritionally important implications, is neglected as well, the result may be disastrous.

Credit policy as now practiced is very restrictive. Credit is less critical to the early stages of modernization, when mostly seasonal crop inputs are purchased (fertilizer and seed); it becomes much more important later when longer-term investments are required (a better plow, yoke of oxen, thresher, irrigation, drainage, etc.)

Agrarian reform, in the sense of a redistribution of land, is not a problem in Burundi, but tenure security is. As a start, program actions should be taken to identify boundaries and regularize titles to land for which ownership is recognized by tradition or customary usage. This will involve some redirection of policy from the present apparent reticence to regularize titles or confer permanent rights to land in resettled areas. The position of women as legal owners of land either by inheritance or purchase should also be recognized, and titles and rights legitimized. Implicit, if not explicit, policy appears to be to ignore the special problems faced by women or children and their need for special attention.

The employment policy of the government is generally directed toward the creation of jobs, probably with too much emphasis placed on public sector employment. The policy, per se, does not appear to be a constraint, although there are some who would argue that the large number and high pay of government employees diverts resources from other priorities.

Import policy seems distorted in favor of industrial and luxury imports, including food. The policy seems inadequately concerned with the import of essentials for expansion and modernization of agriculture, especially for the needs of the food subsector.

The concept of achieving agricultural self-sufficiency seems to be accepted, but there appears to be a view that adequate food, except for a few luxury items, will be forthcoming more or less automatically. This attitude needs to be changed and replaced by a willingness to invest to insure that adequate food will be available for both the near and distant future.

Income distribution (redistribution) does not appear to be more than a slogan. Policies enunciated and actions taken do not appear to reflect a dedication to income re-distribution as an end in itself. An explicit and overt change in implicit income distribution policy does not appear to be a prerequisite to moving ahead on some of the needed programs discussed later (such as a sustained effort to modernize and insure expanded subsistence food crop production).

Recognition that a problem exists in the subsistence food subsector must be obtained. A major constraint exists in the apparent low

priority assigned agriculture by the government, especially the food crops subsector.

## 5. General Conclusions

From the information provided, the following priority list of constraints resulting from organizational and operational shortcomings can be derived. They reflect the weak inter-institutional as well as administrative and infrastructural links to and among the small farm population.

- a. Lack of a statistical information base for meaningful agricultural planning.
- b. Lack of appropriate small farm research and production technology.
- c. Inadequate training and education for small farm extension and development.
- d. Lack of a functioning and effective food crop oriented extension service.
- e. Tenure uncertainty and insecurity.
- f. Inadequate procurement and distribution of production inputs for the small farm, subsistence crop subsector.
- g. Lack of a functioning national food crop marketing and storage system.
- h. Absence of suitable GOB policies, plans and activities concerning prices and supervised credit.
- i. Lack of formal and informal educational opportunities, especially opportunities for practical training on ways to improve productivity and the well-being of the rural family.

IV. DEVELOPMENT STRATEGY

A. General Strategy to Alleviate Constraints

The economic, political and cultural exigencies suggest a strategy composed of elements which fall into one or both of the following categories:

1. Activities directed at constraints facing broad target groups on a national basis, e.g., women, children, subsistence crops of all farm families, lack of inputs, price policies.
2. Activities aimed at inter-related constraints confronting a broad constituency in a more limited area, where poverty is endemic and broadly acknowledged to be severe. The target would be to bring incomes up to or near levels in other areas.

1. Activities Directed toward Broad Target Groups

Several candidate activities fall into the first of the above categories, as follows:

- a. Small farm research unit at Rutegama stressing subsistence crops.
- b. Development of the national extension service.
- c. Expansion of the distribution system for inputs, especially fertilizer and improved seeds, and improved supplies of inputs.
- d. Improvement in general planning, implementation capability, and the statistical data base for planning.

- e. Price stabilization for subsistence crops, including improved storage and marketing facilities.
- f. Development of the University of Burundi to train students for development roles.
- g. Improvement in social services.

## 2. Activities Directed toward Specific Geographical Areas

Under the second category, a concentrated area development program is suggested for selected activities aimed at a target population of say 10,000 to 100,000 people. Elements might include:

- Research on subsistence crops and cropping systems
- Extension of above research
- Storage and marketing
- Conservation of soil and water
- Credit
- Potable water, health training and other health measures
- Area development planning and monitoring
- Transport and other infrastructure

Existing inadequacies of data and institutional weaknesses together create a formidable obstacle to the immediate undertaking of activities which are designed to reach low income target groups in large numbers. For this reason a three phase approach is suggested as follows:

Phase I. The first phase would be designed mainly to develop institutions ultimately needed to reach very specific target groups with the type of integrated program required for self-sustained

growth. This might be coupled with investment that is relatively simple (conceptually). A good example would be the expansion of fertilizer imports and the development of a fertilizer distribution system to reach all farmers. Since almost all farmers in Burundi are small and low incomes are virtually universal, this does not violate AID's mandate to concentrate on the poor. Phase II activities would be designed during this phase. Phase I would cover about three years.

Phase II. This phase would include a series of integrated development projects involving a variety of activities designed to overcome major constraints. It would have major evaluative elements included in the project design. One of the major objectives would be to produce a developed, tested, and proven plan and set of approaches for assisting the target groups. This phase would continue the institutional development activities initiated in Phase I, particularly those involving practical experimentation and learning. It would draw heavily upon tested small-scale development activities now underway and supported by other donors. This phase would require three to five years. A major output would be the longer term plan for which technical, social and economic feasibility analysis would have been completed.

Phase III. A much expanded investment program, probably partially loan-financed, would be carried out in Phase III, based on experience in Phase II. An evaluation, feedback and redesign element would also be an important aspect of this phase. Phase III would begin after approximately six years and continue thereafter.

The interdependence between progress at farm level and the capabilities of the supporting institutions makes the removal of constraints existing both at the level of deprived farm families and in the institutions themselves equally important. The lack of institutional capability has so far prevented small farm sector development. As long as the GOB intention to give priority assistance to subsistence farmers, as stipulated in the last five-year plan, is not implemented by effective policies and measures, donor help probably will only produce partial and temporary results. An approach dealing with only one or two constraints probably would have little effect. The multiphased approach outlined above is aimed, first, at the principal institutional constraints, and then at farm family level constraints.

B. Recent and Current Programs to Overcome Constraints

Since Burundi gained political independence in 1962, numerous foreign assistance and GOB projects and programs have been conducted to provide socio-economic, educational and research support to the country's agriculture.

Tangible results were obtained only in export crop production; the constraints in MOA administration, research, extension, farmer organization, input supply and product marketing have impeded food crop production improvement. As an exception, the successful beginning of a food crop purchasing and marketing cooperative by CARITAS has to be mentioned.

The following current and planned projects and programs, though not always functioning at full efficiency at present, are an indication of the general commitment to continue assisting the peasant farm sector, despite the obstacles encountered.

1. MSAL-Social Centers

MSAL-Social Centers (Foyers Sociaux) provide education for rural women at 58 locations in family nutrition, hygiene and health, child care and basic agriculture. For the present planning period 152 such centers are planned. Women from 15-50 years of age attend the three-year course, meeting 3 times per week. Each social center also has a social extension function, including three female extension agents who take the teaching function out of the center into the collines. Teachers and social extension staff are trained schools under MSAL in Gitega. In addition to this activity, 29 private social centers, mainly attached to religious missions, supplement the Ministry's efforts.

2. Government-Irrigation Farm Settlement Projects

Government-irrigation farm settlement projects in the Lake Tanganyika and Ruzizi River Plains range from moderately successful (Cibitoke/Moarambo) to dismal failure (Imbo/Mpanda). In the first case, mainly farmers indigenous to the Plains region have been resettled and given secure rights over 4 hectares of land. Minimal charges are paid for common mechanized soil cultivation, while irrigation water and extension assistance are free. With GOB an

foreign assistance subsidies, average annual earnings of 100,000 BuF (\$1,100) per farm are possible. In the second case, the 3,000 families resettled from the Central Plateau have been provisionally given only 1 hectare with no ownership title. The farmers untrained in intensive irrigation agriculture, work under stringent regimentation and supervision, and have not easily adapted to the heat, humidity, and malarial conditions of the Plains. Women and children of resettled families are now moving between their 2 families in the settlement and the collines at least two times per year. So far no solution to the numerous social and production problems which have plagued the project have been found.

### 3. Rural Cooperative Development/Extension-CARITAS

Since 1966-67, the CARITAS has established 35 food crop cooperatives, some of which have obtained financial support from other donors for storage and credit facilities. The cooperatives, managed by elected officers, buy food crops from their farmer-members to sell in cooperative stores, with profits being divided in proportion to the shares owned. Reported profits are between 20 and 28 percent. GOB participation in crop cooperatives has not been particularly successful because of the "trust" factor. Under the SRD, the government has established a few cooperatives and is offering a course in cooperative management.

### 4. World Food Program (WFP) - Nutrition Improving Projects

- a. Supplemental feeding of wheat, eggs, fish, sugar and vegetable oil to 7,000 patients in hospitals and medical centers.

- b. School feeding of 16,850 children with a balanced diet.
- c. Food distribution to road maintenance workers - three daily rations in the form of flour, canned fish and cooking oil, affecting 2,300 families.

5. UNICEF Program

Plans for nutrition instruction and extension assistance for the Social Centers and the execution of a preliminary nutritional survey.

6. Catholic Relief Services (CRS) Food Distribution Program

Involves supplemental feeding of about 40,000 children under 5 years of age in the most densely populated areas with preventive and monitoring activities.

7. USAID Highland Fisheries Project

Presently under study, will provide assistance in improving the protein supply base.

8. Assistance Technique Belge (ATB) Monitor Training Center,  
Kihanga

Provision of one year training in agricultural technologies and extension planning for 20 monitors per year since 1977.

9. GOB Agricultural Assistants Training Center (E.P.A.), Karuzi

In operation since 1956, offers three-year courses to train 35 students per year for assistant agricultural positions in government administration and extension.

10. GOB/FAO Agricultural Technicians Training Center (I.I.A.B.),  
Gitega

In 4-year courses, students are trained to become agricultural and veterinary technicians in government agencies. Two hundred students are enrolled; capacity is 250.

11. GOB/ILO-Cooperative Training Institute, Gitega

Training in cooperative planning and development to technical (2 years) and assistant (1 year) levels (in operation since 1978).

12. GOB/FAO-Extension Field Training Project

One month refresher training of monitors in 82 commune centers. Approximately 1,500 people receive periodic in-service training in agricultural techniques and rural development.

13. GOB/ATB/FED-Faculty of Agronomy-University of Burundi

In operation since 1975, provides academic agricultural training for 54 students in a 3-year course. Enrollment is at 75 percent of capacity.

14. GOB/ATB-Institute of Agricultural Research (ISABU)

ISABU conducts studies, surveys and applied field research in land utilization and management, crop cultivation, plant protection, animal production and socio-economics at four main and four sub-stations.

15. GOB/FED-Tea Production and Processing including Food Crops,  
Animal Production and Soil Conservation

Development of 3,100 ha. for planting on estates and small farms, 1,800 ha. for planting of trees and 2,800 ha. for food crops and animal production in the Zaire-Nile Crest area.

16. GOB/IRBD/KUWAIT-Second Phase Coffee Production Improvement and  
Food Crop Cultivation

Has operated in the northern Central Plateau (Ngozi) since 1976. Food crop production started only with the second phase.

17. GOB/ATB/FED/Roumania-Western Plains Irrigation Settlement  
Projects

In operation since 1977, to introduce and promote oil palm, robusta coffee, cotton, food crops, pasture and livestock production, partially under SRD management.

18. ATB-Vegetable Production Pilot Project

Development of production units with technical extension assistance in two highland provinces (Bugarama and Muramvya) since 1977.

19. ATB-Seed Improvement and Distribution Project

Since 1977, installation of 16 seed multiplication and distribution centers in five provinces of the country. Fourteen additional centers are anticipated.

20. GOB/FAO/UNDP/ATB-Fertilizer Procurement and Promotion Project

Execution of fertilizer purchasing, distribution and field demonstration programs in 11 of 18 arrondissements since 1972.

21. GOB/UNICEF/UNDP-Integrated Rural Development Including  
Extension, Food Crop Promotion and Cooperative Development

First phase was started in 1974 in the Gitega Province; completion of the second phase is scheduled in 1980.

Three additional projects of this type are planned, two in the highlands and one in the Western Plains with ADB and IBRD assistance.

22. USAID Peat Project

USAID is giving priority to development of the considerable peat deposits as a substitute for wood and charcoal for fuel.

23. GOB/FED/FIDA-Irrigation Settlement Phase I (In preparation)

Development of 9,500 ha. for the production of cotton, rice, maize and robusta coffee at Mpanda (East Imbo).

24. IBRD-Third Phase Coffee Production Improvement and Food Crop Cultivation Promotion (Planned)

Plans for extension of on-going project into adjacent provinces.

25. GOB/FED/USAID-Basic Food Crops Phase I (Supplement to the Tea Production and Processing Project - In Preparation)

Provision of improved seeds of selected varieties and introduction of modern production techniques in four areas of the High Altitude Zone.

26. IBRD/Saudi Arabia-Robusta Coffee and Oil Palm Production Project (In Preparation)

Establishment of an SRD at Rumonga in the southern part of the Western Plains.

27. IBRD/IDA Agricultural Development Centers Project (In Preparation)

Plans for the establishment of 12 Agricultural Development Centers in the densely populated Muramvya and Gitega Provinces of the Central Plateau. Objective is the improvement of cash and food crop productivity in 12 communes through massive field extension and farmer education.

In addition to the above projects, three reforestation projects financed by FED, FAC and Hungary are underway in the High Altitude Region while 5 more are planned and under study.

FAO is also conducting two livestock projects (a breeding station and a feeding ranch), located in the Central Plateau and the Zaire-Nile Crest Zones respectively. Five additional livestock projects, including one for milk production, are under consideration with funds coming from GOB, BED, ADB and Germany.

Government plans and donor activities are discussed in more detail in individual reports (Annexes I-VII).

C. Principal Program Areas for Emphasis

The areas recommended for program emphasis are as follows:

- Providing social and agricultural education for the rural population, especially rural women.

- Up-grading technical and academic training, and agricultural extension. The development, transfer and adoption of advanced production and soil protection technologies for hill farms.
- Improving the procurement and distribution of inputs for the small farm sector.
- Reorganizing SUBUCOV to support effectively basic food prices at the farm level.
- Strengthening MOA's administrative and planning service capabilities.
- Reducing post-harvest losses.
- Developing and disseminating information on techniques to increase yields of food crops at low cost and incomes of subsistence farm families.
- Improving social services, especially for women.
- Integrated rural development programs on an increasing scale

Some specific projects are suggested in Chapter V and discussed in detail in Annexes I - VII.

## V. DEVELOPMENT PROJECT IDENTIFICATION

### A. Target Area and Groups

In the previous chapters, the principal criteria for selection of target areas and groups were outlined as follows:

Rural in contrast with urban areas; regions with the smallest cropped areas per farm family and the lowest incomes; subsistence farms with food crops which are produced under traditional methods without purchases of yield-increasing inputs such as improved seed,

fertilizer, and insecticides, where yields are low and, in general, where erosion is a serious problem; women as a primary target in the family and through them susceptible young people; other areas, groups and institutions only to the extent they are an essential vehicle for aiding the target areas and groups (e.g., settlement areas for excess population from target areas, off-farm employment, or institutions to assist and serve target groups).

Two levels of project activity were suggested: (a) programs aimed at a single constraint on a broad geographic basis, (e.g., national institutions to serve the poor, national policies adversely affecting the poor), and (b) programs concentrated in small, well-defined areas where people are particularly deprived. A number of interacting constraints might be involved in (b).

#### B. Candidate Activities for AID Financing

Based on the analysis and recommendations detailed in individual reports, the following candidate projects are recommended for AID consideration. Requirements for short-term consultants needed for project review and design follow the project listing.

1. Projects (For candidates a-h, cost estimates have been made)
  - a. Development of national storage facilities of SOBUCOV (6 Years)

A rotating fund should be provided by the government, AID and/or IBRD to help construct and operate storage units which would be used to support food crop programs.

- 1st year - about \$500,000 for 10 modules of 250 tons each plus two technicians and \$50,000 for training in Europe, Africa or the U.S. Est. \$ 800,000
  - 2nd year - about the same, but with additional funds for training 900,000
  - 3rd and 4th years - about \$1,000,000 each year, including funds for an evaluation of the program 2 X \$1,000,000 per year
  - Continue 10 modules per year schedule in 5th and 6th years. If the project is ready to "take off", develop nation-wide storage facilities program for up to 100,000 tons. Training could by this time take place in Burundi, at one or more of the most successful storage locations. Additional technical assistance would probably be required. Estimate about \$1,500,000 per year for the 5th and 6th years. 2 X \$1,500,000 per year
- Total, 6 years \$6,700,000
- The 100,000 ton construction and transport activity would cost in the neighborhood of \$28,000,000 to \$35,000,000. This could be funded by loans.

b. Pure water supply rural areas (5 years)

Pilot project to provide potable water for rural families; tentatively suggest \$1.5 million.

c. Development of an extension service (5 Years) \$5,568,000

(1) Objective - To establish a Department of Extension/Education in the Ministry of Agriculture under the Secretary for Rural Development (5 years)

(Cost in thousands of dollars)

- Material: Sub-total cost: \$222

Divided roughly among 5 years: \$203, \$3, \$3, \$2, \$11.

- Personnel: 10 years expatriate; as counterparts, five additional Burundi staff. Sub-total cost: \$1,000  
Over 5 years: \$280, \$280, \$180, \$180, \$80
- Training: 144 months of long-term and 90 months of short-term.  
Sub-total cost: \$426  
Over 5 years: \$177, \$177, \$24, \$24, \$24
- Total Project Cost: \$1,758

(2) Field support assistance for extension personnel (5 years).

Addresses the support needed to assure effective agricultural extension to farmers.

- Vehicles: 30 pickups, 125 motor bikes, 200 bicycles  
Sub-total cost: \$790  
Over 5 years: \$283, \$91, \$107, \$115, \$194
- Maintenance:  
Sub-total cost: \$379  
Over 5 years: \$260, \$23, \$28, \$45
- Personnel: Expatriate staff: 7 person-years as counterparts to Burundi staff.  
Burundi staff: five at supervisory-technician level.  
Sub-total cost: \$700  
Over 5 years: \$260, \$200, \$100, \$100, \$40.
- Training: 24 months long-term and 24 months short-term  
Sub-total cost: \$108  
Over 2 years: \$74, \$34
- Instructional Equipment and Supplies:  
Sub-total cost: \$32  
Over 5 years: \$22, \$2, \$2, \$2, \$4
- Total Cost: \$1,977

(3) In-service and pre-service training of monitors (5 year)

(Cost in thousands of dollars)

- Construction and Materials:

Sub-total cost: 4290

Divided between 5 years: \$273, \$5, \$2, \$5, \$5

- Personnel - Expatriate, 5 years.

Sub-total cost: \$500

Divided over 3 years: \$200, \$200, \$100

- Training - 72 months long-term and 36 months short-term

Sub-total cost: \$138

Divided over 3 years: \$46, \$46, \$46

- Social (teaching) laboratory:

Sub-total cost: \$470

Divided over 3 years: \$410, \$40, \$20

- Total cost: \$1,008

d. Statistics Division in the MOA-Planning Department (6 years)

Establish an operable system for collecting, processing, storing and retrieving agricultural data.

Inputs: Expatriate expertise, local and scholarship training, vehicles, office equipment, operational capital.

Approximate Cost: U.S. \$2.4 million

e. Small Farm Research Center, Rutegama (6 years)

Develop a suitable small family farm production system; prepare low-cost, low-risk technological packages for the improvement of food crop production.

Inputs: Expatriate specialists, consultancies, local and scholarship training, buildings, water and electricity installations, workshop-laboratory-farm-office equipment, animals, operating capital.

Approximate Cost: U.S. \$3.1 million

f. Fertilizer

(1) Fertilizer Procurement and Supply System (5 years)

Develop a sound fertilizer purchasing and distribution system to supply small farmers.

Inputs: Expatriate experts, consultancies, local and scholarship training, storage construction, transport facilities, office equipment, operating capital.

Approximate Cost: U.S. \$2.2 million

(2) Expand Supplies of Fertilizer for Use on Food Crops (4 years)

Inputs: Fertilizer, mainly DAP and urea, 40,000 tons

Approximate Cost: U.S. \$10 million

g. On-Farm Storage Research Program - ISABU (3 years)

Development of effective, low-cost small farm storage methods to reduce post-harvest crop losses.

Inputs: Expatriate expertise, vehicles, construction work, local training, consultancies.

Approximate Cost: U.S. \$480,000

h. Agronomic Faculty - University of Burundi (4 years)

Objective: Construct a teaching laboratory complex of 320 m<sup>2</sup> plus greenhouse of 100 m<sup>2</sup>; intensify student field experimentation and practical training.

Approximate Cost: U.S. \$400,000

Cost estimates have not been made on the following:

i. Peat Energy

Develop peat deposits as a substitute for wood and charcoal. Team recommends mission proceed with the project as a high priority.

j. Establish a Burundi Social Science Research and Planning Group to work with USAID and other donors in monitoring and evaluating projects.

This project is designed to assist in mobilizing sociologists, applied anthropologists, rural economists, social psychologists, political scientists, and socio-ecologists in an institute or center. These professionals could be utilized as formal counterparts for social analysis in all phases of project work, thus providing inputs from the best-informed, locally knowledgeable sources into the logical framework of projects and in periodic evaluation and project redesign. It should help avoid unintended negative effects of projects (PID/PP stages and later implementation).

Steps Include:

- a. Build up a Social Data Bank to help Burundi social researchers and planners, USAID, and other donors in the macro-social, micro-social and micro-economic analyses needed to better design socially sound projects.
- b. Utilize those Burundians who are most sensitive to the social issues involved in the development of their country's human resources and who can assist in realistic and accurate prediction of project impacts.
- k. Low-Cost Rural Health Care Delivery

This project would aim at distributing basic health services in rural areas. Entails training of paramedical health workers in environmental health problems, nutrition and hygiene to reach target population of rural poor at regular intervals.

- l. Rural Social Centers

Emphasis to be placed on freeing women from heavy workload to participate in training program for social extension agents and to provide training especially in nutrition and health.

- m. National Family Welfare Education

The national family welfare project is proposed to promote family-oriented services to educate women in areas of health,

nutrition, family planning, child care, home economics, community self-help, and hygiene.

n. Land Use and Land Use Mapping

The on-going GOB surveys in soils, swamp lands and forestry will soon provide a basic overview of land use and its potential. The "Land Use and Resource Analysis" project will provide continued monitoring of land use; however, it is recommended that the ultimate emphasis of the project should be to develop a system of land classification within Burundi's physical and social context. When the physical mapping is completed, it is recommended that a specialist be included as a short term consultant to assist in developing the land classification system.

o. Integrated Area Development Plans in Selected Priority Areas

Phase II pilot activities to test methodology, determine social and technical feasibility, measure costs and benefits and develop detailed plans for long-term Phase III programs.

2. Project Planning and Design Teams

a. Irrigation Project Identification

The "Genie Rural" has expressed specific interest in developing irrigation projects in the Nyamuswaga and South Mosso basins. It is recommended that an irrigation engineer be retained to

fully evaluate the merits of these projects. Ideally, an engineer with experience in peat soils is needed.

2 P.M. \$24,000

b. Statistics Project Design

Agricultural and Marketing Statistics Expert

Statistical Training Specialist

Agricultural Planning Expert

3 P.M. \$36,000

c. Small Farm Research Project Design

Small Farm Management Expert (experienced in hill agriculture)

Tropical Agronomist (experienced in peasant farm practices)

Livestock Specialist (with experience in small ruminant  
production)

Soil Conservation Expert (with experience in hill agriculture)

4 P.M. \$48,000

d. Fertilizer Procurement and Supply Project Design

Fertilizer Procurement and Marketing Expert (with  
experience in developing countries)

Fertilizer Logistics and Distribution Specialist (with  
experience in developing countries)

4 P.M. \$48,000

e. On-Farm Storage Project Design

Small Farm Storage Specialist (with experience in  
developing countries)

2 P.M. \$22,000

- f. University of Burundi Project Design  
Construction Engineer (with construction experience in  
developing countries)  
Agricultural Chemist (with experience in laboratory  
organization and training) 6 P.M. \$64,000
- g. Low-Cost Rural Health Care Delivery Project Design  
Health Specialist (project design) 2 P.M. \$32,000
- h. National Family Welfare Education Project Design  
Family Training Specialist 2 P.M. \$22,000
- i. Potable Water Supply Project Design  
Hydrologist  
Social Scientist 3 P.M. \$34,000
- C. Phasing of Project Activities

It is recommended that AID develop a long-term program for Burundi with the first phase, covering the next three years, concentrating on (a) assisting other donor programs in the development of basic institutions, and (b) data collection and analysis which will provide a basis for Phases II and III.

Phase I also might include carefully selected projects of broad geographic scope in which the ineffectiveness of institutions would not be an insurmountable constraint (e.g., input supply and distribution).

Phase II, lasting about three years with some activities running five years, would involve several pilot integrated development activities, each with several distinct elements. It would have a major evaluation, feedback, and redesign element. Pilot activities, designed in Phase I, would draw heavily on the experience of GOB and other donors, as well as on the evaluation of AID results.

Phase II would produce a detailed plan for Phase III, including social and economic feasibility analysis. It would include some continued support of institutions assisted in Phase I to ensure their continued growth and the development of experience and capability to deal with Burundi's more difficult rural problems.

Phase III would involve support for implementation, on an expanding scale, of plans developed and tested in Phase II. It would include a major continuing evaluation and feedback element to ensure continued growth and relevance of institutions and GOB rural development investments. Phase III should be planned to cover at least 20 to 30 years with funding of \$10-20 million per year.

D. Candidates Appropriate for Title XII

Any of the above projects, except for agricultural inputs, conceivably could be implemented using the Title XII mechanism. However, implementation of some through Title XII would require distortion of the present Title XII orientation.

The University of Burundi development activity clearly falls within the framework of Title XII. The research and extension development activities fit somewhat less neatly within Title XII concepts, but still could be implemented using that mechanism. For the other projects it is recommended that other mechanisms be sought.

A N N E X E S

ECONOMIC ANALYSIS

AGRICULTURAL SECTOR

ASSESSMENT

C. CLYDE MITCHELL

BUJUMBURA, BURUNDI

May 1 1979

MASI CONTRACT 698-0135

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ANNEX I  
ECONOMIC ANALYSIS

SUMMARY AND CONCLUSIONS

Assignment: "The Agricultural Economist will prepare a report that describes and analyzes the system of production, consumption, and marketing of small farmers; the constraints which prevent improved efficiency and greater levels of production, consumption, the level of technology, cropping patterns, degree of market orientation, agricultural support activities, and institutions. A recommended strategy for overcoming constraints will be included in the report. Will also assist the team leader in preparing the sector assessment."

The economy of Burundi is almost entirely based on agriculture with 95% of its 3-4 million population living in rural areas. Per capita incomes, especially for farm families, are among the lowest in the world. Agricultural products account for about two thirds of GNP and virtually all of the export earnings come from agriculture, mainly coffee. The decade of the 1970s has shown virtual stagnation in farm production, particularly food crops for which production has failed to keep up with the population growth rate of 2-2.5% per annum. The value of exports grew substantially with the spurt in coffee prices, but the actual volume exported declined. Investments in agriculture have been low and yield increasing inputs such as fertilizer, pesticides and improved planting materials virtually unknown except for export crops-- coffee and cotton. Even for these crops, use has been low. Human nutritional levels are low and apparently declining with the decline in per capita food production.

Although the balance of payments and internal budget were very

favorably affected by the recent high coffee prices, this favorable situation is not expected to endure. Even with favorable coffee prices, Burundi has been heavily dependent on foreign assistance to finance its development. Though the agricultural resource base is good, prospects for the near future are not bright. Land resources are being eroded by overuse and misuse, and with the present high population growth rates and weak institutional and infrastructure base, conditions are likely to continue to deteriorate. There is a general desire among international donors to increase development assistance and to devote this increasingly to the masses of rural low income families, but shortages of good projects and ability to implement projects may constrain donor assistance.

The new president who took office by coup in September, 1976, in a very frank message to the nation delivered in December, 1977, charged that governmental officials were primarily concerned with maintaining their jobs and perquisites in the capital city, and had little contact with the agricultural poor. He reported that the development planning of the country had resulted in "pretty books" which only sat in the file cabinets and that the actual situation of the farm people was worsening. He indicated, however, that these unfortunate defects would be remedied by his new government and that the new five-year plan for 1978-82 would be well-prepared, realistic, disciplined, and would govern the development of the country. The clear implication was made that the public servants whose performance is not up to standards would either be replaced, or rehabilitated.

One and one-half years later, this observer concludes that the defects pointed out by the President continue to persist. The new Plan does speak of agriculture, particularly poverty-agriculture, as having first priority

for development. However, total financial commitments to agricultural development are insufficient with respect to the tremendous task ahead; the regular budget goes largely to pay the salaries of the officials in Bujumbura, with development of the lowest-income subsistence sector dependent on foreign assistance. Institutional and legal constraints remain as they were: no provision is made for the institutional credit needed to enable subsistence units to expand production and market their products at favorable prices; insecure land tenure still makes it almost impossible for a small farmer to borrow and capitalize toward high yield agriculture; the formation of community organization and cooperatives is difficult, both for legal reasons (lack of a proper co-op statute) and for the reasons of fear and mistrust.

The team had interviews with many foreign nationals who have helped keep various government functions operating. In general, it is their opinion that many of the Plan objectives for the 1978-82 period will not be achieved and that the shortfalls will be serious, particularly in food production.

Major concerted efforts will be needed based on well-prepared development plans, careful monitoring and appropriate in process redesign. More and better information is needed as a basis for planning and monitoring of development. An accurate inventory of the natural resources of the country including land use capability and current land use is needed. Such a study can be made on the basis first of satellite-borne sensors, verified by high-level air photography, lower-level detailed reconnaissance, and finally by actual field studies. These might be particularly directed to the better crop areas, areas suffering from severe erosion, and those areas presently unpopulated but offering potential for settlement. The training of local land-use technicians

and planners will be important in future development planning and evaluation.

Projects to introduce intermediate technologies to the poorest farms can increase efficiency and save time, particularly of the farm women, which then can be utilized in farm gardens, small livestock raising, better food and nutritional practices, as well as for farm work itself. For example, individual grist mills could reduce to a fraction the time spent grinding grain. Water supply to farm communities, or to centralized locations in the hills, can save the many tedious hours farm women spend in the dry season carrying water for the family and animals. It is recognized that the Hutu farmers fear being centralized in any manner. Yet, the supply of water close to the home is so important, for the woman and for the welfare of the family, that the task should be undertaken where possible. It need not mean centralization of houses. Simple health facilities and formal and non-formal educational opportunities placed throughout the country are priority tasks which will benefit the small farmer.

Storage and price support are a high priority, to give the small farmer assurance that his crop can be sold at a reasonable price and not virtually given away at harvest time. This would benefit consumers as well as producers. Such an effort should be started on a small scale, and if actual results can be obtained at reasonable costs this should be put to more widespread use. A comprehensive storage, quality control, price support and distribution program should be put into operation when proven technically, operationally and financially feasible. There is a great need for a campaign against post-harvest losses on the farm which will include bird and rat-proof storage structures, solar drying of grains and root crops and protection against insects.

An integrated agricultural development project should be considered which would include bringing farm families together in informal groups with which technicians can work, teaching by group methods and verified by individual farm visits. Proper farm and home plans to grow, harvest and sell increased and/or higher value products should be developed which offer the possibility of escaping from the vicious circle of subsistence farming. Implementation of individual farm plans will require improved seed, fertilizer, farm tools, pesticides, and probably credit, and the discipline and supervision to insure that these modern inputs are being correctly employed. If the farm group can be organized to absorb these inputs and training, it can probably be organized in due time to sell the product in a group or cooperative fashion, or to entice private buyers to come in and buy the increased produce. The "Integrated" approach demands a quality of local supervision that the government extension service does not yet have. Only in the coffee areas has an extension worker been able to secure acceptance by the farmers of relatively simple improved practices. But if the task is possible with small farmers who have a fraction of a hectare in coffee, it should be possible in other areas where the emphasis is on foodcrops. The important role of women in food crop production must be recognized and their participation provided for. Since the subsistence farmers growing food crops have never been able to earn money to buy fertilizer and pesticides, considerable discipline must be exerted to induce them to adopt a package which includes these and other inputs. It has been shown in many parts of the world that once the improved practices are found to increase production of food crops, leaving a surplus for sale, farmers are willing in later years to put more and more of their land into the higher-yielding practices. Various

agencies, religious and international, have tried and are trying such a "package" approach to improvements in yield on small parcels; the FAO is working towards such ends in the Gitega region. AID could perform a useful service if it could, in collaboration with various other agencies, try its hand at the integrated package approach, possibly associating supervised credit with technical assistance.

The seven members of the sector team have discussed their recommendations for programs and projects and each member is recommending developmental efforts in which he has particular interest. This observer supports particularly the suggestions for improving wherever possible the basic data for planning, which must include product and input price statistics, production estimates, costs of transport, as well as nutrition and other quality-of-life factors. Reforestation, soil conservation, and peat-fuel projects should also have support.

I. AGRICULTURAL SITUATION, MID-1979

Production, for Domestic Use and for Export

The economy of Burundi, a small country the size of the state of Maryland, but with three to four million people,<sup>1</sup> is based almost entirely on agriculture. / 95% of the population is rural / 90% of all families are directly engaged in farming. . Their total production since 1976 has remained virtually stagnant at the \$180 million level (expressed in 1976 prices). Very little of this production entered the market, and a small share (mostly coffee) was exported. A sharp rise in coffee prices between 1975 and 1977 distorted this picture. Previously, coffee had made up about 8% of farm production. Suddenly in monetary terms it jumped. Coffee, which had been running \$20-25 million per year spurted to over \$50 million in 1976, and almost \$90 million in 1977, probably 25-30% by value of agricultural production (table 1,2). The 1977 increase in exports reflected only a higher coffee price. Volume was down. The future of coffee prices will have a profound effect on Burundi's earnings from trade.

Burundi's rural people are living in a genuinely primitive subsistence economy. Until the coffee price rise it was estimated that only 30% by value of the farm production but probably only 10% by volume entered the market. Burundi farmers find it hard to enter the money

<sup>1</sup> Attachment 1 discusses the problem of statistical information in Burundi. Neither population figures nor any other of the data necessary for an analysis of the agricultural sector are dependable. Prices, quantities, nutritional data, even exports and imports -- all are estimates, and often quite inaccurate. Improved data will be a recommendation for AID project-assistance to Burundi.

**Table 1. BURUNDI: Production, Export and Price of Coffee, 1970-76**  
(quantities in tons; prices in Bu F/kg)

	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
Quota <sup>1/</sup> <sup>2/</sup> (International Coffee Organization)	16,436	19,089	23,181	..	..	..	..
<u>Production</u>	<u>22,084</u>	<u>25,145</u>	<u>19,483</u>	<u>21,495</u>	<u>28,139</u>	<u>16,929</u>	<u>21,429</u>
Arabica	21,184	23,365	17,960	19,633	26,445	15,021	19,98
Robusta	900	1,780	1,523	1,862	1,694	1,908	1,44
<u>Exports <sup>3/</sup></u>	<u>19,926</u>	<u>18,819</u>	<u>24,558</u>	<u>22,600</u>	<u>20,637</u>	<u>26,041</u>	<u>21,835</u>
Arabica	19,047	18,018	22,744	21,217	18,209	23,874	20,256
Robusta	879	801	1,814	1,383	2,428	2,167	1,57
Destination of exports (in %)	<u>100</u>						
USA	67	77	79	62	36	52	49
West Germany	7	3	7	13	29	24	:
Other EEC	7	7	6	12	25	15	:
Other	9	13	8	13	10	9	7
<u>Prices <sup>4/</sup></u>							
Producer (Arabica :green)	36.0	35.0	34.0	38.0	45.0	39.0	65.0
Export (f.o.b. Dar-es-Salaam)							
Arabica	89.02	71.50	85.67	94.78	87.77	100.29	231.:
Robusta	69.11	67.33	74.51	77.05	74.93	88.08	171.7
All categories	88.22	71.20	84.80	93.24	86.26	98.91	231.6

Source: Banque de la Republique du Burundi.

<sup>1/</sup> Valuation by calendar year.

<sup>2/</sup> Quota is fixed very loosely until June, then is replaced by the next.

<sup>3/</sup> Customs figures in net weight.

<sup>4/</sup> Figures refer to campaigns (May 1 to April 30).

Table 2 : BURUNDI: Components of Sliding Schedule for Coffee Prices, 1973/74 - 1977/78  
(in Burundi Francs per ton)

	<u>1973/74</u>	<u>1974/75</u>	<u>1975/76</u>	<u>1976/77 (P)</u>	<u>1977/78 (P)</u>
Producer price of green coffee <sup>1/</sup>	50,000	60,045	52,899	89,239	153,425
Intermediary	1,579	2,667	2,710	3,434	4,110
Wholesaler	..	..	1,500	2,000	2,500
Transport and handling costs	6,532	8,752	9,124	9,211	10,643
Burundi Coffee Company	..	..	1,636	1,250	3,000
OCIBU levies	4,847	5,647	4,300	7,369	6,100
<u>Total fixed costs</u>	<u>62,958</u>	<u>77,065</u>	<u>72,169</u>	<u>112,503</u>	<u>179,778</u>
Exporters' commission	,776	3,555	-	-	-
BCC's commission (before distribution)	-	-	2,756	13,293	..
Insurance, etc.	656	1,068	1,375	3,208	..
<u>Total variable costs</u>	<u>3,432</u>	<u>4,623</u>	<u>4,131</u>	<u>16,501</u>	<u>26,353</u>
Export tax	21,780	9,870	8,934	58,368	235,000 <sup>2/</sup>
Stabilization Fund operation	4,379	-1,834	15,052	45,546	20,000
Total government taxes and stabilization fund operation	26,159	8,036	23,986	103,914	255,000
<u>Selling price</u>	<u>92,549</u>	<u>89,724</u>	<u>100,286</u>	<u>232,918</u>	<u>444,231</u>
<u>Memorandum items:</u>					
Producer price for parchment (FBu/kilo)	38.0	45.0	39.0	65.0	112.0
Average export price f.o.b. Dar es Salaam (U.S. dollar/lb.)	0.545	0.517	0.578	1.180	2.25

Source: Banque de la Republique du Burundi

.. not available

<sup>1/</sup> One ton of green coffee is estimated to be equivalent to about 1.33 tons of parchment coffee.

<sup>2/</sup> Of which 165,000 BuF/ton for the Extraordinary Budget.

economy -- though it will be a necessity if their living levels are to be improved. Most farmers live some distance from a road, and must take their produce to the road or to a market on their heads, over footpaths and trails. The bulk of the produce marketed is home-made banana beer.

Several other items enter the market -- about 46% of all livestock products and 95% of all fish. When these products are sold, they are absorbed mainly by the markets in Bujumbura city where the upper-income people live: the government employees, the commercial and white-collar classes and foreigners. Diet studies indicate that the general "availability" of meat is only about 4 kilograms per year per person. Even the more fortunate and educated Burundians with whom we talked told us that they can remember eating meat only once or twice a year when they were growing up on the farm.

Virtually all the coffee and tea produced enters the market. The overall 30% value of agricultural produce that enters the market (mentioned above) is heavily weighted by the value of these two export crops. It is reported that about half of all farmers in Burundi produce coffee. Most are very small producers, usually with 100 to 200 coffee trees, producing about 1/2 kilogram of coffee (parchment basis) per tree, and worth about 100 francs per kg. Tea, grown on private farms, is usually grown on small farms quite close (within walking distance) of one of the Government tea estates which have the essential processing machinery for the fresh and perishable tea leaves.

In the coffee elevations, the small farmer with 1 to 2 hectares can earn from \$50 to \$300 or \$400 per year from his 0.1 to 0.4 Ha. in coffee

trees depending on amount in coffee and yields. With about 200,000 families and 30,000 hectares in coffee cultivation, yields averaging 800 kg/hectare and farm prices of over 100 francs per kg, the average grower would have 0.15 hectares, produce 120 kg and receive 12,000 francs or more (\$135). At elevations above those where coffee will grow, tea is a cash crop. Private production of tea is growing rapidly (20 fold between 1970 and 1975, table 4,5), but the number of farmers who can take advantage of this relatively new product is still quite limited. At elevations lower than those for coffee, some farmers can grow cotton as a cash crop, but their number is also limited by access to a market and a cotton gin (table 6). Income from beer, from work off-farm, and from the sale of occasional surpluses above family needs of dry beans, peas, manioc, or grain, provide cash for the family to use for essential purchases such as cloth, medicine, salt and spices.

There are about 800,000 farms in Burundi which together harvest about 1.4 million hectares of subsistence crops and about 50,000 hectares of export (cash) crops. The typical farm has a little over one hectare of arable land but grows a wide variety of different crops -- legumes, cassava, sweet potatoes, maize, bananas, and some vegetables which provide the principal diet of the family (table 7). The diet generally is deficient in calories, protein, vitamins and minerals. Infant mortality is 170 per thousand in males and 153 per thousand in females. Death from infectious disease, parasites and malnutrition is high.

According to available data over 28% of the children in the 1-1/2 -- 4-1/2 year age group die of malnutrition each year. Even in the 4-1/2 -- 14-1/2 year age group 20% of the deaths are attributed to malnutrition, but

Table 3: BURUNDI: Production of Coffee (Parchment) by Province, 1970-76  
(in percentages)

	<u>1970</u>	<u>1974</u>	<u>1975</u>	<u>1976</u> <sup>1/</sup>
Bubanza	10.2	5.5	7.3	8.2
Bujumbura	4.8	2.1	0.8	6.2
Bururi	10.8	6.5	10.6	6.8
Gitega	13.2	14.8	14.9	18.5
Muramvya	5.2	7.0	7.6	5.9
Muyinga	17.5	18.6	8.9	14.7
Ngozi	34.7	41.0	46.5	34.7
Ruyigi	3.6	4.5	3.4	5.0
<u>Total</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>
Hectarage	..	..	29,342	29,639

.. not available

Source: Ministère de l'Agriculture  
Office des Cultures Industrielles au Burundi (OCIBU)

Note: Figures for 1971-73 are not available.

1/ Estimates

Table 4 : BURUNDI: Production of Tea (Processed) by Province: 1970 thru 76  
(in kilograms)

		<u>Bururi</u>	<u>Muramvya</u>	<u>Noozi</u>	<u>Total</u>
1970	T	-	<u>147,429</u>	-	<u>147,429</u>
	P	-	<u>142,326</u>	-	<u>142,326</u>
	V	-	<u>5,103</u>	-	<u>5,103</u>
1971	T	-	<u>238,024</u>	<u>84,080</u>	<u>322,104</u>
	P	-	<u>223,495</u>	<u>84,080</u>	<u>307,575</u>
	V	-	<u>14,529</u>	-	<u>14,529</u>
1972	T	-	<u>326,637</u>	<u>158,710</u>	<u>485,347</u>
	P	-	<u>298,978</u>	<u>158,710</u>	<u>457,688</u>
	V	-	<u>27,659</u>	-	<u>27,659</u>
1973	T	-	<u>415,088</u>	<u>241,719</u>	<u>656,807</u>
	P	-	<u>373,853</u>	<u>241,719</u>	<u>615,572</u>
	V	-	<u>41,235</u>	-	<u>41,235</u>
1974	T	-	<u>568,177</u>	<u>338,231</u>	<u>906,408</u>
	P	-	<u>503,873</u>	<u>338,231</u>	<u>842,104</u>
	V	-	<u>64,304</u>	-	<u>64,304</u>
1975	T	<u>14,534</u>	<u>367,734</u>	<u>404,620</u>	<u>786,888</u>
	P	<u>8,044</u>	<u>270,904</u>	<u>404,620</u>	<u>683,568</u>
	V	<u>6,490</u>	<u>96,830</u>	-	<u>103,320</u>
1976	T	<u>28,794</u>	<u>517,120</u>	<u>477,964</u>	<u>1,164,000</u>
	P	..	..	..	..
	V	..	..	..	..

.. Not available

P = Plantation (tea produced on State-Owned Plantations)  
V = Villageois (tea produced by individual farmers)

Source: Office du Thé du Burundi

Table 5. BURUNDI: Hectarage of Tea by Province: 1969/70 through 1975/76

<u>Province</u>		<u>Bujumbura</u>	<u>Bururi</u>	<u>Muramvya</u>	<u>Ngozi</u>	<u>Total</u>
1969 - 70	T	-	<u>151</u>	<u>316.25</u>	<u>387</u>	<u>854.</u>
	P	-	144	278.25	387	809.2
	V	-	7	38	-	45
1970 - 71	T	-	<u>282.5</u>	<u>493.85</u>	<u>387</u>	<u>1,163.5</u>
	P	-	263	415.85	387	1,065.8
	V	-	19.5	78	-	97.5
1971 - 72	T	-	<u>382.5</u>	<u>669</u>	<u>488</u>	<u>1,539.5</u>
	P	-	334	508	488	1,330
	V	-	48.5	161	-	209.5
1972 - 73	T	-	<u>509.10</u>	<u>805</u>	<u>507</u>	<u>1,821.1</u>
	P	-	444	508	507	1,459
	V	-	65.10	297	-	362.10
1973 - 74	T	-	<u>655.10</u>	<u>913</u>	<u>515</u>	<u>2,083.</u>
	P	-	530	508	507	1,545
	V	-	125.10	405	8	538.10
1974 - 75	T	<u>16</u>	<u>806.20</u>	<u>1,017</u>	<u>561</u>	<u>1,800.</u>
	P	16	580	508	507	1,611
	V	-	226.20	509	54	789.5
1975 - 76	T	<u>16</u>	<u>909.48</u>	<u>1,089</u>	<u>631</u>	<u>2,645.48</u>
	P	16	580	508	577	1,681
	V	-	329.48	581	54	964.5

P = Plantation (tea produced on State-Owned Plantations)  
V = Villageois (tea produced by individual farmers)

Source: Office du Thé du Burundi.

Table 6 : BURUNDI: Production of Cotton: Production (tons),  
Area and Number of Farmers: 1969/70 - 1974/75

	<u>Cotton- seed</u>	<u>Fibers</u>	<u>Total</u>	<u>Hectarage</u>	<u>No. of Farmers</u>
1969/70	8,744	..	..	9,239	20,072
1970/71	8,708	3,321	12,029	9,214	19,870
1971/72	5,153	1,893	7,046	8,358	17,374
1972/73	4,674	1,723	6,397	6,502	14,842
1973/74	4,526	1,653	6,179	8,203	..
1974/75	3,820	1,422	5,242	8,109	14,345

Source: Ministère de l'Agriculture

.. not available.

Table 7: BURUNDI: Production, Area and Yield of Major Food Crops, 1970-76

	(in metric tons)						
	1970	1971	1972	1973	1974	1975	1976
Beans	553,970	445,206	233,660	245,000	432,614	460,932	500,520
Sorghum	95,037	227,318	107,288	205,000	160,816	129,297	119,818
Maize	287,334	460,842	254,172	368,000	504,435	471,014	419,658
Cassava	1,576,554	3,557,860	3,222,640	3,257,000	1,882,230	2,128,081	2,494,536
Sweet Potato	1,074,105	2,817,504	2,127,696	2,556,000	1,828,000	1,695,040	1,425,871
				(in hectares)			
Beans	291,011	321,789	..	533,821	543,148	529,508	467,795
Sorghum	86,700	72,071	..	102,356	107,065	111,266	99,686
Maize	140,152	187,808	..	339,815	336,304	305,076	266,933
Cassava	130,016	157,696	..	263,374	411,039	205,815	214,466
Sweet Potato	100,537	135,572	..	226,530	227,942	247,448	195,400
				(in m. tons/ha)			
Beans	1.9	1.4	..	0.5	0.8	0.9	1.0
Sorghum	1.1	3.2	..	2.0	1.5	1.2	1.2
Maize	2.1	2.5	..	1.1	1.5	1.5	1.6
Cassava	12.1	22.6	..	12.4	4.6	10.3	11.0
Sweet Potato	10.7	20.8	..	11.3	8.0	6.9	7.0

Source: Ministry of Agriculture

Parasites and infectious diseases are the major cause of death, about 40% (table 8). Life expectancy at birth is about 40 years. The population is young with 31% below 10 and 45% below 15 years of age (table 9). Illiteracy is very high, reportedly 90% among women. The typical family does not have access to pure drinking water or reliable medical help. Access to the homestead probably requires a several kilometer walk over paths and hills from the nearest road. The land typically would be seriously eroded and with fertility declining.

Capitalization of Small Farms for Integrated Development -- An Example

For about thirteen years, the Government, with liberal foreign assistance, attempted the settlement of highland farm families on relatively flat and good farmland of the lowlands. In one "showcase" project north of Citiboke each farmer has received 4 hectares laid out in a long strip about 80 x 500 meters, with the 80 meter side fronting a roadway. The 500 meter strip is divided into 10 parcels, and the parcels in the same relative position of all the farmers in the area are planted simultaneously to the same crop, so that a tractor can plow the strips one after the other in a relatively efficient manner.

One of the parcels is usually in lowland Robusta coffee, about 200 trees. The house with its surrounding banana plants and kitchen garden is on the roadway. Beans, cotton, corn, some pineapple and other fruits or high-value crops are grown. These farmers, with some credit, discipline, and irrigation water, all provided by the government, produce and market five to ten times as much as the more-typical one-hectare farmer in the hills. The show-case farms were in quite good condition. Unfortunately such special conditions have been made

Table 8: BURUNDI: Death Rates and Infant Mortality, 1976  
(in percent)

I. Diseases	Ages						
	<u>0-1</u>	<u>2-4</u>	<u>5-14</u>	<u>15-24</u>	<u>25-34</u>	<u>35-44</u>	<u>45</u>
a. <u>Infectious and parasitological diseases</u>	22	47	40	40	37	33	33
Measles							
Tetanus							
Whooping-cough							
Malaria							
Tuberculosis							
Typhus							
Hepatitis							
etc.							
b. <u>Malnutrition</u>	5	28	20	2	3	7	4
c. <u>Pneumonia</u>	10	11	13	4	6	6	14
d. <u>Gastro-enteritis</u>	11	7	2	1	0	0	0
e. <u>Other</u>	52	7	25	53	54	54	49
- cirrhosis							
- alcoholism							
- trypanosomiasis							
- schistosomiasis							
- leprosy, etc.,							
<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

II. Infant Mortality

Age	<u>M</u>	<u>F</u>
0	17.00	15.30
1-4	4.00	4.00
5-9	1.00	1.00

Source: Wiesler: "Etude sur quelques paramètres démographiques et sanitaires au Burundi", June 1976

Table 9 : BURUNDI: Population by Age and Sex: 1971 and 1975  
(in percent)

Age	<u>Males</u>		<u>Females</u>		<u>Total</u>	
	<u>1971</u>	<u>1975</u>	<u>1971</u>	<u>1975</u>	<u>1971</u>	<u>1975</u>
0 - 4	8.43	8.50	7.92	8.24	16.35	16.74
5 - 9	7.05	6.88	7.52	7.32	14.57	14.20
10 - 14	6.73	6.56	7.08	6.60	13.81	13.16
15 - 19	5.43	5.19	5.30	5.49	10.73	10.68
20 - 29	7.12	6.51	8.06	7.71	15.18	14.32
30 - 39	6.09	5.71	6.62	6.62	12.71	12.33
40 - 49	4.17	4.05	4.55	4.71	8.72	8.76
50 - 59	2.17	2.43	3.17	3.33	5.34	5.76
60 - 69	0.75	1.28	1.27	1.74	2.02	2.12
70 +	0.17	0.47	0.40	0.56	0.57	1.03
<u>Total</u>	<u>48.11</u>	<u>47.58</u>	<u>51.89</u>	<u>52.42</u>	<u>100.00</u>	<u>100.00</u>

Source: "Enquête Démographique Burundi," 1970-71  
World Health Organization, 1975

available to only a tiny fraction, perhaps 2% of the total number of farm families. The major conclusion to be drawn is that here as in many parts of the world, if a sizeable investment is made at the beginning, a farm family can live well on a small tract of land and repay the investment. If the initial investment is too niggardly, the family is merely locked into its vicious circle of poverty. A key factor in the success of the settled areas visited was the dependable cash income from the few coffee trees. When asked what he would desire for his farm, the farmer stated that he wanted to be allowed to plant more coffee trees; apparently he would have been willing to put most of his 4 Ha in coffee. His 10 to 13 year old Robusta trees were producing about 1 kg of parchment coffee each year, for which he was guaranteed a government price of 90 francs. The financial investment in trees, the guaranteed price -- these were what he sought. His ambition was to have four improved irrigation hectares, worth ten to twenty thousand dollars, working for him. Most Burundi farmers would be happy to participate, even if the area were only one-fourth as large (i.e. 1 Ha).

Sample Study of Farms in the Communities of Bugenyuzi and Buhiga

Students in Agricultural Economics at the University have been guided in case studies of farm operations in two communities near the town of Karuzi in north-central Burundi. The design of the study unfortunately does not allow an estimate of the costs of production of the basic crops, either in cash outlay or in man-days utilized. A suggestion was made that future studies attempt such estimates, which would be particularly useful to the government in case price supports

should be established which would provide a reasonable reward to the farmer, as has been promised in official government policy. Projects for possible support by US/AID aimed at furnishing improved agricultural statistics should eventually result in accurate estimates as to the various inputs, including labor, on Burundi's farms.

The sample study, referred to above, found that expenditures for food took about 35% of the cash income available and about one-half of this was for cloth and clothing. Farm production absorbed only about 15% of the total cash income, and no fertilizer or pesticides were purchased -- the small amounts spent went for tools, and sometimes for seed. The matter of adult worker-days was not studied -- all farmers and farm women state that they worked all of every day, except Sundays.

The size of the sample of farmers interviewed, based on the rough estimates of total population, was 1.1% in Bugenyuzi and 1.7% in Buhiga. The following data were made available.

	<u>Bugenyuzi</u>	<u>Buhiga</u>
Area in farmland available for family use	1.66 Ha	1.7 Ha
Area in marshland available	.62	.38
	<hr/>	<hr/>
Total land available	2.28 Ha	2.08 Ha
Total Cash receipts for the year:		
Beer Sales	5,150 francs	7,448 francs
Coffee	2,284	4,016
Other farm products	3,800	5,164
Off-farm work	<u>2,578</u>	<u>6,436</u>
Total Cash Receipts	13,812	23,064
Cash expenditures for the year were reported as		
	13,229	18,901
Savings were reported as	583	4,163

If to these cash incomes is added approximately 11,000 for food produced and consumed on the farm, the Bugenyuzi farm with 24,800 production is about "average" and the Buhiga farms are somewhat above. Their land-availability of 2.28 and 2.08 Ha., is definitely above the national average.

#### 1970-71 SEDES\* study of Income and Expenditure

The many sample studies made in 1970 and 1971 by the government, with foreign advice, in preparation for the census of population (which was never carried out) produced considerable data regarding family spending patterns. A SEDES study of these data, published in March, 1973, indicates that the average Burundi farm family earned about 713 francs from selling foods and coffee, and spent about 329 francs on food products, more than half of which was for drinks (beer and bottled beverages). Other expenses were for salt and spices, plus small amounts of other foods during periods when the farm supply had been exhausted.

#### Productivity and Consumption

The Ministry of Planning has estimated the value of production per farm unit in Burundi, on the average, per adult worker, and per day of available labor utilized on the farm. For contrast, the wages of government workers is expressed in percentage figures based on the 1970 government salary as 100. Government salaries have been readjusted in accordance with inflation indexes on several occasions. Production per farm worker per day in real terms was slightly lower in 1976 than in 1970.

\* Société D'Etudes Pour le Développement Economique Et Social.

Year	Average Production, in 1970 francs			Salaries of Govt. workers
	per farm unit	per adult worker	per day	
1970	24,500	7,500	28.9	100 %
1971	24,900	7,600	29.4	106
1972	21,900	6,700	25.9	127
1973	23,900	7,300	28.3	128
1974	22,400	6,900	26.5	147
1975	23,100	7,100	27.4	147
1976	23,400	7,200	27.7	175

(Source: Ministry of Planning, quoted in AGCD Report, Annex 8, page 14)

Since 29 September 1976, the government has decreed a minimum wage: 80 francs per day in Bujumbura, 60 in Gitega and Ngozi and 50 in the remainder of the country. There is a 10% supplement decreed for heavy physical labor.

Since Burundi is a subsistence economy, the derivation of statistics of consumption is relatively easy -- if the statistics of production (Table 10) are good; the consumption is merely the total production, less exports, plus imports. For the 95% of the people who are rural, imports figure virtually not at all in the diet or consumption pattern. The few upper-income rural people are customers for imported cooking oils, soap, spices, and a few other items, particularly cloth and clothing. The other imports go almost entirely to the high-income city dwellers. (Table 12 shows export and import data). Imports for the food industry amounted to only about \$7.5 million in 1977 (\$2 per capita) and imports for agriculture less than \$2 million.

The most important concern in Burundi's food consumption levels is malnutrition. Adequate nutrition would require about 2,400 calories per day, while Burundi intake actually averages 1900 or less, according to the very inexact data available. At least half, and probably more,

Table 10  
PRODUCTION STATISTICS, 1977 "OFFICIAL" FIGURES AND 1982 GOALS, "PLAN", page 108

(All figures in thousands of metric tons except wood products, in M<sup>3</sup>)

ESTIMATED PRODUCTION, 1977 See Annex I regarding statistical validity		1982 GOAL	
	1977	1982 GOAL	
Dry Beans	307.		Fresh fruits/veg.
Dry Peas	33.		100.
Total Leguminous	340.	408.	Sugarcane
			5.
Corn	140.		Cotton(w. seed)
Sorghum/millet	32.		5.
Rice	7.		Coffee(parchment)
Wheat	6.		29.
Total Grains	185.	242.	Tea
			8.
Manioc/cassava	396.		All meat
Taro and yam	111.5		18.
Sweet potato	420.5		Milk
White potato	37.		30.5
Total starchy roots	965.	1,061.	Fish
			19.
Peanuts	9.5		Non-food products:
Oilpalm fruit	11.5		quinine
Total oleagenous	21.	42.	--
			0.1
Bananas (eating, cooking & beer)	1,320.	1,452.	manure
			850.
			1,700.
			2,000.
			2,240.
			40.
			45.
			0.7
			1.

Table 11

EXPORTS ANTICIPATED AT END OF PLAN, in 1982 ("PLAN", page 108)

Cereales,	35,000 Tons,	out of a total production of 242,000.
Fresh fruits		
and veg.	15,000 Tons,	out of a total production of 135,000.
Coffee,	39,000 Tons,	out of a total production of 40,000. ("parchment" weight--
		export weight is about 73
Cotton,	3,500 Tons,	out of a total production of 10,000. ("with seed" weight--
		export weight is about 33
Green Tea	17,000 Tons,	out of a total production of 18,000.
Quinine		
(Chinchona		
bark)	100 Tons,	out of a total production of 100.
Hides	400 Tons,	out of a total production of 1,000.

TABLE 12 : Imports and Exports, 1973-1977

	1973	1974	1975	1976	1977
	(value in millions of Burundi francs)				
<u>IMPORTS</u>					
Of Interest to Agriculture					
For Agriculture	57.3	98.3	127.1	110.9	140.4
For food industries	207.2	367.2	475.5	509.0	679.0
For textile industries	28.6	44.3	58.0	24.7	62.2
For forestry industry	1.1	13.1	10.4	7.1	18.7
For paper industry	13.3	14.3	46.0	16.5	30.7
For leather industry	1.2	1.7	0.5	0.6	0.2
For construction industry	93.6	91.5	196.8	220.7	296.7
Sub-total	402.3	630.4	996.8	889.5	1,227.9
Others (for metal industry, chemicals, solid combustibles, mineral oils, etc.)	2,092.7	2,765.6	3,859.2	4,137.5	5,450.1
Total Imports	2,495	3,396	4,856	5,027	6,678
<u>EXPORTS</u>					
Coffee (Thousand tons)	(23)	(21)	(26)	(22)	(17)
Coffee, value	2,014	1,963	2,213	4,835	8,023
Cotton	127	142	57	202	7
Hides	143	148	60	92	45
Tea	35	72	65	103	236
Minerals	32	37	20	19	10
Manufactured goods					
principally fibrocement	26	22	39	42	32
and bottled drinks	15	10	-	-	-
Other	52	46	64	127	158
Total Exports	2,444	2,440	2,515	5,420	8,511
Negative Balance on imp-exp.	-51	- 956	-2,341		
Positive Bal. on import-exp.				393	1,835

Source: 1977 Annual Report, BRB (Bank of the Republic of Burundi)

of the people do not come up to the average level. Protein is available only in the form of beans and peas, for most Burundians. Lack of certain of the amino acids, say most nutritionists, makes difficult the full utilization of the protein in the beans.

The Plan document, page 110, contains the only official material considered worthy of consideration regarding diets:

Type of Food	<u>Availability per person, Kg. per year</u>	
	<u>"Actual" (1977)</u>	<u>1982 Goal</u>
Bananas	347.3	341.0
Starchy root crops	253.9	249.2
Dry legumes	89.5	95.8
Cereals	48.7	56.8
Fresh fruits and vegetables	26.3	31.7
Oil seeds and fruits	5.5	9.9
Sugar	1.2	1.4
Milk	8.0	9.3
Fish	5.0	5.9
Meat	4.7	5.3

(Also see tables 13 and 14.)

#### Markets, Prices, and Storage

Market facilities for the export crops (coffee, tea, cotton, and hides) are well developed. The market for the remainder of the agricultural production is primitive. A central market exists in Bujumbura, and in a few of the other large towns. Small local markets, on an open plot of land, are gradually being established. The farmers who can take their produce to any of these markets are those who can walk, with their goods on their head, or can afford to take a jitney-truck which carries both passengers and cargo, for a fee which depends on

TABLE 13 : Food Consumption Estimate

(For one year, a family of four)

<u>Food</u>	<u>Kilograms</u>	<u>Nominal Price</u>		<u>Value</u>
		Francs	Bu.	Francs,
Dry beans	360 kg.	18		6,480
Corn	24	12		288
Sorghum	6	12		72
Sweet potatoes	492	3		1,476
Manioc	264	2.5		660
Peanuts	2	50		100
Bananas	336	3		1,008
Meat	4	80		320
Various Others				1,000
<b>Total</b>				<b>11,404 (about \$125 U.S.)</b>

Source: AGCD 1979 Project Statement, page 144. The date to which these estimates refer is unspecified, and probably is mid-1978. The text adds that in this area farmers could expect in normal years to sell any surplus they might have at 18 francs for beans, 14 for corn, 12 for sorghum, 10 for soya beans and 45 for peanuts.

Comments: The AGCD report will be referred to frequently in this document. It was in nine volumes, a Report and 8 Annexes, entitled "Etudes pour la Mise en Valeur de la Region de Kirundo". The combination of 10 projects being recommended for Belgian support would call for an outlay of \$20.6 million, U.S. The Kirundo region was considered typical of the low-income farm area. However, the average size of holdings, per farm, at 2.863 Ha., was considerably larger than the Burundi average.

TABLE .14 : Plan Estimate of Average Income to Farmers, 1970-76

	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
Number of farms (thousands)	548	552	571	582	594	605	616
Average income per farm (in thousands Bu. francs) <sup>1/</sup>	24.5	24.9	21.9	23.9	22.4	23.1	23.4
Equivalent in US Dollars (to support a family of 4 to 5 persons)	\$270	\$275	\$241	\$263	\$246	\$253	\$257
Average income per "adult worker equivalent"	\$83	\$84	\$74	\$80	\$76	\$78	\$79
Income received by the adult equivalent worker, per day worked, Bu. fr.	28.9	29.4	25.9	28.3	26.5	27.4	27.7
Equivalent in U S Dollars	32c	32c	28c	31c	29c	30c	31c

Source: Plan, Annex to Sec. 4.1.4.2. Value figures in 1970 francs.

<sup>1/</sup> Value of products sold and consumed on the farm.

Comments: The number of farms might be much too high. They were estimated from the arbitrary population estimates for each year, which are probably too high. This might have biased the income figures downward. The figure utilized for the 1970 population was 3,207,974 persons on 548,372 farms. One farm consisted of 1.3 families, or about 4.5 persons. 2.5 adult male equivalent workers were estimated to work on each farm. A year was considered to have 260 work-days for each equivalent worker.

distance and the amount of cargo. Farmers are at the mercy of buyers and middlemen. Few of them possess the equipment or the knowledge to store their goods on their own farms in safe conditions. At the time of harvest, when the crop is plentiful everywhere, farmers must take very low prices if they need cash. If they later find they have not saved enough for food or seed, they must go into the market and pay 2 to 4 times what they initially received for the crop.

### Living Levels

#### 1. Income and Diets, Farm and Non-Farm

The only information available on diets has been presented above. Incomes have been subject to very little economic analysis. The reports we have read, most of them stemming from the same original estimates, are summed up in the Plan document, page 21, regarding Gross Domestic Product per capita, which is estimated to be 6,848 francs in 1976, expressed in 1970 francs. This is approximately \$75 (US).

#### 2. Housing and Health, Education, and Other Social Services

These matters are being considered at greater length by other members of the Sector Evaluation Team. As all observers have noted, the situation of the rural poor is abysmally bad, with regard to all living conditions. The Demographic Questionnaire, published in 1974, contains numerous studies detailing the lack of simple comforts and health services in the sample areas studied during 1970 and 1971. Due to the stagnation of agricultural production, the increasing population and diminishing farm-sizes, the erosion and loss of soil fertility, the problems are even more grave now

than in 1970. The only important progress made has been in the construction of a network of roads, trails, and in some cases, schools and social foyers.

## II. BURUNDI'S DEVELOPMENT GOALS AND NEEDS

### A. The Five-Year Plan -- Priority Objectives and Targets

The major goal set forth in the 1978-82 Five-Year Plan is to "bring about social and economic development emphasizing the development of agriculture and increase the purchasing power of the rural masses" (Plan, page 33). Two means are stated to achieve this:

- (1) Increase in food production to improve the nutritional level, both in quality and in quantity, and achieve "food security" for the people;
- and (2) Reduce under- and un-employment both in towns and in the rural area.

Specific objectives were listed for agriculture, livestock, and fisheries:

- (1) A new emphasis to food crop agriculture.
- (2) An intensification of the production of the export crops, and crops which can support agro-industries (particularly cotton).
- (3) Introduction of modern farming.
- (4) Extension of modern livestock methods throughout the country.
- (5) Settlement of lands under plans which will emphasize the regional advantages of each area.
- (6) An end to the fragmentation of farms.

The Plan specifies "measures to be utilized":

- (1) An increase of seeds, to be brought about through the use of selected and higher-yielding seeds, fertilizer, insecticides,

better cultural practices, the use of bovine traction, mechanization in zones suitable, protection against erosion, better agricultural technicians in government positions.

- (2) Specifically for livestock: improvement of pastures so as to change from extensive to intensive livestock-culture.
- (3) Agro-industries, to utilize local products.
- (4) Development of energy and water resources. The regrouping of people from their scattered locations into villages will increase the need for energy and potable water in these settlements.
- (5) Transport: The weakness of the transport system is due both to the modest state of the mainly-subsistence economy, but also due to the bad state of the existing roads. This state of affairs fails to give farmers incentives to specialize in the production of goods for the market.
- (6) Training: a reform in primary education will be carried out, so that young people are not kept from becoming part of a modern milieu.
- (7) Health, social affairs, cultural affairs, public information, regional development, housing -- all receive priority treatment in the Plan (pages 33-44).

(The AGCD Final Report on the Kirundo area, mentioned earlier, contains a good summary of the plan objectives, on pages 10-12.)

The Plan, Section 2.2.1, states that social justice must be realized through an alliance of farmers, workers, and revolutionary intellectuals, of all the races and regions within the Party (UPRONA) which is renovated, and will be the "author" of a "charter for economic and social develop-

ment". Social justice demands "a change in the government personnel, so as to be effective and act without corruption -- this changed cadre of government servants must assure to the entire population access to education and to health services, must interest farmers and workers in the conduct of economic and social affairs; institutional change must not be delayed. In face of a growing population, social justice is necessary for the expanding economy." (pp. 34, ff.)

Section 2.2.2 states sectoral objectives. In these sections, mention is made that the forests are threatened, and there is danger of increasing erosion.

Population problems are mentioned (page 40): "This policy (employment) will be accompanied by measures which will tend to slow down the demographic explosion, a very thorny problem for the country. In fact, the Government believes necessary the spacing of births, and other forms of limitation of births which are adaptable to the mentality and the traditions of the country [emphasis added]. This requires meanwhile a campaign of education and information which will be accomplished with the help of the Party, in strict coordination with the technical health services."

Section 2.3.2.1 (p. 45) envisions the creation of production and marketing cooperatives throughout agriculture. Alongside will be created many Regional Development Societies (SRD). "The Government will establish a price policy which will favor increase in production so that the fruits of the farmers' labor will not make the speculators rich or lead to an inflationary pressure."

On page 55, the increases being sought in the Plan period are

stated: 3.1% per year for food crops, livestock, forest products. 5.8% is sought for export crops. These add up to a 3.4% annual increase for the agricultural sector as a whole. The claim is made that this will mean a 0.9% annual improvement per capita, since population will be increasing at a rate of 2.5%. (Different growth rates are used elsewhere in the planning exercise.)

The Plan recognizes (page 79) that there will continue to be migration to the cities; progress in manufacturing and services can absorb the new workers, the planners think, but not reduce the absolute total now un-employed and under-employed. The Plan calls for the creation of "poles of development" and small enterprises including artisanal enterprises. There are no details with regard to this planned absorption of the rural people migrating to the towns.

Chapter 4 lists, in an informal manner, constraints to progress: lack of good seeds, antiquated tillage methods, lack of fertilizer, lack of money for the average farmer to pay for any improved methods. The farmers do not observe proper seeding dates and methods. They have no secure supplies of potable water; they do not observe sanitary precautions; their homes are scattered instead of concentrated where they could enjoy superior services; they conserve their harvest badly; old people are resistant to innovations. In short, they need a "centralized network of services under one authority."

Section 4.1.2.2 lists (page 107) quantitative objectives for food and lumber for 1982:

<u>Food Crops</u>	<u>1977 production</u>	<u>1982 production</u>
Cereals	185,000 should increase to	245,000
Legumes	340,000	408,000
Oil crops	21,000	42,000
Fruits and Vegetables	100,000	135,000
Sugarcane	5,000	60,000
Starchy root crops	965,000	1,061,000
Bananas	1,320,000	1,452,000
Coffee	29,000	40,000
Tea	8,000	18,000
Chinchona bark	zero	100 tons.

Of the 1982 figures, the following amounts are intended for export:

35,000 tons of cereal grains  
15,000 tons of fresh fruits and vegetables  
39,000 tons of coffee  
3,500 tons of cotton  
17,000 tons of tea

The key commodities, of course, are the coffee and tea, which are expected to provide Burundi's needed foreign exchange.

Of great importance to the Burundi diet are livestock, milk and fish. Modest increases are planned in these:

Livestock (meat)	18,000 should increase to	22,500
Milk	30,500	39,500
Fish	19,000	25,000 tons.

Burundi's lumber production is planned to increase from an estimated 40,000 cubic meters per year to 45,000 cubic meters per year, and firewood from the estimated 2 million steres (roughly a cubic meter) to 2.24 million.

Pages 119 to 123 of the Plan go into sketchy detail regarding projects for agriculture. The document fails to consider the tremendous problem of the administration of these projects. Most farmers are expected to be encompassed within "integrated projects"; those not so

included will benefit from being members of "polyvalent cooperatives" (page 125).

Floor prices for food crops will be fixed "in accordance with costs of production". There are no further details on this most complex of problems that any agricultural system can face (page 126).

Section 4.1.4.4 specifies that in 1982 there will be official cadres to serve all the farmers: 3,000 agents, consisting of 2,620 low-level ("subalterns"), 250 middle-level, and 130 superior officials. The Plan goes into considerable detail (pages 128-131) with regard to the training and assignment of these agents.

B. Donor Agencies

Foreign assistance was reviewed by Milton L. Charlton, in a processed document (fotocopy) entitled "L'Aide Etrangere dans le developpement de l'economie du Burundi" (October, 1976, 155 pages). On page 109 of this document there is a record of grants and loans, as follows:

1965-69	\$57,607,000
1970	(omitted)
1971	\$19,132,000
1972	\$41,268,000
1973	\$24,533,000
1974	\$37,769,000
1975	<u>\$56,844,000</u>
	\$237,153,000 subtotal for period 1965-75, omitting 1970.

Documents prepared for a Roundtable of foreign donors, held 21-24 February, 1978, allow the table to be extended:

1970, loans and grants totaling about \$17,000,000
1976, loans and grants totaling about \$41,000,000
(from "Tableau no. 1, Volume Global des Aides Exterieures", included in "Point III-A de l'ordre du jour" -- page unnumbered)

Aid for the years 1976 to 1980 was estimated by Charlton (page 142):

1976	\$66.4 million
1977	\$61.9 million
1978	\$61.4 million
1979	\$63.5 million
1980	\$66.6 million

Charlton footnotes these guesses: "Very gross estimations based on various sources. These figures do not represent the official policy of any aid donor."

No more-reliable figures were to be found, although the national accounts published by the national bank should eventually show the situation. (The 1977 report of that bank, in the section dealing with donor loans, grants, etc., indicated a figure far less than the 1976 figure of \$66.4 million, above.)

The general trend is unmistakable, however: foreign grants and loans (in past years grants were 79% and loans only 21% of the total 1965- 1975 figures by Charlton, op. cit., page 109) were a very large share of the country's financial resources. The Gross Internal Product in 1975 was \$252 million (US) -- in that same year Charlton reports foreign donor assistance at \$57 million. In 1976 imports to Burundi were \$55 million -- 1976 loans and grants from aid agencies were \$44 million -- in effect, foreign assistance has almost paid for Burundi's total imports. Stated another way: The ordinary budget in 1976 was \$47 million (US), and the Extraordinary Budget was \$11 million. Foreign aid in 1976, at \$57 million, literally paid the governmental operation of that year.

In 1976 there were 560 technical assistance personnel in Burundi, including UN (63), FED (87), Belgium (150), China (117), and France (131).

Programs are mainly but not exclusively export or livestock oriented. Livestock is supported by Belgium, FED, FAC, and FAO.

Coffee [is supported by]: IBRD, FAO, Belgium. Tea: FAO, FED, Belgium. Sugar Cane: Belgium. Fish: FAO,IBRD. State Farm: Rumania. Research: Belgium, FED. Planning: IBRD. Health: France, WHO, Belgium, FAC. Education: IBRD.... These projects are heavily concentrated in the center, north, and west of the country.... Roads are given high priority; IBRD has a large project. These too are mainly sited in coffee and politically important areas. (REDSO, CDSS, page 66)

Private investment, by comparison, is trivial, amounting to only \$1.75 million (US) in 1975. To a private investor, Burundi offers little attraction.

C. Achievable Goals Within the Plan Period

The Plan, in its general language, makes vast promises to the people of Burundi. The specific goals set for 1982 are much more modest, promising only a 0.9% improvement in living level per capita per year. With the 1979 dry season approaching, Burundi is already two complete agricultural seasons into the five-year plan. This observer's guess, based mainly on interviews with many foreign advisers, and not at all on crop statistics which are not yet available for the recent harvest of January, or for the June harvest yet to come, is that these goals cannot be achieved: the cereals increase of 50%, the oil crops increase of 100%, the coffee increase of 38%, and the tea increase of 125%. Shortfalls in these will seriously prejudice Burundi's foreign exchange situation, in addition to the income of the small farmers. Burundi will be doing well if the per capita production can be maintained during the period 1979- 82.

This observer believes that the single most important action the government can take in the time remaining of the third Plan is to establish and make workable a price support program for beans, peas, and possibly cereal grains (corn and sorghum, with wheat a possibility in the higher elevations).

### III. OBSTACLES AND CONSTRAINTS

In December, 1977, the new President of Burundi addressed his report to the nation entitled "The Governmental Program to Repair the Nation" ("Programme Gouvernemental de Redressement National").

He said :

"After one year of intense activities, of organization and re-organization of the nation's life on all fronts, it appeared necessary to us to condense in one document the actions we have already taken, and those we intend to take in the next two years."

This report is remarkable for its frankness in pointing out serious problems and mistakes in the social and economic life of Burundi, the failures of former governments to cope with these, and the hopes of the new government.

Agriculture received highest priority in his message:

"We should ask ourselves why after fifteen years of independence a country whose lands are at least 50% cultivable is still at a stage of primitive agriculture, with the small farmer left completely to fend for himself.... The Development Plans have never been accepted, nor carried out in the various government ministries. It was considered just a 'pretty book' to be kept in the files.... Although agriculture was of highest priority...the total absence of rural organizations, cooperatives, and well-structured community groups, are particularly strong obstacles to agricultural development.... Price policies favorable to development were absent... during 1970-77, discouragingly low prices were set for food and export crops."

The Plan points out the major obstacles to progress, as did the President:

- (1) Useless development plans.
- (2) Agriculture, particularly the small farmers, has been neglected.
- (3) Widespread dishonesty (at worst) and glaring inefficiency (at best) have characterized government officials working in agriculture.
- (4) The interventions in the market that were made by government were

ill-considered, penalizing small producers.

- (5) The land-use situation is worsening. One reason: farms are so small that they are uneconomic, leading to wasteful and land-destroying practices.
- (6) The reasearch and training institutions have failed to produce information or public officials useful to agriculture, and particularly to small farmers.
- (7) Farmers remain scattered and unorganized, making the task of reaching them with modern techniques impossible.
- (8) The credit system has failed to serve the productive sector.
- (9) The educational system has failed: there is a tremendous dropout rate for students, and mass failure to pass the courses; even the small number finishing secondary or technical or higher grades fail to find employment; adults are not helped by the educational system; the system has failed to produce Burundians with any "sense of respect, discipline, or spirit of workmanship."
- (10) Little progress has been made in preparing personnel to take the place of the great number of foreigners who seem to be the only ones who can keep organizations operating -- although at a tremendously high cost, donated about 100% from outside the country.

In addition to these obstacles cited by the President and the government, most outside observers add the following:

- (1) The Government has failed to elevate the role played by the Hutu, or to alleviate the fear which grips them. This fear is a major reason for their refusal to be "grouped", or educated, or trained for community or other types of leadership. Without their improved parti-

icipation in economic life, Burundi's economy will probably fail. Few in government are willing to face up to this problem with any degree of realism, only a few in private and confidential conversation acknowledged the seriousness of the problem.

(2) That government programs are still directed mainly at the three genuine priorities of the government (export crops, livestock culture, and the creation of more high-paying jobs at the central government) is also a very grave obstacle to progress.

(3) Finally, the government has not recognized the extent of its financial limitations with regard to agricultural progress. The credit needed to re-capitalize and intensify the investments the poor farmers must make in their too-small parcels of land, to change from low-value to high-value output -- these credit needs, along with the supervision and marketing assistance, have not yet been planned for by the government.

#### IV. ON-GOING DEVELOPMENT ASSISTANCE

##### A. Government

With regard to the role of government in developing agriculture of the small farmers, this observer can only remark that the goals outlined in the Plan are good and necessary goals. The government's ability to turn these plans into programs and projects that really reach the small farmer is questionable.

##### B. Other Donors

Again, the goals stated in the projects of the other donors are worthwhile goals. In some cases, as has been noted, the major beneficiaries of projects has always been the export producers, the livestock

producers, and the bureaucrats. The projects of all donors appear to be projects operating at a very high cost, compared to the benefits received. The cost of a man-year of assistance from a foreigner living and working in Burundi has already passed the \$100,000 mark, for all donors except the religious missions. The foreign projects, which the government has stated should be phased out within a ten year period, show no signs of being able to phase out. The local counterparts either do not materialize, or they do not appear able to take the place of the foreigner. This will be a continuing and serious problem, with all donors.

C. US-AID

The ongoing assistance of the AID appears to be of great value to Burundi. The Peat project has had an important impact, and a second phase project, larger and more important, is undoubtedly going to be a success. The Highland fisheries project offers the advantage of nutritional assistance which will perforce benefit the poorest farm people.

AID has made a careful and a small beginning in Burundi. Personnel from its projects have been most helpful to this sector evaluation team, in understanding some of the problems and frustrations to be overcome. Assuming AID will increase its participation in Burundi, in spite of the gravity of the constraints which have been mentioned here, the following suggestions for projects are made.

Programs Recommended for AID execution

1. Water supply to rural areas

This can free the women for more productive and more valuable work.

The disadvantage of the proposal from the Hutu majority is that it will pressure farm people to live in villages, along roads, or other-

wise in areas easier to oppress in case violence occurs again.

2. Improved land-use, through land-use capability mapping

This can be the basis for any future improvement in land tenure, improvement in land taxes, land-use discipline of any type.

Particularly this can bring about reduction in extensive livestock enterprises on land that is suited for more intensive use, either in agriculture or in improved livestock.

3. Reforestation and soil conservation

This type of project, in the field, is probably one which can be accepted by the two ethnic groups, since neither would see it as a danger to its position. The training in conservation and planting of trees would, hopefully, be a new gain to the country after the program was finished.

4. Peat energy

This can be a net gain to all parties. Hopefully, the government will cooperate by passing the laws necessary to make the resources available in a manner in which large numbers of the low-income farm people can participate, and receive some of the benefits. The soil-improvement use of peat, as well as the fuel-use, is important.

5. Village Technology Demonstration and Testing

UNICEF has established (with the Youth Development Division of the Kenya Ministry of Housing and Social Services) a half-acre

demonstration of many appropriate technical tools and methods which could greatly improve the efficiency in doing the most onerous and timeconsuming tasks of the Burundi farm family. This writer will visit the demonstration of 2 and 3 May, 1979 in Kenya and report back to the sector-evaluation team leader on possible assistance to Burundi. In the future we could plan on workshops in Burundi for extension workers, such as have been held in Kenya, Tanzania, Senegal, Mauritania, Sierra Leone, The Gambia and other central African areas. Individual grain mills, crop drying equipment, solar cookers, hand pumps for water, rat-proof storage, simple threshers, winnowers, peanut decorticators, oil presses for peanuts and palm fruits, many or all of these could find valuable application in Burundi. The resistance of many Burundi farm families to be grouped into villages makes all the more necessary the provision of the simplest equipment, which can be purchased and maintained or built from simple available materials by the individual family. As farmers begin to live or work closer together, the slightly larger community-owned equipment, displayed and tested at the Nairobi demonstration, can be included in the development plans. In dry season, Burundi women waste a tremendous amount of time carrying water from distances ranging from 1/2 to 5 kilometers. The women spend much time grinding the grain for the day's meal. Simple tools, "intermediate technologies", can save most of this time and allow the women to put it to good use in more valuable farm activities. It is suggested that AID-Burundi should send in the near future one or more Burundi women (the names to be suggested by Evaluation Team

member, Dr. John Mason), accompanied by Ms. Wenche Kunkle of the AID-Burundi professional staff, who has interest and experience in the subject of intermediate technology, to the UNICEF demonstration in Nairobi, to establish contacts that can be utilized in various agricultural development programs and training programs for Burundi.

AID-Burundi should seek information from AID-Ghana on a project underway to survey improved tools, methods, and technologies presently in use and which can be used by the farm women and men to save time and improve productivity, particularly in agricultural activities, water collection, food processing and preparation, house construction and equipment, and the local manufacture of some of this equipment. Another AID project in Mali involving tools and equipment, particularly to improve the efficiency of the woman farmer, should also be studied with possible applicability to the Burundi situation.

The UN booklet "Appropriate Technology for African Women"\* contains a number of additional project-descriptions in Africa, which could be studied and visited by Burundi agricultural and extension officials, particularly women, to discover tools and methods applicable to the Burundi situation.

\*Carr, M., "Appropriate Technology for African Women", UN, 1978. Available from The African Training and Research Centre for Women, Economic Commission for Africa, Box 3001, Addis Ababa, Ethiopia; also from Mr. Jim McDowell, Chief, Village Technology Section, UNICEF, East Africa Regional Office, Box 44145, Nairobi, Kenya.

ATTACHMENT I

BURUNDI'S STATISTICAL DATA

Accurate statistics of land area in various crops, production on that land, and the farm population involved are essential for effective agricultural development planning. Statistics on total population (rural and urban), diets, and family incomes are necessary for the study of income and distribution problems and ways to solve them. Statistics on costs of production, including man-days of family labor, are needed in order to determine what an "equitable" price-support policy would be. Unfortunately virtually none of these types of statistics exists in Burundi, and the figures that are used by the government are in almost all cases highly doubtful. This sector evaluation team is utilizing the agricultural production figures found on page 98-99 of the "Plan" document, plus additional figures on page 108, with regard to the goals for 1982.

One of the recommendations this mission will make involves improvement of the basic social and economic statistics of the country. The 1979 census should, if it is carefully managed, and if the results are promptly and accurately reported, provide useful material to the government to guide its economic and social programs. A land-use survey, probably utilizing Landsat remote-sensing data plus careful lower-level sensing and field studies, will indicate the types of production now utilized and the improved types that can become goals of development projects.

The Demographic Questionnaire, published in 1974, contains rather detailed information on family composition, sex, ages, education, etc.,

from a series of small sample studies made in 1970-71. Use has been made of these data wherever possible, particularly with regard to programs of education, health, water supply, home improvement and diet.

One FAO printout of computer-stored production statistics covered the years 1969-78 (with a 1961-65 average figure, for comparison). One World Bank report covered production for 1976 and a World Bank computer printout contained production figures since 1970 up until 1975, 1976, and 1977 for various products. The President's message of National Rehabilitation, December, 1977, also contained figures, apparently from early drafts of the 1978-82 Development Plan.

Range of Production Estimates (metric tons)

	<u>Range for 1976</u>	<u>Range for 1977</u>	<u>1977 Plan Figure</u>
Dry peas and beans	195,000- 500,500	195,000- 340,000	340,000
Cereals	240,000- 539,000	185,000- 413,000	185,000
Root & tuber starch crops	1,356,000-3,920,800	965,000-1,810,000	965,000
Bananas: eating, cooking, beer	1,165,000-1,450,000	1,320,000-1,475,000	1,475,000
Peanuts	18,000- 28,000	9,500- 18,000	18,000
Coffee, parchment	21,000- 29,000	18,000- 22,000	22,000

At the suggestion of the foreign adviser for agricultural planning at the Ministry of Planning, we have agreed to utilize the production figures by commodity contained on pages 98-99 of the Plan document.

Production Statistics

Mention has been made above of the widely differing statistics used to describe agricultural production. One such instance came from the Ministry of Planning itself. When the new President launched the Plan in his presentation of the National Rehabilitation statement at the end of 1977 (the Programme Gouvernemental de Redressement National", Bujumbura, December, 1977), he reported that the 600,000 cultivable hectares in

Burundi produced about 1,644,000 hectares of crops (through double and triple cropping in some areas), with totals as shown in the following table. The second column of the table quotes the production figures which became the official figures when the new 1978-82 plan was released in 1988.

<u>Crop Group</u>	(in metric tons)	
	(1) <u>"Redressement" Figures</u> (page 12)	(2) <u>Official Plan Figures</u> (p. 98/9 of Plan)
Dry legumes (beans and peas)	391,000	340,000
Cereal grains	240,000	185,000
Root crops	1,536,000	965,000
Bananas	1,165,000	1,320,000
Oil crops	28,000	21,000

We are hard-pressed to estimate average yield of the major crops. The acreages harvested, divided into the total yield, gives us one figure if we use the yields in column (1) above, and another one if we use column (2):

<u>Crop Group</u>	<u>Yield in metric tons per Hectare</u>	
	<u>"Redressement"</u>	<u>Plan</u>
Dry legumes	0.73	0.63
Cereal grains	0.48	0.37
Root crops	3.48	2.47
Bananas	6.85	7.76
Oil Crops	.85	0.64

The major conclusion one can draw is that in the tremendously important dry legume, cereal grain and oil crop groups, yields on Burundi farms are so low that relatively simple improvements in husbandry and storage could in a short time double, or more, the amounts of food available.

### Population

The population of Burundi is not known. No headcount has ever taken place. All figures on population are estimates, which in turn are based on earlier estimates. Page 29 of Volume I of the Demographic Questionnaire (published in 1974) states: "The estimate of rural population in Burundi stemming from the results of the 1970-71 questionnaires, is 3,090,000 persons in 1970, with a margin of error of plus or minus 25%." A few lines later, the statement continues: "However, it is preferred to use the figure of total population to be 3,350,000 plus or minus 5%."

On page 7, Volume I, of the same document is the statement: "The presumed population of Burundi on 1 January, 1971, was 3,400,000 persons." The head-count was scheduled to begin in 1972 with the assistance of United Nations technicians. The civil war of 1972 with its attendant mass emigration from Burundi and slaughter of large numbers of the male population in many areas, forced the cancellation of the census, and the entire effort was abandoned. In 1979, another attempt at a complete census is being considered. If it takes place, only then will definite figures regarding numbers of people, by area, by family unit, by type of farming and land tenure, etc., be available for planning purposes. It will not be until a second decennial census is made in 1990 that dependable information will be available on population growth and migrations.

However, much can be learned by small sample studies, and much was learned in 1970-71 in this manner. Samples of somewhat less than 1% of the assumed population were made during April 1970 to July 1971, preparatory to the planned head-count. (Later, the data discovered in

the in-depth sample studies could have been expanded, using the actual population figures, to give useful national information.) From these studies, although they cannot be extrapolated as planned, we nevertheless have valuable information regarding family size and composition, housing and household equipment, births, deaths, marriage, plural marriages, and so on. However, no nutritional or dietary information of value, or income-levels, were reported. There were a few local questionnaires regarding diet in the sixties and mid-seventies.

The "global food availabilities" figures, on which FAO normally bases its comparison between nations, of dietary adequacy, is not of much practical use in Burundi, since the levels of availability of proteins, fats, and even calories are so low. There is no doubt that the diet is pitiful on a national basis, and far worse for the lower-income half of the population.

Examination of the 1970-71 questionnaires reveals considerable duplication of questions. One schedule lists the names of family members, sex, age, civil status, date of birth, distinguishing between habitual residents in the home, those absent, those "in passage". Profession and mother tongue were listed. Another, a special form for women, asked names and number of children, those born alive, born dead, number of marriages, children alive and dead, etc. Another concerned itself with the house, its type, material, facilities such as water, toilet, beds, rooms, radio, vehicles, and animals. Still another involved movements of the family members, marriages, immigrations, emigrations. There was an additional form on births and deaths.

The sample was intended to cover about 1% of the assumed population: 1,250 persons living in the vicinity of 2,408 "hills", the smallest

civil division. The lack of transport and other facilities are reported to have reduced the number actually interviewed.

ATTACHMENT 2  
THE AGCD STUDIES

A Belgian team made a careful study of the development problems in the region of Kirundo, at the northern end of Burundi. The team utilized all available information, lamenting its lack of accuracy, and conducted small sample studies to ascertain facts about the production, production practices, and nutritional problems of the farm people of the area. A 10-volume document was published early in 1979, consisting of a Report and 9 Annexes, entitled "Etudes pour la Mise en Valeur de la Region de Kirundo". A copy is available for inspection at the Belgian Embassy in Bujumbura. Nine projects dealing with various investments to attack specific development problems are suggested, with a tenth project, entitled "Administration," which would furnish 29 man-years of Belgian technical assistance personnel to oversee the projects and train local counterparts. The "Investment" items for the projects would be 389 million Belgian francs, annual operation costs would be 127 million, and the cost of the 29 man-years of technical assistance would be 102 million, for a grand total of 618 million, or about \$20.6 million (US).

The sample study of three communes in the Kirundo region (the Communes of Kirundo, Busoni, and Bwambarangwe) was made by filling out questionnaires with 728 persons, men and women, or about 1% of the adult population of those three Communes as the population had been estimated by local officials. No details were given on the location or random selection of the persons to be interviewed. If the 1% sample number were farm people who lived on or near an access road, or if any local official

helped choose the interviewees, a sample could have resulted which was somewhat more fortunate with regard to land holdings and income, and exposure to cultural practices, than the Burundi average. However, since this study-in-depth is the only one that has been made in recent years, we have made considerable use of the data the Belgians derived.

The following table shows a land-use pattern typical for the region, where two crops are grown on the upland, and a third crop is usually grown on some of the marshland, as the water recedes during the four to five month dry season. This gives a total land-use per family of 2.3 up to 3.8 Hectares, whereas the amount of land available per family is probably only 40% to 50% of this area, or 1.15 to 1.9 Hectares. Still it appears that the Kirundo region, or this sample studied, had more land available than the Burundi average. The government estimates are that 600,000 Hectares of cultivable land are utilized by about 616,000 farm units. Both of these figures, of course, are very rough estimates, which hopefully will be made more exact after the 1979 census.

Land in Various Agricultural Uses, Three Communes in the Kirundo Region

	<u>Food Crops</u>	<u>Average Area in Crops</u>		<u>Fallow</u>	<u>Total</u>
		<u>Banana</u>	<u>Coffee</u>		
<u>Commune Kirundo:</u>					
per farm	1.402 ha	0.413 ha	0.084 ha	0.964	2,863 ha
per habitant	0.194	.057	0.012	.133	.396
per farm worker	.305	.090	.018	.211	.624
<u>Commune Busoni:</u>					
per farm	1.878	1.213	.091	.671	3.853
per habitant	.283	.183	.014	.101	.581
per farm worker	.472	.304	.023	.168	.967
<u>Commune Bwambarangwe:</u>					
per farm	.866	.797	.075	.583	2.321
per habitant	.134	.123	.012	.090	.359
per farm worker	.210	.193	.018	.142	.563

The characteristics of the simple cultivation utilized on these farms were stated to be: (1) Heterogeneous seeds and multiple crop associations; (2) absence of any anti-erosion practices; (3) absence of any pest-control in the field or after harvest; (4) absence of any artificial fertilizer; (5) a minimal use of animal manure and compost.

Yields: -- the researchers made measurements in the fields, selected at random, and derived the following figures for number of plants per hectare and yields, sometimes with "ranges" expressed:

Bananas, 6000 plants per Ha.

Coffee, 1,570 plants per Ha.

Beans, 200,000 plants per Ha. Yield 740 Kg/Ha (range: 380-840)

Beans, intercropped: 192,000 plants/ha. Yield 540 kg/Ha (range 375-710)

Corn, intercropped: 13,000 plants/Ha Yield 225 kg/Ha (range 75-325)

Sorghum, 300,000 plants/Ha Yield 750 kg/Ha (range 450-910)

Peanuts 148,000 plants/Ha Yield 595 kg/Ha (range 315-725)

Peanuts, intercropped, 141,000 plants/Ha Yield 525 kg./Ha (range 325-~~650~~)

Manioc 9,000 plants/Ha Yield 4,200 kg/Ha (range 2,500-8,000)

Sweet Potato, 13,600 plants/Ha. Yield 5,300 kg/Ha (range 2,800-9,400)

The first growing season is October-January; the second February-June, with marsh cultivation wherever possible in the dry season.

ATTACHMENT 3

LAND TENURE

There are no reliable data on land tenure patterns in Burundi. The Barrows Hall Report, the CDSS document, the Plan, and the AGCD study (Report pages 24-25 and Annex 3, pages 43-46) provide some general information:

The size of farms is becoming too small to support the families-- Heredity forces division, so additional lands, dispersed, must be bought or rented. The sons work the lands, under direction of the father. (The authors remark that the old people are less willing to adopt new methods than young). As to a "free market" for lands, most transfers are made in a "secret" manner. Pressure of population threatens to create a real black market situation -- the government has prohibited black market -- it has decreed that all transfers of land be inscribed officially -- lands not used for three years revert to the government-- however on the local level there are seldom if ever the means to regularize land tenancy-- no administrative structure (surveys, descriptions, cadastral records, land books, land offices, etc.) Some prices noted in the tribunals of Busoni and Bwambarangwe were 10,000 francs per hectare, and 20,000 in Kirundo. This is unimproved land, of not-high quality.

The rules about fallow land do not apply to the large properties of some landlords, rented to the small farmers. "This situation can lead, under the influence of land pressure, to inequality of power and abuses between renters and landlords." The Report states that a more-advanced means of regulating land tenure is absolutely indispensable in the future.

Distribution of lands by the communes to the various villages (groupements) depends largely on favoritism. It is not dependent on any scientific basis such as soil quality.

Consolidation of fragmented holdings, though possible theoretically in law, is probably impossible in reality, since no one wants his lands to be regrouped (page 43 of Annex 8, AGCD).

Although land registration exists in law, only 30% of the lands in the project area are registered, according to a consultation with the tribunal. Farmers won't make permanent improvements because they are not sure of being able to keep the land (p.44) -- these authors say that secure land tenancy is absolutely necessary for progress, particularly for credit under a mortgage system.

There are very few large landholdings in Burundi, and absentee landlordism is not the problem it is in many countries, Latin America, for example. Nevertheless, the land tenure situation for the small farmer is precarious, and the investments of a permanent nature which must be made eventually (if the small farms are ever to become viable) simply cannot be made under present tenure conditions. Even assuming a farmer could borrow money to terrace his land, remove rocks, correct acidity, plant coffee, fruit trees, trees for erosion control, borders, or firewood, to irrigate, to drain, to build permanent structures to house equipment, or animals or even his family-- precarious tenure would threaten that his investments would be taken away from him at some future time. Any programs of AID or any other donor that involve the idea of "Integrated Rural Development", which would help a small farmer on 1 Hectare to

capitalize and intensify his enterprise, to produce high-value crops instead of a bare subsistence -- any such program will come to very little unless this serious constraint is overcome.

An increasingly serious problem involves control over the grazing lands. If progress is to be made, it will probably involve fencing of pastures, improvement of grasses, conservation measures, and carefully controlled grazing. Tenure to the pasture land will undoubtedly remain collective, but there must be secure tenure to qualify for credit for pasture improvement, and assure equitable use of the land for grazing, particularly to the Hutus.

These points have been repeatedly made by the bilateral and international advisers in past years. The government has given occasional lip-service to the idea of validating land titles and indeed, a small proportion have been validated, but it shows no inclination to undertake a program which can alone make a small farmer worthy of bank credit or any other development efforts which can enable one Hectare to support a family in decent living conditions. A fear that comes to mind is that given the tragic ethnic schism in Burundi, the government has no intention of making the Hutu farmer truly secure on his land.

This is another in a series of obstacles to progress on which the donor agencies and countries should coordinate their forces. The USAID can have no influence on the Burundi government when it comes to "suggesting" reforms of this profound a nature. If all the major donors were to come together on the issue, the case would be more convincing. This observer cannot avoid the conclusion that if this reform, and several others mentioned in this report, are not going to be made by the government, most of the programs being planned are indeed doomed to failure.

ANNEX IV -- SOBECCOV

The policy-guidance document entitled "Agricultural Development Strategy Statement, with Policy Guidelines", 14 April, 1977, from the Africa Bureau of US-AID states:

"Guaranteed prices, and assurance that a local organization will buy increased production are known to be required for rapid transition of small producers into a market-oriented economy." (page 41)

On June 20, 1977, the Government created SOBECCOV, the Societe de Stockage et de Commercialisation de Produits Vivrieres du Burundi", with a charter that makes it, if it wishes to be, virtually the monopoly to buy, store, sell foods, and to finance these operations.

An ordinance of 29 May, 1978, fixed a farm price for dry beans at 18 francs the kilogram; this was apparently a floor price, and the farmer can get more for his crop if he is able to. A selling price of 24 francs at wholesale and 28 francs at retail was also established, apparently a ceiling price. Sorghum was priced at a floor price of 12 francs the kilogram to the farmer, with a ceiling of 15 francs at wholesale and 22 at retail. One Article (Art. 2) of the decree states that only persons with a license from government can conduct a commerce in these foods. Art. 3 states that transactions between producers and buyers will take place only at the "centres de Negoce", whatever that might mean. Art. 4 says that the inspectors of commerce and the administrators of the commune have the right to control the prices and stocks of food held by merchants. They can seize products which have been involved in illicit transactions. Art. 5 says the cooperatives and the buyers shall be allowed to buy dry beans and sorghum at the above-mentioned prices and resell to SOBECCOV with a profit of 2 francs a kilogram.

The AGCD Study, from which some of these details were derived, comments that it is still too early to tell whether there will be any effects on prices at the retail market from this ordinance. The SOBECCOV is limiting itself now to buying, stocking, and selling only dry beans and sorghum which are easy to store. It is not trying to maintain a monopoly on the market yet. Private buyers and coops are allowed to continue their activities, buying these products. SOBECCOV has established a sub-station at Kirundo; in June to September, 1978, they had authority to buy 300 tons of beans and 450 tons of sorghum. I was unable to get any information, in visits to the Director of SOBECCOV, regarding the results of that campaign. SOBECCOV is now planning a warehouse of 1,000 tons of capacity at Mukenke in the Busoni commune.

At this writing, SOBECCOV has very little chance of affecting the trade in these grains of a nation with a total production of 340,000 tons of dry pulses and 32,000 tons of sorghum.

Best Available Document

## ANNEX V--Brief Description of a storage-price-support project for Burundi

Utilize the Rwanda storage project documents as a guide. The cost of good storage structures in Burundi is about \$280 per square meter, somewhat higher than in Rwanda.

The basic storage unit should be 250 tons of beans or grain, which calls for 240 square meters of storage. At \$280 per square meter, the module will cost about \$49,450. I suggest that ten of these be built the first year of the project, and ten the second. During the second year, the price-support and storage program can be started with the first ten modules. One module should serve about 10 collines.

The farmers should have the opportunity to re-purchase a share (to be decided) of their stored crop, if they want to. Since farmers cannot store the crop safely against insects and animals on their farms, they should be allowed to store the entire food supply in the safe storage and buy what they need back at the sale price plus a fair charge for storing and disinfecting the crop.

There will be a temptation on the part of government to use the scheme to collect food to move into the city and hold prices down. This can be permitted when there is a surplus amount in any area, but the primary beneficiaries of the storage scheme should be the farmers of the local area. If a profit is to be made late in December to January, before the new harvest is ready, when prices are at their highest, then the farmer-participants in the scheme should be the ones to make at least a reasonable share of the profits.

Any scheme of this sort will have to be operated through SOBECOV, which has been granted a monopoly on marketing and storage by the government. I have grave doubts as to the effectiveness, efficiency, training, etc. at the disposal of SOBECOV. The people who make up the project document should include appropriate safeguards for the autonomy of the AID project, even if it must operate under the wing of SOBECOV, so that achievement of success on this small local scale will be possible.

It is probably not advisable to include trucks and transport equipment in this project--perhaps the private truckers, particularly if government will authorize the entry at lower prices (lower duties, etc.) of considerably more medium-trucks to be used in rural areas, can furnish the trucking necessary. The small storage units will probably be patronized only by farmers within walking-carrying distance of the small farms. The farmers can arrange their own transport both to the storage and from it when they withdraw their food supplies. Truck transport should be needed only if surpluses are moved to deficit areas.

One or at most two expatriates should be able to manage the ten construction jobs the first year, and the operations of the units the second year. Some training funds for Burundi managers and warehousemen should be funded.

If the evaluation, which should be made at the end of two years, is favorable, the project could expand considerably during a third and fourth year, and if progress continues, a fifth and sixth year with very large investments, perhaps from IIRD, could aim at storage sufficient to hold 20% of the total bean/pea crop by 1985-89, for example. With the estimate of bean

## Tons

and pea production at 340,000/presently, and at 450,000 Tons in the 1982 harvest (according to the Plan), the harvest might be up to 500,000 Tons by the 1985 to 1989 period. In fact, although at present the achievement of the Plan target by 1982 is probably impossible, the one major incentive for farmers to grow more beans and grow them more efficiently would be a price-support storage program of the type being proposed here. If the first few years of such an AID project prove that the job can be done, the government will need to plan for a storage capacity of about 20% of a half-million ton production, or as much as 100,000 tons. With this kind of response from farmers, then an even larger and more-comprehensive program of central warehouses and elevators, and heavy truck transport, will have to be considered.

Summary:

Rotating fund should be provided by government or AID or IERD—see below.	
1st year will require about \$500,000 for 10 modules plus two technicians and \$50,000 for training in Europe or Africa or the U.S. Est.	\$800,000.
2nd year, about the same, but with additional funds for training	900,000.
3rd and 4th years: about \$1,000,000 each, including funds	1,000,000.
an evaluation of the program	1,000,000.
5th and 6th years—if the project is ready to "take off", and aim at nation-wide storage facilities for up to 100,000 tons, then a major loan should be negotiated. Training could by this time take place in Burundi, at one or more of the most-successful storage locations. Additional technical assistance would probably be required. Estimate about \$1,500,000 per year for the 5th and 6th years. The construction and transport loan would be in the neighborhood of \$28,000,000 to \$35,000,000.	
	1,500,000
	1,500,000
Total, 6 yrs.	<u>6,700,000</u>

I suggest that the Rwanda projects and the people who prepared them are good source materials. If and when the new proposals for Rwanda are approved, visits to understand their problems and training methods would be helpful.

## ANNEX VI -- Visit to the Unicef Intermediate Technology Unit

On 2 May, 1979, the author visited the Intermediate Technology Demonstration area of UNICEF in Karen, 18 kilometers from the AID office, on the outskirts of Nairobi. He was very kindly received and shown around the project by Mssrs. Phillip Haserick and Peter Scrivener, of UNICEF, after being introduced by Ms. Virginia Hazard, Acting Representative of Unicef.

The UNICEF personnel in Nairobi expressed great interest in making the facilities of their Intermediate Technology project available in case USAID in Burundi can help finance workshops and projects to put in practice in the lowest-income areas throughout Burundi some of the labor-saving and quality control techniques being worked out at Karen.

Ms. Brigit Trimmer-Smith, a recently-arrived technical assistance officer for UNICEF stationed in Bujumburá, could be of great help in drawing up projects which would involve AID financial assistance and close collaboration with UNICEF. Mr. Jallade, the FAO Project Director of a Rural Engineering project, also stationed in Bujumbura, but with a small intermediate-technology demonstration in Gitega, would also be of good help to AID in this endeavour.

The writer recommends that Ms. Wenche Kunkle help draw up details of this type of project, and that she accompany one or more women from the Burundi government to Nairobi to visit the UNICEF Demonstration Center.

The most important part of the demonstration is the fact that little or no imported components are needed for the corn shellers, peanut decorticators, water pumps, hydraulic rams, windmills, sand-charcoal water filters, solar cookers, insulated fireless cookers, pest-free grain and bean storage, and food-dryers. All of these implements can be manufactured locally, from materials available in Burundi (with the exception of cement and a few simple metal fittings). The grist mill does require grinders which must now be imported but even these could eventually be made in a small foundry.

SOCIAL ANALYSIS OF BURUNDI AGRICULTURAL SECTOR

Presented By  
John P. Mason  
Bujumbura, Burundi  
May 1, 1979

In Fulfillment of US AID - M.A.S.I. Contract  
with Development Socio-Anthropologist

Project # 698-0135



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## GLOSSARY

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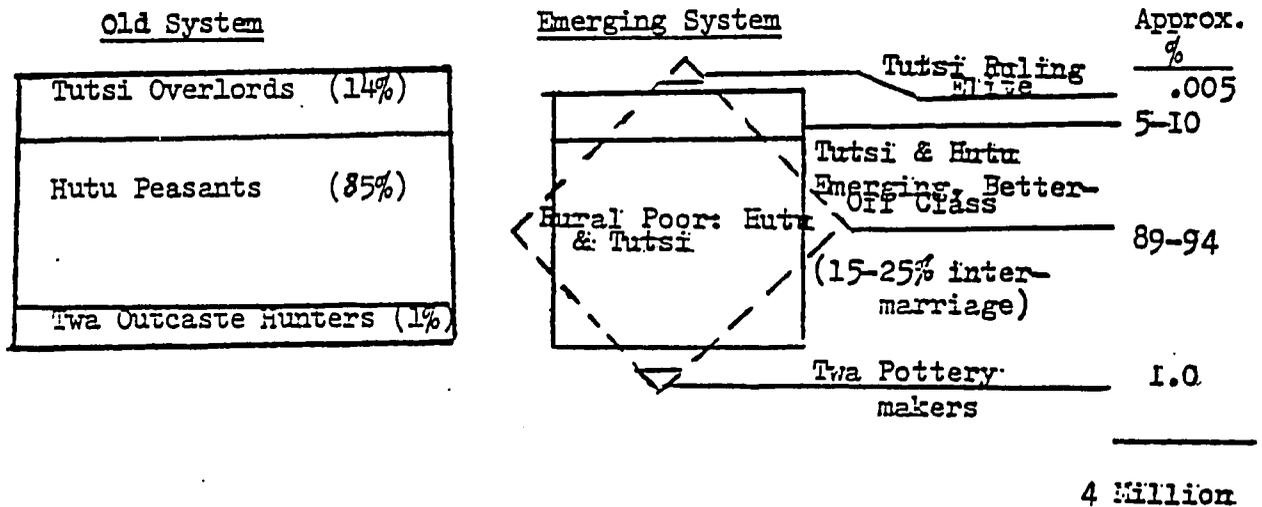
- AGACUPA : "The bottle", usually referring to a bottle of 'PRIMUS' BEER, the locally-brewed drink which presently and traditionally, in the form of homemade banana beer, forms an integral part of Murundi social relations.
- COLLINE : (French) literally hill, on which is located the rugo and its lands; colline de recensement is a group of collines grouped together for administrative and census purposes.
- IMAN : Murundi concept of single God, synonymous with 'religious harmony'.
- INCUTI : Traditional clan sub-section with economic, legal, inheritance functions; nuclear family once highly dependent on this sub-section.
- KWASHIORKOR : Condition of malnutrition resulting from shortage of protein; often sets in after weaning of child from mother.
- ITONGO : Totality of peasants property, including homestead, land, and livestock.
- MURUNDI : A person of Burundi.
- MUKURU : Superior in strength, social superiority, simply superior.
- MWAMI : The Tutsi monarch, whose authority ended in 1968
- RUGO : The Murundi homestead, the human settlement, including the people living in it.
- RUNDIKAZI : Woman of Burundi; Marundikazi is a Murundi woman.
- Transversal de paysannat (French) - single line settlement of peasant homesteads, each including the same fields as others in a straight line for ease of mechanization.
- UBGENGE : Intelligence, successful cleverness; traditionally attributed as innate to Tutsi but attainable by Hutu by chance.
- UPRONA : (French) - Unité Progrès National; Single Government controlled Party.

National Social and Political Setting of Burundi Agriculture

As Burundi is the "Heart of Africa", so the peasant is the heart of Burundi. The poor peasant includes Murundi men, women, and children -- both Hutu and Tutsi and a Hutu-Tutsi admixture. In the aftermath of the Spring 1972 inter-ethnic civil war, the poor, underproductive Murundi tiller has withdrawn into the colline, into his family in the rugo-homestead, into the "rugo of his mind". The elite class that rules from Bujumbura, though long on development promises and short on action, is dependent on the Murundi peasant for its own and ultimately the nation's very survival. The ethnically - defined ruling class is fully cognizant of the risk of not pushing forward the development of the colline. For their own self-interest, if nothing else, the leaders will be compelled in the long run to maximize the poor farmer's productivity while at the same time improving his lot.

Burundi society cannot be understood simply as a three-part ethnic or caste system -- Tutsi ('tall ones'), Hutu ('short ones'), and Twa ('outcastes'). Rather, it is a more subtle organization in which there is a cross-cutting of social class and ethnic lines. Over time, as the poverty of the average Murundi peasant increased while at the same time the introduction of cash crops helped some of that poor majority to rise above the absolute poverty line, the

caste division began to blur. Considerable intermarriage between Hutu and Tutsi has blurred it even more. To be sure, Tutsi continue to rule, with a small presence of Hutu in high Government positions,\* but beneath that line drawn by the power elite we see mostly poverty and limited social mobility -- shared more or less equally by Hutu and Tutsi.



This system, whose lines are now just beginning to fade with some help from the rhetoric of harmony advocated by the President of the Second Republic, was once exploited by the Colonial (later mandate) power, by supporting one side, then the other, always keeping the pot boiling. And though there are deep historical roots for this Tutsi-Hutu division, the part this tactic of divide-and-rule played in strengthening already existing hostility and hatred should not

\* Purportedly five ministers of a total of 15 and two Secretaries of State are of Hutu origin.

be discounted. A further step taken in insisting against the wishes of the United Nations to develop Burundi socio-economically at the expense of political growth in the mandate period cannot have but contributed towards the present political structure.

The fact of the matter is, however, that on the colline level Hutu and Tutsi peasants are often living side by side, marrying one another, drinking the favored banana beer together. Of course, the mistrust and suspicion stemming from inter-ethnic hostilities of 1965, 1969, 1972 have not disappeared, but these groups' main preoccupation is coaxing sufficient productivity from a rapidly exhausting land base to stay alive, while unsuccessfully coping with the environmental degradation caused in part by his own farming and pastoral practices, and reacting to these forces by stepping up production of the only true wealth he knows -- children.\*

It is to these overwhelming forces, man-made and natural, that the Government must react. Even if the leadership did not have the will to improve the lot of the rural poor -- and, to the contrary, its three five-year plans ('68, '73, '78) go to some rhetorical length in supporting development of the rural

---

\* Cattle, once the exclusive domain of the Tutsi (except for those they gave in 'fief' to their Hutu clients) are still considered a form of wealth.

\*\* poor -- it can only improve its own level of revenue by pushing the growth of agricultural production. If conditions permit the two central actors in this equation -- Government and poor peasant -- to see it in their common interest to seek the same goals, improving production and quality of life of the rural poor, then some socially feasible project interventions can be entertained.

General Population Pressures -- Most Murundians express a preference for a poor family with many children to a rich family without offspring. This telling value is matched by the natural growth rate of about 2.5%, which in itself is not so high. But, in juxtaposition to the continuing decline of available resources per person and the resulting degradation of the environment, the figure indicates a potential ecological disaster.

The average number of persons per Km<sup>2</sup> is high for Africa, about 153, reaching a high of 262 per Km<sup>2</sup> in the northern province of Ngozi. In the next several years that kind of pressure on the

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\*\* Samplings of support: From the 2nd Five Year Plan (1973-1977)-- "The Plan can only be realized" ..by actions which mobilize the social forces of the population," i.e., those which demonstrate by example "... human initiative, organization, and discipline of the population commensurate with its technology and organization" (p.003); and from the 3rd Five Year Plan (1978-1982)-- its fundamental theme is that "...social justice will be realized by... an alliance of peasants, workers, and revolutionary intellectuals of all ethnicity and of all regions..." (p. 34) The part to be played by the single, government controlled party, UPRONA (Unité, Progres Nationale), in mobilizing the society is patently clear.

land will increase drastically (projected population by 2,000 being around 8 million), particularly given the present lack of any clear population policy. What is more distressing is that, of several sampled, high fertility countries, Burundi is the only one where the desired number of children exceeds the actual number. Thus, while having on average 6 children per family, Murundians actually desire 8!

A central value of Burundi family life, then, is to have many children -- an accomplishment conveying to the parents no small honor.\* That the value of a woman is derived from the consequences of her motherhood greatly compounds the work situation of the female peasant.\*\* Often left by herself to work the fields, the woman obtains some of the assistance she requires from her children. In time, however, the more children she brings into the world, the less effort she is able to render to farm productivity.

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\* And also no doubt contributing negatively to the just over 45 and 50 year life expectancy of males and females, respectively.

\*\* In one sample of small farmers, the head of the rugo was a woman in almost 1/3rd of the cases. That is the result primarily of widowhood and male out-migration for work. Additionally, the general census shows women as having an almost 2% greater representation in the population. Such a condition is related to heavy male migration to nearby states for work and to the refugee outflow and elimination of males in 1972

And, though seeming to be an illogical trap, the Murundikazi (or Murundi woman) has in fact minimized some of the risk by 'investing' in the future labor potential of her children. In so doing, of course, there are also that many more mouths to feed, more child-care to provide and, ultimately, greater pressures on the land.

Pressures of Society and the Role of Social Stereotypes -- The strong individualism of the family in Burundi society is a central fact which will shape any attempt at project intervention on the level of the colline. Such individualism can be understood in the context of Burundi history and ecology. In the past, Hutu tillers were moved in on by Tutsi cattle herders, the two forming a caste-like system in which the Tutsi became dominant but also in which each provided important economic and social functions for the other. Tutsi royal clans<sup>\*</sup> over time became attached to Hutu client clans in a lord-serf, father-son fashion. There were about 200 such Tutsi-Hutu clans, these providing a certain community of interest. Within these clans there were sub-sections or lineages (incuti), which were somewhat self-sufficient in economic, legal, and inheritance requirements.

In time, pressures of a social and political kind eroded these clans. Ecology and the force of the Tutsi monarchy (mwami) broke

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\* There is not total agreement in the writings on the subject on either the presence or strength of clans in Burundi.

down the clan structure, in the latter case to ensure the king's authority. Princes and other Tutsi 'patrons' took advantage of this dispersion by forming fiefs with individual Hutu families as their clients. Each rugo thus became independent and isolated from its former community, refusing ties of equality because of domination by ties of inequality. As a result the clan, with its base for a community of interest, lost its social and economic value. Ever since that time the motto of Burundi social life has been -- 'everyone for himself'

The clan dispersion and resultant power relationship between Tutsi and individual Hutu families have clearly left their mark on the character of the present population. That the beliefs, values, attitudes and behavior whose roots lie in Burundi social history are impediments to change is not advocated here. Nevertheless, any Government-supported intervention at the level of the poor peasant must take these stereotypes into account. The Murundi see power as a steady diminution from top to bottom, with those at the bottom perceiving the arbitrary and emotional use of personal power as the major force shaping their lives. Political power and authority are central values, and Murundi are characterized as all being busy at politics, rich and poor, men and women, leaders and followers. But power is enacted in a fatalistic mold, because the poor peasant sees those at the top as possessing an innate sense of intelligence (ubgenge) and a total superiority (mukuru) over him.

Such a personal and arbitrary exercise of power over the 'inferior' can be seen as productive of a constant instability: first between those on top and those on bottom, and second between those on the bottom who are competing for the favor of the 'superior'.

This same conception of power has its equivalence in the domain of the sexes. A decided male bias exists in Burundi society at all levels\*. For example, a woman is normally permitted to marry her social equal or inferior, but never up. The man, conversely, may use the woman's position for improving his own status. Where Tutsi-Hutu marriages occur, regardless of physical characteristics of offspring, the children of a Tutsi father will always take his tag, while those of a Tutsi mother-Hutu father are designated Hutu. So, despite the ethnic differences which already divide the Murundi people into this group or that, there are other complementary forces which divide men and women\*\*. That, coupled with the heavy work role of women mentioned earlier, strongly points to the necessity of any project intervention in the agricultural sector to serve better the interests of the female peasant.

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Even in the educational setting of the secondary school the male bias pervades. In a study of coeducational practices, boys defined themselves as 'rough' and 'contemptible', with girls agreeing. Girls saw themselves as 'timid', while boys thought of girls as mainly concerned with 'attracting boys' attention'. Finally, over half of the boys saw themselves as 'more intelligent' than girls; going beyond the boys' immodest self-perception, 3/4's of girls aged 13-14 agreed that boys were more intelligent!

\*\*It would seem at this time that despite some efforts, the Murundi male is still not favorable toward integrating the Murundikazi into national, much less local, level economic, political, and social sectors.

General Quality of Life and Human Resources -- On any scale of life quality, the Burundi measure in rural areas is low, indeed. A preliminary look at a few figures tells why: While the urban scene shows about 62% of the population as having some education, its rural counterpart shows a dismal 16%. Even worse, a study in Bubanza province depicts the illiteracy rate of women at a staggering 90%. For nutrition, the World Bank states that there is much to be desired, 88% only of caloric needs being satisfied.

Felt needs are an important measure of life quality level: A study in Kirundo province found that the peasants questioned, indicated at the rate of 86% the lack of medical care, 74% the lack of clean water, and 25% a deficiency in hygienic conditions. This same sample sees 'Government' as the solution to these problems. In contrast, Government five-year plans define 'self-development' as the means to improving the quality of life. That discrepancy is at the heart of Burundi's dilemma.\*

Despite a poor life quality index, rural Murundians, especially women, work relatively hard for what little they get in return. Of the total active population, 85% is working in agriculture. That figure represents about 1.8 million in 1970, supposedly increasing to 2.2 million by 1980. This agricultural work force is said to be working at about 80% of capacity. Because men often migrate to cash-crop work in and out of the country, women are left behind to till the soil, performing up to an estimated 80% of the agricultural

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\* One interesting measure of life quality is the ability to keep rural projects staffed, since most staff personnel want to return to Bujumbura almost as soon as they arrive in the countryside.

workload. Her role is not only fundamental in the production sector, but also in the sphere of shaping her children's attitudes and behavior, for it is she in the main who conditions the child's intellect, psyche, and subjectivity. It is from that conditioning that the rural family social security 'system' has stemmed, in which there is strong mutual help between parents and married children in times of sickness, in caring for children, and providing counsel, food, and financial assistance.

General Development Constraints and Interventions -- Socio-political development constraints in the agricultural sector are severe, as discussed earlier, certainly more critical than physical environmental constraints. As the base of the social life is material, it is essential to underscore the risk of not effecting some degree of equity (fairness) in the development of the rural population. If the Murundi peasant is not given the opportunity to maximize his return on labor, to arrest the rapid reduction in resource per family member (including incentives to reduce family size), then the ecological stress will snowball the continuing process of soil exhaustion and erosion and environmental degradation generally.

The absence in Burundi of a clearcut policy on population represents a significant impediment to developing the material and social needs of the rural family. Part of the problem is the

political sensitivity of the question; if a policy of population control were effected, the absolute members of the ruling class ethnic group would be considerably reduced, while at the same time any attempt to control the majority population birth rate by the minority would be naturally suspect. Of perhaps equal importance is the role of religion: first, the Roman Catholic position, being the semi-official point of view of the Government, is not especially efficacious in this overpopulated country. Second, the traditional religion, which has a considerable presence among rural peoples--often side by side Catholicism-- is rooted in a fatalistic value system. The central value is that one need not add to what God (Imana) has himself made and, further, that change is so much more difficult to bring about than what Imana has created. It is suggested these values, however, are not impervious to potential change resulting from the self-interested actions of the Murundi peasant, if he is given the opportunity to improve.

Given the constraints of a highly individualized, non-community organization of rural life, the former mandate power and later the Government of an independent Burundi (with Belgian aid) have strongly emphasized intervention through settlement programs and projects. The absence of a village structure in Burundi has long been seen as a serious constraint to human, social, and economic progress. From the time of the first comprehensive Belgian effort to define the socioeconomic context of Burundi (the 1961 Tinbergen report), the

philosophy of development here has been that progress is only possible if new communal structures can be created. Thus, the great faith which has been placed in the so-called transversal de paysannat -- the single-line settlement of peasant homesteads in which each farmer's lands can be combined with others for mechanization purposes, i.e., for tractor-type agriculture.

These paysannats are integral to the Government's policy to resettle people from high density areas such as Buyenzi, Kiri-miro, and Magamba to the Mosso and Rusizi plains. General problems with the settlement program, detailed later, concern differences between mountain and plains areas of climate, disease-resistance, agricultural practices, and social organization. The premise of relieving population pressures in the Central Plateau is quite logical, especially where programs provide for year-round work in factories (such as in the planned sugar cane processing plant near Khiofi in Mosso) or on large-scale agricultural projects. But the planning effort and systematic monitoring of these human dislocations leave much to be desired, for in more cases than not resettlement has been unsuccessful. Perhaps the single-most influential cause of failure is that the Government has not systematically given settlers secure rights of occupancy in land and water nor has it accorded them any role in local self-government. In this respect, any project intervention must consider granting these rights in meeting goals of social equity (evening out differences)

and appropriateness (fit with social context).

Most interventions in the agricultural sector reflect a class interest or bias. Showcase Government research stations directed at improvements of cash crops and cattle are predominant, very little of the resultant information getting down to the Murundi peasant, much less having particular relevance to his needs. Both agricultural extension and cooperative programs have had limited impact on the poor peasant and where they have, the success is often due to the mediating role of the religious missions or an outside donor, rather than Government participation. When Government intervention is introduced at the colline level it is done under the auspices of the national party, UPRONA, which is viewed in rural areas at least in part as a controlling mechanism.

### The Poor Peasant

The poor peasant is the main actor, production-wise in the agricultural sector. He shares the stage with those who orchestrate the sector: Government administrators, from Minister of Agriculture down to provincial agricultural officers who send too few, poorly-trained extension agents to the country side (project extension personnel are purportedly more effective in their efforts). While the greater part of the problem of access to the

poor peasant is human in nature -- including social, political, fiscal-- a certain part is of a geographic, logistical kind.

Geography, Population, and Relationship to Urban Centers -- There are some 2,400 individual collines or hills, that being the principle habitat of the Murundi peasant. 78% of all productive fields occupy collines,

Density of Most Highly Populated Provinces

<u>Province</u>	<u>Inhabitants/Km<sup>2</sup></u>	<u>no. of collines</u>
Muramvya	258	216
Gitega	178	385
Muyinga	120	326
Ngozi	<u>262</u>	<u>581</u>
	$\bar{x} = 204.5$	Total = 1,508

the other 22% lying on flatlands or swamps. The Central Plateau, one of the four major zones of relief, rising between 1,500 - 2,000 meters, includes the most typical colline, peasant habitat. Some of the more densely populated provinces are tabulated. Lighter density zones of relief include the Imbo Plain, except for the capital city of Bujumbura. Bujumbura is the only true urban zone in the country. It has seen a permanent growth in its population without, however, an equal increase in jobs. Each of the eight administrative provincial town centers comprises a minor service

center, dominated by a military governor. Although a case has been made elsewhere for designating several of these provincial centers plus others as poles of development, it is doubtful that the organizational capacity or infrastructure will be present in the near future to carry out systematic planning and development along those lines. Until the existing market system (if indeed it can be called that), including commercial, wholesale, and collection centers, expands and draws into it a much higher level of peasant production, no truly balanced regional development can take place.

Employment, Manpower, and Land Ownership -- Tilling the soil is a family proposition, though the amount of work done is weighted towards women. Drive along any roadway and count: females working the fields outweigh men 10:3 or 4. Such a condition is partly related to the visible underemployment in the traditional agricultural domain, along with other factors mentioned earlier. The rural exodus of males contributes to an already high level of unemployment in Bujumbura. Even several years ago that rate approached 30% of the active population. While there is no landless class per se, there is a growing aggregate of men who presently cannot make a decent living by only working their own land.

If on average one in three males is absent from the rugo, as one study showed, this points to considerable migration and off-

farm (sometimes seasonal) work. 11% is the rate of off-farm employment indicated for one part of the country. Many agricultural projects can only keep workers for part of a season, the men often returning to the rugo during January-March to work their own fields. This suits some projects and other producers well, in that they require temporary labor only in the harvest seasons, January and June, and the seeding time, October.

While it is clear that some peasants, especially men, are being simultaneously pushed and pulled off their land to leave it behind to family members, it is not at all clear exactly how that land is held. The problem is partly one of record-keeping, since even today land ownership, except in towns, is set by oral traditions. Verification of land tenure is provided by witnesses of one kind or another, neighbors or a colline elder; boundaries are marked by planting trees, erecting fences, or simply placing of stones. There is an obvious need for some form of land ownership record-keeping, a task that could well be done by a future local, self-governing body made up of colline members.

Most land in Burundi is obtained through inheritance and purchase, followed by way of a gift or an allotment by the State. Land given by the State as part of resettlement programs is often given only provisionally, with use rights. Another point about ownership which is not well-documented but which requires careful examination

in project intervention is the distribution of land and cattle. From a study done in Kirundo province, it was found that 27% of the landowners owned 50% of the arable surface, while 50% possessed only 28%. For cattle, 5% of the producers owned 50% of the supply. The status quo of such an imbalanced distribution would have to be carefully researched prior to any project intervention in an area showing similar imbalances.

Rural Women, Youth, and Children -- As noted, the Murundikazi is accorded a social position inferior to the male. She has little political power, few legal rights, cannot inherit land or cattle, and has virtually no right to independent action outside the house. Thus, the woman must attain her goals by means of men, essentially men in whose favor she happens to be. But, and this is no small condition, in the absence of considerable numbers of men, women often direct the life activities of family rugo and fields themselves. In that sense, women have liberated the man to pursue other activities, including crop work, schooling, and some not-so-productive diversions. In so doing, however, the men have invented for women a socio-economic role which weds her to the hoe.

All of this is not to say marriage is totally unpredictable. for the woman -- in fact, there is a pattern, but one which does not

particularly favor her. She must endure the fact of polygyny (a man with 2 or more wives), though it is reported to be numerically 'marginal'. What is not so marginal, however, is an increase in the number of 'liaisons'. A man migrates to settlement projects, other paid labor, such as in Bujumbura, on a tea or coffee estate, even in a neighboring state, leaving his family behind to keep a hold on the rural property. Due to the need for assistance in keeping a second household he will find a woman, sometimes formalizing the tie in a polygynous marriage but often as not just keeping her on hand through a casual liaison. The inevitable children follow.

The net result of this social disjuncture in which a man is trying to assist in keeping two families alive is not helpful for overall productivity nor for the condition of women. Granted one of the causes of such social dislocation is the underemployment in the agriculture of the colline and subsequent push of males off the land. Further, the casual nature of liaisons of men and women on the plains, whether in Government-sponsored settlements, seasonal labor, or non-agricultural work in Bujumbura, is due principally to the uncertainty of both employment and land tenure.

An important target group within the poor peasant population is that of youth. There appears to be a growing number of young persons, mostly males, who are forced out of the traditional rural society into the confines of the capital city. They comprise a

disenfranchised lot, left to itself with a lack of employment, ignorance, even occasional delinquency. Representing an important source of labor in agriculture, rural youth are offered no incentives to stay on the colline except the barest one of being able to partially feed themselves.

Many youths stay on the colline, however, to marry and reproduce. Based on a study of women in Bubanza province, the average age of women at first marriage was 19 while age at first birth was 21. Marriages between persons of the same colline comprise about 1/3d of the total and the large majority of the remaining marriages occurring among persons of nearby collines. Concerning knowledge of the time of conception of a child, from the same study of women used above, the role of literacy seems to be incidental. Of the female sample, 96% never consciously attempted to space the births of their children, 74% didn't know of any method of contraception, and of the 26% who did know one method, 89% named abstinence. Spacing of births is partly a function of when the last infant is weaned, a point when so many die of malnutrition. Obviously, project intervention should have some impact on these life areas within which the Murundi peasant and his . . . children are seen to be at best just scraping by. In fact, many simply don't make it to childhood.

The Rugo: Focal Point of Rural Production and Consumption -- The rugo is the homestead, usually fenced in and surrounded by banana trees, the human settlement which includes the family whose land surrounds it. It may comprise several generations, including a man, his wife, their married children, and grandchildren. Limited availability of surrounding fields shapes the size and composition of the rugo family. The Murundi peasant prefers to be close to his land, to the extent that about 4/5ths of the fields are on the same colline as the rugo which exploits them\*. The average number of persons per rugo is reported to be 5.7, sometimes divided among two households, i.e. two separate huts (hut - urugo) within the compound. Most rugos share the same fields but in about 1/4 of the cases separate households work different fields. The household unit with its separate fund and sometimes its separate fields is considered here as a production unit. In contrast to the average number of persons per productive unit provided in the table, one regional study showed a considerably larger average, 7 per unit. Some discrepancy is no doubt due to the definition of such a unit -- to qualify it even more for future use, it should be treated as the totality of the means of production under the direction of a specific individual.

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\*The rugo and dependent lands and livestock as a totality is called itongo.

Composition, Size, and Extent of Holdings of the Rugo

# of households/rugo : 77% = 1 / 16.9% = 2 / 4.2% = 3 / 1.3% = 4 / 0.4% = 5 / 0.2% = 6
$\bar{x}_{\#}$ of households/rugo : 1.3
$\bar{x}_{\#}$ of persons/rugo : 5.7
$\bar{x}_{\#}$ of persons/hut : 3.8 <sup>a</sup>
# of productive units/rugo : 75% = 1 / 90% = no < 2
$\bar{x}_{\#}$ persons/productive unit: 4.4
$\bar{x}_{\#}$ active persons/ productive unit : 3.6
$\bar{x}$ meters <sup>2</sup> / rugo : 400 <sup>a</sup>
Hectares/productive unit : 50% < 0.5 / 56% < 1.0 / 80% < 1.5 <sup>a</sup>

<sup>a</sup>Derived from sample studies

Some productive units have been reorganized over time, enlarged to include a kinship group larger than the nuclear family. Whether or not the fields are controlled by an extended family, bananas are more often than not held in common by a few-several related families. This is no doubt related to the equation of banana beer with social occasions and hospitality, these usually being sponsored by a group larger than the nuclear family.\* Average number of active members per production unit also needs qualification in that one sample regional study depicted 2.7 per unit, a figure smaller than that in the above

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\* Beer, whether banana or the factory-made 'Primus', is the traditional mediator of all social relations on all occasions, between equals and unequals.

table.

Despite that discrepancy and the fact that men purportedly possess more physical strength\* than women, the woman on average works much harder in making the production unit productive. One study depicted an average of 1.1 male and 1.6 female work units per production unit. Further, the woman puts in considerably more time in the fields than her husband, when he is present: 8 1/2 VS just over 5 hours/day; for the week (seven day), she averages 59 1/2, he 37 hours. The absence of the male from production tasks, where it occurs, may go on for several months at a time or even years. The one-third of males who are absent from the rugo, leave their families shortly after marriage. This means the woman is left to fend for her family, aged women often tilling the soil while the younger ones do childcare and other household work.

The presence of incomplete or dislocated household production units has had its harmful effects on such conditions as nutrition and education. The average Murundi household is just at the subsistence level, requiring one active unit to feed one household. When the male is absent, that 1.0 work unit must be made up by some combination of two women or a woman and her children. But while the household is getting just enough food to stay alive, it is not

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\* Active working persons is determined as follows: 1 adult male = 1.0, 1 adult female = .75, 1 child = .50

always in a position to spare children for such benefits as even basic schooling. In rural areas only about 16% of the under-fifteen population has been educated, about one-quarter of the children attending schools.

On the consumption side, the diet is short on protein and fats, high on starch, leading to Kwashiorkor or endemic malnutrition. After weaning, the infant may be fed undigestible and low-in-protein food, often contributing to its death from a cause as normally harmless as measles . which the child otherwise would have survived had it been well nourished. Another problem, which is partly a matter of perception, is the treatment of meat as a food of the rich or for the feast. The peasant will thus voluntarily sell chickens, rabbits, goats, and eggs -- not using these valuable sources of protein and fat for their own consumption, the money being used to buy several bottles of the ever-present banana beer or Primus. The agacupa or 'the bottle' plays a highly important role in Murundi social life and is an important item in their food pattern.

#### Development and Policy Constraints in Production and Living Spheres

Overall constraints on development possibilities and actions have already been considered. Now it is appropriate to see how these translate to the local, colline intervention level.

In the domain of the farm, the socio-geographic fragmentation of the rugo-colline is a formidable obstacle to the delivery and implementation of techniques and services. While the Government administrative structure is theoretically present to deal with the over 2,400 collines and approximately one million families, there is both an organizational and motivational lack on both sides which is constraining. The colline level (actually colline de recensement or several collines grouped together for census and administrative purposes) has a political head appointed by the Government and who also serves as the UPRONA representative. Elections of officials have been mentioned but not yet carried out; problematic are the proposed literacy requirements for elected officials, given the elimination of most Hutu literates. Encouraging in this respect is that many of the eliminated literates' wives are themselves literate, suggesting that project efforts could be directed to them particularly without the open threat posed if literate men were the obvious beneficiaries. At any rate, the Government must go a long way to prove its interest in helping the small farmer. If it can tangibly prove itself, there is some possibility that discrete communities of interest will emerge on the collines.

The Ministry of Agriculture is a carbon copy of the Government it serves. It is not people-oriented, rather it is showcase, project-oriented, providing big jobs for the elite and little help for the poor. Its research is mostly directed at cash crops rather than feeding the under-nourished; its planning concerns the re-

settlement of a miniscule percentage of the overcrowded Central Plateau population under difficult plains conditions which only negligible numbers have successfully adapted to. There are few useful institutions for the tiller per se, and more successes are greater where foreign organizations or religious missions have provided them. Even in those cases, one branch or other of Government continually seeks control of effective programs. This is not to say the poor peasant would not come together with others of his colline if it were plainly in his self-interest to do so. To date such an incentive has not presented itself, but were markets, credit facilities, transport of produce, equitable prices, and some improvements in his living quality available, greater interest and participation could be forthcoming.

On the policy side, one could safely say that the rhetoric of intentions presented in the three five-year plans has in no way been matched by either the will or the need to succeed in fulfilling poor peasant needs. But, to be fair, it is not quite so black and white. While budget allocations to the small farm sector are small, that is partly a function of outside donors supporting mainly large-scale agricultural activities, cash crops, and generally those commodities which bring revenue to the Government. To continue the flow of those funds, the Ministry of Agriculture has had to maintain the status quo. That is changing somewhat on the part of foreign donors, but Government has by now become used to living off of those

funds in contrast to sending the bulk down to the poor.

In the sphere of human services, again the rhetoric of policy is explicit in its commitment to creating a healthy, literate, prosperous rural base. In fact, the action side of the coin points to a dismal record. Population planning, a crucial need, is a political hot potato no one seems to want to touch at the moment\*. Even the term 'family health' is misconstrued by some officials to mean population control. For educational and health functions, generally, there is some genuine effort, though much of this burden is carried by the religious missions. To repeat what has already been stated with respect to quality-of-life requirements in Burundi, it seems clear that any project intervention should effect a trade-off between purely production goals and improving the life quality of the Murundi family.

Strategies for Overcoming Constraints and Projects for their Alleviation. Recent Relative Severity of Constraints -- One has to say the constraints to developing areas of the rural poor are formidable. They are first of all political, a topic covered at the outset of the social analysis; secondly, they are institutional, given the weak

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\* One exception is Dr. Jean-Paul Burafuta, Sociologist, Faculty of Economics, University of Burundi, who is carrying out an attitudinal study towards population growth on part of elites and peasants.

administrative and infrastructural links to and among the peasantry; thirdly, related to 1) and 2), they are social-psychological, meaning the dispersed rugo-colline character of the target group, the drawing inward tendency of peasants due to earlier Government suppression and inattention, and the apparent lack of will of elite class urban and urban-oriented officials to fulfill their promises. In the political arena, it is useful to mention again the absence of a clear population policy, a critical factor in the man-land/degradation of environment equation: if some meaningful action is not taken in the near future, Malthus' worsening progression of mouths to feed relative to available food will solve the problem for Burundi. And as long as the crutch of donors' help in large-scale farming in limited areas continues with its almost total disconnection from peasant production and living requirements, a false sense of security will most likely prevail.

Briefly, the question of donor subsidies is highly relevant because of the thorough way in which these have drawn attention from the majority of rural poor. Heavily subsidized and staffed by foreign personnel, many of these projects will perhaps never reach a point where they are self-sustaining. They pose problems of retaining trained national staff, whom it seems are continuously lured (understandably) by the lights of Bujumbura. Even untrained laborers do not wish to or are simply unable to stay on projects, for they also have requirements on their own fields to fulfill.

Recent and Current Programs/Projects and their Evaluation-  
FOYERS SOCIAUX or SOCIAL CENTERS, under the direction of Ministry of Social Affairs and Labor (MSAL), though not functioning at full efficiency at present, offer a ray of hope among a confusing glitter of splintered, overlapping, even conflicting programs for the rural poor. There are now some 58 Social Centers dispersed over the countryside, with 152 planned for the present five year period. They provide an educational function, 'education of the base', in intellectual, spiritual, and practical areas. For the last, women (as of a year ago men were admitted) are trained in family nutritional, health, and sanitation matters.

The Social Center course is three years, meeting three times per week, and 'ideally' (their word) eight hours per day. The age range of women attending is 15-50. Each center has a social extension function, including on average three female extension agents who take the teaching function out of the center onto the collines. Teachers and social extension personnel are trained at schools under MSAL in Gitega. 29 private social centers, mainly attached to religious missions, supplement the Ministry's activity. Under the direction of UPRONA, the Union of Burundi Women has set the blueprint for the Social Centers and as well in planning -- Social Service Centers for training of women in social work and social workshops, and a Women's Information Service.

RURAL COOPERATIVES and EXTENSION Under CARITAS (Umbrella for Roman Catholic Church missionary effort) -- Rural cooperatives established by R.C. missions service 1966-1967, to provide the rural population with basic food crops and some storage and credit facilities, have been fairly successful. These cooperatives, of which some of the 35 are supported financially by foreign donors other than the Church, are run by elected members who establish purchasable membership shares; the cooperative buys food crops from its members to sell in cooperative stores, with profits shared being proportionate to member of shares owned.

A model cooperative is operating in the parish of Kanyina in the northern Central Plateau. Public officials and party members helped to promote the idea of a cooperative in Kanyina, though the local priest with help of CARITAS and

an Austrian technical cooperation group actually started the organization itself, in 1978. The first year saw 80 members joining, with 260 now active. First-year profits were reported to be 28%. The focal point is the priest/missions, which supplied the building for the store. The priest acts as a 'moral guide' and holds the key to the cash and store. The board is heavily weighted towards Tutsis, due to their possession of literacy skills.

Government attempts at cooperatives have not been too successful because of the 'trust' factor. Under the Regional Society for Development, the Government has established a few cooperatives as well as a course for cooperative management. There is apparently some sense of competition felt by the Government regarding the mission cooperatives and the former is trying now to garner public support for its effort through the machinery of UPRONA.

MISSIONS -- The religious missions over the years have established themselves quite effectively if somewhat modestly among the rural poor. They have provided at least 50% of the country's school needs, many health dispensaries, small farm cooperatives (see above), and a limited degree of agricultural extension. There has come to exist in certain cases, some sense of competition if not jealousy and outright hostility between Government and the missions (mainly Roman Catholic with a smattering of less well-organized Protestant missions) covering the former's ability to touch the population more easily and effectively. Whether or not the following is related to this standoff is uncertain, but it is reported that the Government is considering the gradual phaseout of missions over the next ten years. For project interventions, therefore, mission infrastructure and experience certainly should be used when available, but no project should or presumably even could (given the present Government disposition) be officially attached to a mission or mission group. It is recalled that missions, in the pattern of the colonial and (later) mandate power, have variously supported the status quo of Burundi politics and ethnic divisions over the years. Whether they had any other choice is not in question here, though to tie a project to a mission would be symbolically problematic if nothing else.

GOVERNMENT SETTLEMENT PROJECTS -- The social impact of such projects ranges from moderate success to dismal failure. Mparambo paysannat in the north Imbo Plains Cibitoke Project Area has all the earmarks of success, with individual families having developed some sense of bond to their land. In that particular example, it appears the peasant, some of whom are indigenous to the Plains region, has been given secure rights over his four hectares of land. He pays minimally (\$ 31) for mechanized agricultural services and obtains water for irrigation and extension assistance free of charge. His handsome average 100,000 Fr. Bu. earnings (\$ 1,100) heavily reflect the helping hand of foreign and Government subsidies.

A settlement effort which has not had such success is the Imbo - Mpanda irrigated farming project. Begun in 1968-1969, it resettled 3,000 families, about 12,000 inhabitants, from the north Central Plateau. They were placed in five paysannats which it is recalled is a line of separated houses with fields perpendicularly positioned: it is not a village per se. Each paysannat has a primary school, running water, and sharing health clinics. Each farmer has been provisionally given one hectare, which he must plant systematically. He pays about \$ 31 U.S. for canal cleaning services.

On the social side this project has been a failure: project officials admit that the families are not 'well-settled'. The settlers have not become easily acclimated to the heat and humidity of the Plains, nor well-adapted to malarial-producing conditions. Often unaccompanied by his family, the man takes a second wife or finds a woman who will care for the household. Children inevitably follow. What is equally important in the lack of success is the almost total lack of training of the peasant in the entirely new methods and techniques required for an irrigated system of agriculture. Because of the peasant's lack of commitment, which is no doubt related to the fact that he is not the true owner of the land (the State maintains ownership), and the presence of his land

and family back on the colline, he becomes a trans-migrant. It is a matter of back-and-forth, shifting allegiances between plain's family and colline family, the peasant returning to his original homestead at least two times per year. Until this kind of project with its numerous problems is monitored, fully evaluated, and recommendations made for its improvement on the basis of sound social planning, development of new ones should be slowed. (Here, incidentally, is a perfect place for a Burundi-based social science to do important, valuable work.)

GOVERNMENT RESEARCH STATIONS -- Since these have been discussed in detail by other members of the sector analysis team, only a few brief points are made here. The research station is part of the baggage which has come down to the Murundi over the decades -- it is a fixture as much as those donors who support it are. The connection of the typical station to the actual conditions and needs of the poor peasant is virtually nil. Any new research or experimental station, then, should get away from the large-scale, mechanized high revenue operations and be directed to small-scale, colline replication, with real colline-level peasants participating at the earliest possible point (i.e., including planning stages). Given the history of this, so long as any research station in Burundi remains 'experimental', its chances of ever getting out of the laboratory, down to the dirt and hard work of colline agriculture are miniscule.

Additional Development Needs -- In addition to those needs already covered, the place of the male in development requires a critical examination and updating. Because women make up the bulk of the agricultural working population, it is necessary to re-interest the man in this work. When the land cannot support a full-time effort, several possibilities are apparent: reduction of land surface-to-production unit, in combination with a change from rotation of plots to rotation of crops; halting migration into excess

population areas; creation of off-farm employment possibilities where possible. Concerning on-farm consumption requirements, some greater attention should be given to the provision of extension agents for household management, a function which should be accorded to women, given their dual role of child rearers and farm producers. Appropriate education in the rural milieu is another area in need of no small amount of concern.

Development of local markets, a topic covered elsewhere in the overall report, is important in the general improvement of rural life quality. There is presently lacking in Burundi a strong tradition of periodic local markets, but this is evolving as rural purchasing power increases. Beside matters pertaining to small farmer savings and credit, there is a basic problem of market transport along secondary roads. If that is improved on, the potential for better marketing, which Murundi peasants state a preference for carrying out through cooperative associations, will be greatly enhanced. Lastly, care must be taken so that peasant production is not gauged through adjusting price policies for the sole benefit of the urban elite consumer.

#### Criteria for Project Feasibility and Identification

A set of criteria based on the foregoing social analysis is presented for the purpose of underscoring both the constraints and potentials relevant to the project identification (PID) process.

While the following statements or criteria must be judged in the context of the overall analysis, they may serve as the basis for a socially sound identification, preparation, and implementation of rural-based projects in Burundi.

#### Project Social Equity Statement

SOCIALLY FEASIBLE ('WORKABLE') AND EQUITABLE ('FAIR') PROJECTS CAN BE ESTABLISHED SO LONG AS THE TWO CENTRAL ACTORS -- GOVERNMENT AND POOR PEASANT -- CONVERGE ON THE GOALS OF IMPROVING COLLINE-LEVEL AGRICULTURAL PRODUCTION AND LIFE QUALITY.

#### A Case of Shared Poverty

OUTSIDE OF BUJUMBURA, THE ETHNIC GROUPS ON THE COLLINE SHARE POVERTY MORE OR LESS EQUALLY.

#### Lack of Population Policy and Potential Disaster

THE ABSENCE OF A CLEAR POPULATION POLICY IS A CRITICAL FACTOR IN THE MAN-LAND/DEGRADATION OF ENVIRONMENT EQUATION: IF SOME SIGNIFICANT ACTION IS NOT TAKEN IN THE NEAR FUTURE, MALTHUS' WORSENING PROGRESSION OF MOUTHS TO FEED RELATIVE TO AVAILABLE FOOD WILL SOLVE THE PROBLEM FOR BURUNDI IN THE FORM OF A CATASTROPHIC HUMAN DISASTER.

#### Production-Quality of Life Trade-Off

GIVEN THE QUALITY OF LIFE NEEDS OF THE RURAL POOR IN BURUNDI, PROJECT INTERVENTION SHOULD EFFECT A TRADE-OFF BETWEEN PURELY PRODUCTIVE GOALS AND IMPROVING THE LIFE QUALITY OF THE MURUNDI FAMILY.

#### Real Incentives VS. Social Stereotypes

ATTITUDES AND VALUES OF THE MURUNDI PEASANT WHILE SEEN ON THE SURFACE TO BE IMPERVIOUS TO CHANGE, SUCH AS THE STRONG SENSE OF FATALISM, SHOULD BE DEALT WITH BY ANY PROJECT INTERVENTION AS FOLLOWS: SO LONG AS THE PEASANT IS GIVEN THE OPPORTUNITY TO IMPROVE AND HE SEES IT IN HIS SELF INTEREST TO DO SO, CHANCES ARE HE WILL.

Project and Community Interest

PROJECT INTERVENTION SHOULD STIMULATE THE DEVELOPMENT OF A COMMUNITY OF INTEREST IN THE HIGHLY DISPERSED, FRAGMENTED RURAL SOCIETY.

Authority Structure of Potential Projects

GIVEN THE OUTWARD ACCEPTANCE OF ARBITRARY AUTHORITY AND POWER BY THE MURUNDI PEASANT, THE DESIGN OF ANY PROJECTS INVOLVING THEIR PARTICIPATION SHOULD STRUCTURE AUTHORITY IN A FLUID, NON-AUTHORITARIAN MANNER SUCH THAT PARTICIPANTS DO NOT FIND IT NECESSARY TO COMPETE FOR THE FAVOR OF THE 'MAN AT THE TOP'.

Poor Peasant Rights to Land

ANY PROJECT INTERVENTION MUST CONSIDER GRANTING THE MURUNDI RURAL POOR PARTICIPANTS SECURE RIGHTS OF OCCUPANCY IN ANY LAND AND WATER OR ANY OTHER RESOURCES INTRODUCED BY THE PROJECT AND TO ACCORD LOCAL RIGHTS OF CONTROL OVER THESE. SUCH RIGHTS MUST BE LEGALIZED.

Increased Production at Peasant Level

CARE MUST BE TAKEN SO THAT PEASANT INCREASES IN PRODUCTION ARE NOT EXPLOITED THROUGH THE ADJUSTMENT OF PRICE POLICIES SOLELY FIXED TO BENEFIT URBAN ELITE CONSUMERS.

Family Focal Point

COLLINE-ORIENTED PROJECTS SHOULD FOCUS ON THE FAMILY UNIT-- IN LIGHT OF THE CONSIDERABLE ABSENCE OF THE MALE-- SO THAT AN INCENTIVE IS PRESENT TO SECURE HIS PARTICIPATION AND THEREBY REDUCE THE BURDEN ON WOMEN AND CHILDREN.

Female Focal Point

WHERE THE WOMAN IS THE HEAD OF A PRODUCTIVE UNIT, SOME MEASURE SHOULD BE TAKEN TO GIVE HER OWNERSHIP AND INHERITENCE RIGHTS TO THE LAND SHE SO ARDENTLY WORKS..

A POTENTIAL ROLE EXISTS FOR THE LITERATE WIVES OF HUSBANDS ELIMINATED IN 1972 AS A FOCAL POINT FOR COLLINE-LEVEL INTERVENTION WITHOUT THE THREAT OF LITERATE MEN AS BENEFICIARIES.

Mother-Child Focal Point

BECAUSE THE RURAL PRODUCTION UNIT IS OFTEN BASED ON MOTHER-CHILD LABOR, IT SHOULD BE A PRIMARY FOCUS OF PROJECT INTERVENTION AND WOMEN'S AND CHILDREN'S STATUS AND WELL-BEING SHOULD BE ENHANCED AT ALL COSTS.

Children: Nutrition and Education

ATTENTION MUST BE GIVEN TO THE IMMEDIATE POST-WEANING PERIOD OF THE INFANT, A POINT WHEN LIFE-CHANCES ARE RADICALLY REDUCED DUE TO INADEQUATE DIETARY PRACTICES.

CHILDREN NEED TO BE FREED FROM AGRICULTURAL WORK IN ORDER TO TAKE ADVANTAGE OF SUCH BENEFITS AS EVEN BASIC PRIMARY SCHOOLING.

Youth and Their Disenfranchisement

PROVISIONS NEED TO BE TAKEN FOR THE GROWING NUMBER OF DISENFRANCHISED RURAL YOUTH, ESPECIALLY CONCERNING THE BROADENING OF LIFE OPPORTUNITIES THROUGH EDUCATION, HEALTH, RECREATION, AND COMMUNAL ACTIVITIES.

Settlement Projects

UNTIL SETTLEMENT PROJECTS WITH ALL THEIR SOCIO-ECONOMIC AND ENVIRONMENTAL PROBLEMS ARE MONITORED AND FULLY EVALUATED, PREFERABLY WITH THE PARTICIPATION OF MURUNDI SOCIAL SCIENTISTS POSSESSING UNDERSTANDING OF THE RURAL POOR, DEVELOPMENT OF NEW SETTLEMENTS SHOULD BE SLOWED.

Foreign Donors' Large-Scale Agricultural Projects

SO LONG AS THE CRUTCH OF DONORS' HELP CONTINUES IN LARGE-SCALE FARMING PROJECTS WITH THEIR ALMOST TOTAL DISCONNECTION FROM PEASANT PRODUCTION AND LIVING REQUIREMENTS, A FALSE SENSE OF SECURITY IN GOVERNMENT CIRCLES WILL MOST LIKELY PREVAIL.

ANY NEW RESEARCH OR EXPERIMENTAL AGRICULTURAL STATION SHOULD MOVE AWAY FROM LARGE-SCALE, MECHANIZED OPERATIONS TO SMALL-SCALE, COLLINE-LEVEL PEASANT PARTICIPATION AT THE EARLIEST POSSIBLE POINT.

Projects Recommended to USAID for Project Identification

Several projects are outlined below, some with greater detail than others.

These are ordered for priority assessment.

I. ASSISTANCE IN THE ESTABLISHMENT OF AN ORGANIZED MURUNDI SOCIAL SCIENCE RESEARCH AND PLANNING GROUP, to work with USAID in monitoring and evaluation of projects.

A. Formation of sociologists, socio-anthropologists, rural economists, social psychologists, political scientists, socio-ecologists, either in an institute or center; they could be utilized as formal counterparts for provision of social analysis at all phases of project work (CDSS/SECT.ANAL./PID/PP/P. Implementation/Follow-up).

B. The rationale is to obtain the best possible assessment in:

- 1) Integrating the best informed (i.e. Burundi-based) social analysis into the Logical Framework of projects;
- 2) Avoiding pitfalls of potential unintended negative effects of projects (at PID/PP stages and later periodic points of project evaluation).

C. Further steps are:

- 1) To build up a Social Data Bank to help Murundi social researchers and planners, USAID, and other donors in using macro-social, micro-social and micro-economic analyses to better design socially sound projects;
- 2) To be able to formally utilize those Murundians most sensitive to the social issues involved in the development of their country's human resources and, further, to assist in realistic and accurate prediction of project beneficiaries/impact;
- 3) To upgrade development-related social research and analysis skills of Murundi social science students through post B.A. level training in social/rural development and health, nutrition, and education planning programs at U.S. graduate centers.

D. There is present already in Burundi an interest in formalizing just such a group of experts, given the presence of several trained social scientists in University and Government. (No source of funding has yet been located for such an effort.) In this country, where social and institutional constraints to development are so clear, a formalized mechanism for utilizing socially sensitive local input and feedback on projects could be of invaluable assistance to the Burundi USAID program and its permanent and project staff(s).

E. The ultimate beneficiaries would be the rural poor -- which would be the mandated focus of the social research and planning group.

F. Its location would be in Bujumbura, with one or two field offices in project areas (perhaps UN Gitega Center or in Ngozi). Start-up costs would be in range of \$200-300,000. with contractual consultancy fees offsetting cost in subsequent years.

## II. A PROJECT IN LOW COST INFRASTRUCTURE RURAL HEALTH CARE DELIVERY

A. This project would aim at distributing basic health services in regional rural areas. Entails training of paramedical health workers in environmental health problems and nutrition and hygiene to hit target population of rural poor at regular intervals.

1) The emphasis is on "spread effect", minimizing cost of localized infrastructure, while maximizing human resource (personnel) investment;

2) Distribution through mobile equipment, in attempt to bring rural poor target group up to national standard of health service;

3) Preventative and curative actions; for preventative action:

a) Organization of mobile equipped health units for infant and family health care;

b) Periodic medical examinations of students in all rural schools;

c) Creation of popular committees for health on collines;

d) Establishment of sanitary water points;

e) Creation of more dispensaries, with attached classroom for maternal and family health care education;

For curative action, basically improving ratio of facilities and medical personnel to rural population.

B. Costing not attempted here.

## III. PROJECT FOR UPGRADING RURAL SOCIAL CENTERS (see evaluation of "Foyers Sociaux" under section 'Recent and Current programs').

A. These women<sup>and</sup>-family-focused centers can provide excellent potential low cost service in education, nutrition and health.

B. Emphasis to be placed on freeing women from heavy workload to participate in training program for social extension agents.

C. The social service sector in rural areas should be upgraded and considered as a real sector of employment and its training facilities should be dispersed to more rural/administrative centers than is presently the case.

D. Budget design requires more details than presently available.

IV. Two project ideas deriving from Burundi sources merit consideration: NATIONAL FAMILY WELFARE EDUCATION OF ORGANIZED SECTORS AND IN RURAL AREAS (Dept. of Social Promotion, MSAL) and A SOCIAL AND CULTURAL CENTER FOR WOMEN OF ROHERO (Rohero District, Bujumbura, Union of Burundi Women).

A. The national family welfare proposition is intended to promote family-oriented services to educate women in areas of health, nutrition, family planning, child care, home economics, community self-help, and hygiene. It would require:

1) Design and implementation programs in family services for teachers and extension personnel in the organized sectors so as to reach rural sector.

B. Social Analyst recommends that though this is a worthwhile proposal, it should be examined for possibility of linking its proposed functions to the already-present, well-distributed rural Social Center system.

C. The proposed Cultural and Social Center for Women in Rohero District, Bujumbura, contains very interesting points, such as provisions for legal representation in cases of women's rights, training in nutrition and (very encouraging) family planning.

D. This, too, could be examined with possibility of combining with existing Social Center functions, though specifically adapted to the urban setting since Social Centers do not presently operate in the towns. While some of the recommended points are not perhaps adapted to rural women, the fact that most Murundikazi share the same inferior status vis-a-vis men make it equally applicable in both urban and rural settings.

V. Two projects recommended by (other) foreign donors are worthy of PID consideration: The UNDP/FAO proposal for a CENTER FOR TRAINING AND INFORMATION FOR USE IN RURAL DEVELOPMENT and the Belgian Technical Assistance study/proposal for the DEVELOPMENT OF KIRUNDO REGION.

A. The UNDP/FAO Integrated Rural Development project in Gitega, already underway and under whose auspices the proposed Center would fall, represents an ambitious attempt to bring together many rural functions. The Center is briefly mentioned as a possibility for multi-lateral funding. Since a preliminary proposal already exists (Mr. Jacques Jallade, UNFAO), it is not elaborated here.

B. The study/proposal for developing Kirundo is a well-founded, multi-disciplinary effort in regional planning and development. Its sociological strengths particularly, are considerable. Since this study, too, is available (Belgian Embassy) its review for possible multi-lateral participation is recommended.

A Brief Selective Review of Team Members' Recommendations for Social  
Soundness

This is a preliminary, selective review of team members' recommended projects for their presumed social feasibility (workability), equity (fairness), and directedness to the target population. Since many of these points were discussed at some length with each of the team members, some concurrence and sensitivity to Burundi social and political issues was already present. The following review only points in the general direction of soundness of suggested projects and is in no way intended to be definitive. Further, the context of each expert's recommendation must be kept in view.

Agronomist's Recommendation

Small Farm Research Station at Rutegama: This is a replication of colline-rugo conditions and problems with the full range of environmental potential, for use in evaluating the existing small farming system. It entails the projected introduction of actual peasant families (only) after 'risk' of original experiment reduced - perhaps after the second year. There is a provision for linkage with Agricultural Development Center extension effort in the region.

Social Soundness Statement: Good in its technical conception; could perhaps have potentially greater impact if planned from 'bottom-up', with peasant families being given a full role, including some of the 'risk', with their input and feedback from very beginning. Though perhaps cumbersome in some respects to the research effort, such participation could utilize peasant know-how and give both real and symbolic value to the rural poor effort. The linkage of the extension effort would also be that much closer. Given the ISABU experience, any project that is 'purely' experimental will probably remain just that. This is not to minimize the difficulty of merging poor

peasant participation with research (a careful collaboration between agronomist, training specialist and sociologist could work out most of these), but if the experiment is not applied to the poor peasants' real needs in a very observable and immediate way, then it may not reach out to him/her at all. Suggested possibility of some linkage with MOA Rural Development Department in conjunction with UNDP/FAO effort in Rutegama area.

#### Soil Conservationist's Recommendations

Transmission of Available Knowledge on Soil Conservation Techniques: The major emphasis of the proposal is to deliberately play down the research end and get the existing information onto the farm through extension.

Social Soundness Statement: This recommendation seems to be sound. It is also in keeping with the need to reduce the role of that part of the agricultural sector which says its aim is to improve agriculture and yet whose major achievements would seem to consist mainly of creating nice experiments and good jobs of utility to a miniscule minority. The direct and immediate application of what is now known and proven to be of practical use to the small farmer is the eminently sensible direction of USAID's effort.

#### Nutritionist's Recommendation

##### National Nutrition Improvement Effort through Social Centers:

This is a general recommendation to train social extension agents in nutrition, who could be trained by and work through the existing systems of Social Centers.

Social Soundness Statement: Presently the system is not adequate to the task of carrying out a national program in nutrition, training, and extension, though if the Department of Social Promotion were given more attention and funding by the Government, it might in time be upgraded to do so. Because of the need for a strong program in nutrition it might be appropriate to link such a program to an overall attack on national health problems through a highly mobilized, high spread, low-cost infrastructure health care delivery system (see social social analyst's health care delivery recommendation).

#### Agricultural Economist's Recommendations

Creation of Permanent Water Supply for Rural Areas: One of laudable objectives here is to free women from the time-consuming task of water retrieval.

Social Soundness Statement: Though empirical evidence is lacking on the question, it is probably correct that women and children are burdened with that task. 'Freeing' women may have unintended consequences, however,

if one asks 'free her for what?' If it is simply to provide her more time to perform equally enduring labour somewhere else on the rugo farm, then this would be an impasse. If it's to free the woman so she can attend Social Center classes, well and good. The appropriate question is how to provide a good water supply equitably (fairly)? This also entails the creation of incentives for men to increase their presently diminished effort on the colline, a subject covered elsewhere in the analyst's contribution.

#### Agricultural Extension Specialist's Recommendation

##### Revision and Upgrading of Curriculum/Staff at ITAB (Gitega):

One part of this recommendation is the inclusion of a 'social laboratory' which would utilize three surrounding collines where about 400 peasant families/1,000 population reside, for training agricultural students in small, poor peasant practices and rural development.

Social Soundness Statement: This is an effective strategy which could have a strong input on both small farmer and student. The peasant, however, requires some incentive to 'open up his/her laboratory' to the better-off student. Services for agricultural and life quality improvement as part of the trade-off could provide some inducement to peasant participation. In conjunction with the UN Center for Rural Development (Gitega) the creation of an agricultural cooperative might be considered as another incentive for the three collines' participation. What is learned from and about the small farmer could then be programmed into the curriculum.

#### Education/Training Specialist's Recommendation

Long-term Extension-outreach Program for meeting Needs in Food Production, Nutrition, and Conservation with needs and problems of the rural population as the starting point, and including a sensitivity to conditions of men and women.

Social Soundness Statement: Though not a project idea per se, this recommendation is totally in line with USAID's 'New Directions' mandate and in concert with the social analyst's concern about tying any AID project to the peasant base and including as much peasant participation as possible and, further, keeping such an AID project as free of national level vested interests as is politically (and diplomatically) feasible. The needs outlined in this recommendation are covered in individual project recommendations from other team members.

BIBLIOGRAPHY

Administration Générale Belge de la Coopération au Développement. Etudes pour la mise en valeur de la région de Kirundo. Rapport Final - Textes et Annexes. Brussels, 1979.

Albert, ETHEL. " Une Etude de Valeurs en Urundi ", 1957.  
" Women of Burundi: A Study of Social Values ".

Anonymous " Visage du Burundi " Revues Trimestrielles, no. 1, 1974.

Banque Mondiale " L'Economie du Burundi " Document de Travail.  
Table Ronde, Bujumbura, 21-24, February 1978.  
January 1978.

CAZENAVE-PIARROT, Alain " Les genres de vie traditionnels au Burundi "  
Les Cahiers d'Outre-Mer, No. 119, 7-9/177.

Government of Burundi. Plan Quinquennal de Développement Economique et Social du Burundi 1968-1972.

\_\_\_\_\_ Plan Quinquennal de Développement Economique et Social du Burundi, Republic of Burundi, 1973-1977.

\_\_\_\_\_ " Cultures Vivrières en Haute Altitude":, Projet présenté au Fonds Européen de Développement dans le Cadre de la Convention de Lomé, Bujumbura, 1978.

\_\_\_\_\_ Plan Quinquennal de Développement Economique et Social du Burundi, (including annexes) 1978-1982 (Provisoire).

\_\_\_\_\_ Table Ronde des Aides Extérieures au Burundi, Ministère des Affaires Etrangères et de la Coopération, Bujumbura, 21-24 Fevrier 1978.

\_\_\_\_\_ Département des Etudes et Statistiques, Annuaire Statistique, 1976, No. 37, Juillet, 1977.

\_\_\_\_\_ Séminaire sur la Planification des Ressources Humaines et des Besoins Essentiels. Ministère du Plan et des Affaires Sociales et du Travail, avec la participation du Bureau International du Travail, Projet PNUD/BIT-BDI 78/005, Bujumbura, 1978.

- HALL, C. BARROWS "Burundi's Agricultural Situation and USAID Agricultural Project Possibilities", : U.S. Embassy (Summer Intern) 1975.
- HICUBURUNDI, P. Mme "La Femme au Burundi" Au Coeur de l'Afrique, Tome XIII, No. 4, 1973.
- LANE, Harlan and Pillard, Richard. 'The Wild Boy of Burundi' New-York: Random House, 1978.
- DE MARNEFFE, Gaby. "Animation Rurale", Au Coeur de l'Afrique, Tome XIII, No.4, 1973.
- 
- "Promotion et Développement" Au Coeur de l'Afrique Tome XVI, No. 2, 1976.
- NAVAS, Juan et al. Famille - Famille et Fécondité au Burundi : Enquête Sociologique du Centre de Recherches Socio-Religieuses de l'Episcopat du Burundi et de la Faculté des Sciences Economiques et Administratives de l'Université du Burundi, 1977.
- 
- and Marie-Ange Jadot-Sermens "Etude d'un cas de mixité scolaire" Au Coeur de l'Afrique, Tome XV, No.6, 1975.
- NGENDAKUMANA, Léocadie "Foyer Social de Gatara" Au Coeur de l'Afrique Tome XIII, No.4,1973.
- NTABONA, A. "Religion et Développement" Au Coeur de l'Afrique , Tome XVI No.2, 1976.
- ROBATEL, J-P et al. Les problèmes de Population au Burundi : Résultats d'une enquête sur les motivations démographiques des Barundikazi. Faculté des Sciences Economiques et Sociales de l'Université du Burundi, Bujumbura, et la Patfinder Fund, Boston (U.S.A.), 1975.

---

" La Condition Ouvrière à Bujumbura " Revue  
Universitaire du Burundi, Bujumbura, 3ème Semestre,  
Vol. I, No.2, 1972

Société d'Etudes pour le Développement Economique et Social (S.E.D.E.S.)  
Les Régions de Muyinga-Ruyigi et du Mosso, 1968-1969. Paris, 1970.

---

Enquête  
Statistique Alimentaire et Budgetaire 1970-1971, dans la région de Ngozi  
et Muyinga. Annexes, 1973.

Société Mixte d'Etudes au Burundi (SOMBU) Etude sur les Cultures  
Vivrières et en particulier sur le blé, dans les zones théicoles dans le  
cadre du 4ème FED. (Sur la Crete Zaire-Nil), Bujumbura, ? date ?

TINBERGEN, J. et al. Etude Globale de Développement du Rwanda et du  
Burundi. Association Européenne de Sociétés d'Etudes  
pour le Développement, Bruxelles, 1961.

U.S.A.I.D. Country Development Strategy Statement: Burundi. REDSO/EA,  
June, 1978.

U.S. Printing Office. Area Handbook for Burundi Washington D.C. 1969.

VAN DER WELPEN, Cl. Manuel de Géographie du Burundi. Editions A. De Boeck  
Bruxelles, 1973.

BERBBUGGE, A. " Aperçu sur l'Organisation Juridique Traditionnelle de la  
Famille au Burundi ".

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---

Ministère de l'Education, Bujumbura  
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Roccoco Cattle Station  
IMBO Project - MPANDA Paysannat  
KISOZI Research Station ISABU  
RUVYIRONZA Cattle Station ISABU  
MGAMBA Bututsi Regional Project ISABU  
MOSSO Research Station - ISABU  
MORONGWE Station/Center - N.G. Gitega  
CED/CARITAS Headquarters, Bujumbura  
Ministry of Agriculture Office, Gitega  
E.T.A.B. Gitega  
Collines and Rugos in environs of Gitega  
MUTWENZI Mission - Gitega  
Disean Center - Gitega  
MPARANDA Paysannat, North Imbo Plain  
TEZA Tea Estate, Government Plantation, Tea processing plant.  
Faculty of Agricultural Sciences, University of Burundi, Bujumbura  
Ministry of Social Affairs and Labor, Bujumbura  
Belgian Embassy, Bujumbura  
Department of Rural Development, Ministry of Agriculture, Bujumbura  
ISABU, Ministry of Agriculture , Bujumbura.

TRIP REPORT

ANNEX III

CONSULTATION ON BURUNDI AGRICULTURAL SECTOR SURVEY, CONSUMPTION ASPECTS  
APRIL 6-23, 1979

Clark G. Ross  
Office of Nutrition Economics  
International Cooperation and Development  
United States Department of Agriculture

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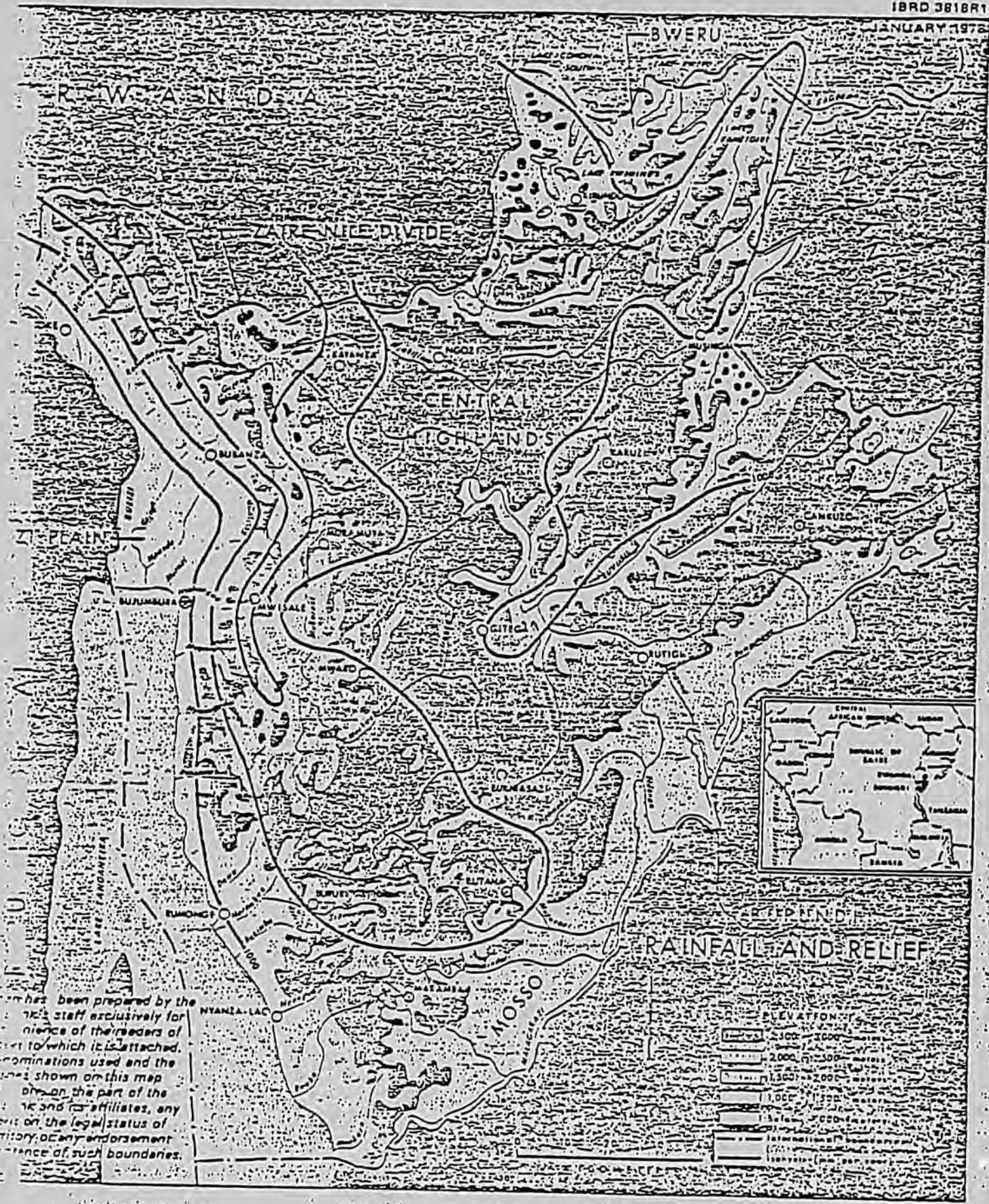
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## PREFACE

This study of nutrition and food consumption in Burundi was undertaken in conjunction with the US AID agricultural sector assessment of Burundi, currently being prepared by a MASI (Multinational Agribusiness Systems, Inc.) team. A slightly abridged version of this report has been transmitted to the MASI team leader for use and possible inclusion in the final sectoral report. The Office of Nutrition Economics (USDA-ICD) commissioned this report; providing the funding and supporting services for its preparation. The author visited Burundi between April 6 and April 23, 1979; during which time the complete MASI team was also in Burundi. While in Burundi, literature relevant to food consumption issues was reviewed and discussions were concluded with appropriate Burundi government officials and international donor personnel. The US AID Bujumbura mission was very helpful in facilitating contact with local government officials and providing in-country support services. Two field visits to the Gitega and Ngozi regions were made. Upon my return to Washington a formal debriefing for US AID and USDA personnel was held. The following report is meant to be descriptive of the Burundi nutritional situation considering the paucity of detailed nutrition/consumption literature, and the briefness of the country visit.

Clark G. Ross  
May 1979



This map has been prepared by the staff exclusively for the convenience of the readers of the publication to which it is attached. The names and designations used and the boundaries shown on this map are those shown on the part of the map on the part of the staff and its affiliates, any reference to the legal status of the territory, or any endorsement or disavowal of such boundaries.

## SECTION I - Introduction and Description of Burundi Agriculture

This report attempts (1) to depict the typical food consumption pattern and intake of the Burundi population, commenting on socio-economic variations to that diet, (2) to describe the basic nutritional status of that population, (3) to identify principal nutritional inadequacies, (4) to review Burundi government objectives in the nutrition area, discussing those national and donor agencies involved in nutritional programs, and (5) to recommend possible means by which US AID can improve the population's overall consumption status.

Information for this report was gathered from those consumption and nutrition studies available for Burundi (see References) and from a three week visit to Burundi. It should be emphasized that there is a lack of detailed empirical work concerning nutrition in Burundi. Those studies which are available are generally for a small segment of the population and often dated. Consequently, those data presented in this report must be used with caution, and considered more indicative than definitive.

A brief description of Burundi and its agricultural sector now follows.

### The Country

"Burundi is a small, landlocked country situated just south of the equator in Eastern Africa at a distance of roughly 2,000 kilometers from the Atlantic and 1,400 kilometers from the nearest port, Dar-es-Salaam, on the Indian Ocean. It covers 27,820 square kilometers, approximately the same area as Belgium. Burundi's population was estimated at 3.8 million in 1976 and has been growing at a natural rate which may be as high as 2.6 percent a year. With the average density of 137 persons per square kilometer, Burundi is the most densely populated country in Africa after Rwanda; however, the population density varies considerably by region. More than 95 percent of the population live in rural areas, making their living from subsistence farming and from one principal cash crop, coffee, which constitutes the major source of foreign exchange for the country. Bujumbura, the nation's capital with a population estimated at 175,000 is also the largest city and the only important business and industrial center. Burundi's GNP per capita was estimated at US \$120 in 1976 and is one of the lowest in

the world. The literacy rate of the population is about ten percent."<sup>1</sup>

### Geography

Four distinct geographic regions can be identified. First, there is the low altitude area (1,000 meters or less above sea level) comprised of the Ruziz Valley and lands along the shores of Lake Tanganyika. Second, the intermediate altitude lands (1,000-1,500 meters above sea level) of the Mosso Plain and the country's eastern portion are among the least densely populated of the country. Significant livestock activity is found in these areas. Third, the middle altitude (1,500-1,900 meters) lands approach Zaire and the Nile crest. Finally, the high altitude (1,900 meters) lands comprise the crest of the Nile and extend to the border with Rwanda. The most populated portions of the country are characterized by a hilly, or even mountainous terrain with marshy valleys.

### Social Setting

Approximately fifteen percent of the Burundi population are Tutsi, who have traditionally been involved in livestock. The current government is dominated by Tutsis, with nearly all important positions restricted to members of that ethnic group. About 80-85 percent of the population are Hutu, the preponderance of whom are engaged in subsistence agriculture. While the social dynamics between the two groups are complicated and difficult to summarize, it is correct to state that relations between the groups are characterized by suspicion and a degree of hostility.

### Agricultural Exploitation

The CDSS report on Burundi provides a succinct description of the typical Burundi farmer: "The representative Burundi is a Hutu farmer with a bit over a hectare of land, often broken into fragments managed by himself and his immediate family. He is illiterate; it is unlikely his sons go to school and even less likely for his daughters. There is an even chance he grows coffee and if so his farm family earns less than \$400 annually. He

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<sup>1</sup>World Bank, Economic Memorandum Burundi, April 1978, p.1

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pays almost no taxes. He owns four animals, none of them cattle. He grows three crops a year, survives on a diet of beans, cassava, maize, vegetables, and occasionally some meat. Up to a fifth of his land is under bananas, mainly used for beer. One member of his immediate family may be off-farm seeking work. His life expectancy is 40, that of his wife 43. He has four living children; his wife is pregnant. One of the living children will not survive childhood. He does not have access to pure drinking water, reliable medical help, regular public transport, and has likely never seen an extension agent. He attends the local Catholic parish. The farm family lives in a single homestead (called a rugo), in reality a cluster of huts, surrounded by a fence and containing places for his animals and a small storage unit. The rugo shares a hill with a dozen other like units, occupied by relatives or kinsmen. The nearest road is five miles, but the hill is connected by a well-developed trail network. The land is now largely treeless, apart from bananas, is overgrazed, and showing signs of gully and sheet erosion."<sup>1</sup>

To this description must be added the tendency for the size of the typical exploitation to be declining. Land is inter-generationally transferred from father to sons. The high population density found in the middle and high altitude areas has considerably reduced the amount of uncultivated land. Consequently, farm size has been declining during the last few years. Currently, there is a tenuous balance between land availability and farmer subsistence. Such a situation can not long prevail, continued population growth will quickly reduce land availability per farming family below that needed for farmer self-sufficiency. Migration schemes to encourage resettlement from the middle/high altitude areas to the less densely populated eastern portion of the country have met with little success. No evidence of significant birth control usage is noted and the government is generally unsympathetic to its introduction or discussion. Because of (1) overfarming, (2) a reduction of manure usage due to increased concentration of cattle in the southern portion of the country, and (3) the lack of any chemical input application, yields per hectare have been declining in Burundi. Obviously, the combination of high population growth and declining land productivity/

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<sup>1</sup>CDSS, Burundi, US AID, 1978

availability implies the probability of serious food deficits in Burundi's near future.

### Agricultural Seasons

Two rainy season plantings are common throughout Burundi. The first of these planting on the hilly terrain occurs in September with a harvest in February. The second crop is planted in February or March with a harvest in June or July. Certain farming groups, particularly those having access to hilly recession lands, can plant a third crop in June or July with a harvest in October. These marshy depression plantings, however, only account for about ten percent of total Burundi agricultural production, and engage an equally small proportion of farming families. While the proportionate distribution will vary with region, all major Burundi crops (beans, sweet potatoes, cassava, sorghum, maize, peas, white potatoes, and greens) can be planted during each of the two rain-fed cropping seasons. Depending on the terrain, rainfall patterns, and altitudes, farmers vary the composition of their plantings. Coffee is generally harvested in June and July with the farmer receiving the bulk of his cash income during this period. The most difficult period for the typical farm household is between November and the first harvest in February. With the limited production by each farm household and with the heavy on-farm storage losses from humidity, food tends to be in short supply preceeding the February harvest.

### Marketing

Little empirical evidence concerning percentage of production marketed, farm prices, trader margins was available in Burundi. The general consensus is that only a small percentage of the peasant's total agricultural production enters the market. Apparently, the difference between the typical rural producer price and the consumer price in Bujumbura is quite large. While the lack of competition among market intermediaries is the most often cited reason for this substantial price differential, it would also seem that high transport and storage costs (direct and losses) must also be considered. There are few market outlets for the Burundi peasant; rural markets are infrequently held and often a great distance separates the peasant from the nearest periodic market. Those peasants in the interior of the country

usually install themselves along a principal highway and await one of the travelling traders who frequent the route by truck. In the ensuing bi-lateral negotiation session between the peasant and trader/trucker, the peasant is relatively disadvantaged. He does not want to return home without having sold his product. Further, he does not know when the next trucker will be coming through the area. Presumably, this scenario represents the uncompetitiveness referred to above. Nevertheless with gasoline selling at about \$3.50/gallon legally, when available, and reaching \$8.00/gallon on the black market, the relatively high cost of transport in Burundi and its eventual inclusion in the trader's margin can not be ignored. Coffee is also collected by these truckers who theoretically pay the farmer the official government producer price; again, widespread claims of trucker noncompliance and underpayment of the producer are common. In summary, the preponderance of the farmer's cash income is derived from coffee sales with some supplement from vegetable and banana sales.

#### Extension

Organized government extension is quite ineffective in Burundi. In principle, monitors should be visiting the rural producer instructing him in land preparation, crop rotation, weeding methods, and harvest/post-harvest techniques. In fact, the producer only sees the extension agent when the agent makes an inspection of the producer's coffee trees to verify that the farmer is growing the requisite coffee and tending his trees. Official government policy is to promote coffee growth for export, representing the principal source of foreign exchange for Burundi. While there are training schools for both agricultural technicians and monitors, the training is little adapted to the realities of the Burundi farmer and no major initiative is made to reach the farmer or to improve his standard of living.

#### Food Versus Commercial Crop Production

Currently the typical Burundi farm household produces a modest amount of coffee, the value of which is estimated at \$300-400 per year. This represents the near totality of the household's cash income since food crops are not extensively marketed. World coffee prices are currently attractive and it could be argued that encouraging additional coffee production by the rural household would be an efficient means to increase rural incomes.

This premise can be disputed from several perspectives. First, the Burundi farmer receives only about twenty percent of the final export price for coffee, with the government and intermediaries sharing the other 80 percent. Second, the World Bank projects a decreasing world price for coffee during the 1980s. Finally, were the rural household to devote additional labor and land to coffee, it would be increasingly obliged to rely on purchased food. Assuming a majority of farmers were in this situation, decreasing food supplies would simply bid up food prices and the farmer would be unable to purchase at a reasonable price the needed food items. Since the government and the intermediaries receive such a large portion of the coffee income, the farmer does not really have a comparative advantage in coffee versus food production. For this reason, increasing the monetary income of the household through increased coffee production probably will not lead to an improved rural standard of living. Rather, concentrating development resources into increased food production would better serve the rural family.

#### Summary

To conclude this section, a brief listing of the major problems facing the Burundi farmer and the national agricultural sector will be made.

1. Given the limited amount of suitable agricultural land, population growth has led to over cultivation and a decline in fallow rates. This has resulted in decreasing land productivity, a problem which will become increasingly serious.

2. A decline in cattle ownership by the typical Hutu farmer, stemming from declining grazing land availability in traditional agricultural regions, has led to a reduction in natural fertilizer usage, further deteriorating agricultural lands.

3. As a landlocked country situated 1,400 kilometers from the nearest port, Burundi currently has a macro-comparative advantage only in coffee production. Imports of all goods, including agricultural materials, are prohibitively expensive. The typical farmer receives no direct benefit from any commercial imports.

4. A lack of internal markets, due to both supply and demand constraints, effectively negates any effort at individual farmer specialization and trade.

5. There is no real system of producer credit for agricultural inputs and no effective government extension reaching the rural producer.

6. The Tutsi-dominated government shows little concern for Burundi's growing problems in the agricultural sector. No effective plan for vitalizing the rural sector or for limiting population growth has been advanced by the national government. Donor groups working in Burundi cite the lack of interest by and cooperation from the local government in donor rural development programs.

7. Increased food production rather than increased coffee production would best serve to improve rural living standards.

The succeeding evaluation of nutrition and food consumption must be considered in light of these problems. Also, efforts and projects to improve rural living standards must be assessed within the social and political context of Burundi life.

## SECTION II - Basic Description of Nutritional and Consumption Patterns.

For this basic description of food consumption patterns, the Burundi population (3,827,200 people - 1976) can be simplistically divided in an urban sector (five percent) and a rural sector (95 percent). The urban population is essentially located in Bujumbura (approximately 160,000) and Gitega (25,000); the rural population is spread throughout Burundi's eight provinces. There is, of course, great socio-economic diversity among Burundi's rural population; however, this basic description of consumption and dietary practices is essentially relevant to the broadly classified rural population.

### General Food Consumption Habits

1. Meals - In rural areas, two meals per day are common. A late morning meal, sometime between 10 a.m. - noon and an early evening meal are typical in rural areas. Generally in urban areas, three meals per day are consumed; the timing of these meals is patterned after European practices.

2. Cooking Practices - In rural areas cooking is almost exclusively done on wood fires. The wood is daily collected by women and children. Wood is essentially viewed as a "free good" by rural inhabitants. With little care for proper management of forest resources, wood is collected where conveniently available. Cooking of food is done by the wife in the rural areas, with the wood fire often in a small room of the house.

At best only a small hole in the roof of the hut serves as a chimney.

In urban areas charcoal (price 20-25 BU.F/KG) is used for cooking.<sup>1</sup> Meal preparation is the responsibility of the women, or in rare cases where both spouses have salaried employment, the responsibility of a hired domestic.

3. Household Membership - Both urban and rural areas are characterized by nuclear families, occupying individual residential structures. Thus, in both areas, food preparation and consumption is on a family basis - the typical household numbering between five and eight individuals. While some polygamy exists in Burundi, monogamy tends to characterize the typical household.

4. Food Supply/Procurement - In rural areas households for the most part depend on their own grown product for their food supplies. Non-produced items like salt and sugar are purchased in periodic (once or twice weekly) rural markets. Considering the emphasis on rural food self sufficiency and with the general lack of marketable produce surpluses, organized markets in the rural areas are not common and do not display the wide variety of products often found in rural West African markets.

Not all farming households in the rural areas of Burundi are self-sufficient in basic food crops. The small size of the typical agricultural exploitation and its declining productivity force many families to rely on purchased food items. These households must either use receipts from the sale of coffee or from other sources to sustain themselves after their own food supplies have been exhausted. While empirical evidence is not available, it appears that many rural households, lacking the necessary financial resources, are forced to reduce their daily food intake until the next harvest replenishes their supplies. Food availability in rural areas is primarily a function of season (see Section I) and region (see Section III, Part B). The variety of food products in rural areas is considerably more limited than that found in Bujumbura.

In urban areas the near totality of food is purchased. Either the wife or a domestic will go on a daily basis to the Bujumbura market to purchase the needed food items. All major food products (see Section II, Major Food Items) can be found in this typical African market.

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<sup>1</sup> 89.55 BU.F/\$

5. Attitudes Towards Food - Of interest is the Burundian attitude towards food. Apparently, in rural areas, food consumption does not play the important social role which it does in many West African countries. Holidays, baptisms, marriages and other social occasions do not revolve around food or special meals. Such occasions in Burundi, when celebrated are more associated with beer consumption.

It is claimed that this relative lack of interest in food consumption has accentuated poor nutritional habits like lack of attention to regular meal hours, nutritionally poor food combinations, and inefficient food preparation practices.

### Major Food Items

This part of the nutrition report details the major food items available to the Burundi population, indicating the fashion in which they are typically prepared and eaten. The estimated caloric content of each food item is shown in Table II.

#### 1. Grains

Maize - Maize is the most important grain in the Burundi diet. Maize in grain form is boiled in water and often mixed with beans. Maize cooked and then eaten on the cob is common. Finally, maize ground into flour for preparation as a "mush" type meal is frequent. Some maize bread is also made from the maize flour.

Sorghum-millet - These grains play a limited role in the average diet. Some sorghum is destined for beer consumption.

Wheat - A large portion of the wheat consumed in Burundi is imported and primarily used for bread in urban areas.

Rice - Part of the rice consumed is imported for consumption primarily in the Bujumbura area. Some local rice is grown on the plains bordering Lake Tanganyika. Rice is generally cooked in water and less often with oil. Rice with a sauce can complement a fish or meat dish.

#### 2. Tubers, Root Vegetables

Sweet Potatoes (Ipomoea batatas) - Sweet potatoes, a major staple in the Burundi rural diet, are usually boiled.

Cassava (Manihot dulcisor) - Whole cassava can be boiled or fried; also cassava flour is commonly used in various mushes, cakes, or porridges.

Colocase Taro (Colocasia esculenta) - The colocase is usually boiled; and occasionally prepared with beans, some oil, and onions.

White Potatoes (Solanum tuberosur) - Either boiled, fried, or mashed potatoes are eaten as part of the urban and high altitude diet.

### 3. Legumes, Vegetables, Fruits

Beans - Beans are the major protein source for the Burundi population. Brown, white, and fresh green beans are all common. Beans will generally be boiled for use in soups or served directly after cooking. The preponderance of beans are dried. More elaborate bean dishes with additional cooking in oil, onions, garlic or condiments are also popular.

Peas - Peas can be prepared in the same manner as beans, but are generally boiled.

Bananas - A number of types of bananas are native to Burundi. The yellow banana (musa sapientum) when ripe is eaten raw; green bananas are often boiled; while the long yellow banana (musa paradiska) is generally fried. A major portion of the banana production is destined for banana beer preparation.

Fresh Vegetables and Fruits - A number of other fresh produce items play a role in the Burundi diet, varying with the ecological conditions of the region. These include carrots, onions, cauliflower, cabbage, tomatoes, cucumber, spinach, pineapple, avocado, guava, lime, grapefruit, papaya, and mango. Consumption of these fresh vegetables and fruits is more common among higher income, urban groups.

### 3. Animal Protein Sources

Meat - While cattle are relatively plentiful in Burundi, per capita beef consumption is very limited. Cattle are primarily viewed as a source of wealth and status; regular and planned marketing of cattle is rare. Beef consumption is considerably higher in urban areas than in rural areas. Goat and sheep meat consumption is also very low on a per capita basis. These meat products, including beef, are most apt to be boiled or grilled when eaten. Chicken is not eaten often. Eggs are rather expensive and extensive consumption is limited to higher income groups.

Fish - Fish consumption is primarily limited to Bujumbura and areas near Lake Tanganyika. Internal transport difficulties, as well as the lack of organized markets account for the lack of fish consumption in rural areas.

Interior lakes and rivers are not well stocked with fishery resources. Further, many rural people look with disdain on fish consumption, stemming from traditional superstition and occasional contamination.

Milk - The most important source of animal protein in Burundi is milk. Even though human destined milk production per cow is relatively low, the large number of cows in Burundi results in relatively high per capita milk production. Cheese and butter processing, however, is very low.

#### 4. Other Food Items

Peanuts (vigna) - In areas where peanuts are grown, their consumption in the form of either whole nuts or oil is important.

Oil - Both peanut oil and palm oil (elais) are used to varying degrees for cooking purposes. Their use is primarily a function of income and accessibility. Palm oil is produced in the south western portion of Burundi.

Salt and Sugar - Income permitting, these items are used in the typical diet.

5. Gathered Foods - No data is available in-country on foods other than the major items above. Given ethnological experiences in neighboring countries where similar conditions exist, it would appear that "gathered" foods play a role in rural diets. These "gathered" foods would be either from trees and plants growing on the farm plots or from uncultivated, naturally growing sources away from the tended plots.

#### Typical Consumption Pattern

Food availability and resulting intake vary with respect to age, sex, region, and income. These variations will be discussed in some detail later in this report. In this section a description of the typical diet of the low-middle income Burundian will be presented.

In urban areas sweet potatoes, cassava, maize and bananas are the staple items in a low income diet. While beans are important, recent price increases caused by increasing demand have led to some per capita diminution in urban bean consumption. In a low income diet fish would be more likely consumed than higher priced meat. The importance of each of these dietary components would vary with seasonal availability and consequent price levels. Higher income urban residents would benefit from increased meat, milk, white potatoes, vegetable and fresh fruit consumption.

In rural areas the individual farm production predominately determines the daily diet. Regional and seasonal variations to the diet will be more pronounced in rural areas. Since family food production is generally limited and on-farm storage methods inefficient, little food is stored beyond a crop season. The production from a harvest must sustain the rural family until the succeeding harvest. Bananas, of course, are available most of the year. Thus, to promote diet diversity and to minimize production risk most rural households interplant a variety of crops.

While varying with season and region, the typical rural diet will be dominated by maize, beans, sweet potatoes, cassava and bananas. Milk when available, banana beer, and water are the principal liquids consumed.

The following section attempts to estimate the food intake of the Burundi population.

### SECTION III - Food Availability, Socio-economic Variation, and Nutritional Indicators

#### PART A

#### Food Availability, Caloric Intake, and Food Expenditure

In this part of the nutrition report various estimates of food availability and daily consumption will be presented. Further, an evaluation of the typical Burundi diet will be made, based on available nutritional indicators.

As will be evident from the ensuing discussion, the quality of the empirical evidence concerning nutrition and consumption is very poor and inadequate. Nevertheless, some broad conclusions can be reached and certain nutritional deficiencies noted.

Further, the empirical estimates differ widely; complicating an accurate assessment of Burundi food consumption. Some of the reported variation results from using different sample time periods and populations. Nevertheless, this wide variation should convincingly demonstrate the need for more comprehensive and precise data collection procedures in Burundi.

Table I provides estimates of domestic agricultural production from the Burundi Plan, the FAO and the World Bank. Further, recorded net imports of these products are noted. The wide discrepancy among the three estimates of domestic production is striking. Of interest is the fact

TABLE I

## ESTIMATES OF NATIONAL FOOD AVAILABILITY

Food Source	(000 tons)				Total <sup>4</sup>
	1977 Plan <sup>1</sup>	1977 FAO <sup>2</sup>	1976 World Bank <sup>3</sup>	Net Imports 1976 <sup>3</sup>	
<u>Cereals</u>					
Maize	140*	255	419.6		140
Sorghum/Millet	32*	137	119.8		32
Wheat	6*	13	N.A.	6.1*	12.1
Rice (Grain)	4.5*	5.2	N.A.	.2	4.7
<u>Tubers/Roots</u>					
Sweet Potatoes	420.5*	755	1,425.8		420.5
Cassava	396*	975	2,494.5		396
Colocase/Taro	111.5*	N.A.	N.A.		111.5
White Potatoes	37*	80	N.A.		37
<u>Animal Protein</u>					
Beef	18.0*	16.0	N.A.	-.3*	17.7
Fish	20.3*	N.A.	N.A.	.15*	20.45
Milk	30.5*	15	N.A.	.56*	31.06
<u>Legumes/Vegetables/Fruit</u>					
Beans	307*	150	500.5		307
Peas	33*	45	N.A.		33
Other Green	35*	N.A.	N.A.		35
Bananas	1,320*	1,475	N.A.		1,320
Fresh Fruit	65*	N.A.	N.A.		65
<u>Other</u>					
Peanuts	9.5*	18	N.A.		9.5
Oil/Butter	N.A.	N.A.	N.A.		N.A.
Salt	0*	N.A.	N.A.	12.5*	12.5
Sugar	5*	N.A.	N.A.	5.1*	10.1

N.A. = Not Available

<sup>1</sup>Rural Production in 1977 from 1978-1982 Burundi Plan  
Fresh fruit and vegetables were estimated at 100,000 total;  
paddy (rice) at 7,000; resulting modifications in table were made by  
the author.

<sup>2</sup>FAO annual production estimates

<sup>3</sup>Economic Memorandum - Burundi; World Bank, April 1978

<sup>4</sup>Indicates estimate used in calculations on Table II

\* Used in total estimate shown on far right of this table.

that official Burundi production estimates are significantly below those of the other sources.

All three sources confirm the dominance of sweet potatoes, cassava, beans, and bananas in total agricultural production. Also, the relatively low individual animal productivity should be noted. Fish production given the abundant resources of Lake Tanganyika, as well as certain inland bodies of water, is very underdeveloped.

The great variance in these production estimates complicates their use as accurate indicators of domestic production and nutritional status.

Table II collects from various sources estimates of per capita daily caloric intake. These sources are identified in the notes to that table. The macro-production figures are derived by taking the sum of 1977 domestic production (Burundi Plan) and net imports then dividing them by the estimated 1977 population (3.9 million) and finally converting them to a daily ration.

Some comment on each of these estimates is needed:

1. The Stanford study basically shows a diet dominated by sweet potatoes, beans, cassava, and white potatoes. Low beef consumption and non-existent fish consumption are indicated by these figures. Mean caloric intake would appear satisfactory.<sup>1</sup> Also, of interest is that beer consumption, both banana and sorghum is not alarmingly high.

2. The WHO report indicates reduced sweet potatoe and cassava consumption in comparison to the Stanford Study. Banana consumption both edible and in fermented beverage form, however, is considerably higher. Finally, total caloric intake is approximately fifteen percent lower than that of the Stanford Study. One interpretation of this difference is that available food supplies have been sharply reduced from those of 1962, the time of the Stanford Study. The "softness" of the data casts doubt on the extent to which such a statement can be accepted.

3. The SEDES Study suggests even lower daily caloric intake. This study, conducted in the Ngozi-Muyinga regions, indicates a diet dominated by sweet potatoes, beans, cassava, and bananas.

4. The caloric estimates from the macro-production figures are the most baffling. They suggest significantly higher per capita food availability than the other studies. Certain explanations can be advanced.

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<sup>1</sup>Such a statement is general since it does not consider differing caloric requirements with respect to sex, age, and work demands.

TABLE II

DAILY PER CAPITA FOOD INTAKE  
(Various Sources)

	Cal. Gm.	Stanford <sup>a</sup> 1962		WHO 1976 <sup>b</sup>		SEDES-1971 1st Survey <sup>c</sup>		SEDES-1971 2nd Survey		MACRO-Production Figures-1977 <sup>d</sup> (Table I, Col.4)	
		Grams	Calories	Grams	Calories	Grams	Calories	Grams	Calories	Grams	Calories
<u>Cereals</u>											
Maize		19.08	66.60			3.92	13.69	9.82	34.26	98	342
Sorghum/Millet		1.96	6.85			1.44	5.03	.02	.06	22	76.7
Wheat						1.62	5.67	.95	3.30	8	27.9
Rice						.28	.99	1.29	4.49	1	3.49
Other Cereals								5.63	19.65		
Total Cereals	3.49			90	314.4						
<u>Tubers, Root</u>											
Sweet Potatoes	1.16	583.2	676.50	200	232.4	312.7	362.67	351.1	407.31	295	342
Cassava	3.33	115.6	385.11	70	233.6	55.4	184.38	59.9	199.29	278	926
Colocase/Taro	2					41.2	82.28	49.3	98.49	78	156
White Potatoes	2	168	336			1.31	2.63	.7	1.38	26	52
<u>Animal Protein</u>											
Beef/Meat	1.67	6.8	11.32	14	23.4	3.5	5.93	2.2	3.65	12.0	20
Fish	3.66			9	33	.6	2.16	.2	.65	14	51.2
<u>Legumes, Fruit</u>											
<u>Vegetables</u>											
Beans	3.04	212.7	646.5	150	456.4	241.5	734.04	265.6	807.33	215	654
Peas	3.04					4.35	13.24	8.68	26.40	23	69.9
Other/Green	.43	39.5	16.98	80	34.4	6.6	2.82	13.0	5.60	25	10.8
Bananas	.53	10.9	5.82	150	80.1	495.6	262.69	228.8	121.30	927	491
Fresh Fruit	.41			30	12.3	22.2	9.10	36.4	14.92	45	18.5
<u>Other</u>											
Peanuts	5.33			8	42.6	1.7	9.18	1.55	8.25	7	37
Oil/Butter	8.78			15	131.7	.50	4.40	.22	1.90		
Diverse (salt, etc.)						N.A.	.02	N.A.	.05		

Table II continued

	Cal. Gm.	Standard <sup>a</sup> 1962		MHO 1976 <sup>b</sup>		SEDES-1971 1st Survey <sup>c</sup>		SEDES-1971 2nd Survey		MACRO-Production Figures-1977 <sup>d</sup> (Table I, Col.4)	
		Grams	Calories	Grams	Calories	Grams	Calories	Grams	Calories	Grams	Calories
<u>Liquid</u>											
Beer-Banana	.44	46.5	20.46	700	308.2	285	125.16	136	59.86		
Beer-Sorghum	.44	127.5	56.10			143.5	63.16	35.6	15.66		
Milk	.77	12.3	9.48	30	23.2	.55	.42	.08	.06	22	16.9
<u>TOTAL</u>		1344.0	2237.7	1546	1925.7	1623.5	1889.66	1207.0	1833.86	2096	3295.4

<sup>a</sup>Leurquin, "Agricultural Change in Ruand-Urundi 1945-1960," Stanford University: 1963. Figures given in Leurquin's article have been converted to grams per day and transformed to adult equivalents.

<sup>b</sup>World Health Organization, "Aperçu sur l'alimentation et nutrition au Burundi, 1976." These figures are for women.

<sup>c</sup>SEDES, Enquête Statistique Alimentaire et Budgetaire 1970-71. March 1974. These samples were taken in the Ngozi-Muyinga regions of Burundi. These regions cover the north and northwestern portions of Burundi. The N'Gozi region, primarily because of a high population density, has lower than mean per capita food availability, while the Muyinga region has greater than mean food availability. Three surveys of nearly 2000 household were conducted during the 1970-71 period. The results used in this report are the mean results from the two regions.

<sup>d</sup>Macro-production figures; taking estimates of global 1977 production given in the 1978-1982 Plan and converting to grams per capita per day. The total grams per day (2096) is essentially identical to that calculated in the Plan (2165) and show on page 110 of the Plan. Note: Banana and sorghum beer consumption has not been netted out of these figures. Also it is not clear from the Plan to what extent post-harvest and transformation losses have been considered and netted out.

First, 1977 was a relatively good agricultural year. Production in succeeding years (1978, 1979) was considerably less (see Le Renouveau, le 29 mars, 1979, p. 1). Thus, these 1977 figures are not terribly representative. Second, it is not clear to what extent post-harvest storage, milling, and processing losses, which could easily approach 20 percent of total production, have been considered. Third, these global figures mask regional shortages-surpluses which are not easily equilibrated due to the lack of organized marketing and high internal transport costs in Burundi. Fourth, a major source of the caloric variation is in the estimated consumption of cassava. The Macro-production figures indicate a per capita ration of cassava 150-500 percent greater than that of the other sources. Due to the great difficulty in measuring cassava yields and production, these macro-production estimates may be greatly overstating cassava consumption and resulting caloric intake. Finally, the overall reliability of these figures again must be questioned.

In summary, the WHO and the SEDES studies, the most recent micro-level surveys available, indicate a low daily caloric intake. This situation could become progressively more serious as an increasing Burundi population places additional pressures on per capita land availability. Food production on a per capita basis will fall unless compensatory agricultural development programs are successfully introduced.

As will be discussed in Part C of this Section, nutritional problems are currently more related to the quality of food than the absolute quantity.

### Food Expenditure

This part of the nutrition report attempts to estimate per capita and family food expenditures.

In assessing the statistics presented in this discussion the following qualifications must be mentioned.

1. The daily diet assumed is subject to great socio-economic variation, which will be discussed in the succeeding section. Also, this diet is one of only 1,890 calories/day; such caloric intake would be below most conventionally accepted standards. Thus, the daily expenditure would be biased downward.

2. Prices are not stable in Burundi. Intra-annual price variations are quite significant due to the seasonality of crop production, the lack

of adequate storage facilities, and the inefficiency of the existing marketing system.

3. Since farmers grow a large portion of their own food, they do not pay explicitly for consumed food. To some extent the prices shown represent an opportunity price, if the farmer were to sell his produce. Thus, the reported expenditure is more implicit than explicit. Some farmers, however, must purchase food after their own supplies have been depleted. In this case the values become explicit costs to the farmer.

Illustrative food expenditures are shown in Table III. The SEDES figures, Survey 1 (see Table II), have been arbitrarily assumed for this exercise. The first column of Table III shows the price (Burundi francs) per kilogram used to value rural production in the 1978-1982 plan. These prices would be considerably lower than either rural or urban market prices. They are used in this exercise simply as a point of reference.

The 1979 Bujumbura market prices were collected during April 1979. Agricultural prices have been annually increasing in Burundi as population growth increases demand. Also, intra-annual increases occur with prices generally rising in the August-January period (see Section I). These urban market prices, however, would exceed those generally prevailing in rural markets. In a sense the two price lists provide a range from an unrealistically low producer valuation to the high prices prevailing in Bujumbura. The rural family, depending upon regional location and season of the year, would pay some intermediate price.

Table III shows the relative expensiveness of food in Burundi. For an inadequate diet the adult daily expenditure in Bujumbura is 56.89 francs. This implies a yearly expenditure of 20,764.8 francs per capita (\$231.88) or \$927.52 for a family of four adult equivalents.<sup>1</sup> At the producer values used by the plan the per capita annual cost would be \$36.15 or \$144.61 per family of four adult equivalents.

Thus, if rural per capita income is only \$50-60 per year, even at the unrealistically low producer values, 60-70 percent of family resources must be spent on food, for an inadequate diet.

At more realistic market prices, this percentage increases and can approach one hundred percent.

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<sup>1</sup>89.55 BU.F./\$

TABLE III

## SELECTED ESTIMATES OF DAILY PER CAPITA FOOD EXPENDITURE

	1977 Plan Price Bu.E/Kg.	1979 B'bura Market Price Bu.E/Kg.	SEDES 1971 Survey 1 Grams/Day (See Table II)	Daily Expenditure Plan Prices Bu.F.	Daily <sup>1</sup> Expenditure Market Prices Bu.F.
Maize	11	20	3.92	.043	.078
Sorghum	11	40	1.44	.016	.058
Wheat	21	N.A.	1.62	.034	N.A.
Rice	18	80	.28	.005	.022
Sweet Potatoes	4.5	20	312.7	1.41	6.26
Cassava	4	20	55.4	.22	1.11
Colocase/Taro	4.5	20	41.2	.186	.824
White Potatoes	15	40	1.31	.12	.05
Beef	80	250	3.5	.28	.88
Fish	N.A.	60	.6	N.A.	.04
Beans	17	45	241.5	4.10	10.9
Peas	30	65	4.35	.13	.28
Bananas	4	30	495.6	1.98	14.86
Fresh Fruit/Greens	10	N.A.	28.8	.288	N.A.
Peanuts	30	55	1.7	.05	.09
Beer	N.A.	50	428.5	N.A.	21.42
Milk	16	35	.55	.01	.02

Table III continued

	1977 Plan Prices Bu.F./Kg.	1979 B'bura Market Price Bu.F./Kg.	SEDES 1971 Survey 1 Grams/Day (See Table II)	Daily Expenditure Plan Prices Bu.F.	Daily Expenditure Market Prices Bu.F.
Per Capita/Per Day (Bu.F.)				8.87*	56.89
Per Family of 4 Adult Equivalents/Day				35.48*	227.56
Per Year Per Adult				3,237.55*	20,764.85
Per Year Per Family of 4 Adult Equivalents				12,950.20*	83,059.40

\* Does not include beer expenditure

<sup>1</sup> Since actual rural prices were unavailable, this estimate is more appropriate for the urban than the rural sector.

While these figures are quite illustrative and subject to considerable variance, the high cost of food in terms of the family's overall financial resources should be evident.

Finally, in Table IV the cost per 1,000 calories of the principal food items in the Burundi diet is shown. These costs are expressed using both farmgate prices of the Burundi Plan and the observed Bujumbura market prices (April 1979). While the level of cost is sensitive to the price series used, the relative ranking of the food products is essentially the same under both the Plan and the market prices. Certain points deserve comment. First, the cost of 1,000 calories from beef is significantly more expensive than from any other food source. With both price series, maize, sorghum, cassava, and colocase are the least expensive sources of calories. Sweet potatoes are only slightly more expensive. Thus, the typical Burundi diet, comprising maize, sweet potatoes, and cassava does approach a least-cost per calorie diet. The major problem is that this diet, while providing low cost calories, lacks certain essential nutritional properties. These will be discussed in Part C of this Section.

This part has described the typical Burundi diet and estimated the cost to the consumer of the diet. Succeeding parts to this section will discuss the socio-economic variation to this diet and possible nutritional inadequacies associated with the composition of the diet.

## PART B

### Socio-Economic Variability

In this part of the report the socio-economic variation to the general food intake estimates previously presented will be discussed. Attention will be given to such factors as sex, age, region, income, and intra-annual.

1. Sex - Only the SEDES report discussed the extent of food consumption variation between men and women. Their findings suggest that caloric intake by an adult female could be 10-15 percent less than that of an adult male within the same family. No information for male/female children was provided.

The inferior caloric intake by females is probably explained by two factors. First, choicer food items and greater quantities of food are usually reserved for adult males. Second, males receive considerably more caloric

TABLE IV

## COST (BU.F) PER 1,000 CALORIES OF PRINCIPAL FOOD ITEMS

Commodity	Calories Per Gram	Kg. needed for 1,000 Calories	Cost/1,000 <sup>1</sup> Calories Farmgate (Bu.F)	Cost/1,000 <sup>2</sup> Calories Bujumbura (Bu.F)
Maize	3.49	.286	3.15	5.72
Sorghum	3.49	.286	3.15	11.44
Sweet Potatoes	1.16	.862	3.88	17.24
Cassava	3.33	.300	1.20	6.00
Colocase/Taro	2.00	.500	2.25	10.00
White Potatoes	2.00	.500	7.50	20.00
Beans	3.04	.329	5.59	14.81
Peas	3.04	.329	9.87	21.39
Bananas	.53	1.887	7.55	56.61
Beef	1.67	.599	47.90	89.70
Fish	3.66	.273	N.A.	16.38

<sup>1</sup>Calculated using those prices shown in Table III under the heading 1977 Plan Price, Bu.F/kg.

<sup>2</sup>Calculated using those prices shown in Table III under the heading 1979 B'bura Market Price BU.F/kg.

intake by virtue of their greater consumption of banana and sorghum beer. This points out the trade-off between banana usage for beer and food with its nutritional implications.

Of further importance, the SEDES study indicated that the variation in caloric intake by sex was most pronounced in the 25-34 year age group. Since most women are pregnant or nursing during this age period, such deficiencies pose serious problems for both the mother and the child. Of relevance is the great demand on woman's time from both agriculture and domestic work. Burundi women apparently work considerably more hours than males. This further intensifies nutritional problems associated with the lower mean caloric intake by women.

Certainly, this question of differing caloric food intakes by sex must be carefully studied. More precise statistical information is needed to judge the true extent of this problem.

2. Age - Little statistical information on the variation by age of food intake is available. Indications are that serious qualitative nutritional deficiencies hinder the growth and development of Burundi children. As will be discussed in Part C of this section, insufficient calcium, protein, and vitamin intake are major factors in child disease and infant mortality in Burundi.

Clearly the 15-45 adult male is benefiting from the greatest caloric intake. The predominant cause of this phenomenon appears to be more a function of sex than of age.

While not providing direct statistical evidence, a UNICEF nutritional expert working in Burundi felt that at least 50 percent of rural children had inadequate height and weight for their physical age.

Thus, from the perspective of nutrition, children and women (ages 25-34) seem to be of the most vulnerable age groups. Deficiencies seem to be more qualitative than quantitative. Nevertheless, many children undoubtedly suffer from an overall lack of caloric intake.

3. Region - The primary source for regional food intake is the recently released Belgian study for development of the Kirundo region, in the north of Burundi. Table V indicates the per capita availability of food in major regions of Burundi.

With the exception of peanuts and maize the weighted national mean for each product is similar to the national per capita mean expressed in

TABLE V  
AVAILABILITY PER YEAR PER PERSON/1977-78  
(Kilograms)

	<u>Population (000)</u>	<u>Beans</u>	<u>Peas</u>	<u>Peanuts</u>	<u>Maize</u>	<u>Sorghum</u>	<u>Wheat</u>	<u>Rice</u>	<u>Total</u>
Bubanza	242	109.3 <sup>a</sup>	15.4	15.9	98.2 <sup>a</sup>	.7	0	16	255.5 <sup>a</sup>
Bujumbura	363	51.5 <sup>b</sup>	11.1	0	24.6 <sup>b</sup>	.1	4.5	0	91.8 <sup>b</sup>
Bururi	418	98.4 <sup>a</sup>	9.5	1.2	55.2 <sup>a</sup>	2.4	2.9	.9	170.5 <sup>a</sup>
Gitega	650	127.4 <sup>a</sup>	.7	9.4	57 <sup>a</sup>	12.3	0	0	206.8 <sup>a</sup>
Muramuya	429	46.9 <sup>b</sup>	12	2.0	31.4 <sup>b</sup>	6.2	6.7	0	105.2 <sup>b</sup>
Muyinga	462	84 <sup>a</sup>	11.8	6.6	64.2 <sup>a</sup>	17.7	0	0	184.3 <sup>a</sup>
Ngozi	749	61.8 <sup>b</sup>	13.8	1.3	36.9 <sup>b</sup>	6.7	1.1	0	121.6 <sup>b</sup>
Ruyigi	374	35.4 <sup>b</sup>	2	4.9	13.1 <sup>b</sup>	9.1	0	.4	64.9 <sup>b</sup>
Weighted Mean		77.98	9.18	4.65	45.69	7.72	1.78	1.19	148.19
National per Capita Consumption (KG's) From Plan (Table II)		78.47	8.39	2.6	35.7	8.0	2.9	.37	136.43

<sup>a</sup>Above mean

<sup>b</sup>Below mean

NOTE: Statistics available only for those products shown.

the Burundi Plan. Thus, the implied caloric intake would be similar to that shown under Macro-Production in Table II. In principle, storage and other post-harvest losses were deducted from the Belgian estimates and the weighted mean would reflect their exclusion.

Again, a satisfactory mean per capita food availability is expressed in these figures. Nevertheless, the validity of both these production and availability figures cannot be established. Further, the micro-level studies presented in the previous part of this section did indicate that per capita food intake was somewhat deficient. The importance of the fundamental issue of food quality versus quantity again becomes evident from this discussion.

It should not be assumed, of course, that production on a per capita basis is equivalent to per capita consumption. Inter-regional transfer of food products must be considered. The surplus Bubanza region, for example, would be a supplier to the deficit relatively urbanized Bujumbura region. Nevertheless, with the relatively meager quantities of food crops marketed, these regional figures are indicative of inter-regional consumption differences. Of course, intra-regional differences related to income need be considered before drawing conclusions about a typical regional diet.

The above figures would indicate below mean per capita availability of the principal agricultural crops in the Bujumbura, Muramuya Ngozi and Ruyigi regions. To what extent these deficiencies are compensated by inter-regional transfers is not clear.

Further, in certain regions other food items not referenced in the Belgian study are available. Fish consumption, for example, would be greater in the Bujumbura area, bordering Lake Tanganyika, than in other parts of the country. Meat and milk consumption would be greater in the urban Bujumbura area, as well as in the southern region where cattle grazing predominates.

Thus, the available empirical evidence does not lead to clear-cut indications of regional food deficiencies. The Ngozi, Muramuya, and Ruyigi areas, however, appear to be less advantageously placed with respect to availability of the various food sources considered.

4. Income - There is little data on food consumption by income levels. In rural areas, higher income farming groups, defined to include those possessing access to above average hectareage and land quality, undoubtedly have superior production and food supplies. Further, these groups are most

apt to have some production surplus which can be sold to generate cash income for supplemental food items.

In urban areas, higher income groups have greater access to meat, fish, and other expensive, but nutritionally sound, foods. Further, no estimates of the actual income distribution in Burundi were found.

As detailed in Section I of this report, lower income groups, depending on regional characteristics, have a diet dominated by cassava, beans, maize and sweet potatoes. This diet is minimal in certain important requirements and leads to malnutrition and disease. Thus, with poorer groups both quantity and quality are lacking in the diet. Furthermore, during the months of October-February before the first harvest, poorer families which have exhausted their food supplies will be less able to purchase supplementary food.

5. Seasonal - Seasonal diet variations are difficult to differentiate from those attributable to regional differences. Two harvests, one in February and one in June or July account for about 80-90 percent of Burundi Agricultural production. (See Section I for a more complete description of Burundi agriculture.) The period between December and February is particularly difficult since many families have nearly exhausted their production from the July harvest. Increasing proportions of cassava and bananas would be eaten during this time period. Those families fortunate enough to have some cash reserve from coffee sales or other transactions will buy increased amounts of food during this period.

Also, families having access to cultivatable swamp or marsh lands can plant a crop in June for harvest in October. Total production from these marsh areas, however, is very limited.

Thus, there is a strong seasonal pattern to consumption in Burundi.

Nutritional and health problems caused by an inadequate diet can be accentuated by seasonal, income, and regional factors.

## PART C

### Nutritional Problems

In this part of the report various nutritional deficiencies and groups most affected by these deficiencies will be identified.

Again, quantitative information for the principal nutritional indicators is generally lacking or out-dated. The SEDES report, using 1971 data for the

Ngozi-Myinga region, is the only comprehensive source.

Their findings are presented in Table VI below:

TABLE VI  
NUTRITIONAL INDICATORS (SEDES REPORT)  
(Estimated needs are those established by SEDES)  
Per Person/Per Day

<u>Items</u>	<u>Survey 1</u>	<u>Survey 2</u>	<u>Survey 3</u>	<u>Estimated Needs</u>	<u>Mean Coverage of Needs</u>
Calories	1,899	1,921.1	1,855.6	2,140	.88
Proteins (g)	63.3	75.5	68.7	58.75	1.17
Calcium (mg)	576.9	716.1	695.7	990	.67
Iron (mg)	35.4	39.0	38.1	11.8	3.18
Retinol/Vitamin A (ui)	1,830.4	2,155.8	2,065.7	4,470	.45
Thiamine/Vitamin B-1 (dmg)	14.9	16.3	16.3	11.4	1.39
Riboflavin/Vitamin B-2 (dmg)	6.7	7.4	7.06	14.8	.48
Vitamin C (mg)	204.7	185.0	219.0	70.5	2.88
Fats (mg)	6.9	7.4	6.93	Not Stated	N.A.

A mixed picture emerges from this table; the major items of which are discussed below.

1. Calories - As mentioned in the previous discussion, mean per capita caloric intake of foods is probably not greatly below recommended standards. However, this survey was taken in 1971, since then the additional population has undoubtedly further reduced per capita food supplies. In the future this problem will be even more acute as farms are further subdivided for inter-generational transfer.

Also, the previous discussion identified certain groups which are suffering from insufficient food/caloric intake. These were:

- (a) women of child-bearing age and children,
- (b) rural and urban poor,
- (c) inhabitants of the Ruyigi, Muramuya, and Ngozi regions,

(d) seasonally affected groups during November-February. The exact magnitudes of these deficiencies cannot be established based on the available evidence.

2. Proteins - The evidence on protein intake is confused by the regional bias of the SEDES sample. In the Muyinga region per capita bean and maize availability is above the mean. When these foods are consumed in common, the beans facilitate the release of protein from the maize. Thus, protein intake would be enhanced in this area. Beans, of course, have a high protein content themselves.

In less advantageously situated regions, like Ruyigi, bean and maize per capita availability is less and protein intake would be a more serious problem.

Throughout the country, it appears that children exhibit protein deficiencies.<sup>1</sup> Weaning foods composed of high carbohydrate cassava are a direct factor: Cassava should be supplemented by some other protein source. Recently much attention has been given to introducing soybean supplement into the child's diet. A major problem with this is the long cooking process involved with soybeans. Declining wood supplies force children and women to search over increasingly dispersed areas for wood. Thus, the additional pressures on forest resources, as well as the increased expenditure of energy by those collecting wood, would render the soybean a relatively inefficient source of supplemental protein. Some modification to the soybean cooking process may be possible. Continued use of beans, with milk, oil, animal/fish, peanut, and egg supplements would be more desirable to increase protein content.

3. Calcium and Retinol (Vitamin A) - Inadequate calcium and vitamin A intake is reported by the SEDES survey. Often these two nutritional elements are received in common, particularly from milk. While overall milk supplies, on a per capita basis, seem adequate, the unequal distribution of cattle result in a similar unequal consumption of milk. These deficiencies are particularly harmful for growing children and hinder proper bone development. Some discussion

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<sup>1</sup> While data on the incidence of protein deficiencies among children were not available, all in-country sources indicated that it was a serious problem. Both expatriates working at UNICEF and WFP, as well as sources within the Ministry of Social Affairs confirmed this. A visit to a children's clinic at the Katara mission center also revealed the extent of the problem.

of introducing fortified powdered milk in rural areas has occurred. This is not an entirely desirable solution due to the difficulty of children to digest the powdered milk and some problems with poor water supplies. However, adding the powdered milk in dry form to other food sources mitigates these problems.

4. Thiamine (Vitamin B-1) and Vitamin C - Both vitamin B-1 and C intake appears to be adequate. Beans are an important source of thiamine and fruit consumption in certain areas accounts for the sufficient vitamin C levels. In areas where bean and fruit production are limited, intake of these vitamins could be a problem.

5. Riboflavin (Vitamin B-2) - Mean levels of vitamin B-2 intake, as estimated by SEDES, are below recommended standards. The meager per capita consumption of meat and fish products is the primary reason for this deficiency. Attitudes towards fish and meat consumption were discussed in the first section of this report. Increasing consumption of these products has complicated social and economic implications. It would seem that some initial effort towards increasing the rural population's receptivity to fish would be desirable. Complementary production programs aimed at stocking inland lakes and rivers could then be initiated. Also, increased use of dried fish is a possibility which should be considered.

6. Fats - Per capita consumption of fats may be inadequate. Again, this could be particularly damaging to children. Increased peanut oil, and perhaps butter production, could mitigate this problem.

Unfortunately, these items are rather expensive for the typical rural inhabitant. Some consideration to lower cost fat sources should be given.

7. Banana and Sorghum Beer Consumption - Due to the prevalence of local beer consumption with its nutritional and social implications, some discussion is merited. The Burundi Plan estimates that 66 percent of banana and 11 percent of sorghum production is destined for transformation into beer. Again, using figures from the Plan 3,520 tons of sorghum and 871,200 tons of bananas would have been transformed into beer in 1977.

Estimating the quantity of beer from this banana and sorghum production is difficult. The transformation rate is primarily a function of the amount of water added during the process. Beer destined for sale, since its price is a function of quantity, has a much higher water content and reduced alcohol content. The SEDES report cites the following rates

of transformation for their sample groups:

	<u>Ngozi</u>	<u>Muvinga</u>	<u>Mean (liters/Kg.)</u>
Banana	.66	.41	.535
Sorghum	2.37	1.37	1.87

Applying the mean rate to the national production of bananas and sorghum assumed destined for beer gives the following estimated annual national production of local beer.

TABLE VII  
ANNUAL BEER PRODUCTION-CONSUMPTION

	<u>Liters</u>	<u>Liters Per Capita</u>	<u>Adult Male Equivalent</u>
Banana	466,092,000	119.51	239.02
Sorghum	6,582,400	1.69	3.38
Total	472,674,400	121.20	242.40

To this total per capita beer consumption must be added the consumption of Primus, the national premium beer. During the season when payment for coffee is made, rural inhabitants are prone to purchase this premium beer. Unfortunately, no estimates of per capita consumption are available. The last column above, entitled adult male equivalent, simplistically assumes that the adult male drinks twice the per capita ration of beer. In this case, 50 percent of the local beer production would be destined for the 16-50 male<sup>1</sup>. This assumption is arbitrary and could be changed as additional survey information becomes available. This greater intake of beer by males is one of the reasons that their caloric intake exceeds that assumed for females. For males the daily caloric intake from beer represents between 188 calories (SEDES/Survey 1, Table II) and 292 calories (242 liters/year or 663 grams/day x .44 calories/gram).

As previously implied the actual alcohol content of this beer will vary greatly depending on water content. An alcohol content (5-10 percent volume) lighter than an American premium beer is possible. More commonly, however, the alcohol content exceeds that of the local premium beer (10-12

<sup>1</sup> Approximately 25 percent of the Burundi population are in this age/sex classification (16-50 male). The other 75 percent of the population would have an implied per capita consumption of 80.8 liters.

percent) and can reach nearly 40-50 percent of volume. As a result, it is difficult to evaluate the extent of excessive alcohol intake among rural Burundi males. Conflicting observations and opinions on this question are prevalent. There are cases of males neglecting their fields after beginning to drink beer in the early morning. On the other hand, there are those who claim that the beer is an important social outlet whose consumption is relatively restricted. No definitive or general statement appears applicable. Regional and family variation is extensive.

It does appear that beer consumption does contribute to social tensions and problems - women resent men being absent for long periods of the day engaged in drinking and socializing. Women must work in the fields, prepare meals, collect wood and water, as well as care for children. It is understandable that women would be resentful of the greater freedom enjoyed by men and would, to varying extents, associate excessive beer consumption with this socializing. Further, local marketing of bananas represents one of the few sources of income for women, with which they can purchase small food items or some clothing for children. Thus, devoting large quantities of bananas to beer effectively reduces the woman's purchasing power and her ability to satisfy certain family obligations. Men generally control the disbursement of coffee receipts and tend to purchase items other than those needed by the women. Again, a conflict of values develops.

This discussion has shown that the question of banana beer and its role in Burundi life is complicated. The separation of the nutritional aspect from the social aspect without detailed surveys of quantity consumed and alcohol content is impossible.

#### PART D

##### Summary of Major Findings

1. Per capita caloric intake is somewhat below recommended levels.
2. Great variation in per capita consumption is present. Women of child bearing age, the poor, and certain regionally disadvantaged groups have less than mean consumption levels. These people undoubtedly suffer from overall consumption deficiencies.
3. Unless agricultural production programs are successfully introduced or external food supplies increased, per capita food availability

will become an increasingly serious problem over time. With annual population growth at 2.5 percent a comparable growth in food availability is needed just to maintain the status quo.

4. Protein deficiencies among children are a serious problem.
5. Calcium and retinol deficiencies affect most of the population.
6. Riboflavin and fat consumption are both inadequate.
7. The use of banana and sorghum beer has both nutritional and social implications which are difficult to separate.

#### SECTION IV - Efforts to Improve Nutrition

##### Government Goals

One of the expressed goals of the Government of Burundi is to maintain food self-sufficiency and eventually to produce an exportable surplus of basic food products. Increasing farm incomes and improving the quality of rural life are major priorities expressed in the Plan.

The specific targets for increasing food production, shown in the Plan, are reviewed in Table VIII.

The Government, based on the figures in Table VIII, foresees a 2 percent increase in the per capita ration of foods during the planning period. The initial ration of 790.1 kg./year (Base: 1977, Table VII) is essentially that shown under Macro-figures of Table II.<sup>1</sup> The implied content of that ration (Table II) is 3,295 calories/day. It is unlikely, however, that this is a realistic base figure; the mean daily ration is undoubtedly below that level. Nevertheless, the planned 806 kg./year ration would be more than adequate if the requisite production is forthcoming.

Some adjustment in the composition of the diet is envisioned. A slight reduction in banana and cassava consumption is planned. The major increase in consumption would be in more nutritious grains. Milk, fish, and meat consumption is expected to remain at relatively low levels.

While protein and fat inadequacies will be lessened by increased bean/maize and oil consumption, respectively, this "improved" diet will

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<sup>1</sup>The 2,096 gram/day ration shown in Table II is equivalent to an annual ration of 765 kilograms.

TABLE VIII

FOOD PRODUCTION GOALS OF THE GOVERNMENT OF BURUNDI  
(Kg.'s Per Capita)

Commodity	Base 1977	Target 1982	1977-1982 Percent Change in Ration	Percent <sup>3</sup> Increase in Production
Bananas	347.3	341	-1.8	10
Roots <sup>1</sup>	253.9	249.2	-1.8	10
Beans, Peas, Colocase	89.5	95.8	7.0	20
Grains <sup>2</sup>	48.7	56.8	16.6	50
Fresh Fruits/Vegetables	26.3	31.7	20.5	50
Oil	5.5	9.9	80.0	100
Sugar	1.2	1.4	16.7	1,100
Milk	8.0	9.3	16.3	30
Fish	5.0	5.9	18	30
Meat	4.7	5.3	12.8	25
<b>Total</b>	<b>790.1</b>	<b>806.3</b>	<b>2.05</b>	

SOURCE: Burundi Plan p. 109

<sup>1</sup>Cassava, sweet potatoes, and white potatoes.

<sup>2</sup>Maize, sorghum, millet, rice, and wheat.

<sup>3</sup>This is the percentage increase in production over the planning period (1977-1982) needed to supply the targeted 1982 ration for the estimated 1982 population (4.47 million inhabitants).

not overcome the calcium and vitamin inadequacies previously discussed. Further, no assurances of an equal distribution of these foods have been made.

The last column of Table VIII shows the percentage increase in total production of each product needed to provide the per capita increases. Given the limited resources and effectiveness of agricultural development programs in Burundi, these production increases are not likely to occur.

In summary the Burundi Plan does not really confront the issue of inadequate nutritional intake. The base of the GOB (1977) per capita consumption figures are unrealistically high; and the projected production increases are overly optimistic given the resources committed to agricultural development. Finally, the composition of the typical diet will not be sufficiently altered to reduce significantly the protein and vitamin deficiencies previously noted.

#### Burundi Government Agencies

As discussed in the previous section, Burundi's objectives in the area of nutrition and consumption cannot be achieved with existing programs and resources. This portion of the report describes governmental efforts in this area.

1. Promotion Sociale - Under the direction of the Ministry for Social Affairs, Promotion Sociale directs the operations of the Foyers Sociales and the Foyers d'Animation. Approximately 65 Foyers Sociales are spread throughout Burundi engaged in teaching literacy, explaining basic nutrition and providing some basic agricultural training. While open to the whole Burundi population, the majority of those attending classes in the Foyers Sociales are young unmarried women. In the nutrition area, the training is not directed to the low income rural farming family. Little attempt at improving the nutritional content of typical meals is made. The training is somewhat classroom, formally oriented, and often discusses the usage of foods priced beyond the income of the typical Burundian.

In an attempt to reach the busy Burundi wife and mother, the Foyer d'Animation concept has been introduced. Programs centered at these Foyers, which are usually located closer to concentrations of population, are less time consuming and formal than those of the Foyer Sociales. While some preventive health measures have been introduced, little has been done to

improve nutritional practices, particularly those of children. Some research on and development of ways to improve the nutritional content of the typical child's diet is vitally needed. These Foyers d'Animation would then provide a structural outlet for their introduction to the rural Burundi population.

In summary Promotion Sociale has a structure capable of reaching most rural inhabitants. It lacks the practical programs (i.e. better ways to improve the nutrition output from cassava in a child's diet) needed to affect positively rural life.

Also, some inducement to attract the busy Burundi mother to the programs of the Foyers must be devised.

2. Nutrition as Part of Agricultural Education and Extension - In each of the various agricultural education institutions, a portion of the curriculum is devoted to nutrition. In some cases the treatment of nutrition is very theoretical, in others very superficial. While it is vital that the nutritional content of improved plant varieties or new crops be considered before their introduction, such an evaluation does not seem to be emphasized. Attention to this problem must be given priority when agricultural extension programs are improved, restructured, or reorganized. A more complete discussion of the treatment of nutrition in agricultural extension is found in the training section of the Burundi agricultural survey.

Also, within the limited Burundi agricultural research effort, little or no attention is given to nutrition and its relationship to improved varieties or seeds. Improved livestock feed, however, has been given some priority at the training institution for agronomic technicians.

### International Programs

International agencies are involved to varying degrees in projects and programs aimed at improving Burundi nutritional standards.

This discussion is not an evaluation of these programs but a simple identification of the relevant international agencies with which potential US AID collaboration in the nutritional area can be considered.

First, missionary groups are spread throughout Burundi. These groups commonly provide food, clothing, and medicine to particularly disadvantaged segments of the population. Some groups engage in basic agricultural and

nutritional training to interested rural residents. Certainly, the experience, if not the actual use of these missionary groups would be helpful in establishing any nutritional program in Burundi.

Second, Catholic Relief Services (CRS) is involved in food-aid distribution programs aimed at the most vulnerable population groups. A large part of their effort is an under 5 year age supplemental feeding program, reaching perhaps 40,000 recipients. Of importance is the preventive and monitoring aspects of this CRS program. Other preschool and self-help projects constitute CRS's activities in Burundi. CRS should be an important information source, and potential implementing agency for any nutritional programs in Burundi.

In addition, other international charitable organizations are involved in food distribution programs. Again, these agencies would be valuable sources of information in establishing nutritional programs and identifying particularly disadvantaged groups.

Finally, both the World Food Program and UNICEF have functioning offices in Burundi. A brief description of their activities follows.

1. World Food Program (WFP) - The World Food Program has four on-going projects in Burundi.

(a) Supplemental feeding of wheat, eggs, fish, sugar, and vegetable oil reaches an estimated 7,000 patients per year confined in Burundi hospitals and medical centers.

(b) A school feeding program benefits 16,850 children with a balanced, nutritionally sound diet provided. This diet includes canned fish, meat, powdered milk, and vegetables.

(c) Food Grants to those involved in resettlement projects have been budgeted but the project is not now operating.

(d) A self-help program in which road maintenance workers are partially reimbursed with 3 rations daily of flour, canned fish, and vegetable oil, affects about 2,300 families.

2. UNICEF - Under new direction in Burundi, UNICEF is reorganizing its activities. Some preliminary nutritional surveys are planned. Following this, UNICEF will aid the Foyers Sociales in developing a more appropriate and effective nutrition course. Also, monitors will be sent

into the rural areas to encourage more preventive health methods and to promote sounder nutrition practices.

This discussion has shown that while there are both national (Burundi) and international efforts, of varying natures and effectiveness, aimed at improving Burundi nutritional standards, there is no real national nutritional program or policy.

#### SECTION V - Recommendations

The following recommendations to US AID are based on the findings presented in this report.

\*1. The lack of reliable and comprehensive statistical information concerning food intake and resulting deficiencies necessitates that a well designed random sampling of Burundi's population be made to identify nutritionally disadvantaged socio-economic groups. This survey could be done in conjunction with Promotion Sociale, interested mission groups, or independently.

2. While Promotion Sociale needs to be strengthened and upgraded, it appears to have a structure adaptable to any national nutritional effort. Thus, it would be unnecessary at this time for US AID to support the creation of any new governmental agency in the nutritional area.

\*3. US AID could consider providing technical assistance to the Foyers Sociales. A well trained nutritionist responsible for training the agents, developing nutritional materials for distribution, and experimenting with local food products would be a valuable addition to the staff of the Foyers.

4. US AID support of programs implemented by the Foyers should include some provision to have families visited in their homes, when possible. The busy Burundi woman, particularly one having many children and most in need of some aid, generally does not have time to participate in formal, classroom type training programs.

\*5. US AID should also support the Foyers in their attempt to sensitize families towards changing their consumption patterns, when desirable.

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\* Indicates recommendations with elements for a potential US AID nutrition project(s).

For instance, encouraging rural groups to eat fish could greatly reduce the incidence of protein deficiencies. Complementary production programs to stock inland bodies of water or to market dried fish need to accompany this effort.

\*6. Some form of storage/marketing program to facilitate the transfer of products from deficit to surplus regions of Burundi would be desirable. For example, beans from the northeastern region of the country could be shipped to more southerly regions in exchange for palm oil. Currently, due to a variety of marketing and storage inefficiencies, such transfers are not substantial. Excessive price differentials and product losses currently result from the lack of market transfers.

\*7. In conjunction with either the University of Burundi or another educational institution, a program of research and development aimed at a more nutritious use of Burundi's national agricultural produce could be established. For instance, programs to develop indigenous supplements of cassava and sweet potatoes, especially as weaning foods, could greatly reduce the incidence of malnutrition among children.

\*8. US AID could consider additional support to currently operating organizations like the Catholic Relief Services or the missions. Providing medicines and high protein foods (those comparable to local products) to these organizations could also reduce the incidence of malnutrition among children.

9. All agricultural programs supported by US AID in Burundi should be evaluated for their nutritional impact. For instance, before improved seed varieties or higher yielding cultures are introduced, the nutritional content of the resulting product should be considered.

10. At this time, any attempt to induce the Burundi farmer towards increased specialization in certain crops should be cautiously approached. The current diversity of his plantings provides some assurance of his having different food items in his diet. Without complementary marketing and storage programs, crop specialization destined for commercial outlets and resulting purchase of food items could be a risky process for the Burundi

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\* Indicates recommendations with elements for a potential US AID nutrition project(s).

farmer. As explained in Section I, this conclusion about specialization also applies for the food crop versus coffee trade-off. Increasing rural incomes through augmented coffee production will not necessarily improve rural living standards. A decreased availability of food and higher food prices would undoubtedly occur, offsetting any benefit to the rural family from higher monetary resources.

11. Additional nutritional recommendations, particularly those aimed at vulnerable groups or specific dietary deficiencies, must await the results and analysis of a comprehensive nutrition/health survey of the Burundi population.

12. Finally, as a general policy, US AID's activities in Burundi should be primarily directed towards improving the quantity and quality of food production/consumption. Such efforts would have their major impact on the poor rural farm household and other nutritionally vulnerable groups. Further, due to the wide geographic dispersion of nutrition problems in Burundi, a comprehensive country-wide development approach rather than a regional approach should be undertaken. The country-wide approach is particularly desirable when the problem of future food deficits is considered. Current population growth coupled with declining land productivity and land shortages will lead to serious national food shortages in Burundi's near future.

## REFERENCES

Close, J., 1955, "Enquête Alimentaire au Ruanda-Urundi," Académie Royale des Sciences Coloniale, Classe Sciences Naturelles et Médicales, Mémoires in 8°, N.S. II, 4, 64 pp.

Enquête Démographique 1970-1971 Tome 1, 2; République Française, Ministère de la Coopération 1974.

Enquête Statistique Alimentaire et Budgétaire 1970-1971 Dans La Région NGOZI et MUYINGA Mars 1973 SEDES (Paris).

Etude Pour la Mise en Valeur de la Région de Kirundo Février 1979 bureau Courtoy, Bruxelles.

Foreign Areas Studies, Area Handbook for Burundi; Washington, November 1969.

Hall, C. Barrows, "Possibilities for US AID Agricultural Projects in Burundi in Light of Burundi's Agricultural Situation," September 1975 US AID Report/Bujumbura.

Hiernaux, J., 1954, "Les Caractères Physiques des Populations du Ruanda et de l'Urundi," Institut Royal des Sciences Naturelles de Belgique, Brussels, Mémoires 2<sup>e</sup> série, 52, 114 pp.

\_\_\_\_\_, 1956, "Annales du Musée Royal du Congo Belge, TERVUREN, Sci. Humaine Série in 8°, 3, 131 ppg.

\_\_\_\_\_, Analyse de la variation des caractères physique humain en un région de l'Afrique Centrale: Ruanda-Urundi et Kivu.

Leurquin, 1957, "L'évolution des prix des produits agricoles au Ruanda-Urundi, exemple de marché non intégré," Bulletin de l'Institut de Recherches Economiques et Sociales, Louvain, 23, 463-496.

\_\_\_\_\_, 1960, Le niveau de vie des populations rurales au Ruanda-Burundi, Ed. Naurvelaerts, Louvain, 420 pp.

\_\_\_\_\_, 1963, "Agricultural Change in Ruanda-Urundi 1945-1960," Food Research Institute Stanford University.

Neesen, V., 1956, "Aspects de l'Economie du Ruanda-Urundi," B. de l'Institut de Recherches Economiques et Sociales, Louvain 12, 423-508.

République Du Burundi "Plan Quinquennal de Développement Economique et Social du Burundi" 1978-1982.

US AID, CDSS/Burundi 1978

Vis, H.L., Pourbaix et al., "Analyse de la situation nutritionnelle de sociétés traditionnelles de la région de Kivu - Enquête de consommation alimentaire" Annales de la Société de Médecine Tropicque, 49, 353-419.

World Bank, Economic Memorandum-Burundi, April 1978.

WHO, Aperçu sur l'alimentation et la nutrition au Burundi, 1976.

INSTITUTIONS CONTACTED

- (1) US AID Mission in Bujumbura Burundi
- (2) World Food Program
- (3) United Nations Development Program
- (4) UNICEF
- (5) Catholic Relief Services
- (6) Faculty of Agronomy, University of Burundi
- (7) Ministry of Social Affairs
- (8) Ministry of Agriculture, Livestock, and Rural Development
- (9) Field Visit to Gitega:
  - (a) Technical Institute of Agriculture for Burundi (ITAB)
  - (b) German Mission (Catholic)
- (10) Field Visit to Kyanza Region:
  - (a) Public Health Dispensary near Banga
  - (b) Katara Mission Center for Treating Children (South of Kyanza)
- (11) MASI Team Members working on the Burundi Agricultural Assessment
- (12) USDA and US AID personnel in Washington

SOIL AND WATER CONSERVATION

IN

BURUNDI AGRICULTURAL SECTOR

PHILIP ROARK

BUJUMBURA, BURUNDI

May 1 1979

MASI CONTRACT 698-0135

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## I. INTRODUCTION

The problems of the conservation of natural resources in Burundi are formidable and daily growing larger. This report endeavours to focus upon the conservation of soil and water resources in a country whose density of population ranks among the world's highest. The combination of dense population, steep lands, and high rainfall places Burundi in an extremely precarious position in terms of conservation of soil resources.

Emphasis is placed herein upon the assessment of current farming and grazing practices in terms of the long-term productive use of soils and water. Recommendations have been made with respect to the technical requirements for soil conservation and the domains in which USAID interventions would be warranted. Particular attention is directed towards the High Plateau region, an area of high population and food crop needs.

Finally, it should be noted that many of the observations contained in this report are based upon limited field experience in Burundi. The fuel crisis which beset the country at the time of the team's visit severely restricted the team's mobility. Nevertheless, it is hoped that the comments contained in this report will be beneficial to both the USAID mission and the GOB in focusing attention on conservation problems and solutions.

## II. PHYSICAL RESOURCES

### A. Geographical Regions

The extremely varied physiographic nature of Burundi produces eleven natural regions whose relief, climate, and flora are unique. The regions are shown on map A-1 in the appendix.

#### Imbo

This region is composed of the low lands north of Bujumbura and the eastern shore of Lake Tanganyika. The Rusizi River flows through the northern Imbo at an average elevation of 850 m. It is tropical savannah in vegetation type and traditionally scarcely populated. Recent irrigation schemes on the alluvial soils have been technically successful in growing cotton and rice and are expanding.

#### Mumirwa

This is a transition region between the mountain crests and the Imbo plain. Slopes are extremely steep and farming is hazardous. Much of the area is in pasture. Rainfall rates are the highest in Burundi, producing a woody savannah vegetation type.

#### Mugamba

The Mugamba forms the divide between the Zaire and Nile watersheds. Altitudes range from 2000 to 2600 m. The original vegetation was forest but only relict stands remain. Some Arabica coffee and, at the higher altitudes, tea are commonly grown.

#### Buvenzi

The provincial capital of this region is Ngozi and the highest population density is found here. Soils are relatively fertile and

rainfall is regular, thus allowing the highest yields of coffee and food crops in Burundi.

#### Kirimiro

The Kirimiro can be described in a fashion similar to the Buyenzi. The population is somewhat less dense and the altitude is lower, as is rainfall.

#### Bututsi

This region is one of high plateaus and is predominantly pastureland. The migration of cattle is necessary, however, during the dry season. In past times the Bututsi region was densely forested.

#### Bugesera

The Bugesera is located in the NE corner of Burundi, contains several large lakes and is generally swampy. The vegetation is of a savannah type.

#### Beveru

This is a region just south of the Bugesera with a somewhat higher altitude which allows better drainage. The vegetation is again a savannah type.

#### Buyogoma

The Buyogoma forms the eastern edge of the High Plateau and contains a series of ridges and valleys aligned SW to NE. Several rivers follow this alignment and the valleys are considered fertile. Food crops and coffee are grown, and the region is the least populated in Burundi.

#### Kumoso or Mosso

This region forms the low lands along the Tanzania border, a swampy

and hot area. The natural vegetation is wooded savannah. With supplementary irrigation and drainage the area offers a high agricultural potential.

### Buragane

This region is the southern extension of the Kumoso region and is similarly described.

#### B. Climate

The climate of Burundi is termed "tropical with two dry seasons." The long dry season includes the months of June, July, and August with transition months in May and September. The rainy season then lasts from October through April. The second dry season occurs with a reduction in rainfall during January and February. This reduction is statistically insignificant; for example, at Bujumbura one quarter of total average annual rainfall (200 mm) occurs during January and February. Nevertheless, all rainfall stations evidence this reduction which is a result of the period that separates the two annual movements of the Intertropical Front.

While the areal extension of Burundi in a north-south direction is less than two degrees (S2° 53' - S4° 21'), there is a significant difference in the timing of the rainfall. In October, the rains are well established in the North but do not reach the South until the following month. As the Intertropical Front passes over Burundi during its return to the northern hemisphere, it passes over southern Burundi and then the northern part. The result is that, while there is little difference in total precipitation between the North and South, the latter is favored because of a more even distribution of rainfall throughout the rainy season.

The dry months of June through August rarely have zero precipitation. The transition months are relatively dry with much less reliability in rainfall in September than in May, thus requiring some caution as to dates of planting. The rainy months of October through April receive 80-90% of the annual total rainfall.

The basic study of precipitation in Burundi was by Arend (1971). A complete statistical analysis was performed for 35 stations throughout Burundi over a period of record of 30 years (1931-60). During the years following 1960, the average was exceeded eight out of nine years. One year, 1961-62, the rainfall had an expected return period of 300 years (the amount of rain expected every 300 years). It is therefore most likely that the Arend study underestimates Burundi's rainfall. With 18 years of additional data available it is advisable that a new study of climatological data be undertaken. For lack of better information, however, the Arend data is quoted herein unless otherwise noted.

Rainfall averages about 950 mm annually for elevations below 1000 m, 1100 mm for elevations from 1000 m to 1500 m, 1250 mm for elevations from 1500 m to 2000 m, and 1500 mm above 2000 m. The correlation between altitude and precipitation for all Burundi is high ( $r=.61$ ) and exceptionally high for the Central Plateau ( $r=.76$ )\*. Highest rainfall occurs on the west slope of the Zaire-Nile divide. There is no discernible relationship, which is unusual, between altitude and intensity of precipitation (24 hour). Normally the intensity decreases with altitude.

\* All stations,  $n=35$ , regression line  $y = .3x + 707$ .  
Central Plateau,  $n=21$ , regression line  $y = .56x + 209$ .  
 $x =$  altitude,  $y =$  precipitation.

Potential evapotranspiration (PET) in Burundi ranges from 1800 mm in the Imbo region to 1100 mm annually in the higher altitudes. A balance water analysis is given for Ngozi, with an altitude of 1830 m, as shown in the accompanying table. The figures shown should be considered as representative only as their period of record is not for the same interval. The required data was not available.

At Ngozi, the center of highest population density and food crop production, precipitation exceeds PET for seven months of the year (almost eight). That is for a statistically average rainfall year. However, rainfall probabilities for a dry year, occurring once in five years for example, are reduced by one third and rainfall exceeds or is equal to PET only two months per year. In spite of the high average rainfall received in Burundi, droughts and consequent reductions in agricultural production do occur on a regular basis.

The temperature varies with the altitude. For altitudes below 1000 m, the average annual temperature is above 20° C with little seasonal variation. At high altitudes the average temperature drops to 14° C with large daily variations. Frost occurs occasionally during the dry season at altitudes above 2000 m.

The soil climate has a temperature regime termed isothermic and a hydric regime which is marginal between ustique and udique with a dry season of 3-4 months (USDA, Soil Taxonomy, 1975). The average annual temperature at root level on the Central Plateau is 21° C with

MONTHLY PRECIPITATION & EVAPOTRANSPIRATION

AT

UNGOZI

	J	F	M	A	M	J	J	A	S	O	N	D	ANN.
P (1940-59)	125	103	144	208	121	9	8	26	58	137	169	155	1263
PET (1972)	107	95	129	100	89	111	148	159	161	136	113	138	1481
P exceeds PET	18	8	15	108	32						56	17	
PET exceeds P						102	140	133	103	1			
ANNUAL DEFICIT (PET exceeds P)													218

DRY YEAR (1 year in 5) PRECIPITATION

P(.8)	84	69	96	139	81	6	6	17	39	92	113	104	1112
PET	107	95	129	100	89	111	148	159	161	136	113	138	1481
					39								
PET exceeds P	23	26	33		8	105	142	142	122	64		34	
ANNUAL DEFICIT (PET exceeds P)													660

P = Precipitation  
 PET = Potential Evapotranspiration (Pan)  
 P (.8) = Precipitation with probability of occurrence of .8 (1 year in 5)

biannual variations of 20.8 to 21.3°C. Soil temperature imposes no limitations on current crop production.

C. Soils

Burundian soils are classified primarily as latosols (Humic Ferrasols). They contain many of the metal compounds found in laterite soils but are generally lighter and more fertile. The soils are porous, fine to medium textured, have a gross structure (quartz, white mica) and, despite heavy leaching, are relatively fertile. The upland soils are favorable for any crop type, if they are protected from erosion and the organic content is maintained.

The valley alluvial soils are also fertile but usually require drainage. Peat soils are commonly encountered. A specific section on peat soils is included in the section on irrigation.

The soils branch of ISABU (Institut des Sciences Agronomiques du Burundi) is in the process of completing a soil mapping study for Burundi. A major part of the study has already been completed with only the northeastern region remaining. The complete map will be published in 1980 at a scale of 1/250,000, although the working scale is 1/40,000. The mapping will include soil units, morphology, vegetation and aptitude. The soil aptitude will be crop specific depending upon the region. The completion of this map could be a major step towards the development of a masterplan of land classification.

It should be noted that the soil classification system employed is a European system which emphasizes soil genesis rather than the individual soil properties for which the American USDA classification is reputed. In the case of Burundi, this is not a liability in that the USDA

system is recognized as being weak when applied to tropical soils. Furthermore, land utilization in Burundi appears to be strongly related to the soil series that have developed because of geomorphological implications, and therefore the system employed is most satisfactory.

For the Central Plateau area, two major physiographic formations are common and dictate the zonal use of the hillsides. These are a schist formation with basalt intrusions, and a metamorphic formation of schist and granite-gneiss.

The schist formations underlie a landform that is peneplaned, sometimes lateritic, and has a drainage network that is quasirectangular. Hilltops often expose outcrops of quartzite and schist. The hillsides are quite steep and usually heavily farmed. The alluvial valleys are relatively wide. Typically, the hill top is occupied by one or more rugos with fields ringing it. Only the very steepest of slopes are in pasture or have been reforested usually with Eucalyptus.

The metamorphic rocks form hills that are dome-shaped, giving a rolling texture to the landscape. Occasional outcrops of quartz-schist are found on the domes. This formation is less favored for farming and is more often in Eragrostis pasture. Valley bottoms are sometimes wide and often contain peat soils.

Specific soil series are mapped at a variety of scales and at a variety of locations throughout Burundi. A list of soil maps is attached in the appendix.

### III. AGRICULTURAL PRACTICES AND SOIL EROSION

In the assessment of soil erosion it is convenient to distinguish the effects of four factors - climate, relief, soil and vegetative cover (or farm management).

#### Climate

The potential for erosion is directly proportional to the intensity of precipitation. Except in unusual circumstances, little or no erosion occurs with rainfall of low intensity.

Climatic studies in East Africa (Lumb, 1971) have calculated the probable maximum precipitation for one hour to be 130 mm for an altitude of 900 m and 110 mm for an altitude of 1500 m. In Burundi the maximum observed is 100 mm. This intensity is erosive but still below the extreme situations.

The same study mentioned above also found that rainfall intensities generally decrease with altitude. Lower areas, often with lower rainfall and accordingly lower vegetative cover, receive the highest precipitation intensities and are often the most eroded. A comparison between altitude and maximum 24 hour precipitation (the only data available) showed no clear relationship in Burundi, although total rainfall and altitude are highly related.

#### Relief

Taken on the scale of Burundi as a whole, the relief is obviously pronounced. While the Nile watershed descends into the Central Plateau at slopes which are relatively moderate, the Congo watershed drops in a few kilometers from 2000 m (2,670 m maximum) to the Rusizi Plain at 800 m. These slopes are likewise located in the zone of highest rainfall

(1600 mm annually). Only the Imbo and parts of the Mosso Plains have extension areas whose slopes do not present an erosion hazard. As an example of the slopes upon which land is typically farmed, the Muramvya region, a densely populated area located between Bujumbura and Gitega, is found to have 5% of the area with slopes greater than 30°; 52% between 20° and 30°; 32% between 12° and 20°; and 11% between 0° and 12°.

### Soils

The erosion hazard of a particular soil is related to its inherent soil properties, including structural strength and rainfall acceptance, and degree and length of slope on which the soil rests. The red Burundian soils on the Central Plateau have high clay contents, a gross mineralization (quartz and white mica), and fair organic matter content (if it hasn't been damaged). This produces a relatively stable microaggregation and texture that is fairly permeable. These structural characteristics allow Burundian soils to be farmed on slopes that could not be tolerated in most regions. This structure is apparently easily and widely damaged by compaction and/or reduction in organic content through exhaustive farming practices.

In most cases, infiltration increases accorded by cultivation appear to be only temporary, and infiltration is often greatly reduced by compaction through animals. In many pastoral areas the only erosion found is in those areas where animals are trailed downslope for watering. The resulting compaction along these trails has produced severe gully erosion in otherwise well-managed areas.

In the valley bottoms the soils are black alluvials and often contain peat. They have little structure and are apparently quite fragile. The clay content allows a high water holding capacity but, because of the generally low slopes, the drainage is poor.

In the pastoral areas such as the Bututsi region the soils are shallow, and because of burning and overgrazing, have a low humus content. Rock outcrops are often apparent.

#### Vegetative Cover

As shown on the appendicized map, Le Tapis Vegetal, about half of Burundi no longer supports its original vegetation. Virtually all of the Central Plateau was forested perhaps 400 years ago. Gradually, but at an increasingly accelerated rate during the past 30 years, this forest has been completely eliminated by human action. In the Buyenzi-Kirimiro region the vegetation has been denuded largely to allow cultivation, while in the Bututsi region, fire and overgrazing have produced a grass vegetative cover of Eragrostis.

The mountain crests in the regions of Bufundu-Mugamba still support several forests containing climax species. In addition there are numerous small forest plantations, mostly Eucalyptus, scattered throughout the Central Plateau. The erosion hazards in the forested areas are minimal as these areas have a high water holding capacity.

### Farm Management

Farming in Burundi is characterized by mixed crops, small field units often harvested over a period of time, and the lack of much weeding. All of the above tends to reduce erosion hazards by maintaining a vegetative cover during most of the rainy season. On the negative side, cultivation and weeding is accomplished with a hoe and consists of pulling the soil down the slope. This is a practice that is as devastating as erosion by water action on steep slopes.

Perennial crops such as coffee, tea and especially bananas afford good soil protection as long as they are not clean weeded. Generally the better managed coffee and tea plots are provided with layers of protective mulch. Unfortunately the trees are usually planted in rows down the slope, a practice that tends to channel runoff. This is also true of cultures that are mounded such as manioc. Bananas are allowed to provide their own mulch through defoliation and are extensively planted.

Erosion-control terracing has been observed particularly in pastoral areas and in new forest plantations. In those areas terraces (actually level and closed-end ditches constructed along the contour and expected to capture total runoff) have been extensively constructed. Many of them date back to the Colonial era. Where maintained the terraces have been effective erosion control measures. However, some neglected terraces were observed to have broken, thus draining their volume of water onto the next terrace, precipitating a chain reaction and causing the entire system to fail. This is a common fault of terraces constructed in the manner described above.

There is also some use of grass (Pennisetum) for bank control between fields. However, neither terracing nor vegetative bank control measures were observed in being applied to areas displaying the greatest erosion hazards with any degree of consistency.

Terracing would in most cases be unnecessary were it not for the fact that most, if not all, communal range lands are overgrazed. The resulting diminution of vegetative cover, as well as the replacement of the original vegetation with less desirable species, has led to sheet erosion which is not readily noticeable.

The key to erosion control lies in the maintenance of a high percentage of vegetative cover particularly at critical times of the year. In Burundi crop cover is highest at the beginning of the rainy season and after harvest. These times are fortunately periods when rainfall is usually light and erratic. The density of crop cover will influence erosion more than any other management factor. Studies in Rhodesia found that maize planted at 36,000 plants/hectare (90% cover) had only one fourth the soil loss of maize planted at 24,000 plants/hectare (60% cover). In summary, the single most important factor affecting erosion is management - not so much the crop grown, but the way it is grown.

#### IV. IRRIGATION

There are three distinct conditions under which irrigation is practiced in Burundi - the flat Imbo plain, the valley bottoms separating the hills and mountains of the Central Plateau, and the swampy areas of the Mosso region.

##### Valley Lands

Typically valley bottom lands are narrow, depending upon the size of the watershed, ranging from a few tens of meters to 500 meters. Low gradients in the larger valleys produce a series of swampy pools which remain throughout the dry season. Valley lands are therefore only cultivated if it is possible to drain the soils for the dry season.

Valley lands are usually not privately owned but rather are state property. These lands are leased without payment by local authorities to farmers on an annual basis. The size of plots varies but they commonly are 10-20 acres. During the wet season the land becomes communal pastureland.

The principle crops grown in the valley bottoms are corn, beans, and sweet potatoes. Corn and beans are usually mixed, while sweet potatoes are farmed as a monoculture. From time of planting to harvest, the varieties of beans utilized require three months; corn requires five and one half months; and sweet potatoes need three to four months. Valley bottoms are thus farmed from July to December, and the rest of the year are left fallow.

The crops are planted in elevated beds either along a drainage canal or if no canal is used then they are randomly spaced. The beds are elevated from 30 to 50 cm and are commonly two to four meters in width.

The beds apparently withstand the wet season in a normal runoff year, thus requiring little reconstruction.

Average yields are estimated to be as follows: corn, 500 kg/ha; beans, 600 kg/ha (under mixed culture); sweet potatoes, 5000 kg/ha. It should be noted that these figures are suspect in that it is not clear whether yields were calculated on a basis of individual plots or whether canals and ditches were included in the cultivated area.

The Department of Genie Rural of the Ministry of Agriculture is presently completing a survey of all valley lands which are either under irrigation or have irrigation potential. A preliminary estimate is that 5% of the surface area of Burundi (1000 sq. km.), not including the Imbo Plain, is classified as valley bottom land. About half of this area is seasonally under irrigation leaving about 500 sq. km. of land potentially available for development. A map of the Ngozi region showing the irrigated area and the areas of potential irrigation is attached in the appendix.

The Nyamuswaga river basin is an area of valley land that is considered to have a high development potential (Norconsult-Electrowatt, 1976). Ngozi, the capital of the most populous arondissement, is located in the center of the basin. The total area of potential development covers an area of 9324 ha. with 3970 ha. already farmed where drainage is assured.

The basin consists of several relatively steep (9% slopes) lateral tributaries, while the principal valley is only about a one-half percent slope. The Genie Rural is proposing a pilot project on one of the tributaries, the Mukatsa river, which will cover 200 has. There has been

no previous attempt in either Rwanda or Burundi to develop peat soils for agricultural production on a large scale.

There are several criteria which are deemed essential for development of peat soils. Storage dams will be necessary to assure the flow of water to avoid the dessication of the peat soils. Canal depths must likewise be carefully maintained to allow the proper subsurface irrigation. Two canal systems are necessary, one to allow passage of flood waters and another to serve the irrigation system. Hydrologic studies are also needed for design purposes.

#### South Mosso

The Mosso Plain is an area of high potential for irrigation development where drainage is possible. Presently in the "Paysannat\* du Mosso Sud" located near Gihofi, a good infrastructure has already been established. Four dams, main and lateral systems are already in place. The Genie Rural is proposing to extend this system to include 500 more has. of irrigation and 300 has. of drainage.

Development plans have been prepared by FAO including soil maps and contour maps at one meter intervals. Rice and other vegetable crops are being proposed as the principal cultures.

A semi-private organization is also producing sugar-cane in this area, and a sugar mill is proposed. ISABU maintains a research station and has studies advancing the idea that the area is equally suitable for intensive ranching (cattle fattening). The local SRD (Societe Regional du Development) is reportedly committed to providing other needed infrastructure including water, electricity and health services.

\*Collective farm settlement

The Mosso plain has traditionally been underpopulated primarily because of malaria and tsetse. The development plans require resettlement, and a campaign in the Ngozi area reportedly achieved a list of 2000 families who are interested in moving to the Mosso area.\*

#### Imbo Plain

The irrigation potential of this under-utilized area, with vast flat plains, bordered by mountains with high rainfall and located close to marketing and transportation facilities in Bujumbura, cannot be overstated. The Imbo Plain has already received intensive irrigation development primarily in cotton and rice.

The area has recently been the subject of several new irrigation studies. The firm of Motor Columbus (1977) completed a study of 9500 has. The firm of DHV (1979) has recently completed a report for irrigating 14,000 has., including the construction of multipurpose storage dams. Further reports will be forthcoming in 1979 from DHV. ISABU (Rep. of Burundi, 1978) has studied the potential for beef and dairy production using irrigated forage crops.

As the Imbo Plain has development projects already in progress or being proposed, it has not been emphasized in this report. Other specific irrigation projects are listed in the appendix.

#### Peat Soils

Special mention is made herein in regard to peat soils as it appears that a significant percentage of bottom lands are made up of these soils. Burundi is somewhat unique in having extensive peat deposits under tropical conditions.

\* Personal communication of Mme Van Leuven, Dept. of Planning.

In the valley of Nyamuswaga (SOCINO-SCRV, 1959 and Norconsult-Electrowatt, 1976) deep peat soils make up 63% of 9324 has. surveyed for development. Most of the remaining soils are classified as clay-peat soils with only a small percentage of soils containing no peat.

Deep peat deposits have an extremely high factor of contraction. There is also a risk of contraction in clay-peat soils. In pure peat soils the potential of contraction is more or less inversely proportional to the state of decomposition of the peat. With drainage the peat is subjected to decomposition by oxydation and aerobic bacterial action. The final product after decomposition may have only 20% or less of the original volume.

The risk of contraction is the basis for classifying the agricultural suitability of peat soils. With peat that is only slightly decomposed there is a risk of permanent drying out. The maintenance of the water table at a height sufficient to subirrigate the peat is a precondition for management. As water is the natural medium for supplying nutrients to the peat soils, the irreversible drying out of peat will lower the fertility. Since fire is commonly used as a tool in Burundian farming practices, there is also a danger of setting dessicated peat on fire.

Peat soils have relatively low fertility. They are acid with a pH ranging from 4.0 to 4.8. The nutrients by volume of soil are also low. High fertilization is necessary to provide satisfactory production.

V. REQUIREMENTS FOR LONG TERM PRODUCTION AND CONSERVATION OF NATURAL RESOURCES

A. Soil Erosion Research

The Burundian Forest Service with French aid has begun a research project on soil erosion. Their goal is to determine the values of the parameters of the universal soil loss equation by Wischmeier. The volume of soil loss in the Wischmeier equation is dependent upon rainfall intensity, soil resistivity, degree and length of slope, crop, and erosion control measures.

The project is located in the foothills near Bujumbura. A series of plots with different land uses have been replicated on a 45° slope. Stilling basins measure total soil and water losses from each individual plot. While the project is barely underway, some preliminary results are available which rank the erosion hazards of individual land uses.

The land uses considered were corn, corn with terracing, mulched coffee, tree plantation, and native pasture. The corn plot had large soil losses, rivulets and exposure of fist-sized stones. The corn plot with terracing had only slightly less soil loss because the terraces had filled up and overflowed. The tree plantation, only recently planted, had no more soil loss than the native pasture, whose loss was minimal. Surprisingly, the mulched coffee plantation had little more soil loss than the natural pasture.

At the conclusion of this research and in conjunction with the ongoing soil mapping by ISABU, it should be possible to determine the relative dangers from erosion to each soil unit. This will allow the proper conservation activities to be proposed. While this information is necessary for large scale regional planning activities, the needed conservation measures for on-farm locations can usually be identified by simple inspection.

ISABU has requested aid in setting up a research station in the northern part of the Central Plateau. In terms of soil conservation research it should not be accorded a high priority. The priority should be placed upon disseminating the present knowledge of soil conservation to the farmers. However, a research station which could be used as a demonstration station, or better termed "pilot project", has merits.

#### B. Soil Conservation Measures

Ideally, soil erosion control measures should begin at the top of the watershed and progressively work their way downslope. This should be accomplished on a watershed-by-watershed basis. Generally the steepest slopes are near the top of a watershed, an area best suited for permanent vegetation, either forest or pasture. The lower slopes are best reserved for agriculture.

#### Forests

Forest plantations should be established such that the rows do not run down the slope, thus creating a potential avenue for runoff. Individual sites of about one meter in diameter should be dug and back-sloped to accommodate the nursery plants. Terraces are largely unnecessary and add to the plantation costs.

Species selection is the subject of ongoing research but several species can be recommended for the central plateau region:

Callitris calcarata (good for poor sites, drought resistant)

Pinus patula (needs good site, productive, timber)

Eucalyptus maidenii (needs good soil)

Eucalyptus saligna (needs good soil)

### Pasture lands

The pasture lands, it is easy to state, require controlled grazing. Stocking rates must be reduced in order to achieve a balance between forage production and animal units. The ISABU, supported by Belgian aid, has begun a program of controlled grazing within "paddocks" or pastures that have been fenced vegetatively with rows of eucalyptus. These pastures are rotationally grazed for 6 to 8 months per year at a stocking rate of slightly less than one animal per hectare. Excess animals are purchased at market prices by the project and there is reportedly no participation problem with local stockraisers. During the dry season the animals are herded to the Mosso area, fattened on state-owned ranches, and ultimately shipped to Bujumbura for sale.

Such an operation follows the basic tenets of good cattle management under the existing range conditions and where possible its extension to other parts of Burundi is highly recommended. The maintenance of a correct stocking rate and due regard for trailing animals along paths will be sufficient measures for erosion control. Terracing is not generally recommended. ISABU has reported poor results to date with attempts to improve grass species through reseeding but further research may prove beneficial.

### Crop land

The key element in soil conservation of crop land is to persuade the farmer to change his/her orientation from vertical to horizontal. Almost without exception, the visual lines seen on hillsides run vertically down the slope. Coffee and tea are planted in rows running down the slope. The orientation of rectangular fields is such that the long axis runs down

the slope. The cultivation and weeding are accomplished by hoeing down the slope. Mounded crops such as manioc or yams often have channels between the mounds that are vertically aligned.

All of the above should be re-oriented so that the lines of contour are followed by field borders and by crop rows. Field borders should be protected by bench terraces whose banks are planted to a bank stabilizing grass such as Pennisetum sp. (or other forage species). For larger or steeper fields, terracing within the field or bench terracing will be necessary. The borders of fields are often paths which have been compacted and now serve as conduits for excess water. These borders should be allowed to return to vegetation. Again to maximize production forage species should be selected which can be grazed. This can be accomplished on a rotational basis by staking the animal, or the forage can be harvested.

It is also recommended that fruit trees be emphasized for planting along field boundaries. They serve not only to diversify subsistence diets but also hold soil and may produce a more favorable microclimate through shading and wind reduction.

Soil amelioration can be accomplished through fallowing and composting. Population pressures on the land have reportedly reduced or even eliminated the period of fallowing in recent years. Ideally three or four years of cropping should be followed by the same time of fallow. The fallowing can be accomplished by either allowing natural vegetation to regenerate or planting a forage-legume mix both of which can be lightly grazed or cut for feeding.

Composting is little practiced but highly recommended. The tropical conditions of high temperature and humidity afford ideal conditions for rapid composting. The recipes for composting vary considerably with the type of vegetation or harvest by-products, the extent to which it is chopped-up, and the availability of manure. Since almost all farm animals are corralled at night, manure is generally available and should be utilized in the composting process.

Special mention deserves to be made of a conservation technique that has limited potential but in certain cases may be beneficial. In the Bubanza region the resettlement of local farmers onto the Paysanats of the Imbo resulted in greatly reduced population pressures. The regrowth of native grasses and trees was reported to be spectacular. Thus, the simple deferrment of farming, grazing and burning on a watershed will allow rapid soil protection at little cost. While population pressures will not realistically allow this practice to be extensively utilized, there are instances, such as protecting a dam or highway from sedimentation, which can warrant such an undertaking.

The conservation measures mentioned up to this point have all had the objective of preventing or slowing down runoff and thus increasing infiltration. However, there will always be storms which produce rainfall rates that cannot be absorbed by normal conservation activities. The frequency and size of these storms are predictable and require waterways to allow the runoff of excess water. On shallow slopes the maintenance through controlled grazing and prohibition of burning of grass waterways will be sufficient protection.

Steeper slopes which are generally eroded into a ravine usually have a natural bank protection of shrubs and grasses. This vegetative control must be maintained and improved species introduced in critical zones. Normally drop structures are to be recommended on the steeper slopes, however none were observed in Burundi. The construction of drop structures is expensive and requires skilled labor and can thus be recommended only for the protection of the more valuable lands. Drop structures may be loose rock masonry, rock and mortar, gabions or concrete structures. All except the gabions require skilled masons for their construction.

#### V. Land Utilization Planning

The long term use of Burundian soil and water resources cannot be appraised optimistically. While precise figures are not available, there is ample evidence that soil and soil fertility losses are large and increasing. The simulation model developed by Wills et al. (1976) relating demographic growth to agricultural production in Zaire and Rwanda, predicted the destruction of the soil's capacity to sustain even a fraction of the population within 20 years. While the exact time frame is open to debate, there is no doubt that the continued use of Burundian soils in their present manner will eventually lead to the same conclusions.

There are a great many land units that are being improperly utilized, primarily through the farming of slopes that are too steep and through overgrazing. It is not possible to make even a good estimate of the amounts of land in these states of deterioration. Indeed the Burundian

planning department extrapolates figures from a SEDES (1969) study that covered only five arrondissements (out of a total of 18 for Burundi) for its national planning efforts. This information is, unfortunately, the best available and is more than 10 years old\*. National estimates of land use are quoted in the Five Year Plan but do not exist regionally. In sum, there is no information with an accuracy necessary for proper planning efforts available on land use in Burundi.

Long range planning for the conservation of natural resources requires, first, a knowledge of the available resources. The proposed USAID project "Land Use and Resource Analysis" will contribute to this information base as will other GOB surveys in soil mapping, valley irrigation and forestry. However, a requirement equally as important in planning activities is a policy of land classification.

A knowledge of how land is being used and how land should be used allows planners the proper flexibility in achieving national goals. It is obvious that a very extensive amount of steep land should be prohibited from farming activities, but what are the alternatives? Logically, this will require some farmers to resettle in other areas deemed suitable for farming. As mentioned earlier the development of Paysannats and the resulting re-settlement has achieved mixed results. However, it is difficult to envision better alternatives.

\* The Belgian Cooperation Agency has just published a report on the Kirundo region which details land use in that area.

D. Extension Needs

A substantial amount of moderately sloped Burundian land can be farmed (in the long term) only with highly developed conservation measures. The measures outlined in the previous section, with few exceptions, are understood and accepted by the Agronomy Department. In fact their own extension manual, "Guide pratique pour les Travaux de Developpement Communautaires," provides basic guidelines for conservation and crop extension activities. If the techniques provided in the above mentioned manual were actually applied to farm lands in Burundi, most of the agricultural sector problems would be solved.

With this reasoning, the obvious necessary step is to improve the extension service. The total numbers of extension agents to be employed by the Agronomy Department, as calculated on the basis of one agent per 250 farm units, is probably sufficient. However, their training, supervision, and mobility are not sufficient. It is recommended that the present extension schools be improved and that a program of in-service training be instituted. It is also recommended that sufficient vehicles (pickups, mopeds, bicycles) and tools (surveying instruments, shovels, picks, etc.) be obtained to equip the extension agents and workers employed on extension projects.

## VI. POTENTIAL FOR RESOURCE DEVELOPMENT

### A. GOB Priorities

A quote from the current "Five Year Plan" as part of the sector objectives is pertinent in describing GOB priorities.

"In the near future the Burundian forests risk being totally eliminated which in turn aggravates the problems of erosion which menace cultivated land. It is most urgent that land not suitable for crops and pasture be reforested. Specific programs are proposed for the reforestation of highlands and for the anti-erosion campaign."

Conversations with directors of all the pertinent agencies (ISABU, Agronomy, Forestry) have confirmed their priorities in this area.

However, this interest, in terms of actual accomplishments, is heavily weighted towards reforestation and terraces in the range lands.

Relatively little is being done in on-farm soil conservation measures and this (in the author's opinion) is the area deserving the highest priority.

Conversations with the Director of the Department of Agronomy indicate he has agreed that more emphasis should be placed upon farm level conservation measures, and he is interested in reinforcing his present program. The same interest in expanding programs was expressed by Genie Rural for irrigation projects and the Forest Service for reforestation projects. A project list is included in the annex.

### B. Cost Benefit Implications

The economics of conservation is a subject which is open to a considerable divergence of views. The problem usually lies in determining benefits and attaching some monetary value to those benefits. There will be no attempt made herein to champion a specific

economic theory nor to attach any values to the supposed benefits of conservation. Instead, a few of the relative merits of soil conservation measures will be discussed.

The loss of fertility and loss of soil volumes each year could be measured in terms of loss of revenue from the crops grown thereon. Making reliable estimates of those losses would be impossible. However, it is likely that these losses are much larger than the amount of land that is being placed in production each year. Reference is again made to the Zaire Simulation Model (Wils, 1976) as evidence of this soil production loss.

On the Imbo Plain there is considerable loss each year of arable land through sedimentation. The losses are in terms of the cost of cleaning canal networks, the added cost of sediment drains in the design of the canal systems, and finally the reduction in arable land because of the deposition of sterile sands and gravels. Upstream, the life-span of costly dams for irrigation storage and hydroelectric power will be reduced by sedimentation. Conversely, the planting of forests in the upper watersheds of these dams will not only reduce erosion but will also increase dry season flows, thus increasing water volumes for irrigation. Other costly engineering works that require high maintenance costs in Burundi, because of erosion and sedimentation, include the road systems.

The cost of certain protective measures for these lands and structures is somewhat easier to calculate. While costs vary greatly between projects, the Forest Service estimates the average cost of one hectare of reforestation to be 35,000 BF (\$390.) The Agronomy Depart-

ment calculates the cost of constructing terracing over one hectare of land to be 4100 BF (\$46). Intuitively, it would seem that these are small costs indeed in comparison to the potential benefits of soil conservation.

### C. Constraints

The constraints in introducing more effective soil conservation measures in Burundi are basically those constraints attached to the processes shaping underdevelopment in itself. That is, the pressures of overpopulation in relation to limited land resources is forcing more and more land to be placed under cultivation. The farmers know that the steep lands are not desirable farm lands but they simply have no other choice. The farmers see the soil losses in their fields, but long range planning in terms of conserving for the future is simply not a characteristic of subsistence living.

To overcome these land pressures alternate areas of arable land must be delineated and developed. Lands which are presently suitable for cultivation must be farmed more intensively. Such developments require technical sophistication and capital, two items that are in meager supply in Burundi.

Recommendations are advanced in the following section which are aimed at helping solve the problem of technical sophistication. Improving the availability of data resource information so that planners can weigh their options is part of the solution. The other solution is to improve means by which land use policy and techniques are conveyed to the farmer. This requires improving the quality of the extension service both in personnel and administration.

## VII. RECOMMENDATIONS

Specific areas of recommended USAID intervention are as follows:

1. The ongoing GOB surveys in soils, swamp lands and forestry will soon provide a basic overview of land use and its potential. The "Land Use and Resource Analysis" project will provide continued monitoring and synthesis of the land-use conditions; however, it is recommended that the ultimate emphasis of the project should be to develop a system of land classification within Burundi's physical and social context. When the physical mapping is completed it is recommended that a specialist be included as a short term consultant to assist in developing the land classification system.
2. Considering the large need for fuel and the resulting pressures placed upon forest and peat products, it is suggested that the continued support and possibly the expansion of the peat and Bururi forest projects is warranted.
3. The Genie Rural has expressed specific interest in developing irrigation projects in the Nyamuswaga and South Mosso basins. It is recommended that an irrigation engineer be retained to fully evaluate the merits of these projects. Ideally, an engineer with experience in peat soils is needed.
4. The recommendations for improving the Extension Service are being developed by the team's extension specialist, Mr. Swecker, and will not be elaborated upon here other than to emphasize this need.
5. Research, in terms of soil conservation techniques, should not be given a high priority. More emphasis should be placed upon transmitting the available knowledge to the farmers.

Bibliography

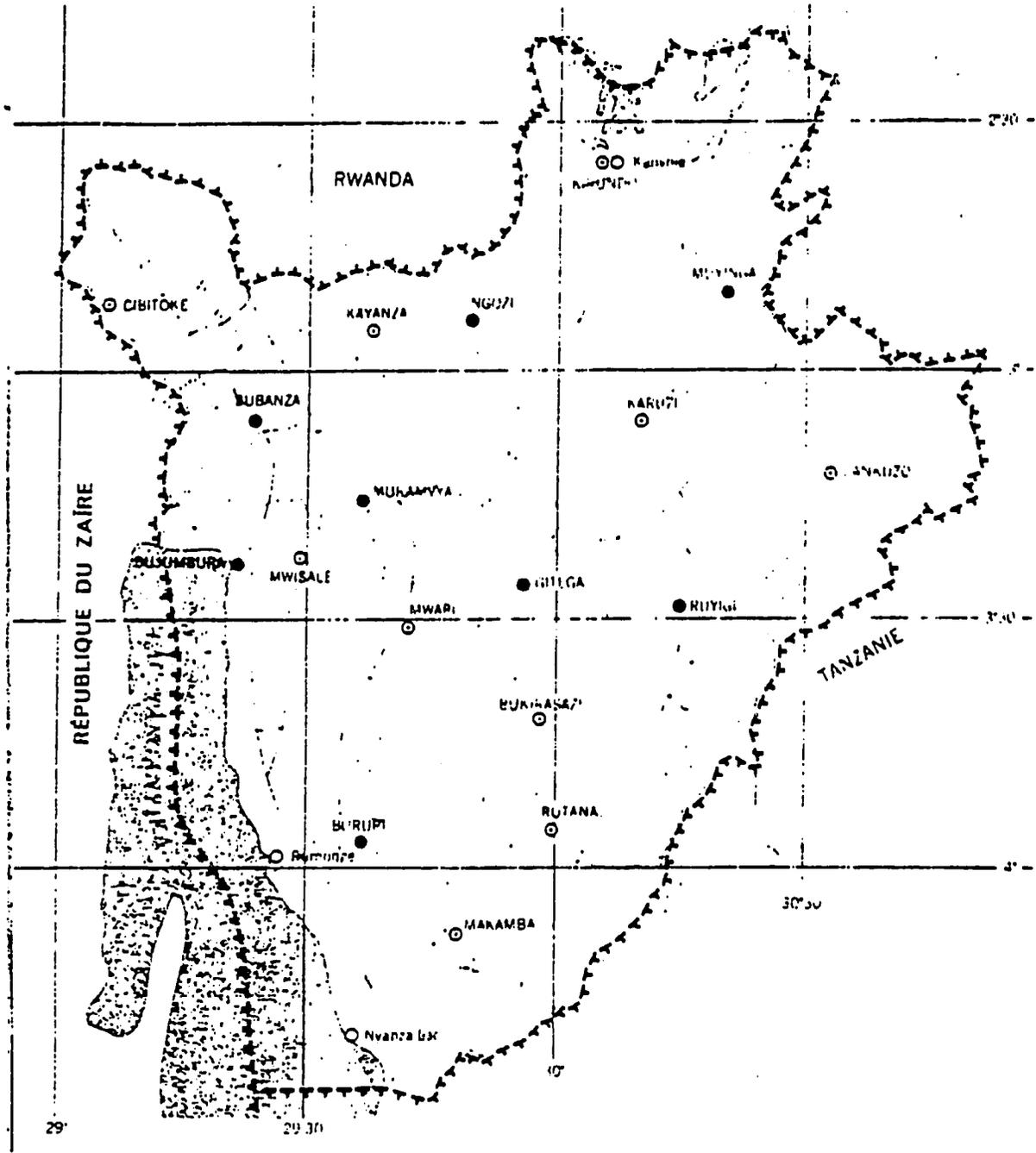
- (1) Administration Générale Belge de la Coopération au Développement (1979). Etudes pour la Mise en Valeur de la Région de Kirundo. Brussels.
- (2) .AGCD (1979) Etudes pour la Mise en Valeur de la Région de Kirundo. Bruxelles.
- (3) Ahn, P. (1975). Erosion Hazard and Farming Systems in East Africa.
- (4) Arend, H. (1971). Normales et Distributions de Fréquences des Hauteurs annuelles et mensuelles des Precipitations. Centre Météo. Pub. no. 7. République du Burundi.
- (5) Benoit de Coignac, G. et Pouilloux, C. (1975). Problèmes de Sylviculture et de Défense et Restauration des Sols. CTFT.
- (6) DHV (1979). L'Irrigation d'Imbo Centre par les Eaux de la Kagunuzi. Etude de Factibilité. Netherlands.
- (7) FAO (1971). Bassins Expérimentaux du Mosso.
- (8) FAO (1970). Développement Rural Intégré. Région du Sud Mosso.
- (9) FAO (1971). Marais de la Zone Mosso Cankuzo.
- (10) FAO (1972). Burundi, Développement Rural Intégré. Schéma indicatif d'Aménagement Zonal (SIAZ).
- (11) ISABU (1976) Données Climatologiques de Réseau d'Écoclimatologie. Kisozi, Burundi.

- (12) ISABU (1975 , 1976). Rapport Annuel de l'ISABU. A. Rapport Technique pour les Stations. B. Rapport Technique pour les Projets.
- (13) ISABU (1977). Projet de Programme Quinquennal 1977-81. Ministère de l'Agriculture, de l'Elevage et du Développement Rural.
- (14) Lumb, F.E. (1971). Probable maximum precipitation in East Africa for durations up to 24 hours. African Meteo Dept. Nairobi. Tech. Mem. No. 16.
- (15) Mission CFDF (1976). Projet FED IMBO. Utilisation des Terres du Périmètre Imbo.
- (16) Motor Columbus (1977). Etude de factibilité pour la mise en valeur de 9500 has. de la basse vallée de la Ruzizi. Swiss.
- (17) Norconsult, Norvège et Electrowatt, Suisse (1976). Anénagement du Bassin de la Rivière Kagera. Phase II. Etudes de Prefaisabilité. Projet de Mise en Valeur de Nyamuswaga.
- (18) République du Burundi (1978). Rationalisation de l'Elevage Bovin dans la Basse Ruzizi.
- (19) République du Burundi (1978). Plan Quinquennal de Développement Economique et Social du Burundi 1978-82.
- (20) S.E.D.E.S. (1969). Enquête Statistique Agricole 1967 dans la Région de Ngozi et Gitega. FAC. Paris.

- (21) SOCINO-SCRV (1959). Aménagement de la Vallée de la Nyamushwaga. Léopoldville. Netherlands.
- (22) SOMEBU (1977). Etude sur les Cultures Vivrières et en particulier sur le Blé dans les Zones Théicoles.
- (22 BIS) USAID FID Land Use and Resource Analysis in Burundi.
- (23) USDA (1975). Soil Taxonomy.
- (24) Weber, F. and Heermans, J. (1978). Agricultural Land Protection. FID/USAID.
- (25) Wils W. et. al. (1976). Le Kivu montagneux. CEMUBAC, Bruxelles. IRS, Zaire.

# LES RÉGIONS NATURELLES

(1:100,000)

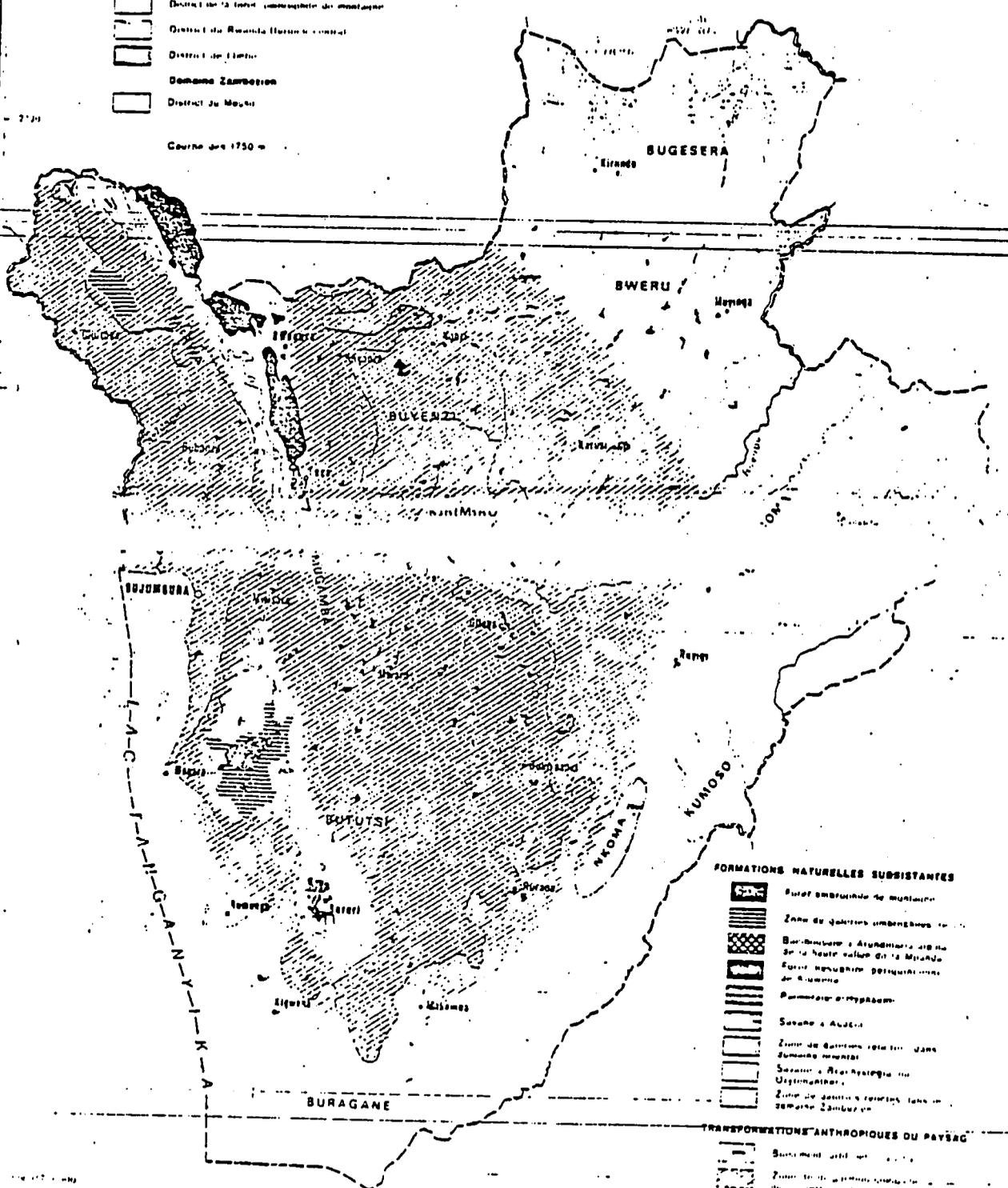


# LE TAPIS VÉGÉTAL

## DISTRICTS PHYTOGÉOGRAPHIQUES

- Domaine Oriental**
-  District de la forêt ombrophile des montagnes
  -  District du Rwanda (faune à contact)
  -  District de l'Est
- Domaine Zambouze**
-  District du Mouzo

Courbe des 1750 m



## FORMATIONS NATURELLES SUBSISTANTES

-  Forêt ombrophile de montagne
-  Zone de contact ombrophile
-  Burutsi et Buragane de la haute vallée de la Kivu
-  Forêt ombrophile persistante de Buragane
-  Plateau d'Uvuhira
-  Savane à Acacia
-  Zone de contact forêt dans savane montagnarde
-  Savane à Acacia de l'Uvuhira
-  Zone de contact forêt dans savane Zambouze

## TRANSFORMATIONS ANTHROPIQUES DU PAYSAN

-  Buissonnement
-  Zone de contact forêt dans savane montagnarde



ZEGE	Carte des sols, délimitation cultures-paturages, emplacement ferme 1/2.000)
Buhoro	Carte des sols (1/10.000)
Tora	Carte des sols (1/20.000) 1965
Nyakararo	Carte des sols (1/5.000)
Burundi	Carte des sols dans régions naturelles
Par. Elevage	des paddocks plus Carte des sols 4.000 ha, plus carte des sols péri EL.M.Figura
Muramvya	Carte des sols 1/20.000)
Kisozi-Tora	" " (1/20.000)
Kisozi plus al	" " " du bloc ... (1/40.000)
Ruzizi	Carte des sols Projet J.R.R. 50 ha 1/5.000)
Rwira	" " de la Concession 1/10.000)
Kisozi	" " 1/20.000)
Mitangaro	" " 1/10.000)
Mahango	" " )1/10.000)
Nyamabere	" " T7 à T11 1/20.000)
Luvyironza	" " stations (1/5.000)
Mubanga	" " 1/10.000)
Katumba	" " 1/20.000)
Teza	" " 1/5.000)
Muramvya-Teza	Carte des sols. Flanchette Muramvya 1/40.000 // 1/20.000)
Remera	Carte des sols et de productivité 1/20.000)
Buhoro	Carte des sols, bloc A

## PROJECT LIST

This section includes both ongoing and proposed projects, as of the beginning of 1979, in forestry, stock raising and irrigation (integrated development.) Information presented includes, in order, project name, donor organization, cost and some brief observations,

Forestry Projects

1. Forest planting of timber specie at Mumirwa  
 FED  
 250 M BF  
 Total of 3,200 ha. or 800 ha/yr. At end of 1978, 750 ha were planted,
2. Forest planting for watershed protection in Bututsi-Mugamba region.  
 Saudi Arabia, Belgium, Burundi  
 450 M BF  
 Work schedule not completed. Total area will be 10,000 ha.
3. Forest timber near Bururi and forest for firewood near Bugarama.  
 IDA, France, UNDP  
 720 M BF (IDA) plus 135 M BF (France) plus UNDP contribution not finalized.  
 Timber specie total 5,000 ha, fuel wood total 2,000 ha. Also includes a communal nursery of two studies: (1) Energy needs (2) Ovens for domestic use.
4. Watershed Protection for Bututsi-Mugamba  
 41 M BF  
 Belgium  
 Total of 2,000 ha, date uncertain,
5. High altitude reforestation at Kayongozi - Ruvubu.  
 362 M BF  
 Hungary
6. Watershed Protection of the Kibira region including Teza-Kayanza  
 65 M BF  
 France  
 Four year project, begin 79, covering 500 ha.

7. Protection and replanting of Bururi forest  
45 M BF  
USA  
Under consideration
8. Erosion Study  
21 M BF  
France  
Study is in process, includes study of erosion and Pinus sp.

#### Stock Raising

1. Kifurwe Project, milk production.  
44 M  
GOB  
Requires bank financing
  2. Basse-Ruzizi Project  
100 M  
RED  
Technical study completed by SEDES, economic study in progress by ISABU
  3. Cankuzo Project on Kigamba farm  
80 M  
FED  
Economic analysis to be done by SEDES.
  4. Gihungwe Feeding Ranch  
50 M  
France
- Fattening ranch for Muramb-Nord Project in range management
5. Mosso Project Feeding Ranch  
100 M  
Germany  
Under study in connection with Sugar Cane processing plant.
  6. Bututsi-Mugamba Range Management  
Belgium  
187 M  
Four year project covering 30,000 has. with plans for 200,000 has more beginning 1983.

## 7. Mugamba Stock Raising

112 plus 122 M

France

Two phases of intensive and extensive cattle ranching.

Irrigation

## 1. Imbo-Nord Extension of present project.

Cost not available.

Belgium

Project includes dam, irrigation network and housing construction.

Soil, topo and socioeconomic studies underway.

## 2. Mpanda, located in the Central Imbo Plain.

1,266 M

FED, FIDA, GOB

Project study completed by MOTOR/COLUMBUS.

Rice irrigation already underway with North Korean aid.

## 3. Central Imbo

Cost not available.

World Bank

Economic analysis underway by firm of D.H.V.

## 4. Southern Imbo at Rumonge

1,700 M

FAD, Saudi Arabia, GOB

In study stage.

## 5. Lake Nyanza

500 M

Rumania, GOB

Begin 1979 with development of 7000 has. total (some irrigation) by mixed enterprise of Rumania and GOB.

## 6. Kirundo Regional Development

Cost not available

Belgium

Study just completed of integrated development scheme.

## PEOPLE CONTACTED

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AGRICULTURAL PRODUCTION AND RESEARCH

B U R U N D I

Heinz A. Graetz  
Consultant

March - May 1979

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## SUMMARY

Agriculture in Burundi has come to a turning point where a drastic re-orientation of Government production and foreign assistance policies becomes essential.

Priority attention given to export crops and negligence of the food farms subsector in view of the fast growing population, has led to an alarming food supply and nutrition situation in rural areas.

Food crops other than rice are grown by the small subsistence farmers in all four ecological zones of the country. Where possible export crops such as coffee, tea or cotton, are produced in addition to ensure a cash income.

Under traditional cultivation methods which are still predominant, soils became impoverished and food crop yields declined to a critical level. Peasant farmers growing food crops for subsistence often have to search for seasonal off-farm employment to be able to cover minimum family expenses.

Production related administrative extension and research institutions are weak or conceptually disoriented. Half-hearted efforts to improve food crop production remained without tangible results and progress in the export crop sector was only possible through massive foreign project assistance. Shortage of academically trained personnel is one of the constraints which led to this unsatisfactory situation. Since 1975 the Faculty Agronomy of the University of Burundi does the best possible to educate young Burundians for leading agricultural administrative, extension and research positions.

Mission activities of the churches in Burundi are quite intensive and often include an agricultural education and production improvement element. Through their close relationship to farm families missions and missionaries have gained the confidence and respect of the peasant population, Mission

stations therefore could successfully support development efforts by stimulating farmers' receptiveness to innovative practices.

For the 1978-1982 planning period GOB has defined ambitious objectives. However, according to past experiences and in view of the still existing administrative, technological and supply constraints, the production targets look over-optimistic.

Foreign assistance projects have been successful in alleviating major constraints in the export crop sector which brought substantial increase in production. Development support for food crop improvement, however, is just beginning, and there is room for additional intervention in this field. In the last part of the report, specific needs for assistance in MOA administration, input supply, agricultural research and academic education are defined and recommendations made for USAID projects appropriate to meet these needs. Assistance interventions should focus on areas where farming and living conditions are especially difficult. Here GOB and foreign support in a concerted effort should implement an appropriate strategy to increase small farm food crop production. Suitable development measures should be aimed at an improvement of MOA operations, rural infrastructure and input supply and product marketing services as well as intensification of agricultural education, training, research and field extension activities.

Under this aspect the following projects are recommended for USAID execution:

1. Organization of a statistics Division in the MOA-Planning Department.
2. Establishment and operation of a special "Small Farm Research Center."
3. Improvement of fertilizer procurement and supply.
4. Assistance to the ISABU-On Farm Storage Research Program.
5. Support to the Agronomic Faculty - University of Burundi.

The findings presented in this report are based on data obtained through intensive study of the existing literature and documentation and on information gathered during interviews with government authorities, foreign assistance agencies, research staff, project personnel, missionaries and farmers in Bujumbura and in the field (Annex 1).

## I. General

Burundi is one of the poorest of the developing countries with an economy based exclusively on agriculture. Production of food and export crops, except for a few large coffee and tea estates operated by parastatal organizations, is the domain of the small farm sector which employs 95% of the population. Food crop farm sizes vary from 0.4 - 0.8 ha. in the most densely populated zones of the Zaire-Nile Crest and Central Plateau to 2 - 4 ha. in the Lake Tanganyika/Ruzizi Plains and East/Southeastern border areas.

The vast majority of the approximately 700,000 family holdings with an average size of 1 ha are engaged in subsistence farming on mountain slopes producing an annual income of about US\$230.00 or below US\$40.00 per capita (1977). Traditional cultivation practices characterized by a backward technology and lack of modern inputs, especially in the food crop sector, have brought production to a critically low level. This and the increasing demand of a fast growing population (2.5% per year) for basic food products not only excluded the desirable reduction of food imports but also aggravated the already unsatisfactory nutrition status of rural families.

Sporadic famine and dietary imbalances are especially severe where localized crop failures cannot be off-set by supplies from surplus areas due to the absence of a functioning marketing and distribution system.

## II. Agricultural Production

Burundi's agricultural potential is considerable but only part of it has been exploited during the last 20 years through intensification of export crop cultivation especially of coffee, tea and cotton.

Food crop production, although accounting for 50% of the domestic product, remained a consistently neglected sector hard pressed to cope with existing nutrition problems. Lately, however, indigenous food crops have been given higher priority in GOB production policy as is reflected in the third Five Year Plan 1978 - 1982.

Principal food crops are dry beans, bananas, cassava (manioc), maize, sweet potatoes and sorghum. These are the backbone of Burundi's rural subsistence economy and the single source of farm income where coffee, tea or cotton are not cultivated.

Rice, wheat and triticale have been introduced to reduce the dependence on food imports especially for the urban population, and irish potatoes and soya to improve the nutritive conditions of farm families in the High and Medium Altitude Zones. During the period 1970 - 1977 crop production developed as is shown in table 1.

Coffee, tea and cotton, thanks to the continuous attention and support from GOB, foreign assistance projects and marketing boards could maintain or slightly raise their production level. Output of major food crops (maize, beans, cassava, sweet potatoes) increased only insignificantly while the population grew by 17%. Therefore actual per capita production fell by 6%. GOB and outside donors alike, concerned about the noticeable deterioration of the domestic food supply situation are now determined to mobilize appropriate assistance to stem and reverse this detrimental development.

Table 1

## Production de l'agriculture (en tonnes)\*

	1970	1971	1972	1973	1974	1975	1976	1977
Café (mar.)	22.044	25.145	19.348	21.495	28.139	16.929	21.200	21.400
Thé (sec)	148	322	485	657	906	787	1.136	1.470
Coton (grain)	8.700	8.700	5.150	4.600	4.525	3.818	3.010	5.160
Haricots	278.700	284.831	256.348	291.097	232.078	294.008	300.478	307.000
Petits Pois	30.100	30.762	27.686	31.439	25.151	31.753	32.515	33.000
Bananes à légumes	440.507	450.198	405.178	460.102	462.000	464.703	474.926)	33.000
Bananes à bière	756.522	773.166	695.850	790.176	780.000	798.078	815.636)	1.320.000
Manioc	370.300	378.446	340.601	386.772	389.418	390.640	393.374	396.000
Pommes de terre	34.000	34.748	31.273	35.512	28.410	35.867	36.584	37.000
Sorgho	20.040	20.481	18.433	20.931	16.745	21.140	21.457)	
Eleusine	8.800	8.994	8.095	9.192	7.354	9.284	9.423)	32.000
Colocase	96.200	98.316	88.484	100.479	80.383	101.484	103.412)	
Igname	5.750	5.876	5.288	6.005	4.804	6.065	6.180)	111.500
Patate douce	381.600	389.995	350.995	398.575	318.626	402.561	411.417	420.500
Mais	130.000	132.860	119.574	135.782	108.860	137.140	138.500	140.000
Froment	5.000	5.110	4.599	5.122	4.098	5.173	5.500	6.000
Riz	5.017	4.277	4.785	4.800	6.186	6.730	6.705	7.000
Fruit: de palme	11.600	11.600	8.900	9.400	10.500	11.600	11.600	11.500
Arachides	6.200	7.000	7.200	7.800	8.400	9.000	9.225	9.500
Autres (fruits, légumes, courges, tabac, feuilles)	97.746	99.900	89.900	103.000	82.400	105.770	108.100	105.000
Production visée	2.678.082	2.736.560	2.463.189	2.796.184	2.565.413	2.830.996	2.885.032	2.936.000
Pertes 20%	535.661	547.312	492.638	559.236	513.082	565.200	577.006	587.200
Production disp.	2.142.421	2.189.248	1.970.551	2.236.948	2.052.331	2.265.796	2.308.026	2.348.800

\* Ministry of Agriculture and Ministry of Planning - Annexes

.../...

Table 1 - Continued

- 2 -

	1970	1971	1972	1973	1974	1975	1976	1977
Indice de production	100,0	102,2	92,0	104,4	95,8	105,7	107,7	109,6
Population	3.350.000	3.417.000	3.424.000	3.575.000	3.655.400	3.735.900	3.817.200	3.901.200
Production par tête - en Kg	639,5	640,1	575,5	625,7	561,5	606,5	604,6	602,1
- en indice	100,0	100,2	89,8	97,7	87,7	94,6	94,5	94,1

## Ecological Zones

Crop production in Burundi is influenced by three major environmental factors, topography, altitude and rainfall which determine features and limitations of natural and agricultural vegetation.

Four distinct ecological zones exist (Annex 2) which are subsequently described as they follow each other from West to East.

### 1. Lake Tanganyika and Ruzizi River Plains

Includes the lower western slopes of the Zaire-Nile Crest up to an altitude of 1000 m.

Annual Precipitation: 800 - 1.000 mm

Medium Temperature: 22.5 - 25.0 ° C

Growing Seasons: Major - September to December

Minor - January and February

Dry Season - June to September

Irrigated, semi-irrigated and rainfed cropping.

Production of rice, robusta coffee, cotton, maize, sorghum, cassava.

Millet and cowpeas are tested for possible introduction.

#### Robusta Coffee

Planted: 2.5 x 2.5 m

Fertilization: 400 g/tree of 45-10-10

Yield: 1200 kg/ha (parchment)

#### Cotton - semi-irrigated

Planting rate: 15 kg/ha

Fertilization: None

Yield: 550 kg/ha (seed cotton)

Rice - irrigated or semi-irrigated

Planted: 20 x 22 cm

Fertilization: 40 - 40 - 20 kg/ha

Yield: 2500 kg/ha

Maize - rainfed

Planted in pure stand

Fertilization: None

Yield: 800 kg/ha

Sorghum - rainfed

Plant population: 250.000/ha

Fertilization: None

Yield: 700 kg/ha

Cassava - dryland

Planted: 90 x 90 cm

Fertilization: None

Yield: 6000 - 8000 kg/ha

Cropping pattern example:

0,15 ha coffee - 0,30 ha rice - 0,50 ha maize/sorghum - 0,30 ha beans -  
0,40 ha cassava - 0,30 ha bananas

2. Medium Altitude Western and Eastern Zone - 1.000 to 1.500 m

Annual precipitation : 900 - 1.200 mm

Medium temperature: 20.0 - 23.0 °C

Growing Seasons: Major - December to April

Minor - September to November

Dry Season - June to August

Production of beans, peanuts, maize, cassava, bananas. Introduction of sugar cane into the Mosso area.

Beans - pure stand

Planted approx. 15 x 15 cm

Fertilization: Small amounts of  
compost/manure

Yield: 800 kg/ha

Peanuts

Mixed planting

Fertilization: None

Yield: 500 kg/ha (unshelled)

Maize

Mixed planting (12.000 plants/ha)

Fertilization: None

Yield: 450 kg/ha

Cassava

Mixed planting (6000 plants/ha)

Fertilization: None

Yield: 5.000 kg/ha

Bananas

Mixed stand (6.000 plants/ha)

Fertilization: Small amounts of manure or compost)

Yield: 7.000 kg/ha

Cropping pattern example:

0.35 ha bananas - 0.25 beans - 0.40 ha cassava/maize - 0.30 ha maize/peanuts -  
1.70 ha natural pasture

3. High Altitude Zone - Zaire/Nile Crest - 1.900 - 2.500 m

Annual precipitation: 1.300 - 1.600 mm

Medium temperature: 17.0 - 19.0 °C

Growing Seasons: Major: October to January

Minor: February to May

Dry Season: June to September

Principal crops are tea, maize, wheat, peas, sorghum, millet, sweet and irish potatoes.

Tea

Pure planting (12.000 plants/ha)  
Fertilization: 400 kg/ha of 25-5-5  
compound

Yield: 1.500 kg/ha (made tea)  
Without fertilization: 900 kg/ha  
(made tea)

Maize

Pure stand (35.000 plants/ha)  
Fertilization: None

Yield: 650 kg/ha

Wheat - Pure stand

Seed rate: 60 kg/ha  
Fertilization: None  
Yield: 450 kg/ha

Peas

Mixed planting  
Fertilization: None  
Yield: 350 kg/ha

Sorghum/Millet

Mixed planting  
Fertilization: None  
Yield: 550 kg/ha

Sweet Potatoe

Mixed planting  
Fertilization: None  
Yield: 4.000 kg/ha

Irish Potatoes

Pure stand (30 x 60 cm)  
Fertilization: Manure  
Yield: 6.000 kg/ha

Cropping pattern example:

0.06 ha tea - 0.15 ha maize/peas - 0.20 ha wheat - 0.50 ha sweet potatoes/  
peas - 0.20 ha sorghum/millet - 0.07 ha irish potatoes - 2.50 ha natural  
pasture. In the marshy valleys well drained soils are cultivated during the  
dry season.

4. Central Plateau - 1.500 to 1.900 m

Annual precipitation: 1.000 - 1.200 mm

Medium temperature: 19.0 - 20.0 °C

Growing Seasons: Major - October to January

Minor - February to June

Dry season - June to September

Arabica coffee, bananas, beans, maize, sweet potatoes and cassava are  
produced.

Arabica coffee

1.600 trees/ha

Fertilization: 120-40-40 kg/ha

Yield: 900 - 1.200 kg/ha (parch.)

Bananas

Mixed (4.000 plants/ha)

Fertilization: Manure

Yield: 6.500 kg/ha

Beans

Mixed planting

Fertilization: None

Yield: 450 kg/ha

Maize

Mixed planting (15.000 plants/ha)

Fertilization: None

Yield: 400 kg/ha

Sweet Potatoes

Mixed planting

Fertilization: None

Yield: 4.000 kg/ha

Cassava

Mixed planting (6.000 plants/ha)

Fertilization: None

Yield: 4.500 kg/ha

Cropping pattern example:

0.12 ha coffee - 0.25 ha bananas - 0.30 ha maize/beans - 0.20 ha cassava/sweet potatoes - 1.00 ha natural pasture.

Where possible crops are also grown on the marshy soils of the valleys during the dry season.

Throughout the four ecological zones traditional and more modern farming practices are divided as shown below.

<u>Crop</u>	<u>Traditional</u>	<u>Modern</u>	<u>Cultivation</u>
Coffee	40%	60%	
Tea	30%	70%	
Cotton	50%	50%	
Beans	90%	10%	
Maize	90%	10%	
Beans/Maize	100%	-	
Rice	40%	60%	
Wheat	90%	10%	
Banana	100%	-	
Cassava	100%	-	
Sweet Potatoes	100%	-	

<u>Crop</u>	<u>Traditional</u>	<u>Modern</u>	<u>Cultivation</u>
Irish Potatoes	90%	10%	

From the major food crops only a minute part is cultivated according to advanced methods. Haphazard mixed planting is still preponderant. The following are the most common crop associations:

Two Crop:

Beans-Maize

Beans-Sorghum

Beans- Cassava

Beans - Banana

Sorghum - Maize

Sorghum - Cassava

Cassava - Sweet Potatoes

Cassava - Peanut

Maize - Peanut

Three Crop:

Beans - Maize - Peas

Beans - Maize - Cassava

Beans - Maize - Peanut

Beans - Maize-Banana

Cassava - Sweet Potatoes - Banana

Cassava - Sweet Potatoes - Peanut

However, suitability and performance of the listed mixtures were never evaluated through field experiments and proportions of mixture components are arbitrarily chosen by farmers.

Experimental results obtained at ISABU-Stations over a number of years could prove that on Burundi soils food crops respond well to modern inputs. The magnitude of crop response expressed in kg/ha yields is illustrated in the subsequent tabulation.

CROP	Average traditional farming practice	Research Conditions	
		Mechanical cultivation Row Planting Conventional Seed	Mechanical cultivation Row Planting Improved Seed Fertilization
Beans	650 kg/ha (100%)	750 kg/ha (115%)	1.100 kg/ha (169%)
Maize	800 kg/ha (100%)	1.200 kg/ha (150%)	3.400 kg/ha (425%)
Rice	1.500 kg/ha (100%)	2.800 kg/ha (187%)	4.200 kg/ha (280%)
Wheat	500 kg/ha (100%)	900 kg/ha (180%)	2.200 kg/ha (440%)
Sorghum	550 kg/ha (100%)	1.000 kg/ha (182%)	3.500 kg/ha (636%)
Peas	350 kg/ha (100%)	600 kg/ha (171%)	1.100 kg/ha (314%)
Potatoes	5.500 kg/ha (100%)	7.000 kg/ha (127%)	12.000 kg/ha (218%)

These are impressive figures and even if one concedes that under practical farming conditions just 60 to 70% of the experimental yields would probably be obtained with equal inputs, only the bean yields would hardly justify the effort.

Fertilizer responses of a number of food crops have also been investigated by the FAO Fertilizer Promotion and Distribution Program since 1972. NPK proportions, quantities and benefit/cost ratios have been determined as given below.

Crop	NPK - kg/ha	Benefit/Cost Ratios*)					Average
		1973	1974	1975	1976	1977	
Maize	40 - 60 - 0	2.4	1.7	1.3	2.1	5.7	2.7
Wheat	30 - 55 - 30	2.5	1.4	1.6	2.5	2.6	2.3
Irish Potatoes	40 - 40 - 60	8.6	2.9	5.0	6.3	7.2	6.0
Beans	17 - 57 - 30	1.7	0.8	1.9	3.3	3.2	2.2
Peas	17 - 57 - 30	3.2	1.1	2.1	2.7	4.1	2.7
Rice	20 - 45 - 40	-	-	0.8	3.6	-	2.2
Sorghum	25 - 30 - 30	-	-	-	2.2	1.1	1.7

\*) Yield increase divided by fertilizer cost

In these tests all crops except sorghum returned more than double the amount invested in fertilizer. Potatoes even produced an additional yield six times as high as the fertilizer cost. The data only reflect the effectiveness of fertilizer on crops planted in lines but without mechanized cultivation.

Despite these results and efforts fertilizer consumption in Burundi has remained stagnant as is reflected by the practically unchanged and lately declining import volume:

Fertilizer Imports in MT \*)

1970-71	1.368
1971 -72	1.309
1972-73	1.412
1973-74	1.679
1974-75	2.809

1975-76	1.668
1976-77	798
1977-78	1.842
1978-79	463

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\*) Banque de la République du Burundi

Although fertilizers imported by the government enjoy a 50% price subsidy and food crop prices raised at an average of 23%, fertilizer acceptance by small farmers remained insignificant. This must be ascribed mainly to the lack of forceful field extension and the absence of an efficient fertilizer procurement and distribution system.

As one grave consequence the per ha yields have continued to decline to an alarmingly low level as is illustrated by the comparison below:

Yield Levels 1959\*) and 1979 in kg/ha

	<u>1959</u>	<u>1979</u>	<u>% Decline</u>
Beans	750	650	15
Maize	1.000	800	20
Rice	3.500	2.500	28
Sorghum	1.200	550	54
Millet	600	450	25
Wheat	750	500	33
Peas	800	350	56
Peanuts	600	500	17
Cassava	13.000	7.500	43
Sweet Potatoes	7.500	4.000	47

	<u>1959</u>	<u>1979</u>	<u>‰ Decline</u>
Irish Potatoes	7.000	5.000	29

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\*) P. Leurquin: Change in Ruanda-Urundi 1945 - 1960

Apart from the ongoing depletion and degradation of the formerly productive soils by traditional cultivation this dismal development also is the result of a progressive degeneration of the local seed material. Reduction or elimination of fallow periods, the reduction of the number of animals and additional cultivation of marginal land to feed the growing population have made their negative contribution as well.

To arrest and eventually reverse the deterioration of productivity and production will require sincere efforts in soil conservation, fertility restoration, and promotion and adoption of improved farming practices by the GOB-MOA and the peasant farmer alike.

In this connection the extreme post-harvest losses on small farms must specially be mentioned. Granaries are unknown and cereals and pulses are stored within family huts in small earthen containers, baskets and bags. No protective measures are applied and the storage losses caused by rodents, weevils (Bruchidae) and fungi are estimated as high as 20 - 30%. ISABU and the Faculty of Agronomy of the University of Burundi have just started a program to test different types of elevated granaries for their cost and effectiveness. If successful, this program will result in the development of improved storage methods the small farmer can afford which could reduce crop losses to a more tolerable 10% level.

Fruit and vegetable production up to now remained a rather neglected sector. Both types of products are not generally used in the traditional rural diet which is not only short of proteins and fats but also lacks vitamins and minerals.

Available data indicate that in 1977 hectareage and production were the following:

Fruit (415.000 trees and 2 million pineapple) 1.400 ha - 15.000 MT

Vegetables (Onions, leek, cauliflower, cabbage, carrots) 4.200 ha - 85.000 MT

With this output an annual per capita consumption of bare 4 kg fruit and 23 kg fresh vegetables could be ensured.

For 1982 GOB projections foresee production increases of 5.000 MT (33%) for fruit and 4.500 MT (53%) for vegetables. However, research and extension efforts to promote cultivation and consumption in rural areas are still half-hearted. They are restricted to the distribution of seed and planting material. Follow-up technical assistance is rarely provided.

Nonetheless vegetable supply and quality have reached a remarkable level especially around urban centers. In contrast, fruit production and quality are still below desirable standards.

### III. Rural Productive Activities

The harsh conditions of traditional mountain agriculture require the concerted effort of adult and teenage family members of both sexes to secure their livelihood and existence. The magnitude of combined earnings from farm and off farm activities determines to what extent the most basic needs for food, clothing and other essential items (candles, kerosene, matches, spices, hand-tools etc.) can be met.

#### Farm Work

Women and teenage daughters are carrying the main burden of all food crop cultivation work. Soil preparation, planting, weeding, harvesting, threshing/shelling and storage are their responsibility while men and boys only take care of the cash crops and animals. Brewing of banana or sorghum beer and burning of charcoal are additional activities conducted by women and men respectively.

Apart from the marketing of their export or cash crops (coffee, tea, cotton, rice) farmers usually sell only small quantities (5 - 7%) of food crops.

Latest farm product prices were reported to be the following:

Coffee (parch.)	110 FBU/kg	Wheat	15 FBU/kg
Tea (dry)	16 FBU/kg	Rice	20 FBU/kg
Cotton (seed and Lint)	30 FBU/kg	Cassava	15 FBU/kg
Beans	30 FBU/kg	Sweet Potatoes	13 FBU/kg
Maize	20 FBU/kg	Banana	20-25 FBU/kg
Peanuts	35 FBU/kg	Beer	25 FBU/l
Sorghum	20 FBU/kg	Charcoal	300 FBU/30 kg
Peas	25 FBU/kg	Cow	25.000 FBU

Calf	10.000 FBu	Goat	1.200 FBu
Sheep	1.000 FBu	Chicken	150 FBu

Off-Farm Engagements

Possibilities for off-farm employment are very limited and entirely restricted to male labor.

Small farmers are normally recruited on cash payment basis for agricultural work on Government estates, research stations, mission farms and development projects. Seasonal or part-time opportunities also exist with road construction, maintenance and reforestation programs.

Outside farm work is especially sought after by family heads with no or with not enough farm land and pure subsistence farmers which cultivate no marketable export or cash crops.

From the 600 work days available per family and year for the farming operation only about 320 days are utilized for this purpose. Therefore ample time can be devoted to off-farm jobs where employment possibilities exist. The following salaries are paid:

Government estates	)	
Agricultural research stations	)	
Agricultural development projects	)	80 FBu/day (US\$ 0.89)
Road maintenance/construction	)	
Reafforestation	)	
Mission farms	)	50 FBu/day (US\$ 0.56)

For the Gitega area in the Central Plateau the subsequent average net incomes from farm and off-farm activities had been reported for 1977:

Coffee and Food Crops and Animal Production -	20.600 FBU/year (US\$ 223.0)
Coffee and Food Crops, no Animal Production -	16.500 FBU/year (US\$ 184.0)
No Coffee, Food Crops and Animal Production -	14.500 FBU/year (US\$ 162.0)
No Coffee, Food Crops, no Animal Production -	11.500 FBU/year (US\$ 128.0)

Assuming that a coffee grower could work 2 1/2 and a food crop farmer 3 1/2 months off their holdings for about 65 FBU/day, their net incomes would be:

Coffee and Food Crops and Animal Production -	24.000 FBU/year (US\$ 268.0)
Coffee and Food Crops, no Animal Production -	20.600 FBU/year (US\$ 229.0)
No Coffee, Food Crops and Animal Production -	19.900 FBU/year (US\$ 222.0)
No Coffee, Food Crops, no Animal Production -	16.900 FBU/year (US\$ 188.0)

The economic advantage of the small group of farmers living in areas with employment possibilities is obvious.

#### IV. Production Related Agricultural Institutions

Government administration, research and academic education are extending their direct or indirect influences on crop production with differing intensities and results.

In addition, mission programs of the churches with their separate and localized activities also play a remarkable role especially in practical farmer education and production promotion.

#### Ministry of Agriculture

The Ministry of Agriculture is the central organization for the execution of Government policies and plans but it is a weak institution with frequent changes of the decision making personnel in higher positions. As a consequence, foreign development agencies and the GOB itself have entrusted production activities to a number in effect autonomous organizations\*) reporting to the MOA.

In total the ministry employs over 2.000 people and this number is expected to grow further. There are 25 expatriate and 60 Burundian professionals working in the different departments of the ministerial headquarters in Bujumbura. 64 local professionals hold administrative/extension positions in the provinces and 51 expatriates and 145 Burundians occupy technical or management posts in agricultural development projects.

\*) OCIBU - Coffee Board

COGERCO - Cotton Board

OTB - Tea Board

SRDS - Regional Development Societies

ISABU - Agronomic Research Institute

Except for its participation in specific development ventures, Government services to the farm sector through the MOA are quite modest despite substantial increases in recurrent and investment budget allocations.

	<u>1977</u>	<u>1978</u>	<u>1979</u>	(Millions FBu)
Recurrent	202	257	365	
Investment	455	471	870	

From these expenditures the near total is used for the supporting of the MOA infrastructure and for providing government contributions to foreign financed projects. Farmers living outside the project areas have hardly a chance of receiving any kind of support from the Ministry. Administrative and managerial shortcomings in the MOA must be attributed to the involved, unbalanced organization, the bad inter-sectorial communication and cooperation caused also by a dispersed location of offices, the absence of a statistics service and lack of transportation at all levels.

There are several organization charts in existence of which the most simple and most complicated ones are given in the Annexes 3 and 4. Straight lines of command as shown in Annex 3 in fact do not exist. Responsibilities and competences are not clearly defined or demarcated and overlappings, duplication of efforts and execution gaps are frequent. In one chart e.g. the aforementioned almost autonomous units (ISABU, OCIEU etc.) are placed under the Secretariat for Rural Development, in the other they fall under the Food Production Secretariat or the Minister's office. The Food Production Secretariat in comparison to Rural

Development seems highly overburdened.

Ministerial offices are located in 8 different buildings scattered all over Bujumbura which in view of the underdeveloped sense for communication makes cooperation really difficult.

The absence of statistics section must be considered a specific detriment for the definition of policies and agricultural planning. Without a reliable information base both activities have to rely on unsound guesswork which is often far apart from reality.

Transport difficulties are very grave at provincial, arrondissement and commune levels where they are severely curtailing administrative and especially field extension activities.

Victim of all these weaknesses is the peasant farmer.

#### Agronomic Research Institute - ISABU

ISABU is the only agricultural research institution in the country. In the decade after Burundi's independence in addition to doing research, it was also planning, preparing and implementing development projects. Nowadays all efforts concerning production and commercialization of coffee, tea, cotton and rice are entrusted to the aforementioned parastatal agencies or regional development societies which operate their own budgets, have their own extension services and can deal directly with foreign assistance agencies.

Since 1976 ISABU has been restricted to just doing pure research.

The organization is divided into five scientific departments which encompass

land utilization and management, crop production, crop protection, socio-economics, animal production. The head office is in Bujumbura where all management personnel of the department and research laboratories, engineering, surveying and cartographic services are located. Field experimentation is conducted on four main and four substations (Centres Agricoles). They are concentrated in the West - South Western part of the country, leaving the center and North East uncovered (annex 5).

There are 13 expatriate and 8 Burundian professionals working in the soil/plant department and three expatriate and two local experts in the socio-economic and animal production departments of the headquarters.

The four main research stations are manned with 4 foreign and 8 Burundian scientists, the four substations with five local technicians. One half of the total field and headquarters staff (20 expatriates, 23 Burundians) is dealing with food crops representing a remarkable research potential in this specialty. ISABU's annual budget amounts to 162 million Fbu (US\$ 1.8 million) of which 80% is covered by ATB and 20% by the GOB.

Despite this concentration of effort and expertise especially in the food crop sector ISABU's applied research had little effect on small farm food crop cultivation practices and production.

In part this must certainly be ascribed to the apparent lack of extension support. But it is also obvious that ISABU's basic research concept and

approach disregards the pressing need for special small farm research on slopy lands. Field experimental work puts major emphasis on variety testing, selection and seed multiplication with cultivation, fertility and rotation trials ranking second.

There is almost no research done on farmers' fields.

Mixed cropping vs. pure planting is not under test and there is no comparative evaluation of traditional and improved farming systems. Field research at stations is of the conventional type as it is done in countries with a developed agriculture. Experiments are mostly conducted on plain fields with mechanized soil preparation and use of costly inputs such as fertilizer and plant protection chemicals, everything the subsistence farmer in the mountains cannot afford.

Therefore it is not astonishing that simple, low cost food production packages have not been developed for the small farm sector.

According to the new five-year operational plan there will be no tangible changes in ISABU's research concept but newly added activities will include animal traction, hand tool and on-farm storage research.

#### University of Burundi - Faculty of Agronomy

In 1975 an agronomic faculty was established with Belgian (ATB) technical and financial assistance to meet the country's requirements for academically trained agriculturists. Official estimates for the next five years indicate a need for about 300 ingénieurs agronomes to fill existing and anticipated

professional positions in the MOA, SRD's, crop marketing boards, development projects and research. The faculty budget is funded with an annual amount of US\$ 650,000, eighty (80) percent of which is covered by ATB and 20% by GOB contributions. Faculty activities to a considerable extent have to be conducted on an improvised basis in one single building which GOB is renting for this purpose. Teaching laboratory and greenhouse facilities do not exist. Equipment supplied by the Belgian Government could not be unpacked due to lack of space. Practical field training for students had to be tailored to the limited funds available for this program. At present five Belgian professors provide academic agricultural training to 54 students in a three-years course. The curriculum (Annex 6) is very comprehensive and as to government request is determined to educate generalists for all kinds of positions rather than specialists. Under the present situation this is understandable and credit has to be given to the teaching staff for their efforts and the remarkable level of scientific knowledge provided under the prevailing conditions. It is to be expected, however, that with a gradual sophistication of Burundi's agriculture also the academic training of younger generations of students will become more specialised.

#### Church Missions

Intensive missionary activities of the christian churches are conducted all over the country. The catholic CARITAS organization and the ALLIANCE OF PROTESTANT CHURCHES with its 5 congregations maintain 130 mission stations in rural areas (Annex 7 - 8). All are engaged in evangelization, education and health care.

Most of the Caritas stations and two of the Protestant Missions also demonstrate and promote improved methods of crop cultivation and small animal production. These activities although not always based on latest technical knowledge are conducted with unselfishness and undiminished idealism. In contrast to the government extension service, missions and missionaries have gained unconditional respect and confidence among the peasant farm population. Such relationship combined with knowledge of native dialects represents a most valuable resource which could and should profitably be used by foreign development projects.

Based on a mutually acceptable modus of cooperation the combination of proven technology and mission instilled farmer motivation could prove highly beneficial to all parties involved. It appears as a most promising possibility for a successful stimulation of small farmer receptiveness to innovative agricultural practices promoted by projects. It is not advocated though to integrate missionary activities into AID projects.

## V. Production Plans and Targets

Agricultural production planning with definition of concrete objectives began only with the second five year plan covering the period 1973-1977. Despite the disruption through the 1972 disturbances, increased production targets were set for export and food crops except for beans, cassava, sweet potatoes and rice (table 2). This was probably with the intention to obtain a better balanced general food offer.

The data of Part I of table 2 show the projected output increases in percent and metric tons compared to the actual achievements.

In the export crop sector tea production exceeded the target by 100% while coffee remained slightly and cotton far below expectations, since 1977 was not too good a coffee year and cotton production had suffered from low prices and marketing shortcomings.

The food crop sector in spite of the foreseen modest increases or even reductions showed remarkable increases of the bean, tuber crop, banana and especially millet and rice harvests. Other cereals and legumes failed to reach the respective goals by 6-7 or 28-38 percent.

Part II of table 2. reveals that also the anticipated alteration of production proportions could not be accomplished. Compared to 1972 at the end of the planning period (1977) the production positions of cereals dry legumes, tuber crops and bananas were still unchanged. In view of these trends one can assume a disparity between GOB production and price policy mainly in the case of potatoes and rice. One must also

Table 2

Second Five Year Plan - 1973-1977

Crop Production Projections\*)

Part I

Type of Crop	Pred.MT 1972**)	% Proj.incr. 1973-1977	Proj.Prod.MT 1977	Actual% incr. 1973-1977	Actual Prod.MT 1977
Coffee	19,348	+ 22	23,605	11	21,400
Tea (dry)	485	+ 52	737	203	1,470
Cotton	5,150	+ 73	8,910	-	5,160
Beans	256,348	- 4	246,100	20	307,000
Peas	27,686	+ 25	34,608	19	33,000
Bananas	1,101,000	+ 10	1,210,000	20	1,320,000
Cassava	340,601	-45	187,300	16	396,000
Ir. Potatoes	31,237	+ 3	32,210	18	37,000
Sorghum	18,433	+ 27	23,410	20	22,200
Millet	8,095	-24	6,150	21	9,800
Taro/Yam	93,775	+ 51	141,600	18	111,000
Sw. Potatoes	350,995	-42	203,600	20	420,000
Maize	119,574	+ 55	185,300	17	140,000
Wheat	4,599	+ 58	7,260	30	6,000
Rice	4,785	-	4,785	46	7,000
Peanuts	7,200	+ 65	11,900	32	9,500

\*) Ministry of Planning-Second Five Year Plan 1973-1977 } Estimates  
 \*\*) Ministry of Agriculture }

Table 2

Part II

Percent of Total Production

Crops	Actual 1972	Projected 1977	Actual 1977
Cereals	6.6	9.9	6.6
Dry Legumes	12.3	12.8	12.4
Tuber Crops	34.5	24.6	34.2
Bananas	46.5	52.7	45.4

conclude that traditional production habits do not comply with largely theoretic planning projections.

The third five year-plan (1978-1982) while still much concentrated on cash crops puts greater emphasis on food crops. In this context it lists as primary objectives: food self-sufficiency, production of exportable/marketable surpluses and the replacement of imports.

These ambitious conceptions are supplemented by equally ambitious quantitative targets as is illustrated below.

Third Five Year Plan Production Targets

Type of Crop	Prod. 1977 MT	Projected % increase 1977-1982	Projected Prod. MT 1982
Coffee (made)	21,400	38	29,530
Tea (dry)	1,470	144	3,600
Cotton	5,160	100	10,320
Cereals	185,000	50	278,000
Dry Legumes	349,500	20	419,400
Tuber Crops	964,000	10	1,061,000
Bananas	1,320,000	10	1,452,000

To reach the projected targets the third plan also foresees an extension of the food and export crop surface by 5% to 1,280,000 ha, an increase of the manured land from 47,000 to 106,000 ha (125%) based on improved livestock and manure (120%) production and the provision of 13,000 tons of chemical fertilizers.

Since fertilizer imports have dropped to an all time low of 463 MT and actual 1978 production data are not available to document production

increase, stagnation or decline, one must doubt whether progress would be possible in view of the hitherto unsatisfactory development results in the food crop and livestock sectors. The anticipated improvements will only be accomplished if planning objectives are accompanied by concurring policies and supporting and promotional measures in extension and marketing.

## VI. Production Constraints

Burundi's most pressing problem is how to increase food crop production to keep pace with raising demand, resulting from population growth. Government plans and foreign assistance interventions geared to cope with this problem through the promotion of food crop production are still in a take off phase, and existing constraints are manifold. Environment, administration, research and technology extension, marketing and supplies are sectors exhibiting the most tangible weaknesses.

### Environment

Areas of difficult topography are the most densely populated with subsistence farming being prevalent. From the small average farm size of 1 ha or less, 80% is now under subsistence crops. This is barely enough to support a normal family of 4-5 persons. Under a continuing population pressure on the land resource, by 1982 only one-half as much land would be available per family for food crops as at the present time. Unless per ha yields can greatly be improved and new land in the Western Plains and North East and South East Plateau opened up for production, famine will be imminent. Small farm size and land fragmentation militate against rationalization of cultivation. Soil degradation manifested by erosion and nutrient depletion caused by a reduction of fallowing and declining availability of manure represents the most serious natural obstacle to yield improvement efforts.

### Administration

For sometime, GOB has declared that agriculture in general and food crop production in particular are priority sectors. However, the current stagnation of food production development in Burundi to a great extent must be ascribed to the failure of the government to provide adequate resources for production inputs, supporting services and infrastructural improvements. GOB has also been unsuccessful in offering attractive production incentives to farmers and motivating agricultural officials to design and forcefully implement badly needed development measures.

Basic development components like research, a rudimentary extension service and farmers willing to improve crop cultivation in response to incentives do exist. But despite intensified planning activities of the Ministries of Agriculture and Planning it has not been possible to mobilize and orient available resources and institutions to a concerted small farm development effort. Progress remained restricted to the export crop sector in areas covered by previous or ongoing foreign assistance projects. No improvements were achieved in regions depending exclusively on government support. Shortage of manpower, inadequate training and transportation lack of supervision, unequal distribution of funds and a poor infrastructure must be held responsible for the current state of affairs. As a major constraint the lack of a sound statistical information base and its effect on the overall planning and policy determination process has to be mentioned. The negative impact of this shortcoming on evaluation, interpretation and correction of the production situation cannot be overemphasized,

### Research and Technology

Food crop production as the domain of the small subsistence farmer is based on traditional hoe and machete cultivation with hand-labor and local, low quality seed as the only inputs. Haphazard planting of frequently disproportioned crop mixtures with arbitrary seed rates and spacings is the common practice which makes inter-plant cultivation and weeding quite difficult. Since only small quantities of animal manure are collected and fertilizer use is restricted to export crops, food crop soils are progressively impoverished and yields declining.

High post-harvest losses further diminish the already small production. Anticipated improvements will depend upon a successful introduction and promotion of advanced crop cultivation practices through effective field extension campaigns. Half-hearted extension efforts aimed at food crop improvement through demonstration of known techniques have failed.

ISABU on its part so far did not develop production and storage technology packages for peasant farmers. Such disregard of small farm research needs proved to be a major constraint that has to be alleviated before future food crop development plans and programs would have a reasonable chance of success.

Input Supply and Marketing

Insufficient imports of modern means of production (fertilizer, pesticides, small farm equipment), inconsistent price policies, lack of credit and a mal-functioning marketing system have kept input utilization by small farmers at a negligible level. SOBUCOV as the government food crop purchasing and storage organization has neither been able to make or guarantee purchases from farmers at reasonable prices nor to establish food crop reserves for times of shortage and price stabilization. Private traders usually offer better prices to farmers but the volumes purchased for the urban markets are too small to stimulate surplus production overall. Thus far government has not developed appropriate price and marketing policies in support of anticipated production promoting projects and programs. Without an economic advantage representing a real incentive to farmers' future food crop development efforts based on modern practices and inputs will lack the decisive momentum for progress in production.

VII. Production Improvement Projects

In view of the long existing production improvement problems numerous foreign assistance projects were launched to develop and implement strategies for successful elimination of constraints and subsequent augmentation of output. Ongoing projects and those in preparation or planned for the next three years are listed hereunder.

Ongoing projects

1. Promotion of food crops, robusta coffee, cotton, oil palm, pasture and livestock production under dryland conditions and irrigation mainly on settlement farms.

Location: Western Plains: Imbo-North; Imbo-Center; Nyanza-Lac.

Duration: 1977-1982

Funding : 200.000.000 FBU (2.2 mill. US \$)

Contributors: FED - AIB - Roumania - GOB

Production improved at a rather slow pace due to remarkable shortcomings in farmer organization and marketing of produce. Settlement concept and strategy proved only partially successful.

2. Tea production and processing; food crop promotion, animal production and soil conservation.

Location: Zaire-Nil Crest perimeters: Igenda, Banga, Rwegura, Remera, Tora, Kisozi: 600 Ha tea on estates - 2500 ha tea on small farms - 1800 ha forest trees - 2800 ha food and animal production.

Duration: 1973-1980 overall

Funding: 1.500.000.000 FBU (170 Mill. US \$) FED

158.000.000 FBU (1.8 Mill. US \$) GOB

Total : 1.658.000.000 FBU (18.8 Mill. US \$)

So far 1800 tea and 600 ha of forest trees have been planted. Tea still receives priority attention through input provision and special technical extension. Food crops remained of secondary importance and get only nominal support which had no visible impact on production.

3. Second phase - Coffee production improvement and intensification of food crop cultivation.

Location: Province of Ngozi (North)

Duration: 1976-1980

Funding : 468.000.000 FBU (5.2 Mill. US \$) IDA/IBRD  
108.000.000 FBU (1.2 Mill. US \$) Kuwait Assist. Fund  
99.000.000 FBU (1.1 Mill. US \$) GOB

Total : 675.000.000 FBU (7.5 Mill. US \$)

Coffee improvement progressed well due to timely provision of good planting material, fertilizer, pesticides and forceful extension. In contrast food crops got little attention and overall production showed no thorough improvement.

4. Vegetable production pilot project, development of production units with technical assistance through field extension.

Location: Bugarama and Muramvya Provinces.

Duration: 1977-1979; extension requested for 1980-1984.

Funding: 1977-1979 63.000.000 FBU (0.7 Million US \$) ATB  
1980-1984 80.000.000 FBU (0.9 Million US \$) ATB

TOTAL : 143.000.000 FBU (1.6 Mill. US \$)

Project so far had no wide impact since general product acceptance in rural areas, marketing and processing are still unsolved problems. The requested project extension until 1984 is still undecided.

5. Production and distribution of improved seed; installation of 30 multiplication and distribution centers.

Location: Bujumbura, Gitega, Muyinga, Ruyigi and Bururi Provinces.

Duration: 1977-1982

Funding : 120.000.000 FBU (1.3 Mill. US \$) ATB

Sixteen centers have been installed. Seed materials are accepted by farmers but parts are often used for consumption. Maintenance of seed quality is a problem. Traditional planting habits favor cross-pollination and accelerated degeneration.

6. Fertilizer procurement and promotion; execution of annual procurement, field extension and distribution programs. Project activities concentrate on food crops.

Location: Project integrated into Department of Agronomy - MOA.

Activities in 12 out of 18 arrondissements.

Duration: 1972-1980.

Funding: 66.000.000 FBU (0.75 Mill. US \$) FAO and ATB  
7.000.000 FBU (78.000 US \$) Fed. Rep. of Germany.  
6.750.000 FBU (75.000 US \$) UNDP  
16.000.000 FBU (180.000 US \$) GOB

TOTAL : 95.000.000 FBU (1.083.000 US \$)

Proper fertilizer use resulted in 80-100% yield increases. Economics depend on an appropriate price subsidy level. Inefficient purchasing and distribution and the uncertainties in the marketability of food crops so far prevented full project success.

7. ISABU - Agricultural Research.

Location: Bujumbura, Kisozi, Luvironza, Mosso, Imbo and sub-stations

Duration: 1978-1981

Funding : 162.000.000 FBU (1.8 Mill. US \$) ATB  
45.000.000 FBU (0.5 Mill. US \$) GOB

TOTAL : 207.000.000 FBU (2.3 Mill. US \$)

8. University - Faculty of Agronomy

Location: Bujumbura

Duration: 1978-1982

Funding : 24.000.000 FBU (260.000 US \$) ATB  
1.400.000 FBU ( 16.000 US \$) FED  
12.600.000 FBU (140.000 US \$) GOB

TOTAL : 38.000.000 FBU (416.000 US \$)

Projects planned or in preparation

1. Development of irrigated agriculture (robusta coffee, cotton, rice, and other food crops) on a 9500 ha perimeter.

Location: Mpanda - East Imbo.

Duration: Four years - Phase I

Funding: 700.000.000 FBU (7.8 Mill. US \$) FED  
700.000.000 FBU ( 7.8 Mill. US \$) FIDA \*)  
1.500.000 FBU (17000 US \$) GOB

TOTAL :1401.500.000 FBU (15.617.000 US \$)

2. Third Phase - Coffee production improvement and intensification of food crop cultivation.

Location: Province of Ngozi

Duration: 1981-1985

Funding : IBRD; cost under study.

3. Basic Food Crops - Phase I (Supplement to No. 2 ongoing projects)  
Provision of improved food crop varieties and production techniques to subsistence farmers.

Location: Remera, Muramvya, Igenda, Tora (Zaire-Nil Crest)

Duration: 1979-1982

Funding : 357.000.000 FBU (4.0 Mill. US \$) U.S.A.I.D.  
299.000.000 FBU (3.4 Mill. US \$) FED  
75.000.000 FBU (840.000 US \$) GOB

TOTAL : 731.000.000 FBU (8.240.000 US \$)

4. Establishment of an SRD to start plantation production of oilpalm and robusta coffee.

Location: Rumonge - Western Plains - South

Duration: 10 years

Funding : 1.700.000.000 FBU (18 Mill. US \$) IBRD, Saudi-Arabia,  
Agric. Dev. Bank.

\*) FIDA : Fonds International de Developpement Agricole.

5. Establishment of 12: "Agricultural Development Centers" in densely populated problem areas. Improvement of cash and food crop productivity in 12 communes through massive field extension.

Location: Muramvya and Gitega Provinces (Central Plateau)

Duration: 6 years

Funding : 1.350.000.000 FBU (15 Mill. US \$) IBRD/IDA

In addition, several integrated rural development projects must be mentioned. All include a food crop promotion and cooperative development components. One project is already operational:

Location: Province of Gitega

Duration: 1974-1980

Funding : 50.400.000 FBU (560.000 US \$) UNICEF  
25.200.000 FBU (280.000 US \$) UNDP  
900.000 FBU ( 10.000 US \$) GOB

TOTAL : 76.500.000 FBU (850.000 US \$)

The following are planned or in preparation:

(a) Integrated rural development.

Components: Food crops, animal production, infrastructure, health

Location : Kirundo - NE Central Plateau

Duration : 6 years

Estimated Cost: 1.900.000.000 FBU (20 Mill. US \$)

(b) As above

Location: Kinyinya

Duration: 6 years

Funding: IBRD

Cost: Under study

(c) Integrated rural development with cotton production as basic component.

Location: Kabezi (South of Bujumbura)

Funding : IBRD credit

Cost : Under study

The geographic areas covered by crop production and related projects in operation are illustrated in Annex 9.

### VIII. Production Development Possibilities

To cope with the existing calamities in the food crop producing small farm sector, forthcoming foreign assistance interventions should concentrate on areas where rural families must work and live under most disadvantageous circumstances. Such conditions characterized by a sloping topography, high population pressure on the land resource, limited possibilities for cash crop production, eroded soils, backward technology, lack of animals and low income are typical for the Center and South of the Central Plateau where development project activities are still limited. Apart from the prospect of changing the farming and living conditions in this area long-term through sporadic or organized migration to sparsely populated regions, more immediate improvements could be expected from a substantial increase in food crop production. Possibilities for a realization of this objective exist once GOB and outside assistance unite resources and efforts to strengthen productivity related institutional capabilities at national and field level to design and implement strategies for an intensive motivation and support of the small farm sector. This would involve the application of site and situation specific combinations of the following development measures:

- (a) strengthening of the administrative planning and supervisory capacity of the Ministry of Agriculture.
- (b) Intensification of academic, technical and extension training.
- (c) Initiation of special small farm research work.
- (d) Reinforcement of food crop extension in the field.

- (e) Execution of appropriate farmer education campaigns.
- (f) Amelioration of infrastructure and transport capacities.
- (g) Improvement of input procurement, distribution and product marketing services.

For a concerted impact the interdependence and complementary nature of the cited activities must be taken into account. On this basis foreign assistance projects have been successful in developing and implementing strategies for the improvement of export crop production. Food crop cultivation project support is of only recent date and still in an initial stage. This opens many possibilities for additional development assistance which US-AID is also prepared to offer.

IX. Projects Recommended for US-AID Execution

From the agricultural production and research angle specific needs for successful implementation of development measures mentioned under points (a), (b), (c) and (g) can be defined. Thus far, foreign donors have not addressed these needs which gives US-AID the opportunity to provide appropriate project support to meet them.

To put MOA's planning and decision making function on a sound basis, an effectively operating statistics division has to be established. It will have to produce reliable data on which a meaningful production development strategy must be based.

To improve the professional capability of forthcoming generations of agriculturists, their academic training in agricultural sciences and techniques must be intensified. This requires outside assistance for expansion of the still limited university facilities for practical scientific work and teaching.

ISABU's orientation toward conventional research more suitable for a developed agriculture, calls for a special small farm research effort. A research station of limited size should be established in an area where subsistence farming problems are concentrated. It should base its field work on several simulated family units addressing itself to -

- . the full mobilization of indigenous production resources
- . the evaluation and improvement of crop cultivation storage habits and small farming systems including livestock

- . the control of soil erosion and fertility restoration
- . the development of low cash, low risk packages of technical recommendations for production promoting extension campaigns

In support of the recommended small farm research operation, AID assistance is also suggested for ISABU's recently initiated on farm storage research program.

Realizing that a restoration of soil fertility and augmentation of small farm production cannot progress rapidly enough if based only on residue recycling and rotational improvements, the supplementary application of limited amounts of fertilizer nutrients appears essential. However, fertilizer use development in the small farm sector will require substantial strengthening of the poorly performing fertilizer procurement and distribution system. US-AID assistance could help to overcome the existing weaknesses, but would only be appropriate if accompanied by serious government measures aimed at an improvement in purchasing and storage of marketable food crop surpluses.

In this context the following projects are recommended for US-AID execution:

1. Organization of a Statistics Division in the MOA-Planning Department.

Objective: To establish an operable system for collecting, processing, storage and retrieval of agricultural data.

Location: MOA-Bujumbura

Duration: 6 years

Inputs: Expatriate expertise, local and scholarship training, vehicles, office equipment, operational capital.

Approx. Cost: US\$ 2.4 million

Beneficiaries: Ministry of Agr. → Ministry of Planning → the Agric. Economy → the Peasant Farmer.

2. Establishment and operation of a special "Small Farm Research Center".

Objective: To evaluate existing and develop new, suitable family farm systems and to prepare low cash, low risk technological packages for the improvement of food crop production.

Location: Rutegama - Province of Gitega

Duration: 6 years

Inputs: Expatriate specialists, consultancies, local and scholarship training, buildings, water and electricity installations workshop-laboratory-farm-office equipment, animals, operational capital.

Approx. Cost: US\$ 3.1 million

Beneficiaries: ISABU → GOB Extension Service → the small farmer → the Agr. Economy

3. Fertilizer Procurement and Supply.

Objective: Strengthening of the inefficient fertilizer purchasing, storage and distribution system for timely provision of reasonably priced fertilizers to small farmers.

Location: Bujumbura and Country Provinces.

Duration: 5 years

Inputs: Expatriate experts, consultancies, local and scholarship training, storage construction, transport facilities, office equipment, operation capital.

Approx. Cost: US\$ 2.2 million

Beneficiaries: MOA Dept. of Agronomy → National Fertilizer Committee → Input Supply Organizations → the Small Farmer → the Agr. Economy

4. Assistance to the ISABU - On Farm Storage Research Program.

Objective: Development of effective, low cost small farm storage methods to reduce post-harvest crop losses and to strengthen the marketing position of food crop producers.

Location: ISABU research centers

Duration: 3 years

Inputs: Expatriate expertise, vehicles, construction work, local training, consultancies.

Approx. Cost: US\$ 480,000

Beneficiaries: ISABU → MOA Extension Service → the Small Farmer → the Agr. Economy.

5. Support to the Agronomic Faculty - University of Burundi.

Objective: To provide funds for the construction of a teaching laboratory complex of 320 m<sup>2</sup> plus greenhouse of 100 m<sup>2</sup> and for an intensification of student field experimentation and practical training.

Location: Bujumbura

Duration: 2 and 4 years respectively

Approx. Cost: US\$ 400,000

Beneficiaries: University of Burundi → the Students → GOB  
→ Agric. Administration → ISABU → the Agric. Economy

Project design teams should be composed as follows:

- Project 1. Agric. and Marketing Statistics Expert  
Statistical Training Specialist  
Agricultural Planning Expert
- Project 2. Small Farm Management Expert (experienced in hill agriculture)  
Tropical Agronomist (experienced in peasant farm practices)  
Livestock Specialist (with experience in small ruminant  
production)  
Soil Conservation Expert (with experience in hill agriculture)
- Project 3. Fertilizer Procurement and Marketing Expert (with  
experience in developing countries)  
Fertilizer Logistics and Distribution Specialist (with  
experience in developing countries)
- Project 4. Small Farm Storage Specialist (with experience in  
developing countries)
- Project 5. Construction Engineer (with construction experience in  
developing countries)  
Agricultural Chemist (with experience in laboratory  
organization and training)

Bibliography

1. Activities Report 1978 Faculty of Agronomy - University of Burundi
2. ADC-Project Identification Mission Report - IBRD, 1976
3. Basic Food Crops - Phase I. USAID Project Paper
4. Etudes pour la Mise en Valeur de la Région de Kirundo. Rapport Final: Texte en Annexe 6 - 1978
5. Etudes sur les Cultures Vivrières et en particulier sur le Blé dans les Zones Théicoles. Société Mixte d'Etudes au Burundi (SOMEFU). 1977
6. FAO - Rapport du Programme Engrais - 1977
7. FAO - Rapport Intermédiaire au Gouvernement de la République du Burundi sur le Programme Engrais. 1972 - 1976
8. ISABU Annual Reports 1975 - 1977
9. ISABU - Five Year Development Plan 1977 - 1981
10. Les Régions de Muyinga, Ruyigi et du Mosso. Société d'Etudes pour le Développement Economique et Social. 1970
11. LEUCAENA. Promising Forage and Tree Crop for the Tropics. National Academy of Sciences. 1977
12. MASI - Rwanda Area Development Reconnaissance Survey. 1978.
13. Ministère de l'Agriculture et de l'Elevage - Rapport Annuel 1974 - 1975
14. Ministère de l'Agriculture et de l'Elevage - Projet "Cultures Vivrières en Haute Altitude" 1978
15. Plan Quinquennal de Développement Economique et Social du Burundi. 1978 - 1982
16. Programme Gouvernemental de Redressement National. 1977
17. Programme des Nations Unies pour le Développement du Burundi. ENUD. Juin 1978

18. Recent Economic Development and Prospects of Burundi; IBRD 1975
19. Small Farm Grain Storage - Appropriate Technologies for Development.  
Action/Peace Corps and Training Program Manual Series 2. 1976
20. Table Ronde des Aides Extérieures au Burundi. 21 - 24 Février 1978.

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Mr. A. Vaucalck - Secretary General

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Caritas - Catholic Missions Organization

Père Remacle - Director  
Père Knoll - Missionary Mutwenzi Mission Station

Alliance of Protestant Churches

Pasteur E. Ntahomereye - Dir. of Mission Activities

Société Mixte d'Etudes Au Burundi (SOMEBU)

Mr. J. Delchambre - Dir. General

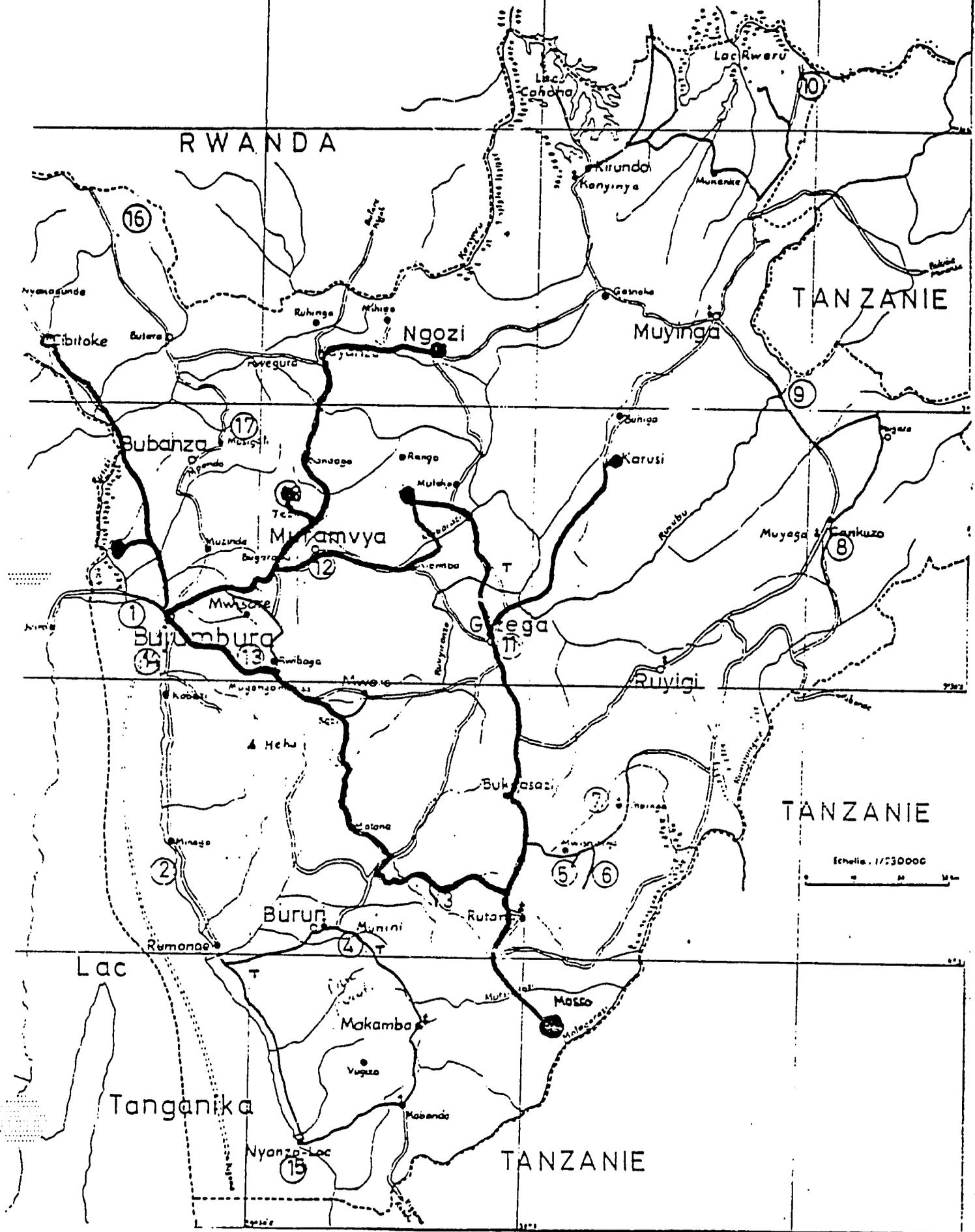
ABBREVIATIONS

ATB	Assistance Technique Belge
FAO	Food and Agric. Organization of the United Nations
FBU	Burundian Franc
FED	Fonds Européennes de Développement
GOB	Government of Burundi
IBRD	International Bank for Reconstruction and Development
IDA	International Development Agency
ISABU	Inst. Des Sciences Agronomiques du Burundi
MOA	Ministry of Agriculture
PNUD	United Nations Development Program
SOBUCOV	Soc. De Stockage et De Commercialization Des Produit Vivries du Burundi
SOMEBU	Soc. Mixte d'Etudes Au Burundi
UNICEF	Fonds Des Nations Unies Pour l'Enfance

Exchange Rate: \$1.00 U.S. = 89.55 FBU

# BURUNDI

CARTE TOURISTIQUE



RWANDA

TANZANIE

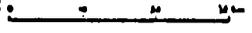
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TANZANIE

Lac

Tanganika

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Tanganika

Bururi

Rutana

Bujumbura

Gitega

Muyamvya

Muyinga

Ngozi

Bubanza

Kirundo

Nyamasunde

16

9

17

Karusi

12

8

1

13

11

10

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7

5

6

4

Makamba

15

Lac

Makamba

Vugata

Mabanda

Nyanza Lac

MOSO

Nyamasunde

16

9

17

Karusi

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Makamba

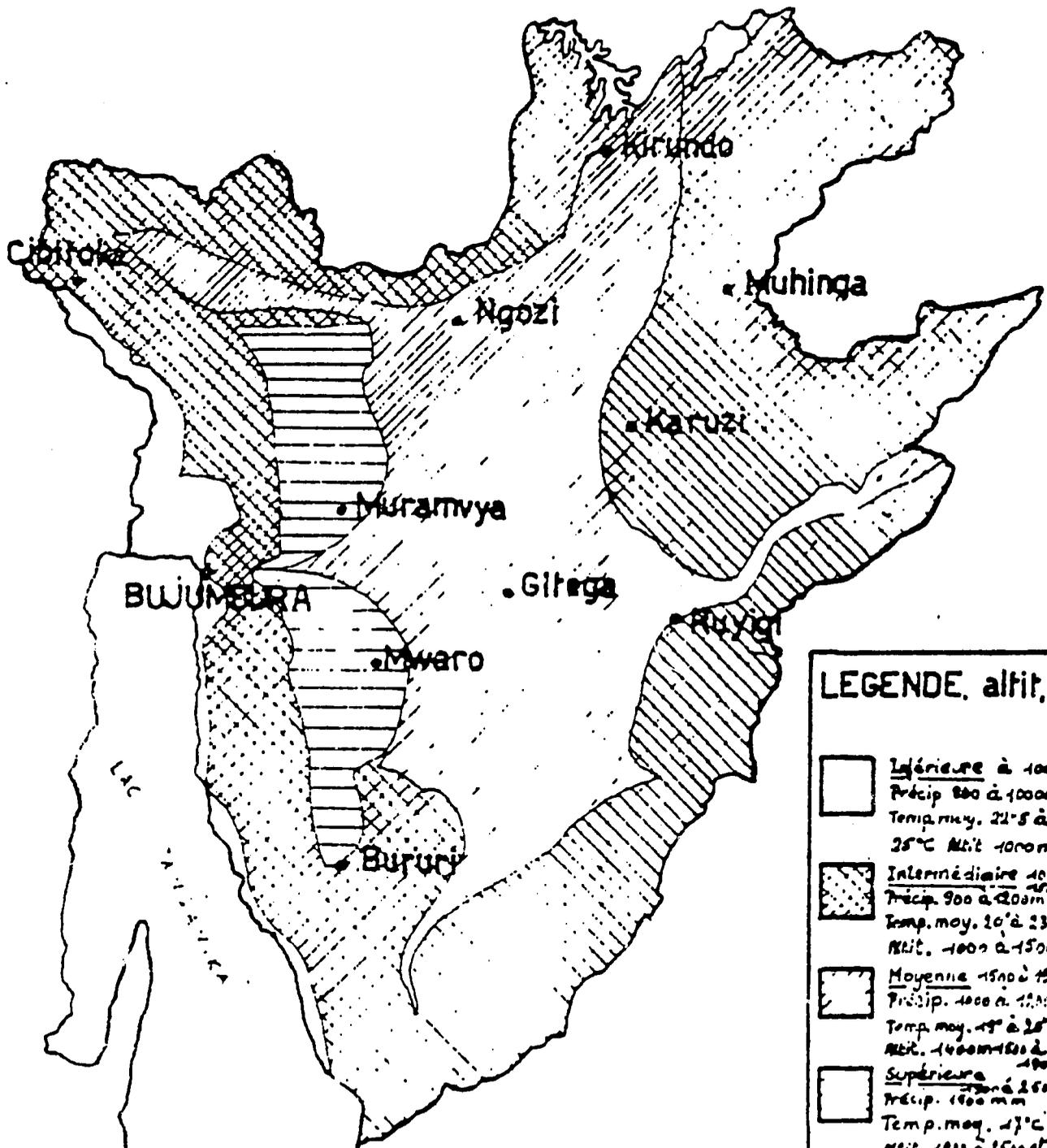
Vugata

Mabanda

Nyanza Lac

MOSO

# ZONES ECOLOGIQUES DU BURUNDI



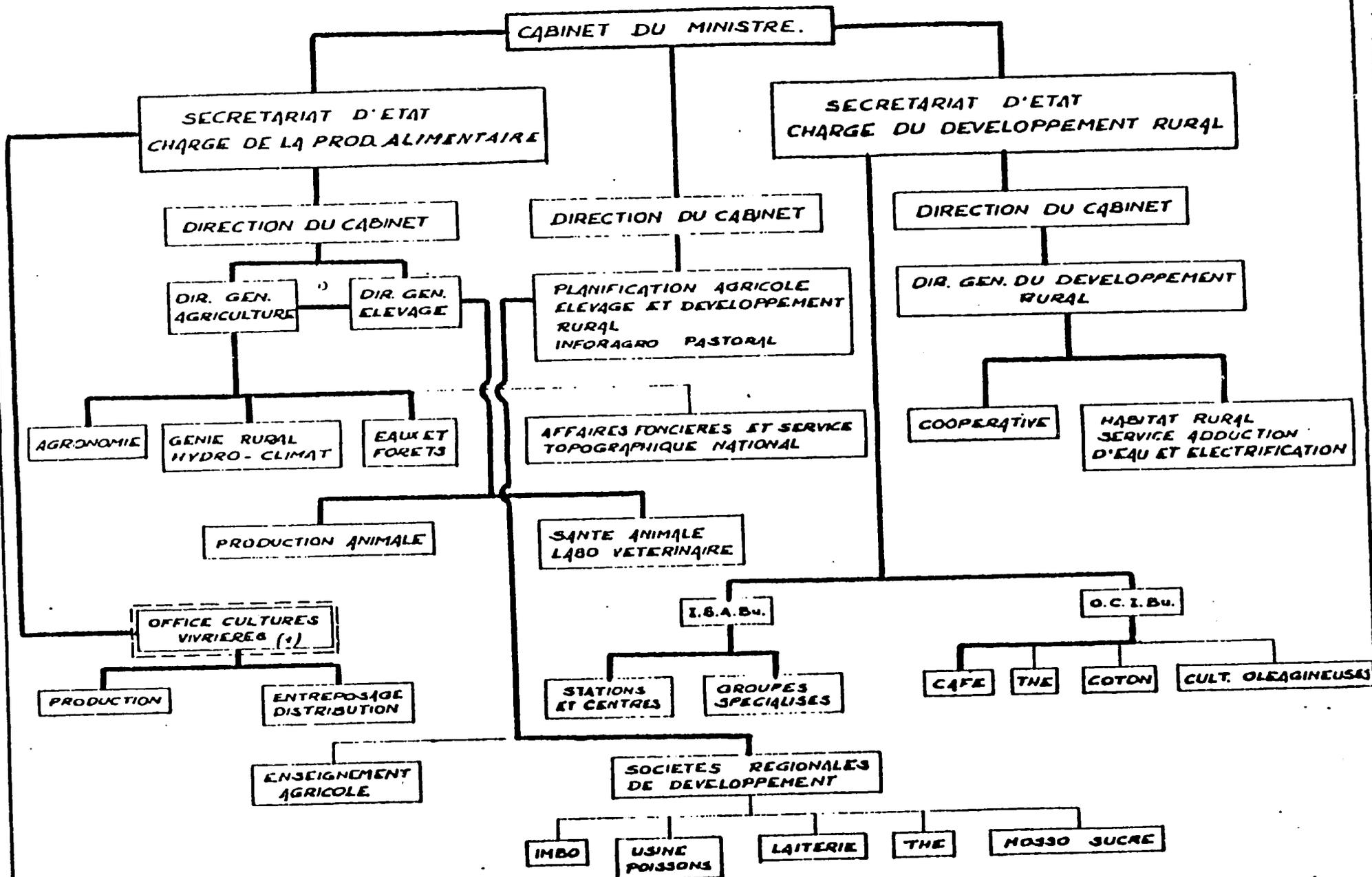
**LEGENDE, altit.**

	<b>Inferieure à 1000m</b> Précip. 800 à 1000mm Temp. moy. 21°S à 25°C Alt. 1000m
	<b>Intermediaire 1000 à 1500m</b> Précip. 900 à 1200mm Temp. moy. 20° à 23°C Alt. 1000 à 1500m
	<b>Moyenne 1500 à 1900m</b> Précip. 1000 à 1500mm Temp. moy. 19° à 25°C Alt. 1500 à 1900m
	<b>Superieure 1900 à 2500m</b> Précip. 1500 à 2500mm Temp. moy. 17°C Alt. 1900 à 2500 et plus

Echelle: 1:1000 000



# 1. ORGANIGRAMME DU MINISTRE DE L'AGRICULTURE, DE L'ÉLEVAGE DU DÉVELOPPEMENT RURAL

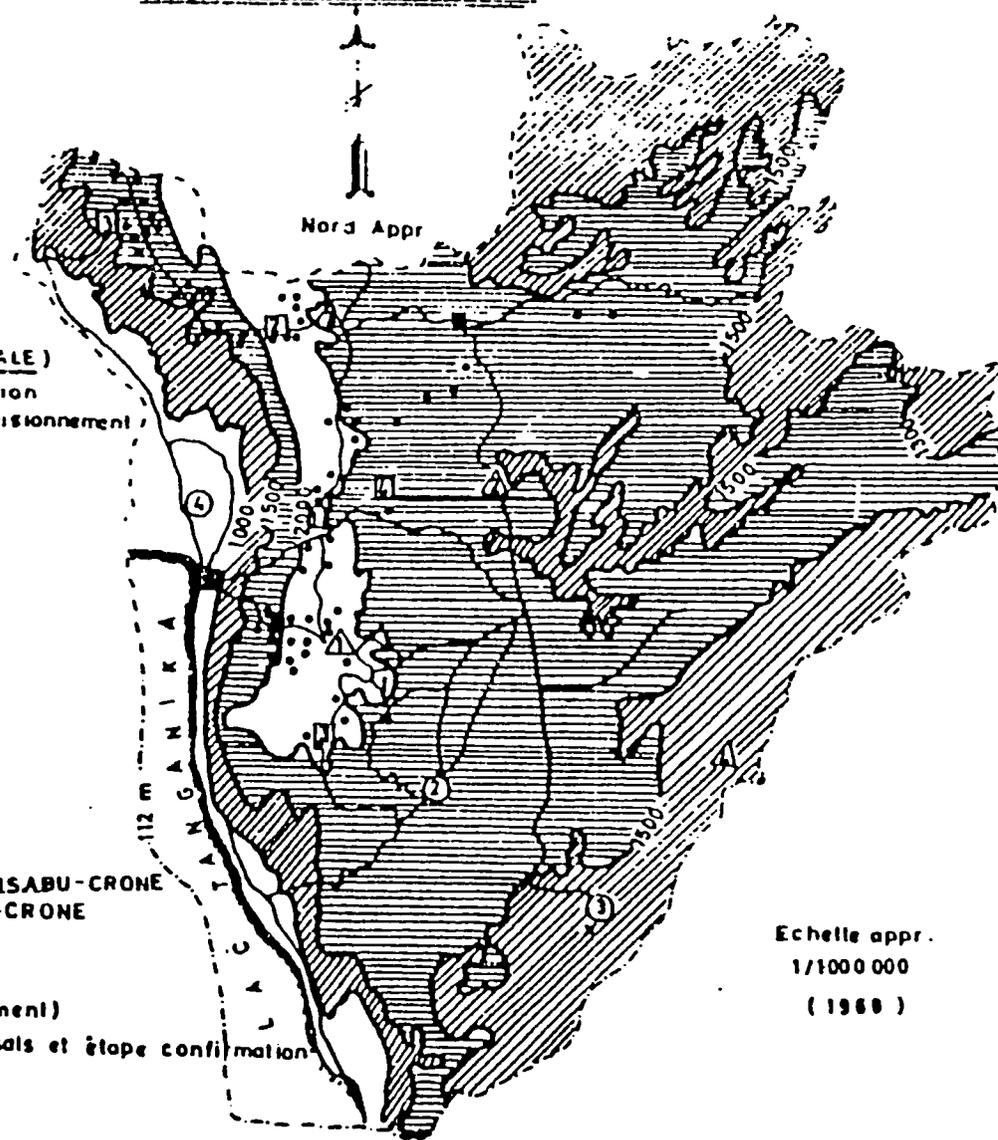


— Liens essentiels intéressant le Projet

(1) En voie de création

ACTIVITES DE L'ISABU

- LEGENDE**
- Route principale
  - 1500 - Courbes hypsométriques
  - - - Limite d'état
  - **BUJUMBURA (DIRECTION GENERALE)**  
Direction, planification, coordination  
Administration, comptabilité, approvisionnement  
Pédologie  
Phytopathologie  
Economie rurale  
Coordination thé
  - **STATIONS I.S.A.B.U**  
1 Kisozi -  
2 Lunronza  
3 Mosso  
4 Imbo (à créer)
  - △ **CENTRES AGRICOLES**  
1 Nyakararo  
2 Murongwe  
3 Munanira  
4 Kininya
  - **CHANTIERS THE**  
1 Teza ex. Bugarama: Association ISABU-CRONE  
2 Rwegura: Association I.S.A.B.U-CRONE  
3 Tora chantier thé INDACOM  
4 Muramvya (ISABU)
  - Parcelles Thé (Réseau compartement)
  - Mission engrais café Ngozi (essais et étape confirmation)
  - x Essai Tabac (MOSSO)



Echelle appr.  
1/1000 000  
( 1960 )

UNIVERSITE DU BURUNDI  
FACULTE DES SCIENCES AGRONOMIQUES.

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PROGRAMME DES COURS (1978-1979).

Ière année d'ingénieur agronome.

	<u>Théorie</u>	<u>Trav.pratiques-séminaires</u>
Entomologie générale	30	30
Microbiologie générale	30	30
Biochimie	45	-
Physiologie et anatomie animale	45	15
Génétique	30	15
Compléments de Physiologie végétale	30	-
Phytogéographie	22,5	-
Pédologie générale	45	30
Climatologie et Bioclimatologie	45	15
Zootechne générale I	22,5	7,5
Phytotechnie I	30	15
Topographie	15	30
Hydraulique	15	15
Biométrie et expérimentation	30	30
Economie rurale I	30	15
Nutrition générale	30	15

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495

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262,5

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757,5.

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690.

Période de stage sur le terrain : 3 semaines.

+ Période de stage et de travaux expérimentaux du mémoire : 4 mois minimum.

UNIVERSITE DU BURUNDI  
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---

PROGRAMME DES COURS.

2ème année d'ingénieur agronome.

	<u>Théorie</u>	<u>Travaux pratiques -séminaires.</u>
Phytopathologie (mycologie, virologie)	45	30
Pathologie animale	30	30
Parasites animaux des plantes	15	-
Agrostologie	30	15
Zootecnie générale II	45	30
Foresterie	30	15
Limnologie - Pêche - Pisciculture	45	15
Phytopharmacie	15	-
Fertilisation	30	15
Amélioration foncière	30	15
Technologie	30	15
Economie rurale II	30	15
Photointerprétation	15	30
Classification et cartographie des sols	15	15
Phytotechnie II	30	15
	435	255

690.

Période de stage sur le terrain : 3 semaines.

+ Période de stage et de travaux expérimentaux du mémoire : 4 mois minimum.

UNIVERSITE DU BURUNDI  
FACULTE DES SCIENCES AGRONOMIQUES.

PROGRAMME DES COURS.

3e Année d'ingénieur Agronome.

	<u>Théorie</u>	<u>Trav.pratiques -séminaires.</u>
Législation générale et agricole	30	-
Comptabilité	30	15
Marketing des produits agricoles	15	-
Planification agricole	30	15
Séminaires sur les méthodes de vulgarisation -		30
Séminaires sur l'aménagement global du milieu,		30
Sociologie générale et rurale	30	-
Constructions agricoles -Résistance des matériaux	30	30
Machines agricoles	30	30
Amélioration végétale	30	-
Zootechne spéciale	22,5	7,5
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405.

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Questions spéciales de phytotechnie	15
Questions spéciales de défense des cultures	15
	30

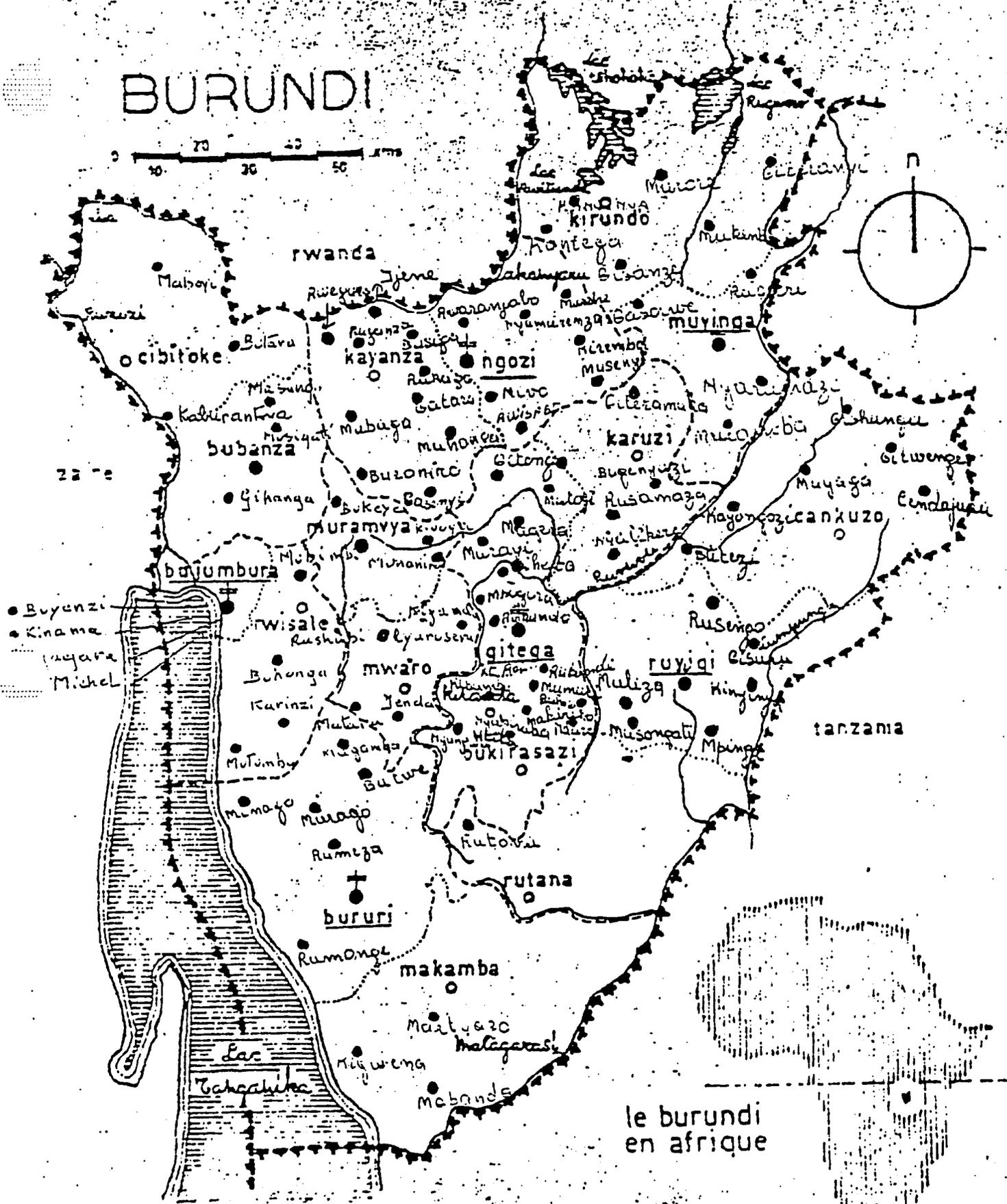
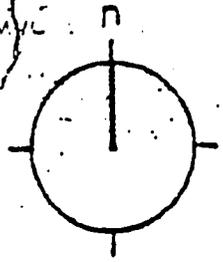
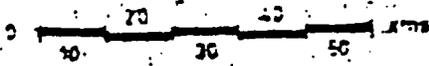
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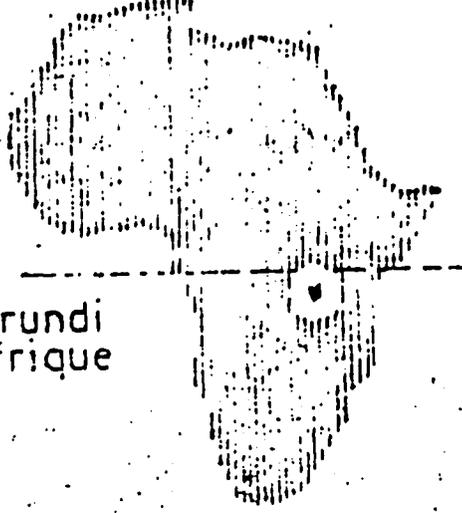
+ Période de stage et de travaux expérimentaux du mémoire : 4 mois minimum.

# BURUNDI



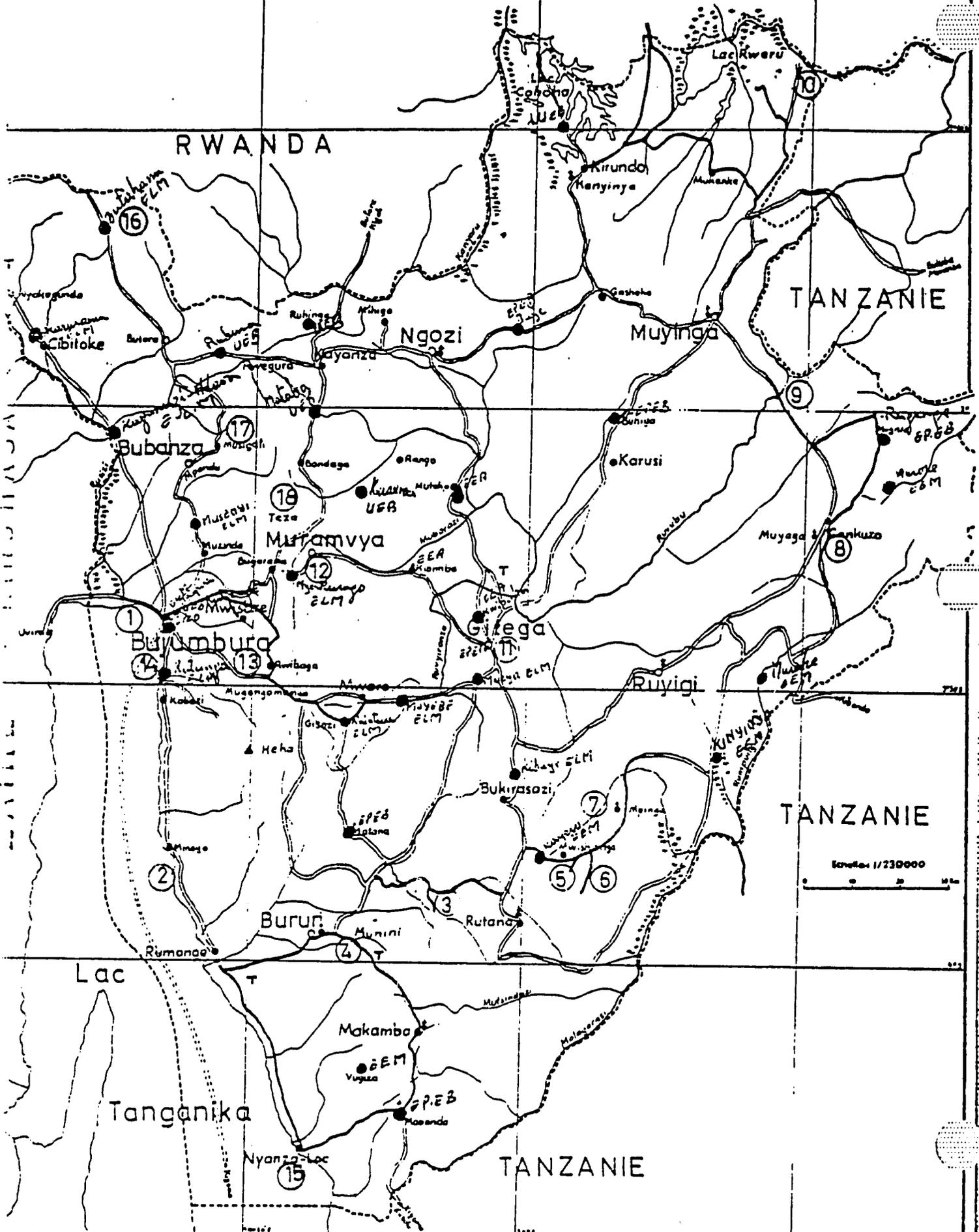
- Buyenzi
- Kinama
- Mucyana
- Michel

le burundi en afrique

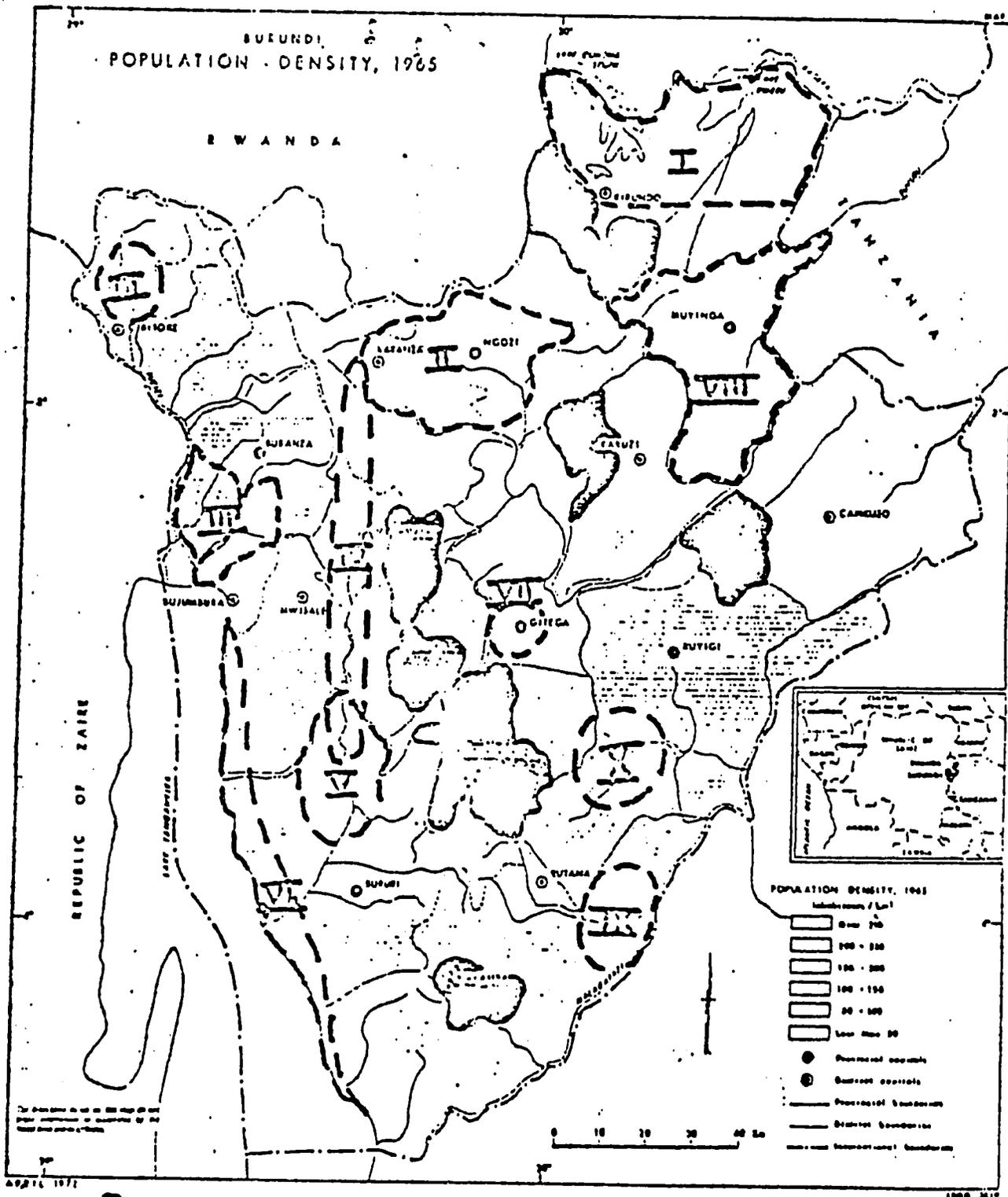


mission stations

# DURUINDI CARTE TOURISTIQUE



Location of ADC Project and Other Development Projects



**ADC Project**

- I. Kirundo Regional Development (under study by Belgian Tech. Aid)
- II. Coffee Improvement Projects (IDA)
- III. Ruzizi Valley Development Projects (FED)
- IV. Tea Projects (FED)
- V. Mugamba Livestock Projects (French & Belgium Technical Aid)
- VI. Fisheries Project (IDW)
- VII. Training Centers, ITAD (Belgian Technical Aid, 1960)
- VIII. Muyinga Rural Development (under study by USAID)
- IX. Mosso Sugar Project
- X. Mining Development.

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R E P O R T

BURUNDI AGRICULTURAL SECTOR ASSESSMENT, No. 698-0135

EXTENSION/ADMINISTRATION/TRAINING

JOHN B. SWECKER

MAY 4, 1979

PRESENTED TO:

MULTINATIONAL AGRIBUSINESS SYSTEMS INCORPORATED,  
1728 K. STREET, N.W. WASHINGTON, D.C.

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## SUMMARY AND CONCLUSIONS

1. Burundi farmers, more especially those who grow food crops, are lacking effective extension services to assist them solve a serious agricultural situation of decreasing land resources due to soil erosion, diminishing soil fertility, declining crop yields and mounting population pressure on the land that is decreasing the size of already tiny farm units.
2. A separate organization for agricultural extension service is lacking. 'So called' extension is located in the Department of Agronomy, Ministry of Agriculture, however, it is fragmented among other Departments in the Ministry, quasi-government agencies and agricultural projects and programs throughout the country. Therefore, a dual system of extension is in play. On the one hand, a rudimentary government extension and on the other a project extension, somewhat more effective; but far from being successful.
3. Support of agricultural personnel at all administrative levels is non-existent, or weak at best. Personnel lack transport, funds, equipment and supplies to perform the functions of their positions. Low morale and lack of dedication are perceptible.
4. Institutions for training middle level personnel, technicians and assistants, are adequate and well equipped. However, they are not utilized to the best advantage. There is little relationship between the extent of preservice training received by technicians and assistants and their performance in the field.

5. A projected apex employment of 3200 monitors by mid 1980 (1 for each 250 family units) will require an additional training facility to accommodate 30 students annually. This, in addition to 25 trained at Kihanga will provide agriculturally trained monitors in sufficient numbers to replace those lost through attrition only.

6. Approximately 88% of the monitors presently employed did not receive institutional training in agricultural technologies and extension methods. Until recently, no effort had been made to provide much needed in-service training to this level employee. (See extension and training development projects for details of GOB/FAO in-service training to be initiated in near future). There is need for an extensive in-service training program for monitors to be conducted on a sustained basis (see project proposals).

7. It is difficult to ascertain the extent that the quality of life of subsistence food crop farmers in Burundi can be enhanced by Government and donor assistance projects and programs. However, it is certain that a well conceived organization for extension services, that addresses the needs of rural people and makes available to them, by an educational process, improved agricultural technologies and methods, will make the task easier and more meaningful.

## I. INTRODUCTION

A general objective of the agricultural sector assessment is to provide a descriptive and quantitative analysis, where possible, of the agricultural sector of Burundi. In addition to extension and training the assessment involved other agricultural disciplines including: agronomy, agricultural economics, sociology, soil conservation, nutrition economics and education. The last two mentioned disciplines provided specialists for two and one-half weeks of an 8 weeks team assignment.

Information gained through the assessment may be used by USAID to identify, design and implement development assistance projects and programs which will assist the Burundi Government to accomplish its stated goals to increase production and to improve the quality of living of the rural population.

This section of the assessment is specific for agricultural extension and training. It attempts to define the existing situation, delimit problems, identify needs, provide development strategy and suggest specific assistance projects relating directly to extension and training.

Information for the assessment was derived from many sources including: a review of government reports, reports of government departments and agencies, donor reports, country studies, handbooks.

periodicals and other printed materials. Direct contacts were made with government officials, donor personnel, institutional staffs, church mission representatives, extension and research personnel at all position levels and farmers. (See Bibliography for details.)

A preliminary review of printed materials indicated that the nature and functions of extension and the purpose for agricultural training were not well understood by administrative personnel from national to farmer levels. At the onset, and continuing through the various stages of the assessment this factor became more vivid. It appears that all efforts to implement effective agricultural extension have been unsuccessful.

## II AN OVERVIEW OF AGRICULTURAL EXTENSION AND TRAINING

### 1. Organization for Extension

In the organizational structure of the Ministry of Agriculture, extension is not included as a separate administration unit. Rather, it is an indistinct part of the Agronomy Department, M.O.A., with its functions integrated with many other functions of the Department. An organization to provide extension services to farmers is lacking. By almost any standards it is a very rudimentary system of government extension.

As early as 1924, there was evidence of extension in Burundi. The nature of this extension was stated in an ordinance dated November 7, 1924 which gave District Officers the power of compelling cultivations, only for their own profit, to plant food crops, do harvest work and plant export crops. In spite of resistance of farmers, extension service insisted that sweet potatoes be grown in the marshes, which before was reserved for cattle in the dry season /1

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/1 Agricultural Change in Rwanda-Urundi, 1945-1960. Phillip P. Leurquin, 1963.

With a sharp decline in coffee production in the period 1959-1966, extension was increased to carry out government policies dealing with factors causing the production decline, such as poor crop care (fertilizing and mulching), abandonment of holdings, losses from diseases and insects and unfavorable weather conditions. At this time a new agricultural training institution, The Institute of Technical Agriculture of Burundi (ITAB), was opened, thereby increasing the number of agriculturally trained persons for extension. Consequently, its scope has increased during the past 2 1/2 decades, particularly for project extension. However, its principles and methods remain the same, and a well defined organization for extension is still lacking.

Church missions also give agricultural assistance to farmers. They lack a system for administering assistance country wide, however, on an institutional basis, missions use extension methods, such as demonstrations, campaigns, group meetings and individual contacts to transmit agricultural technologies to food crop farmers. success has resulted from their efforts. This contrasts to autocratic methods used by Government to provide extension, largely, to cash crop and livestock farmers, and neglecting those who need it most - the food crop farmers.

Extension is carried out by technicians in the provinces, by assistants at the zone/commune level and monitors at the farmer level. Technicians and assistants are identified by the nature and responsibilities of their assignment i.e. crop technicians, forestry techni-

cians, vegetable assistants, etc. There is no evidence of extension technicians or extension assistants. Monitors are the direct linkage between farmer and Government and the only agricultural functionaries to come in direct contact with farmers. They are inadequately trained, being deficient in both agricultural knowledge and extension methodology. As a result the linkage is very weak.

Extension in Burundi is highly fragmented. Various departments in the Ministry of Agriculture, quasi-government agencies, cash crop projects, settlements, etc. operate their own extension service. This is commonly referred to as project extension. The nature and scope of extension on a given project is determined by size of operation and function performed. Various categories of agricultural personnel, technicians, assistants and monitors are used to conduct extension relating to the project. Formulas have been devised and are used by project directors to determine the number and kind of personnel needed on a given project: example, one technician per 1400 ha. of rice, 1 assistant per 1000 ha. of rice and 1 monitor per 500 ha. of rice.

Project directors are their own director of extension. Like government, project extension tends to address assistance to cash crop and livestock farmers, leaving food crop farmers without assistance.

## 2. Organization for Extension Training

Training of personnel inputs must bear a close relationship to the agricultural extension effort. In the Ministry of Agriculture, extension is located in the Agronomy Department, and training is in the Planning Division.

Three institutions, below the higher education level, have a role in training agricultural personnel. Each has a responsibility to train students for a specific grade or position level. They are: The Institute of Technical Agriculture of Burundi (ITAB), opened in 1965, is located near Gitega and trains agricultural and veterinary technicians for positions at the provincial level and specific agricultural positions in Government and in Agricultural projects throughout the country. On most projects there are indications of extension training. First, project technicians who have graduated from ITAB, provide one month of pre-service training to monitors as they are appointed to positions on the project and secondly, one month of in-service training is given to technicians once per year. This training is directed to agricultural technologies and does not touch upon extension methodology.

The professional School of Agriculture (EPA), at Karuzi, was opened in 1956 to train students for assistant agricultural positions. Included in their agricultural duties, assistants have a responsibility

of giving pre-service training to monitors. A further responsibility is to provide supervision to monitors and assign them responsibilities.

The third institution that provides agricultural training is the Agricultural Training Center (C.E.V.A.), located 25 kms. Northwest of Bujumbura. It is the only institution in the country that gives training to monitors, the most numerous of agricultural personnel. In 1977 this institution was moved from Rutegama where it was known as the Center for Social Promotion since 1969. Its function was to train students for monitor positions.

At the higher educational level, the Department of Agronomy of the National University of Burundi offers a curriculum whereby students can pursue an engineer agronome degree (B.Sc.) in Agriculture. Only one class, 7 in number, has graduated from this curriculum. Due to a deficiency of qualified personnel in administrative positions in Government, the graduates are finding themselves in Government administration rather than in agricultural positions.

In addition to institutional, a limited amount of non-institutional training takes place throughout the country. This is on-the-job training for monitors, who have recently received an appointment from Government. The training is for a period of one month and is generally supervised by an agricultural agronome; the highest level agriculturist in a province. However, it is given by technicians and assistants in the area where the monitors will work. Training is

held in any suitable facility available. Much use is made of primary schools when other facilities are not available.

### III TRAINED PERSONNEL WITHIN THE FRAMEWORK OF EXTENSION

#### 1. Administrative and Field Level

The fact is that a distinct organization is lacking at the national level, extension is highly fragmented and responsibility for its functioning and management is not specific for a single individual, even in the Department of Agronomy where it is located. Analogous to this is a lack of staff with specific training in agricultural extension to plan and implement an effective program.

A similar situation exists in quasi-government agencies and projects. Personnel assigned to projects have had little opportunity to learn about and gain experience in conducting a program of agricultural extension.

Throughout the agricultural sector different terminology is used to identify various grades of personnel below the national level. From top to bottom of the hierarchy the most common terms used to identify persons in the various positions are; (1) technicians (technician agronome), (2) assistants (assistant agronome), and monitors (moniteur agronome). The term encadreur is being used more frequently in place of monitor. In some cases the top agriculturist in a province is an agronome who received training, other than in Burundi and has been in the position for a long periods of time.

Technicians are posted at the provincial level and coordinate the activities of 3 assistants who are located at the zone/commune level. Their stated function is to implement Ministry of Agriculture policies and programs in their area. In this respect they serve more as administrators of policy than as extension workers addressing the problems of farmers. They are secondary school graduates with 4 years of agricultural training at ITAB.

Characteristic of technicians in agricultural positions at the provincial level, is their notion of being underpaid and in a position lower than their extensive training should warrant. They would like a position that locates them in an urban setting and not among rural people. They are not provided transport and have no funds, equipment or supplies to perform the duties of their position. They are also characterized by those on the local scene as being the least motivated of agricultural personnel. Consequently they are doing little to develop agriculture in Burundi.

On the other hand, some technicians, assigned to special projects or programs ex. research centers, which are adequately funded usually by donors, are better motivated and are performing in a better manner. Although, they have specific duties relating to agriculture, are better paid and provided transport, they are out of the mainstream of peasant agriculture and their contribution to extension is minimal.

Assistants (also referred to as monitors or agriculturists) are primary school graduates who have completed a three year course

of agricultural training in EPA. Assistants coordinate activities of 4 or 5 monitors who are located at the zone or commune level of administration. They are the immediate supervisor of the monitors and give on the job training to those who have not had institutional training after graduating from primary school.

The assistants are poorly and irregularly paid. As with technicians they have no transport, equipment and supplies to perform the functions of their position. Their limited extension activities are directed to cattle and cash crops. They, as a group, are not highly motivated; but unlike technicians are more prone to be satisfied living and working at the lower level even though their institutional training has not prepared them adequately in basic agricultural subject matter and extension methodology.

The lowest level of agricultural personnel are monitors. They are by far the most numerous and the least trained of the agriculturists. About 88% of the monitors presently employed were recruited after graduation from primary school and with one month of on-the-job training. They are expected to give extension services to farmers.

Monitors are the direct linkage between farmers and Government. They are responsible for giving extension to farmers on 3 to 5 hills which taken together make a "sector", a subdivision of one of the 78 communes in Burundi. Although he has a superior, an agricultural assistant, the monitor is obliged to carry out the policies of the commune administrator who may or may not know or care about the needs of farmers.

In 1978 the total number employed in this part of extension commonly referred to as government extension was 886. The workers distributed among the several extension position in 1978 with figures in parentheses representing 1979 projections were: Technicians-28 (34), assistants-84 (98) and monitors-928 (1043)\*. These figures differ slightly from those obtained from the Department of Agronomy.

Due to the absence of an organization for carrying out extension from national to farmer level efforts are largely ineffective. The only evidence of extension getting to farmers is with cash crop and livestock farmers - none to food crop farmers who need more than others.

## 2. Project Personnel

As in some other African countries extension in Burundi does not have a single linkage between the government and farmers. It is roughly divided between government extension and project extension.

Government extension personnel at all levels, national, provincial and zone/commune are employed and paid by the Government, through the Agronomy Department. They are civil servants. On the other hand, in project extension, quasi-government agencies, projects and programs conduct their own agricultural extension. Examples are,

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\* Third Five Year Plan - 1978-1982.

research stations, tea and coffee projects, settlements, cooperatives, forestry, fisheries, etc. The project director is also the director of extension and all grades of extension personnel, positioned on the project are submissive to him. The nature of extension is autocratic and bears no relationship to a system of extension whose purpose is to assist farmers to identify and solve their problems. This is well illustrated by a statement from the director of a research station during a discussion on the role of monitors in the station's research program. Quote, "he tells the farmers what we tell him to tell them and if they (the farmers) don't listen and obey they are punished". The monitor has no recourse, he must tell the farmers what to do, right or wrong, and insist that they obey. The extension personnel received their pay from the project and unlike from Government it is received on a regular basis and more likely than not the salary scale is higher. The size and nature of a project will dictate the number and level of personnel required.

Below is the staff of a typical research station:

<u>Position</u>	<u>Number of Staff</u>
Agronome	1
Technician (vegetables)	1
Technician (other crops)	1
Technician (animal)	1
Assistant	1
Monitor	18

In 1978 the total number of agricultural personnel found in the various projects and programs throughout the country was 766<sup>\*</sup>, a distribution of the total with 1979 projections in parentheses is as follows:

Technicians-62 (70), assistants-68 (82) and monitors -382 (548)

The projected need for technicians, assistants and monitors to staff government and project agricultural positions in 1982 is as follows:

Technicians 130, assistants 250 and monitors 2570.\*

This projection is realistic given the present training facilities.

Other extension functions of projects, more especially research stations are to provide in-service training for their technicians and provide practical training for students from ITAB and EPA.

### 3. Training Personnel

A very important element of agricultural extension is training of personnel. This refers to the "trainers of the trainers", the staff in institutions who prepare students for agricultural positions at the various administrative levels. Competency and dedication, which characterizes an effective staff member in a training institution are deficient in the Burundi situation. This does not infer that all staff are incompetent or not dedicated. However, a noticeable element of each exists. In regards to competency a great many have not had the opportunity to become adequately trained in agricultural

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\* Third 5 Year Plan - 1978-1982

subject matter. One staff member in EPA stated that he had specific training in extension methodology and communication.

Dedication and motivation taken together create a problem in the institutions. It is not conducive to the self-ego of some staff members to live away from the city in a rural environment after spending considerable time and effort to become educated.

Four principal categories of staff are found in the training institutions. They are full-time or permanent nationals, part-time or visiting nationals, expatriates on specific assignments and visiting expatriates. Part-time nationals are government employees who are called upon to teach specific topics for a short period of time.

#### IV CAPABILITIES TO PROVIDE EXPANDED AND IMPROVED EXTENSION AND TRAINING

A network of agriculture related institutions - training, research is in place, but is weak, and is mainly oriented towards crops and livestock. /1

Existing agricultural training facilities in Burundi are presently underutilized and appear adequate to train the number of agricultural personnel who will be needed for the country's development over the medium term. /2

The CDSS statement and World Bank report, except for monitor training, accurately evaluate and go a long ways towards describing the capabilities of institutions to provide expanded and improved extension education and training.

An overview of the institutions, from bottom to top of the hierarchy, gives an assessment of their three principal components; facilities, staff and curriculum and provides an insight to their capabilities for expanding and improving training.

The Agricultural Training Center at Kihanga (CFVA) is responsible for training monitors in theory as well as practical agricultural subject matter. The capacity of the center is 25 students, and the present enrollment is 23. The Center's facilities are new and quite adequate.

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/1 Country Development Strategy Statement, June 1978, AAO Burundi, prepared by REDSO/EA.

/2 World Bank Report 1978, Round Table, Bujumbura.

This includes, classrooms dormitories, land, supplies and equipment for practical training, office, storage etc.

Although the curriculum shows a high percentage of theory to practical, 85% to 15% respectively, it is adequate for the training needs of the students (See Appendix 1). The eleven hectares of land, comprising the school compound are being used efficiently and effectively for practical training in both food and cash crops. The curriculum includes extension planning but neglects extension methods and communication.

Staff of the Training Center includes the Headmaster (expatriate), two full-time teachers (expatriate) and nine part-time Burundi nationals who have had training abroad (Europe). The nationals are government employees who teach selected subjects or topics on call. Staff numbers and their qualifications are adequate. In fact all elements in Kihanga are adequate to train 25 students each year. To accommodate more students and improve the quality of training will require additional facilities. This is treated later in the report.

The Professional School of Agriculture, EPA, has a principal function to provide three years of theory and practical training in agricultural technologies to prepare students for assistant positions at the sub-provincial levels. The present enrollment is 108 students. The capacity of the school to graduate 35 students per year has not been utilized efficiently.

Facilities for training, except for teaching materials, in EPA are adequate. However, the full potential of the facility for both quantity and quality training, is not being realized. The curriculum, being general and academic oriented lacks agricultural subjects needed for training students properly as agriculturists. It also lacks in subjects needed to develop an understanding of extension methods and communication (See Annex 2). Persons acquainted with the local situation verify that students from EPA have more practical agricultural skills than those from ITAB. However, there is doubt about the school using its practical training facilities to full advantage.

The EPA staff is comprised of 6 Burundi and 4 Rwanda nationals. The educational level of staff members is as follows: two with 2 years of university training, 2 who are secondary school level, 4 agronomes and 2 who teach religious subjects. It is not clear about when and where the staff members, referred to as agronomes, received their training. One staff member received agricultural extension/ education training in Egerton College, Kenya. Qualifications of the staff are based more on general subjects rather than technical agriculture.

Pending completion of a new dormitory, EPA will enroll women students for the first time, probably in 1980.

This institution is not reaching its full potential as an agricultural training facility. With a revised curriculum and more competent staff it has far reaching capabilities for providing expanded and improved training in agricultural subject matter and extension education.

The principal function of the Institute of Technical Agriculture (ITAB) is to train agricultural and veterinary technicians. The training period is four years, and students are graduates of secondary schools. Facilities are adequate, except for books and laboratory supplies. However, they have been underutilized as indicated by past, present and projected student enrollment. In 1976-77, 104 students were enrolled; 1977-78, 150 students; 1978-79, 200 students; in September 1979, 230 students are expected and in 1982 the projected enrollment is for 250 students. There are 40 female students presently enrolled in ITAB.

The staff is barely adequate for the present enrollment and additions are necessary for anticipated increases in coming years. The total staff is comprised of 13 full-time teachers, 8 visiting (part-time) teachers, 2 assistants and 3 expatriates. The qualification level of the staff is reasonably high. Two of the full-time staff members have a Doctorate degree and three are Engineer Agronomes. Dedication of staff is low.

The ITAB curriculum\*, both theoretical and practical, is live-stock and cash crop oriented. To provide expanded and improved agricultural training, congruent with the needs of extension and the rural population, will require considerable revision and upgrading. A slight move has been made in this direction with the initiation of a program to strengthen the practical training and methods of teaching agriculture; much more needs to be done.

In addition, a social laboratory, involving some 1000 families residing in 3 collines, is being established to provide practical training in the field of rural development to include agriculture. ITAB owns approximately 125 ha. of agricultural land which has not been fully developed as a teaching laboratory.

For the capabilities of the Faculty of Agronomy, National University of Burundi, refer to separate report on training by Janet Poley, International Training Division, USDA.

\* Description of courses in Agricultural Technician Curriculum available - but no time assignment for individual courses. See Annex 3 for Veterinary Technician Curriculum.

## V. CONSTRAINTS OF EXTENSION AND TRAINING

### 1. Extension

The absence of a well-defined organization for planning and executing effective agricultural extension, from national to farmer levels, is a serious problem. Coordination of extension, training and research, an important function of extension, is lacking at all levels. Agricultural research is weak and not oriented to the needs of small farmers. The results are not interpreted and made available to personnel who need it, including staff in training institutions and personnel posted in provincial, zone and commune positions.

Lines of communication from the national level to farmers are extremely weak. Consequently, supervision and assignment of responsibilities in the various positions are elementary and poorly motivated and ineffective civil servants is the end result.

Input support required for effective extension at the various position levels is not forthcoming from the Government. Extension is conducted in an autocratic manner. It is reacted to as Government policy rather than an educational exercise. Punishment, for failure by farmers to carry out practices prescribed to them is not unheard of.

Church missions have found that well conceived and executed demonstrations are effective to introduce and get acceptance of farming practices. This extension method is not practiced widely by extension personnel.

Farmers reacted strongly to an increase in coffee prices in 1973. This is evidence that farmers will react when there is incentive to do so. Government needs take precedence over farmer needs in matters of extension.

A preponderance of the weight of agricultural production in Burundi falls on the shoulders of women. No evidence is available to indicate that rural women have a role in matters of agricultural extension.

## 2. Training

The lowest level of extension staff is inadequately trained for the assignment of helping peasant farmers to solve their serious agricultural problems. This constitutes a major obstacle to planning and conducting an effective program of agricultural extension.

Monitors, the low level staff, are of the peasant farmers and have their support and confidence. However, they lack technical knowledge and communicative skills to introduce and gain acceptance of improved agricultural practices which will minimize loss of soil by erosion, sustain soil fertility, make use of better seeds, produce more nutritious crops and employ better cultural practices.

By and large, monitors are recruited after graduation from primary school and given on-the-job training by assistants, their immediate superior in the extension hierarchy. Only one in approximately eight of the monitors now in service have had institutional agricultural training. None have had in-service or refresher training.

Institutions and facilities for training agricultural personnel are adequate but underutilized is frequently vented by persons on the local scene. Therefore, it is concluded that there is both a curriculum problem and a staff problem in the agricultural training institutions.

There are common weaknesses in the curricula of the two principal institutions - ITAB and EPA. The most prominent being the insufficiency

in practical training and methods by which it is given. This shows as a weakness in the graduates from both schools. The nature of practical training is not applicable to small-holder farming. Neither school makes full use of available land on or near the school compound for practical training. Off campus facilities, including local farms, research stations and agricultural projects are used for this purpose.

The theory aspect of the curriculum in both ITAB and EPA is weak in agricultural subjects and not addressed to the needs of farmers. In particular, this applies to EPA. The EPA curriculum, in particular, is lacking in subjects and practical training directed towards extension methods and communications (See Annex 2).

Upgrading the staff in both ITAB and EPA is required if they are to achieve full potential as agricultural training institutions. Both need more staff who are qualified in technical agriculture as well as methods of teaching.

## VI. NEEDS OF EXTENSION PERSONNEL

### 1. Local level

The principal need of local level personnel is for in-service training in technical knowledge and extension methodology required to conduct effective extension to farmers. This should be given high priority in any bilateral assistance undertaken by USAID to enhance agricultural extension in Burundi.

A well conceived and executed program of in-service training for local level extension staff may be the shortest route possible to meeting the basic assist

ance needs of the rural people. Such training would form a basis for accelerated personal improvement and development of local level staff that otherwise would be impossible. Specific objectives to enhance the effectiveness of an in-service training program, are as follows:

- a. To develop basic agricultural knowledge and skills which have a close relationship to the needs of peasant farmers.
- b. To develop skill in assisting farm people to identify and solve their problems.
- c. To develop skill in the use of extension methods.
- d. To develop a favorable attitude towards the purposes and objectives of agricultural extension.
- e. To create an awareness of sources of information needed to make extension effective.
- f. To develop the ability to plan and conduct an effective program of extension.

Local level staff, more especially the monitors, need the support and supervision of personnel in higher level positions. All personnel require administrative support for materials and personal amenities needed to perform the functions of their positions such as; equipment, supplies, transportation and payment of salary on a regular basis.

There is a need for all field staff to be divorced from duties which give priority to administering Government policy and relegates extension to a secondary role.

## 2. Training level

The basic need of training personnel is to have a curriculum that includes subjects and subject matter which addresses agricultural problems inherent to Burundi, provides a favorable ratio of theory and practical experience and includes subjects which emphasize skills and techniques of agricultural extension.

Both ITAB and EPA need a staff development program which, among other things, recognizes competence and dedication as basic qualifications for advanced study and promotion.

Concerted effort by Government to meet a need for more amenities of life for staff who are dedicated and want to make their home at or near the institution in which they teach. Many amenities of life are lacking in rural areas where the institutions are located and people with high educational qualifications do not like to live there permanently.

## 3. Administrative Level

The first and foremost need of administrative personnel is to have a separate organizational unit in the MOA, whereby responsibility for developing an informal agricultural education system (extension) for the rural population may be undertaken. To fulfil this need, personnel in Government, especially the MOA, must have an understanding of the principles, purposes and functions of extension. This can only be accomplished through an educational process.

Given the absence of a distinct organization for extension it is highly questionable whether personnel in the Department of Agronomy, who are linked with extension and need training should have it provided through a GOB/USAID project. It is a high risk area for intervention with little potential benefit to the rural population.

However, if and when extension and training becomes a separate unit in MOA, with autonomy for administration, both long-term and short-term participant training will be needed to develop staff at the national, provincial and zone/commune levels.

An administrative function, gravely needed, to coordinate extension, training and research is not practiced. As stated previously, agricultural research is weak and not oriented to small food crop farmers. However, if results were interpreted and made available to personnel who can use them including staff in training institutions as well as personnel posted in provincial, zone and commune positions; a need would be fulfilled. Otherwise all efforts of research are wasted.

#### VII. ADMINISTRATIVE TRAINING, INSTITUTIONS AND FACILITIES REQUIRED

Personal contacts with a wide range of personnel in Government and elsewhere has failed to identify persons in administrative positions who have had training specific for extension administration. This is not an unusual situation. At the moment, no agricultural training institution in Burundi is offering courses or parts of courses which

deal directly with extension administration. However, a significant section in the ITAB curriculum is allocated to extension methods, communication and planning extension programs.

Any bilateral development assistance projects undertaken by GOB/ USAID, relating to agricultural extension should be preceded by a series of courses in agriculture for people in agricultural administrative positions. Courses suggested are as follows:

- (1) Development and operation of agricultural extension programs;
- (2) Agricultural trainer development and
- (3) Keys to agricultural development at the local level.

(Details are found in a separate report by Janet K. Poley, Assistant Deputy Director, International Training Division U.S.D.A.).

Training for extension administration is hardly needed as long as the program remains an indistinct part of the Agronomy Department. On becoming a separate unit in MOA, the staff would require two kinds of training. One would be long-term, two year and one year, administrative, supervisory and management training in a country known to have a successful and ongoing program of extension. The two-year program should concentrate on top level extension personnel and be largely institutional with provisions for experience gathering at the grass roots level. The one-year program should be for a selected extension person, technician, from each of the eight provinces. This training should provide for both institutional and experience in a ratio of approximately 4 - 1, and be conducted in French speaking countries in Africa if possible.

A second kind of training for two selected assistants from each of the eight provinces should be short term or experience gathering in nature. It should be for approximately one month duration and involve a tour of countries in Africa, or elsewhere, where successful extension programs are in operation (Kenya, Nigeria, Lesotho, others).

An effective extension service requires a program of in-service training for personnel at all levels. The in-service training should include administration and policy procedures, as well as keeping staff up to date on agricultural subject matter, extension teaching methods and communication skills. Facility requirements for administrative extension training are minimal. Once an administrative staff is trained and positioned, turnover is so infrequent that on the job training is sufficient to provide administrative skills to staff replacements if they are otherwise qualified in agricultural subject matter and extension methods and principles.

In addition to offices, a department of extension and training should have facilities for in-service training and other activities which are carried on through conferences, meetings, seminars, etc. Facilities including room space, equipment and supplies for preparing and duplicating teaching materials are required.

#### VIII. EXTENSION AND TRAINING DEVELOPMENT PROJECTS

Donors, consisting of Foreign Governments and International Agencies have provided substantial development assistance to Burundi during past

years. However, a review of projects, project proposals and assistance programs of various donors, revealed an insignificant amount of the total was directed to development assistant projects and programs to assist the food crop farmers, "the poorest of the poor," to achieve their need to produce food of sufficient quantity and quality to satisfy basic nutritional requirements on a sustained basis. The Burundi Government has also exercised restraint in projects and programs to assist the food crop farmers.

Agricultural extension and training have received only minimal development assistance, with a major portion directed to institutional development. The most significant project being the development of ITAB. Projects and programs to enhance agricultural extension, per se, have been insignificant.

Below are donor projects which have been identified directly or indirectly with agricultural extension and training. The projects are either on-going, or are to be initiated at an early date.

1. Training Center for Agricultural Extension

Located: Kihanga, 23 km northeast of Bujumbura

Objective: To train 20 agricultural monitors each year, in agricultural technologies and extension planning.

Duration: Two years, renewable

Organization: ATB Belgium

Funding: \$164.503 (est.)

Impact: This center was opened in 1977. Only one class of 20 students had graduated. The training received should have a positive influence

on the ability of graduates to contact and influence farmers to accept and use recommended agricultural technologies.

2. Field Training of monitors of agriculture

Location: To be carried out country-wide in 82 commune centers

Objective: To provide one month of in-service training in overall rural development to all agricultural monitors, approximately 1500, throughout the country.

Duration: Two years

Organization: GOB/FAO

Funding: FAO, \$ 82,000 for one expert and miscellaneous equipment and supplies. GOB, 2,223,402 BuF for equipment, and 1,224,000 BuF annually for each of the 82 centers for salaries of personnel.

Impact: As monitors are in direct contact with farmers, the total rural population will benefit from the training.

3. Extension component of the Basic Food Crop Production Project  
(seed multiplication)

Location: Site only tentatively selected

Objective: Provide advisory services, other technical assistance, inputs, and marketing services to participating farmers and provide for certain infrastructural improvements, such as an input supply and market/collection site and storage.

Duration: 10 years

Organization: GOB/FED

Funding: FED \$ 7.8 million

GOB \$ 863,000.-

Impact: The project will provide farmers, crop farmers in particular, with a wider range of improved seed, and through the extension component farmers throughout the country will receive assistance in selecting and using practices needed to get the most benefits from their efforts.

#### 4. Project of Rural Development in Gitega Province

Location: Located in Gitega province, sub-division of Gitega and Karusi

Objective: Multiple objectives:

- (1) increase agricultural production
- (2) organize a system of agricultural extension
- (3) introduce nutrition projects
- (4) introduce small animals (poultry for meat) based on foodstuffs provided locally, example: soybeans.
- (5) organize the people in cooperative groups

Duration: Pilot phase started in 1974, completed 1977. Second phase started 1978, to be completed 1980.

Organization: GOB/UNICEF

Funding: UNICEF, \$556,000 GOB has obligations relating to national personnel and administration.

Impact: At the end of the pilot phase it was concluded that the project may have a long time effect to use as an extension base for the entire country. Specific results of this phase were: 1,178 farmers used fertilizer and 70 farmers became established in chicken raising.

5. Reinforcement of practical training and methods of teaching agriculture at the Institute of Technical Agriculture of Burundi (I.T.A.B.) (First and second of three phases).

Location: Gitega province

Objectives: Three objectives

- (1) Improve practical training and methods of teaching agriculture at I.T.A.B.
- (2) Periodic refresher courses for field personnel
- (3) Develop a Social Laboratory near ITAB for practical application of Rural Development.

The project relates to the first two objectives. The third is to be initiated when funding is available.

Duration: Two years 1978-1980

Organization: GOB/FAO

Funding: FAO \$ 42,780; GOB 83,820,000 BuF

Impact: One farmer stated that as many as 20 neighboring farmers had adopted better methods of farming and yields were much greater. The multiplier effect indicates a wide impact.

## 6. Cooperative Training

Location: Gitega

Objective: Training in all aspects of cooperatives, planning organization, conducting and management.

Duration: Two years training to the technician level and one year to assistant level.

Organization: GOB/ILO

Funding: ILO \$ 280,599 est., GOB 700,000 BuF in kind

Impact: The project has been underway for one year plus. It has a potentially wide impact towards enhancing the cooperative movement in Burundi.

This project is not directly related to extension and agricultural training, however, there is an interrelationship which is significant.

The "Foyers Sociales" and INADES" activities are covered in Janet K. Poley's report.

## IX - CONSTRAINTS OF THE TARGET GROUP/AREA

### 1. Agricultural Extension

Bilateral assistance projects and programs conducted by USAID through the framework of Government will be addressed to enhancing the quality of life of poor peasant farmers. They are characterized by having 90% plus of the rural population, achieving less than marginal subsistence from upward of 700,000 tiny farming units averaging approximately 1 ha. in size, receiving less than \$100.00 average annual income, being the nation's food crop producers, embracing the most densely populated area in Burundi, having little or no formal education and being entrapped in traditional agricultural technologies without the assistance of agriculturists, extension or otherwise, to help solve their problems.

Already serious agricultural problems of the food crop farmers are being compounded by loss of soil through erosion, decreasing soil fertility, reduction in crop yields and a momentous population pressure on the land. There are problems and/or constraints which limit the educational process, extension and training, to assist farmers in their efforts to raise food production to a marginal subsistence level or above. They must be subdued or modified.

Agricultural Monitors, so called extension workers, give service to cash crop farmers on a somewhat regular basis with limited but noticeable results. From direct observation and knowledge of persons on the scene, no incident of monitors giving service to food crop farmers was found. This may result from unwritten policy which is both economic and political. Economic in the sense that cash crops bring revenue to the government while food crops bring only a sub marginal subsistence to farmers. Political in the sense that assistance to poor subsistence farmers strengthens the majority and weakens the minority. This policy is a formidable constraint to the educational process but not insurmountable.

The fact that a very high percentage of farmers are illiterate greatly affects the nature of extension and methods required to make it effective.

A farmer may understand from demonstrations while verbal explanations and printed words mean nothing.

As in many other African countries, women in Burundi are primarily responsible for the labor inputs for crop production, perhaps as much as 80%. Also a significant number of men do off-farm work or continuously search for off-farm work leaving women in charge of the farm. Due to war and other events many more women are heads of households. In view of this women extension agents are needed to work with this important segment of the rural population.

The social structure in Burundi is strongly family oriented as opposed to a communal or village organization found in most African countries. Consequently, traditional extension methods may have to be modified for this situation.

At present and for the next 4-5 years, agriculturally trained personnel, from administrative and supervisory to the doing level, will be insufficient to do what is required to properly plan and implement effective agricultural extension. For middle level positions, capabilities, including institutions, exist for training required personnel. At the higher educational level, as well as at the lowest level, institutions are deficient for properly training respective personnel, engineers, agronomers and monitors, respectively.

At all position levels, inputs required to bring about effective extension are totally lacking. At the bottom of the position hierarchy, the monitor is more noticeably affected than his superiors. Given the present number of monitors in service, approximately 1115, (Department of Agronomy records), each has a responsibility for approximately 750 farm units. His work is from the commune to collines and up into the hills to the farmers. He is called upon to give agricultural extension service without support from Government. He has no transport, he has no funds, equipment and supplies to carry out the functions of his position, he is poorly and irregularly paid, and lastly, he receives minimal supervision and guidance from his superiors. It is apparent that lack of extension inputs is a major problem in getting extension to the peasant farmers.

## 2. Agricultural Training

The monitors provide the only linkage between farmer and Government. The fact that they are the most inadequately trained personnel in the position hierarchy causes the linkage to be very weak. A Government policy of employing monitors with a primary school education, only one month of on-the-job training, with expectations for effective agricultural extension service to farmers needs to be scrutinized very closely. The problem is compounded by the lack of in-service training for this level of personnel\*

A total of 20 students per year, an insignificant number, is receiving institutional training in Kibonga Training Center, the sole institution in the country that trains personnel for monitor positions. Although the training is for one year only monitors who receive it will be much better prepared to perform the functions of agricultural extension than those who receive on-the-job training only.

In addition to lacking technical knowledge, monitors lack the communicative skills and extension methods needed to help farmers identify and solve their problems. Consequently, extension is performed in an autocratic manner and ceases to be an educational process. Associated with this situation, extension through the monitor to farmers may often be policy of Government rather than agricultural technologies designed to help farmers solve their problems. (Additional on training in Janet Poley report.)

## 3. Priority of Constraints

Each problem/constraint discussed above is a formidable impediment to planning and conducting agricultural extension for food crop farmers. However, some are deemed more formidable than others. In order of priority the problems/constraints are listed below.

(1) The absence of an organized extension program from monitor to national levels, results in a weak linkage for planning and implementing effective extension and training.

\*The first in-service training program for monitors to be initiated by GOB/FAO in 1979.

- (2) A lack of facilities and programs to provide monitors with in-service training in agricultural technologies and extension methodology on a sustained basis constitutes a major problem in disseminating useful agricultural practices to farmers.
- (3) Except for salary payments to personnel, which may or may not be received regularly, Government support to extension is lacking. Means of transport are nonexistent and personnel are not provided basic equipment and supplies for providing extension services.
- (4) Institutions are in place, ITAB and EPA, to give agricultural training to personnel who are regarded as trainers of the trainers. However, curricula weaknesses and undertrained staff are major constraints to training competent and motivated technicians and assistants.
- (5) The fact that only one institution is presently training students for monitor positions which are the most numerous of all agricultural personnel, approximately 3200 at the employment apex, an additional institution is required.
- (6) The policy of Government to provide extension services to cash crop farmers to the detriment of food crop farmers is a constraint of national proportions as well as at the grass roots of food production.

Singly and collectively the above constraints pose a formidable obstacle to planning and conducting effective agricultural extension in Burundi.

#### 4. GOB Extension and Training Priorities and Plans

The entire agriculture sector receives a great deal of lip service for enhancing the quality of living of the rural population. Likewise, Government officials speak rhetorically of the importance of extension to the development of all aspects of agriculture. However, plans and programs for expanding and improving extension and training are not congruent with their importance as expressed verbally, and the scope of inputs provided for making it effective.

A priority of considerable significance is being given to a plan for training monitors during the next two years. This is a joint effort of GOB and FAO, largely funded by GOB, and will provide one month of in-service training to all monitors, employed by Government, in 82 training centers throughout the country.

All monitors should receive one month of in-service training annually. The technical school of Agriculture, ITAB, is developing a social laboratory close to the school, approximately 100 ha. in size, to provide for practical training in rural development for students. This will include a large agricultural component with extension applications.

This constitutes the third objective of a GOB/FAO project to improve practical training and methods of teaching agriculture in ITAB.

The Government plans to include women in agricultural development. Forty women students are presently enrolled for agricultural training in ITAB. When dormitory facilities, now under construction, are completed at EPA, women students will be enrolled to train for assistant agriculturist positions. Plans for the establishment of agricultural training facilities for Agronomy Faculty (Univ.) are discussed in detail in the agronomy section of the sector assessment.

Possible development assistance projects and programs discussed with various Government officials with no intent of securing approval or disapproval are:

- (1) Including in the Organization of the Ministry of Agriculture a separate department for the administration of agricultural extension and training.

- (2) Provide support assistance for extension to field personnel.

- (3) Provide an additional institution to give pre-service and in-service training for monitors.

- (4) Provide assistance in upgrading the educational level in the Institute of Technical Agriculture (ITAB), and the Professional School of Agriculture (EPA). (See Development Project Identification for details.)

## X. EXTENSION AND TRAINING RECOMMENDATIONS

### 1. Target Groups and Areas

An organization for effective extension recommended for Burundi, includes four categories of personnel. At the national level are administrative, supervisory and management personnel with a responsibility to provide a communication linkage from top to bottom of the extension system, which will support and give assistance to all field level personnel.

Technical agriculturists representing the many areas of agriculture including livestock, cas crops, food crops, forestry, veterinary, etc., are positioned at the provincial level. By and large, these personnel are technicians who receive their training at the Institute of Technical Agriculture. The aim of an organized extension effort is to extend the administrative and supervisory arm from the national level with an Extension Director to coordinate agricultural activities at the provincial level, with an additional responsibility to supervise agricultural assistants positioned at the zone/commune level.

Agricultural assistants, some positioned at the zone level, others in communes, will have a very important role in an organized extension service. Their primary responsibility is to supervise and assist monitors in their efforts to bring extension services to farmers. In an organized extension program, assistants will be divorced from policy enforcement duties to render full-time extension responsibilities.

On the bottom of the position are monitors who are the "county agents" of Burundi's extension service. They are the only, with rare exceptions, agricultural personnel who come in contact with farmers on a sustained basis. With extensive in-service training, proper supervision and adequate material support, monitors will play an important role in improving the quality of living of the rural population.

There is a fifth group of personnel who play an important role in the total extension effort. This group is comprised of the "trainers of the trainers." They are the staffs of institutions, ITAB and EPA, who give training to middle level, provincial and zone/commune, personnel for the extension service. An effective extension program requires personnel at all levels to be adequately trained in agricultural subject matter as well as extension methods. This is the first responsibility of the institutional staff.

University level staff included in Janet K. Poley report.

## 2. Development Strategy for Each Target Group

The fact that organized extension per se is lacking in Burundi, USAID assistance in this area should be in the long term, as short term interference would further fragment what little extension exists in Government as well as in research stations, settlements, cash crop projects, etc., commonly referred to as project extension. A possible exception for short-term assistance might be in the areas of INADES and Foyers Sociale, as described in Janet Poley's report.

For the long term, the extension and training element of the sector assessment has adopted a total extension/education approach, composed of ~~xxxxxx~~ four component projects, each being an integral part of the whole. These components are:

- Organization for extension
- Support for extension
- Training of monitors and
- Material and personnel assistance to ITAB and EPA.

Additional experience is required of USAID/Burundi before initiating the project. A first step to achieve this should be to recruit and employ, direct hire by USAID, an extension advisor assigned to Bujumbura to do the spade work required. This should be followed by short courses in extension agriculture by expatriate agriculturists to develop an understanding among government personnel, of the nature and functions of an extension service.

### (1) Organization for extension

"The extent that agriculture will be developed in Burundi depends upon the capability of extension to introduce and gain acceptance by

farmers of non-traditional agricultural technologies and methods found by research to enhance food production-quantity and quality-on a sustained basis." This was a common concensus expression of many persons contacted during the course of the assessment, including team members. There is a great deal of evidence to support this point of view.

A persuasive case exists for USAID assistance in the development of an organization for extension, which in-ludes a department of agricultural extension/education, at the national as well as field levels. To gain full receptivity by government, considering the extent that facilities and Burundi staff are provided, presents a formidable obstacle to be overcome. An educational and diplomatic approach by a USAID extension advisor, coupled with extension short courses, will go a long way toward gaining the receptivity desired.

In addition to office space, facilities for the department will include providing a conference room, and space for materials preparation and development. In recruiting personnel to staff five positions in the department, high priority should be given agricultural training, experience and personal characteristics. Staff positions will include: Director, Extension Supervisor, Training Supervisor, Materials Preparation Expert and Management Supervisor. Expatriates will be employed to fill positions while Burundi counterparts are receiving training in a country or countries having a successful and ongoing program of extension. Other capital expenses, transportation, three vehicles and training materials and development equipment and supplies will be provided by USAID.

To separate, physically, agricultural extension from administration at the provincial level, development assistance will provide a small office complex and furnishings. At provincial and zone/commune levels, supervision will be provided on a sustained basis. Assistants and monitors at the zone/commune levels will be divorced from administrative duties to devote full time to extension.

(2). Support for Extension

Morale and dedication to duty constitute a major problem among middle level agricultural personnel. There are various reasons for this,

however, lack of government support is the dominant one. Two elements of needed extension support, transportation and equipment and supplies, are non-existent. Mobilizing extension personnel, minimum for efficient and effective performance is a high risk area, however, the probability of extending extension services to great numbers of the rural population is an inducement for USAID intervention. Further, transportation is a prerequisite for using training materials and equipment to carry out extension methods such as demonstrations, group meetings, use of visual aids, educational campaigns and individual contacts on the farm. Providing 30 pickups to provincial personnel, 125 motor bikes to assistants at the zone/commune levels and 2000 bicycles to monitors in the collines would be a big step towards improving extension services to peasant farmers.

### (3.) Training of Monitors

The competency level of monitors, due to inadequate training, poses a major problem to developing an effective program of extension. There is only one defensible solution to the problem - providing them adequate training. The question to be answered is - how? GOB/FAO are supplying a partial answer by initiating an in-service training program for monitors, employed by government, in 82 centers throughout country. The program will provide one month of in-service training, in two 15 day sessions, over a period of two years. The training will address rural development, however, a significant component will be agriculture. This is a very significant project, but it is only a drop in the bucket in relation to needs. To improve the competency of monitors, in-service training on a sustained basis is needed. This will require a facility that provides for in-service training at a central location and will serve as a base for the GOB/FAO program as needed at the local level. In addition the center will have multiple uses to include: Pre-service training for 30 monitors annually, provide adult farmer training (both men and women) and for refresher courses for technicians and assistants.

This monitor training center will include classrooms, dormitory, office, teaching materials, room storage, a directors residence and furnishings. It will also provide for tools and equipment, instructional materials, a mobile teaching unit and transport vehicles.

Personnel to staff the Center will be a director and six Burundi teachers. An expatriate director will be required while a Burundi counterpart is receiving training. Additional short and long term training will be provided to teaching staff. Adequate provisions for practical training will be an important part of the Center.

(4). Material and Personnel Assistance to ITAB and EPA

Few, if any, African countries can match Burundi's facilities for training middle level agricultural personnel. However, the performance of graduates from ITAB and EPA indicates that both institutions are lacking elements needed to properly train students to function effectively as agriculturists.

A careful review of the school's curricula reveals weaknesses which can only be ameliorated by a complete revision. This, plus the fact that the staffs have more teachers for general subjects than for agricultural subjects leads to the missing elements. With an increased enrollment during the past two years in ITAB, and a substantial increase projected for the next two years, three additional staff are needed, two expatriate and one Burundi. In addition, three present staff members need further training to gain competency in subject areas relating to food crop production.

In EPA the staff is sufficient for the middle term. However, with an intake of women projected in the next year, an addition will be needed. There is a need, however, for further training of staff in agriculture and related fields. Three members of the EPA staff will qualify for further training.

Gaining receptivity for curriculum revision in ITAB and EPA poses a difficult problem and will not be resolved immediately. Vigorous efforts by an extension/education advisor, in country, employing the educational process, will overcome this constraint. The revision process will advance through stages to include: introduction, materials gathering, work committees, conference (with consultants) and adoption. Specific areas in which the process should concentrate are: extension methods, food crops, practical training, nutrition and soil and water conservation. Possible sources for consultants include: Egerton College, Kenya and Lesotho Agricultural College, Lesotho.

In ITAB a short-term activity requiring capital assistance, bearing immediate benefits to students with significant long-term benefits to the rural population, is available for USAID intervention. The activity is two-fold, providing assistance in acquiring much needed instructional materials, mainly books, laboratory equipment and supplies and the funding of (teaching) laboratory project undertaken by the school. The laboratory, to provide for practical experiences in conducting integrated rural development is largely agricultura/ in substance. It is near the school, containing approximately 100 ha., involves parts of three communes and an estimated 1,000 farm people. This is the third objective of a GOB/FAO development project in ITAB. The first two objectives are to improve practical training and teaching methods, and provide refresher courses for agricultural personnel in the field. It will complement an extensive ongoing integrated rural development project in the Gitega province.

Along with the above recommendations, the most severe restraints inhibiting the implementation of the extension/education concept, have been mentioned. However, the overriding constraint to be dealt with is gaining full receptivity of the recommendations as a package instead of piecemeal. During the course of the assessment expressions of interest in monitor training and support assistance were frequent. There were less frequent expressions of interest in establishing a department of extension/education and nil interest in curriculum revision in ITAB and EPA.

Programs to overcome the constraints by GOB, USAID, and other donors are included in the Extension and Training Development Projects section of this report.

## XI - DEVELOPMENT PROJECT IDENTIFICATION

To submit and recommend that GOB/USAID accept and implement the agricultural extension and training projects identified below, the reporter has veered from a conviction cultivated through 14 years of experience in agricultural extension/education in all regions in Africa. This conviction is: "It is better to complement an existing extension/education program, even though it is weak, rather than try to introduce a new system, techniques and methods."

In Burundi, an organization for extension is lacking and methods of disseminating agricultural technologies are so ineffective, stringent procedures are required if results are to be forthcoming. The organization, or lack thereof, for extension cannot be effectively complemented. The four projects described below are components of a total extension/education program and little good will be derived by implementing one and not the others. Each project, excepting assistance to ITAB and EPA, will require a built-in management factor for at least five years to assure that peasants are the true beneficiaries of the program.

### PROJECT NO. 1

Objective - To establish a Department of Extension/Education in the Ministry of Agriculture under the State Secretariat for Rural Development.

Nature - It will provide an organization for administering a system of informal agricultural education (extension) to all elements of the rural population, by competent and dedicated extension personnel. The organization will establish a proper relationship and utilize the services of other administrative units in the Ministry of Agriculture.

Location - The national organization will be in Bujumbura, with eight provincial administrative centers and in zone/communes as required.

Beneficiaries - The total rural population will derive benefits from the project.

Duration - A minimum of five years.

Manpower needs - Ten years of expatriates, as counterparts, five Burundi nationals at the professional level.

Capital needs - Divided as follows: Material, personnel and training.

(In thousands of dollars)

- Material: Total cost: 222  
Divided roughly between 5 years: 203, 3, 3, 2, 11.
- Personnel: 10 years expatriate as counterparts, five additional Burundi staff.  
Total cost: 1,000  
Over 5 years: 230, 280, 180, 130, 80
- Training: 144 months of long-term and 90 months of short term.  
Total cost: 426  
Over 5 years: 177, 177, 24, 24, 24  
Total Cost of Project: 1648

Requirements - To be successful the project must be in conjunction with other projects in the agricultural extension/education development assistance program, and have full receptivity of government. In addition, GOB will be required to furnish sites for facilities and provide Burundi personnel as required.

#### PROJECT NO. 2

Objective - To provide support assistance for extension personnel in the field.

Nature - This project addresses the support needed to assure effective agricultural extension to farmers.

Location - In all provinces and at zone/commune locations.

Beneficiaries - Primary beneficiaries are personnel responsible for extension services to farmers. Secondary beneficiaries are farmers themselves as they will receive more extension services as a major obstacle, lack of transportation, will be removed. Other support measures conducive to effective extension, teaching materials and equipment, will be provided.

Duration - A minimum of 5 years.

Manpower Needs - Expatriates for a total of 7 years, as counterparts for Burundi staff. Two additional Burundi staff at the professional level, and six at the supervisory-technical level.

Capital Needs - Divided as follows:

Vehicles, Maintenance, Personnel Training and Instructional Equipment  
and supplies (in thousands of dollars)

Vehicles: 30 pickups, 125 motor bikes, 2000 bicycles

Total cost: 790

Over 5 years: 283,91,107,115,194

Maintenance:

Total cost: 379

Over 5 years: 260,23,28,45

Personnel: Expatriate, 7 years as counterparts to Burundi staff.

Five Burundi staff - supervisory-technician level.

Total cost: 700

Over 5 years: 200, 200, 100, 100, 100

Training: 24 months long-term and 24 months short-term

Total cost: 108

Over 2 years: 74,34

Instructional Equipment and Supplies:

Total cost: 32

Over 5 years: 22,2,2,2,4

Total Cost of Project:                    1977    2,009

Requirements. This project, in particular the transport element, will not be successful without rigid policies and strict enforcement procedures regarding use and maintenance of vehicles. Four regional workshops will provide preventive maintenance and minor repairs. Major repairs will be performed in the central workshop located in Bujumbura. Government will be required to provide building sites for workshop and Burundi personnel as required for the project. GOB will also provide petroleum products needed for effective operation of vehicles.

PROJECT NO. 3

Objective - To provide an additional institution to give in-service and pre-service training to monitors on a sustained basis.

Nature - In addition to monitor training, the institution will offer agricultural training to adult farmers, both men and women and refresher training for technicians and assistants.

Location - The institution will be located in the Gitega area. The site to be selected.

Beneficiaries - Persons receiving the training will be primary beneficiaries, however, farmers who need the services of a competent extension person will be the true beneficiaries.

Duration - A minimum of 5 years.

Manpower Needs - Expatriates for a total of 5 years over a 3 year period. Six additional Burundi staff.

Capital Needs - Divided as follows: Construction and Material, Personnel and training. (In thousands of dollars)

- Construction and Materials

Total cost: 290

Divided between 5 years: 273, 5, 2, 5, 5

- Personnel - Expatriate 5 years.

Total cost: 500

Divided over 3 years: 200, 200, 100

- Training - 84 months of long term and 12 months of short term.

Total cost: 135

Divided over 3 years: 53, 53, 29

Total cost of Project: 925

Requirements: Full receptivity by government is required for the project to be successful. It will be necessary for GOB to provide at least .15 ha. site for establishing the center and furnish Burundi staff as required.

PROJECT NO. 4

Objective - To provide material, personnel and training assistance to upgrade the educational level of ITAB and EPA.

Nature - Obvious areas for USAID assistance are: Expanding and improving

staff, curriculum revision, providing teaching materials and supplies and establishing a social (teaching) laboratory near the school.

Location - Near the Institute of Technical Agriculture (ITAB), near Gitega. Site selected.

Duration - 4 years.

Beneficiaries - From staff development and technical materials and supplies, benefits are immediate for students. By being better trained extension personnel they will be better able to help farmers. The benefits ensuing from the laboratory will be more competent rural development workers and the 400 or more farmers and their families in the laboratory area will have a higher quality of life.

Manpower needs - Expatriate, 2, for a total of 4 years. Three additional Burundi staff.

Capital Needs - Divided as follows:

Teaching materials and supplies, personnel, training and social (teaching) laboratory. (In thousands of dollars)

- Teaching Materials and Supplies:

Total cost: 10. In initial year of project.

- Personnel: 2 expatriates - 4 years

Total cost: 400

Divided over 2 years: 200, 200

- Training - 72 months long term and 36 month short term

Total cost: 138

Divided over 3 years: 46, 46, 46

- Social (teaching) laboratory:

Total cost: 470

Divided over 3 years: 410, 40, 20

Total cost of Project: 1,008

Requirements - Government will be responsible for salaries of personnel, service and maintain equipment and infrastructure as well as provide land for building site.

TOTAL COST OF EXTENSION/EDUCATION PROGRAM (PROJECT): \$5,590,000

This is an ambitious project, however, it will provide an organization, curriculum and staff with adequate support to develop and implement a program of informal agricultural education for all elements of the rural population, which cannot be achieved by other means.

BIBLIOGRAPHY

CONTACTS

Meeting: Ministry of Education and MASI Team for Orientation

Mr. Jean-Baptiste NDIKUMANA,

Director General of Higher Education

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Mr. Emmanuel NTIBAYINDUSA, Deputy Director of Higher Education

Mr. Melchior NDUWINGOMA, Advisor to the Ministry of Education

Professor Luc TACK, Dean of the Faculty Agronomy, National University

Mr. Vital BARANYITONDEYE, Vice-Director Department of Agronomy, Ministry  
of Agriculture

Mr. Etienne BARADINKANYA, Director General ISABU

Mr. John NTAWA, Administrator of ISABU

Mr. Joshua WALTON, Project Manager Peat Project, USAID/Burundi

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Mr. Theodore RISHISHIRUMUHIRWA, Principle, Institute of Technical  
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Mr. R. DEDNER, Ministry of Government Planning

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Mr. A. NTAMIBEUGO, Director, Radio Station, Bujumbura

Mrs. SAAD, Deputy Field Representative UNDP

AGRICULTURAL TECHNICIANS, ASSISTANTS AND MONITORS.

FARMERS

PUBLICATIONS

1. Small Grain Storage. Carl Lindblad, Peace Corps and Laurel Hroben, Vita.
2. Paper prepared in 1975 by C. Barrows Hall, for the US Embassy, Bujumbura
3. Etude Globale du Développement du Rwanda et du Burundi. 1961
4. L'Economie du Burundi, Document de Travail Table Ronde, Bujumbura 21 - 24  
Février 1978, Banque Mondiale
5. Plan Quinquennal de Développement Economique et Social du Burundi, 1978 -  
1982 and 1979 - 1977
6. Geography of Burundi, C.L. Velpen, 2nd Edition, 1973
7. Société Mixte d'Etudes au Burundi, Bujumbura, Burundi, July 1977
8. Programmes des Nations Unies pour le Développement au Burundi, 1973 -  
1978
9. Area Handbook for Burundi, Gordon C. McDonald, et al, Nov. 1969
10. Curricula - Agronomy Department National University of Burundi
- 11.-Institut Technique d'Agriculture, Gitega
  - Professional School of Agriculture, Karuzi
  - Agricultural Training Center, Kihonga
12. S.E.D.E.S. (1969). Enquête Statistique Agricole 1967 dans la Région de  
Ngozi et Gitega. FAC. Paris
13. Guide Pratique pour les Travaux de Développement Communautaires. Département  
de l'Agronomie, Ministère de l'Agriculture, de l'Elevage et du Développement  
Rural.

pondant aux programmes autres du Ministère de l'Agriculture et de l'Élevage.

Le programme réalisé comporte les cours suivants:

<u>Matières:</u>	<u>Heures:</u>
- Agriculture Générale	143
- Cultures potagères	18
- Sylviculture	28
- Zootechnie	21
- Mathématiques	27
- Topographie	2
- Phytopathologie et Entomologie	21
- Botanique	3
- Lutte anti-érosive	17
- Correspondance administrative	30
- Rapports et enquêtes	2
- Economie agraire	16
- Quinquina	15
- Tabac	15
- Théiculture	28
- Enseignement pratique	51
- Introduction au stage	<u>11</u>
Total	448 heures -----

ANNEX - 2

(CURRICULUM EPA)

Branches à enseigner par Mrs. les Professeurs

Année scolaire 1977-1978

Noms et Prénoms	Branches	Année d'études			Total Pér.
		I <sup>è</sup>	II <sup>è</sup>	III <sup>è</sup>	
1. SINZINKAYO Albert (cours techniques)	Zoot-Elevage	3	2	-	5
	Défense des cultures	-	1	1	2
		<u>3</u>	<u>3</u>	<u>1</u>	<u>7</u>
2. RUSAGABANDI Etienne	Cultures spéc.	-	4	4	8
	Génie rural	-	2	-	2
	Pisciculture	-	1	-	1
	Vulgarisation	-	-	1	1
		<u>-</u>	<u>7</u>	<u>5</u>	<u>12</u>
3. SEMATURO Félicien (cours techniques)	Agri. générale	4	2	-	6
	Sylviculture	-	1	1	2
	Pédologie	-	-	1	1
	Climatologie	-	1	1	2
	Botanique	2	-	-	2
	Arpentage	1	1	-	2
		<u>7</u>	<u>5</u>	<u>3</u>	<u>15</u>
4. BUNANE Cassien (cours techniques)	Apiculture	-	1	1	2
	Hygiène	1	1	-	2
		<u>1</u>	<u>2</u>	<u>1</u>	<u>4</u>
5. NDAYISHIMIYE Gaspard	Français	6	-	4	10
	Kirundi	2	1	1	4
	Formation civ.	2	1	1	4
		<u>10</u>	<u>2</u>	<u>6</u>	<u>10</u>
6. RWAGAHUNGU Albert (cours généraux)	Français	-	4	4	8
	Géographie	1	1	-	2
	Histoire	1	1	1	3
	Formation civ.	-	1	-	1
		<u>2</u>	<u>7</u>	<u>5</u>	<u>14</u>
7. HAKIZIMANA Juvénal (cours généraux)	Mathématiques	5	3	2	10
	Physique	2	1	-	3
	Chimie	2	1	-	3
		<u>9</u>	<u>5</u>	<u>2</u>	<u>16</u>

(Annex - 2 - Continued)

8. Abbé NKUNDWA Pierre	Réligion Catholique	<u>1</u>	<u>1</u>	<u>1</u>	<u>3</u>
9. Pasteur KABEBE Papias	Réligion Protestante	<u>1</u>	<u>1</u>	<u>1</u>	<u>3</u>

ANNEX - 3  
(CURRICULUM VETERINARY TECHNICIAN ITAB)

MATIERES:

	1ère année Tronc Comm.	2ème année	3ème année	4ème année	Coefficient
<u>I. ENSEIGNEMENT GENERAL:</u>					
1. Français	3	2	-	-	-
2. Kirundi	-	-	-	-	-
3. Anglais	2	1	-	-	-
4. Religion, morale	-	-	-	-	-
5. Education Civique	-	-	-	-	-
6. Education Physique	1	1	-	-	-
7. Histoire	-	-	-	-	-
8. Géographie	3	-	-	-	-
9. Mathématiques	4	-	-	-	-
10. Physique	4	-	-	-	-
11. Chimie	4	-	-	-	-
12. Botanique	6	-	-	-	-
13. Zoologie	6	-	-	-	-
14. Nutrition appliquée	-	2	-	-	-
<u>II. ENSEIGNEMENT TECHNIQUE:</u>					
1. Agri. Générale	-	2	-	-	1
2. Zootechnie extérieure - Apiculture	-	4	4	2	4
3. Anatomie	-	3	-	-	2
4. Physiologie	-	3	-	-	2
5. Parasitologie	-	3	3	-	3
6. Maladies parasitaires	-	-	-	4	2
7. Bactériologie - Microsc.	-	3	3	-	3
8. Maladies infectieuses	-	-	-	4	2
9. Pathologie générale	-	5	-	-	3
10. Pathologie médicale	-	-	2	2	3
11. Pathologie chirurgicale	-	-	2	1	2
12. Thérapeutique Pharmacie	-	1	3	-	2
13. Obstétrique	-	-	2	2	2
14. Inspection des viandes	-	-	2	3	3
15. Topographie - G.R.	-	-	2	-	1
16. Socio-Vulgarisation	-	-	-	2	1
17. Economie Rurale	-	-	2	2	2
18. Technologie Agri-Elevage	-	-	2	1	1
19. Statiques	-	5	-	1	1
20. T.P. Elevage	-	-	10	12	-
21. T.P. Agri	4	-	-	-	-
Total	37	35	35	36	

N.B. Les participants de la Commission ont souhaité que les matières qui traitent de la biologie: botanique, zoologie, chimie (minérale, organique, biochimie) soient renforcées en raison de leur importance comme base des connaissances nécessaires à l'assimilation d'autres cours.

TRAINING REPORT  
. AGRICULTURAL SECTOR ASSESSMENT  
USAID BURUNDI

Janet Poley  
International Training Division  
Office of International Cooperation and Development  
USDA

April 1979

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## INTRODUCTION

The purpose of this report is to present preliminary findings, conclusions, and recommendations relative to human resource development and training in Burundi. The general agricultural situation, the economic situation, the social situation, the agricultural extension situation, and the areas of conservation and nutrition are covered in detail in other sections of the agricultural sector analysis. This report will not attempt to repeat information contained there, but rather take into account the situation in these areas to the degree that information was available to the author, in suggesting possible USAID strategy with respect to human resource development and training in Burundi.

Additional consideration has been given to the Strategy Statement for Education and Human Resources for the Africa Bureau (AID Circular Airgram 395). In general the Strategy Setting Statement, including population characteristics and educational characteristics and problems, is applicable to the situation in Burundi. It would also appear that AID's human resource development strategy for Africa emphasizing delivery of a practical education through formal and non-formal means in order to satisfy basic human needs, directed at the rural poor majority with the purpose of maximizing equity and local participation in the educational process efficiently and effectively, is appropriate for Burundi, but may be difficult to achieve.

All material contained in this report should be considered in light of the relatively short period of time during which data was gathered in Burundi and recommendations should be considered tentative and subject to further study.

## THE HUMAN RESOURCE PROBLEM

Appropriately trained manpower appears to be a critical constraint in planning, agriculture, nutrition, education, health, and conservation. Currently the problem--particularly at the upper and mid-levels of government--is not so much a question of quantity of people in positions to do the job, but rather a question of quality, competence, and incentives. Without improved quality in administrative, managerial, and technical manpower, there is little hope that GOB will be able to implement agricultural and rural development projects which are intended to serve the rural farm family.

The high degree of reliance on expatriate technical assistance (approximately 560 in-country) from a number of countries and organizations and with varying approaches to development frequently leaves the GOB on the side while foreign experts do the management and technical analysis required. Competently trained and motivated Burundian personnel, capable of managing their own affairs, must be a long-run goal of development.

While the government currently has little additional capacity to absorb more trained manpower at the higher and mid-levels, at the monitor level (closest link to the poor majority) additional trained persons will be necessary. (See John Swecker's report for details concerning current extension situation and statistics.)

It is critical that for development to occur an understanding of the peasant, his/her attitudes, needs, traditional methods, and motivations must be developed. Obviously the peasant-oriented project development approach is not easy, and is perhaps even more difficult in Burundi because of the prevalent foreign expert mentality of telling the peasants what to do, rather than working with them. (See C. Barrows Hall's paper.) AID must work throughout the system attempting to keep peasant needs as the focus of project work done at any level in the system.

In order for improved human resource development to occur in Burundi in AID priority areas the following areas must be addressed: Training organization and linkages; management of training; training content; training process; training clientele and training support.

#### Organizational Constraints

Government is simply not organized and/or motivated to meet the real human needs of 90% of its population.

##### 1. Ministry of Agriculture, Livestock, and Rural Development

It would appear that certain organizational changes within the Ministry of Agriculture, Livestock, and Rural Development would be desirable. At present responsibility for agricultural training in the MOA is under the Planning Division. While the organization chart shows a position for agricultural training, it is in fact vacant. This Planning Division is responsible for the agricultural training institutions (primarily ITAB, EPA, and Kihanga) and the quasi-governmental coffee and tea companies.

In addition, there is no organized system for agricultural extension and outreach. (Extension will be referred to throughout this report as "extension" given that there really is no Extension Service per se.)

A number of "extension" workers are attached to foreign financed technical assistance projects, mainly in the areas of livestock and export crops, while government "extension" workers fall under the Agronomy Division of the MOA and have traditionally focused their attention on carrying out government policy, rather than helping to solve real agricultural problems of the majority.

In general, government "extension" workers have little supervision, little training, no transport or supplies and equipment necessary to carry out their work.

Project "extension" workers tend to be better supported and, in some cases, are more adequately trained; however, most of these projects are outside the area of food crops and do little to meet the real needs of the rural population.

## 2. Planning and Project Management

The MOA appears to be doing little or nothing with respect to managing the agricultural projects currently being implemented in Burundi. While the five-year Development Plan calls for a decentralized approach with project management responsibility resting with Regional Societies of Development (SRD's), only one SRD currently exists at IMBO; paper plans exist for SRD's at Ruminga, Mosso, and Kirimiro (to be a World Bank Project) and there are intentions to create SRD's for Ngozi and Kirundo.

It was indicated in interviews that the five-year plan is badly respected with respect to management and implementation.

## 3. Research

With respect to agricultural research, ISABU's (Institute of Agricultural Science of Burundi) experimental stations and centers are supported by Belgian technical assistance. However, applied research adapted to the

real needs of small farmers is generally lacking and linkage between research, "extension", and teaching is minimal.

#### 4. Teaching

The Faculty of Agronomy, University of Burundi, was established in 1976 with Belgian technical assistance. It currently has few of the skills necessary to perform in the sense of a U.S. land-grant institution. It is staffed by five (5) full-time Belgian professors, ten (10) visiting professors, and three (3) part-time Burundians (one from ISABU and two from MOA).

The Faculty was promised a permanent facility by GOB which has not materialized, so they are located in rented facilities which are inadequate and provide no laboratory space. Organizationally the linkages between the Faculty and the research and outreach efforts are far from fully developed.

#### 5. General Formal Education System

While the severe organizational problems in the area of agriculture are probably the most constraining to USAID's immediate area of interest, organizational constraints exist in other parts of the educational system as well. Formal education in Burundi is organized on a European model as follows:

Primary School: 6 years long; ages 6-12; 22% eligible attend;

Secondary School (Humanities): 6 years long; may then attend Faculty of Sciences, University of Burundi for 2 years and specialize for 3 years. (An agriculture student goes to the Faculty of Agronomy.);

Secondary School (Technical): Students in agriculture may go directly from primary school to EPA at Karuzi for a 3-year technical agriculture program or students may attend 3 years of humanities secondary school and then both types of students potentially become eligible to attend ITAB at Gitega to complete their technical training. However, there is no possibility for a student graduating from the technical track (ITAB in agriculture) being admitted to the University of Burundi.

Only 3,000 students completed both levels of secondary school last year.

#### 6. Inter-Ministerial Coordination

In addition to the intra-organizational problems of the Ministry of Agriculture, it appears that adequate linkages and coordination do not exist between the MOA and the Ministry of Education and the Ministry of Social Affairs.

With the attempt to re-orient primary school education to rural living needs (being done with help from UNESCO and the World Bank) and with the intention to infuse more agriculture into the secondary school curriculum it would seem that such coordinative linkages are essential.

Also, it is the responsibility of the Ministry of Education (Direction generale de l'enseignement superieur) to pass final judgement with respect to which students are sent from Burundi for foreign training.

The Ministry of Social Affairs is responsible for the operation of the Foyers Sociales and the Foyers d'Animation involved in the delivery of training--predominately to women in the fields of agriculture, nutrition, and literacy. There are eight Foyers Sociales (one per province), graduating 20 per year. The Foyer training is four years in duration and those

entering are graduates of three years of Secondary School. There are 65 Foyers d'Animation located in the countryside and attended by rural people for three years, three times a week, for eight hours a day. In 1977 5,148 were enrolled in these school and of these 4,231 were girls/women.

#### 7. Coordination Outside Government

The lack of project management and coordination between and among various donor-supported projects has already been noted. In addition, linkages (or the lack of) between GOB and private organizations may need examination--for example, Mission activities.

Also, organizations such as the African Institute for Social and Economic Development (INADES) which provides correspondence education in agriculture, rural development, and development economics to approximately 1,500 subscribers (some farmers, some government and "extension" workers as well as other development practioneers) appears to be only informally linked to activities of the government. (Foyers use some INADES materials as to some "extension" workers.)

INADES, which began in the Ivory Coast, has a three-year curriculum in general agriculture, ten lessons in rural development, and a more advanced one-year course for development workers. Participants pay 50 francs a year to participate in the INADES program. INADES attempts through intermediaries (including missionaries, volunteers, and monitors) to visit every participant once a year, check progress, collect exercises, and report to the central staff (currently nine people). They also hold three-day group seminars, usually during school vacations for training and discussions. INADES would like to be able to do more with respect to practical agricultural models and demonstrations in the field. They also consider training of women to be a priority and have begun a series of publications to be

distributed, particularly to women. (The first has just been distributed to 500 people and is on water. It appears to be too technical and detailed for the target audience, many of whom are illiterate). They are further interested in the area of appropriate technology, particularly for easing women's work.

It appears that improved linkages between INADES and the other government ministries could diminish unnecessary duplication, make better use of scarce resources, and provide increased benefits more efficiently.

#### Management of Training

Coupled with the large-scale organization problems indicated, there is a lack of personnel trained and/or motivated to manage human resource development efforts at all levels. Little evidence was found that those currently administering training and human resource development efforts had an understanding of--or ability to--apply management concepts to their organizations so as to initiate change in the direction of improved productivity and effectiveness. Skills in planning, analysis, problem solving, communication, decision-making, motivation, and supervision appear generally to be missing. Delivery of a practical education to the majority of rural people will not be possible without improved management systems and behaviors.

#### Training Content

There appears to be fairly general agreement as to the content (subject matter) areas in which USAID Burundi might most productively work in the rural sector. These include soil and water conservation, food crop production, food storage and marketing, fish production, forestry, nutrition, and health. Obviously, training is but one necessary component for the achievement of development objectives in these areas. All the technical

training in the world will have little effect without improved organizational structure and management and political will to establish and implement rural development oriented policies. Examination of curriculum at EPA, ITAB, and the Faculty of Agronomy show rather recently some attempt to do more training in the areas mentioned above, but considerably more can be done. Many of the subjects taught have little relevance to the rural development needs of Burundi or to the jobs people are being trained to do. Clearly the lack of research relevant to small farmer production systems in Burundi makes it more difficult to sort out the areas in which it would be most useful to train. Obviously overt and covert agendas of government, class distinctions, and the influence of foreign donors on the educational system and curriculum further compound the problem.

A number of the individuals interviewed in the course of the Sector Analysis commented that technically competent agriculturists, capable of applying knowledge, planning, analyzing, supervising, and transferring knowledge and skills are practically non-existent in Burundi.

#### Training Process

Along with the problems associated with the content orientation of training programs in Burundi, there is an almost total lack of an experiential, process approach in the training delivered. This is true not only in the formal training institutions, but in the delivery of non-formal training to the rural sector as well. It is commonly recognized that development requires an appropriate set of attitudes and behaviors as well as knowledge and skills. People must be prepared to do and act as well as to think and know. Changing attitude and behavior is facilitated by an experiential structure of learning (rather than lecturing or "telling" farmers what to

do), respect for participants, promotion of interaction among participants and between trainers and participants.

Some specific features of effective training are:

- Connection between training and goals that are meaningful to the individual is established;
- Structuring the training in such a way as to harness the participants' values, customs, attitudes, and motivations and avoidance of any violation of cultural or social norms;
- Sequencing of items to be learned to maximize learning based on proven psychological principles;
- Frequent and large number of opportunities for the participant to apply what is being learned and rapid feedback on how he/she is doing;
- Building in a high probability of the participant experiencing a closely spaced series of successes;
- Assurance of opportunity to apply what is learned during and after training.

These points are emphasized because the "how" or process of the training has been shown in many developing country situations to be a more critical constraint than the technical content of the training.

Obviously the "how" of training is of little value without the appropriate "what", but modern training as distinct from academic education or authoritarian outreach programs is aimed at the whole person, not merely his intellect. It involves changing attitudes and behavior as well as creating understanding. It provides whatever skills are necessary to successfully perform the functions contemplated. These can be psychomotor, analytical, inter-personal, interorganizational, procedural, conceptual, logical, and behavioral.

In general it starts from the participant's perceptions, feelings, and experience, and provides a set of experiences which expand his understanding as well as practice in carrying out the functions in a sequence in which there is a high probability of his achieving success in the tasks undertaken.

in the training. As new concepts and techniques are used, there is practice on exercises and case studies, but then the participant applies what he has learned to real tasks that demand precisely the skills which he has to master. The final test is how well he performs these real tasks. To the extent that these tasks are real, of obvious value to his organization, and a conscientious effort achieves successful performance--the motivation is high.

Interviews in every part of the educational system indicated over and over that the problem in Burundi is that the teachers do not know how to teach. (As mentioned earlier, in many cases it was also said that they do not "what" to teach as well.) This was true for the primary, secondary, technical schools, "extension" and higher education.

#### Training Clientele

USAID's mandate in the education area is to introduce and expand learning systems that have a direct impact on the rural poor majority. In Burundi the lack of a systematic extension-outreach system to reach these people appears to be an obvious area for USAID intervention, particularly at the monitor level--in effect, training those who train rural people. But as indicated earlier, unless appropriate training occurs at many points in the system (or current non-system) there is little chance that monitors (even if we improve their training) will have any possibility for motivated sustained outreach to the rural poor. Administrative, technical, and training process training are needed at many points in the system, remembering that learning is a lifelong process and competent personnel requires continual re-training as new needs are identified, research renders new results, and methodologies are improved.

With respect to clientele it is very important to note that women and youth should be considered high priority clientele. With Burundi's expanding large population under age 25 and the major responsibilities women have for farming, feeding, and child development, it would seem that more possibility of a long-run sustained change is likely to come through these groups.

In terms of youth at present there is a large-scale effort in the 800 public primary schools to make them more oriented to rural needs. The program is administered by the Bureau d'Education Rurale (BER), Ministry of Education and is currently supported by UNESCO and other donors. The World Bank is financing a project to work with 100 of these converted primary schools to add an additional two-year program for those who cannot go on to secondary school, oriented toward practical and income producing skills training for rural people.

These schools will train in agriculture, livestock, carpentry, home economics, and mechanics. In addition, the World Bank is building a center to train trainers for these Centres Polyvalent. Therefore, it would appear that any USAID help in this area might come at a later stage following evaluation of the current efforts of other donors.

In the secondary schools Programme Alimentaire Mondial (PAM) is aiding the secondary schools to introduce school gardens along with some agriculture in the curriculum. The program is administered by the Bureau d'etudes des programmes de l'enseignement secondaire (BEPES), Ministry of Education.

With respect to women as training clientele, the problem is difficult. Approximately 89% of Burundi women are illiterate; many more boys than girls are educated at all levels. In the agricultural area it appears that what was once solely the domain of men is opening a little to training women.

The Faculty of Agronomy has two women students among 54; ITAB graduated four women (all in veterinary) this past year and has approximately 25% female students currently in training; EPA is currently building a women's dormitory, but will have no women students until it is completed. The Foyers Sociales and the Foyers d'Animation are currently the primary vehicle for training young rural women, but the illiteracy problem and the long hours and heavy burden of work required of women means a very small percentage are really able to benefit.

In addition, INADES, while aware of the tremendous needs for educating women, to date has only programs requiring literacy.

It is most probably at the monitor level that the greatest possibility exists for training additional women as "extension" outreach workers who can then deliver training to rural women. It would further appear that work can be done to develop women leaders and managers. At present nearly all high- and mid-level government jobs are reserved for men.

#### Training Support

Along with the problems and needs identified to this point, vehicles, supplies, equipment, books, and other material goods will be necessary. It must also be remembered that the capability to maintain vehicles and audio-visual equipment, for example, must be developed.

Finally, the area of developing audio-visual capacity seems a potentially rich possibility. Almost nothing in this area is currently being done and it would seem that radio and graphics might be particularly fruitful for delivering non-formal rural education.

## USAID BURUNDI STRATEGY FOR HUMAN RESOURCE DEVELOPMENT

As stated earlier the Draft Strategy Statement for Education and Human Resources for the Africa Bureau is quite appropriate for application in the Burundi situation. The following more specific recommendations are made with respect to training strategy:

1. Long-term U.S. academic degree training should be minimal and, when done, only in areas unavailable in Burundi or appropriate other African institutions of higher education. When U.S. academic training is done programs should be tailored to real needs in Burundi and choice of U.S. institution should consider whether institutions are willing to be flexible with respect to curricular and program changes and adaptations.
2. U.S. short-term and non-academic training should be utilized primarily for "unfreezing" purposes and, whenever possible, those selected for training should be in positions where they can transfer the training received to others (multiplier effect). Priority needs for this type of training exist in planning, analysis, management, technical agricultural areas related to food production, nutrition, conservation, and experiential training methodologies.
3. Utilization of appropriate third country training institutions such as CAFRAD, PAID, Egerton, and IITA should be encouraged.
4. Special attention should be given to needs of women and youth and attempts to identify women candidates for all types of training should be a priority.
5. It would appear that there are a sufficient number of training facilities in Burundi where, in the future, USAID might appropriately introduce in-country training courses utilizing U.S. trainers linked with Burundi trainers in the specific content areas already identified.
6. All training efforts should respond to the needs of the rural poor, but this cannot be done in a simplistic fashion in that appropriate infrastructure currently does not exist for maximizing human resource development.
7. Experiential training should be emphasized with training directed toward development of specific skills, as well as knowledge and attitude changes where appropriate. Skills training should be accompanied by application in real settings.

8. To the degree possible Burundi trainers should be involved in training the individuals that they will have, continuing the responsibility to train. For example, Assistant Agriculturists might receive training from U.S. technical assistants and Agronomists (previously trained) and the Assistant Agriculturists would then participate in the training of the monitors.
9. Attention must be given to adequately supporting training efforts with material goods; at the same time developing the capacity to maintain and/or replace such goods.

#### SHORT-TERM RECOMMENDATIONS

1. The direction USAID Burundi has begun in training seems appropriate. The areas of Food Crops and Food Storage appear to be the first two areas in which AID will work and modest training components are to be included. If USAID Burundi develops a Food Storage project utilizing two regions with a possible five storage units in each region and approximately 5,000 to 15,000 tons of capacity (see Ross's report for other information concerning this), the following might be a reasonably accurate picture of training requirements:

##### Project Managers

Two long-term trainees (approximately one-and-a-half years) to be trained in the U.S. Kansas State University has a highly developed program in food storage for developing countries--approximate cost would be \$26,000 per trainee for a total cost of \$52,000.

##### Warehouse Managers

Ten short-term trainees (approximately four months in duration) to be trained in the U.S., preferably done in French. It might be possible to use Kansas State as the training site with some additional outside tours. Ross knows several French speaking trainers who might be used to deliver the program. Approximate cost would be \$75,000.

##### Monitors

Thirty monitors trained in Burundi with training assistance from the U.S. Training to be done in French. Training duration is approximately six weeks. Approximate cost would be \$35,000.

Estimated over-all budget for training component would be between \$136,000 and \$150,000.

2. It is recommended that USAID continue what it has begun with respect to identifying appropriate candidates for short-term U.S. training courses (i.e., USDA short courses, special seminars, conferences, etc.) utilizing

Africa/RA funding. Since USAID Burundi did not prepare a Country Training Plan for FY 1979, a systematic approach to training in the Mission is not yet in place. The FY 1980 CTP should be prepared taking into account the recommendations from the agricultural sector assessment, so that participants are sent for U.S. training that fits with USAID Burundi's future directions. Burundi needs and future Mission directions include:

1. Grain Storage and Marketing (presented at Kansas State; referred to in recommendation #1);
2. Agricultural Trainer Development;
3. Agricultural Communications and Media Strategies;
4. Organization Development Skills for Agricultural Managers;
5. Management and the Role of Women in Development;
6. Agricultural Project Planning for Implementation;
7. Agricultural Capital Projects Analysis;
8. Managing Agricultural Projects;
9. Agricultural Policy Seminar;
10. Agricultural Policy Formulation and Analysis;
11. Soil Fertility and Ecological Relationships Affecting Food Production;
12. Organization and Management of Agricultural Cooperatives;
13. Small Farmer Credit Policy (later, Small Farmer Credit Distribution and Administration);
14. Integrated Pest Management;
15. Development and Management of Water Resources.

In addition to these offerings there are a number of food U.S. short-term training opportunities in management, trainer development, and technical agriculture. The one advantage of the USDA coordinated short courses is that they are specifically tailored to the needs of developing countries, rather than requiring developing country nationals to fit into courses designed primarily for U.S. students and U.S. situation. Also, third country training sites (particularly in French-speaking Africa) must be considered. For some more senior-level trainees who speak English the East African Management Institute in Arusha, Tanzania should be considered.

4. It is recommended that USAID Burundi consider the possibility of including in its FY 1980 country training plan at least one course in-country to be taught in French. The Agricultural Project Planning, Agricultural Capital Projects Analysis, and Managing Agricultural Projects courses would appear to be most appropriate for an early course. This recommendation is made not only because of the need in these areas, but also to provide the Mission and GOB some experience with in-country training relative to future more extensive efforts of this type.
5. USAID Burundi should consider establishing some type of English language training program. English is studied in the secondary school in Burundi in the humanities track and a number of GOB officials understand English reasonably well, but speak it only hesitantly. An early effort might be directed toward refresher English training for persons already having some background and who are seen as candidates for U.S. short-term "unfreezing" training.

A more extensive effort might be considered later when project training components are more extensive than at present. The results of the USAID English language training program in Zaire might be examined for possible lessons.

6. USAID Burundi might consider a very small scale WID project. The WID project currently being run by Joyce Stanley in Tanzania (Arusha area) might offer a possible model. The project is very small in scale, supported by the WID office in Washington, but appears to be yielding results that will potentially improve AID's ability to involve women more effectively in the development process. The project is producing some very good data with respect to the real needs and problems of rural women and at the same time helping them work toward solving these problems. In Burundi something like this might be attached to the Foyers and it would probably be important for it to have a nutrition dimension as well.

#### LONG-TERM RECOMMENDATIONS

1. USAID Burundi should consider an extension (outreach project) focused particularly on meeting basic human needs in food production, nutrition, and conservation. The needs and problems of the rural population should be the starting point for project design. Focus should be on farmer needs, wants, and problems and developing an outreach response capability, rather than focused only on information delivery in a top down fashion.

An organization development effort should be a part of this type of project. As indicated earlier, developing a system and appropriate coordinative linkages inside and outside the system will be very important. Also, of course, appropriate support will have to be included (vehicles, supplies, materials, etc.). Careful attention to how women as well as men will be reached must be taken into account in design. (Kathy Crowdt's research in women's participation in agricultural extension in Kenya should be examined for implications here.)

The USAID Bangladesh Organization Development - Training of Trainers project with the Jute Extension Service should be examined for possible insights and approaches. Evaluation of this project should be completed shortly.

Development of an audio-visual capacity to support extension should be included.

2. USAID Burundi should wait to see the outcomes of the current donor efforts in the primary and secondary schools before considering any project assistance in these areas.
3. USAID Burundi might consider project assistance to the technical schools (ITAB, EPA, the Foyers) although particularly ITAB receives considerable donor assistance already. Most significant needs appear to be in redesign of curriculum, teachers trained in modern teaching methods, practical application laboratories that simulate or are "real" rural situations (ITAB's planned social laboratory appears to have possibilities), and supplies, equipment, case studies, audio-visual. The Foyers, as indicated in the Ross report, have potential for more effectively delivering nutrition and rural development oriented education, particularly to women.
4. In terms of the Faculty of Agronomy, University of Burundi, a clear cut recommendation for USAID at this time is difficult. The current Belgian project has been fraught with problems--lack of adequate facilities, lack of counterparts and trainees to replace ex-patriates. Professor Tack indicated that the Belgians will probably renew the current project for another five (5) years. It would appear that currently Belgium is rather firmly entrenched in both higher education and research. It would appear that development of extension is an easier entry point; however, in the long run linkages among teaching (all levels--for example, competent technical school graduates should also have an opportunity for a university education), research, and extension will have to be made.
5. USAID should consider the possibility of some assistance in the area of planning, project analysis, and management. As indicated in the CDSS training and improved data base are probably where efforts should be directed. USAID Ghana's management training project and the USAID Botswana's planning project should be examined for results to date and possible approaches. USDA's Development Project Management Center (AID centrally funded) might also be tapped.
6. It would appear that development of small farmer credit system and cooperatives have future potential. If a project is developed in either area, it is assumed they would have a training component. Formation of cooperatives might also be built into an extension project.
7. USAID Burundi should consider additional efforts in non-formal education, in addition to the extension service. Based on data collected to date, it would appear that there is a possibility for innovations in this area.

The USAID Bangladesh Organization Development - Training of Trainers project with the Jute Extension Service should be examined for possible insights and approaches. Evaluation of this project should be completed shortly.

Development of an audio-visual capacity to support extension should be included.

2. USAID Burundi should wait to see the outcomes of the current donor efforts in the primary and secondary schools before considering any project assistance in these areas.
3. USAID Burundi might consider project assistance to the technical schools (ITAB, EPA, the Foyers) although particularly ITAB receives considerable donor assistance already. Most significant needs appear to be in redesign of curriculum, teachers trained in modern teaching methods, practical application laboratories that simulate or are "real" rural situations (ITAB's planned social laboratory appears to have possibilities), and supplies, equipment, case studies, audio-visual. The Foyers, as indicated in the Ross report, have potential for more effectively delivering nutrition and rural development oriented education, particularly to women.
4. In terms of the Faculty of Agronomy, University of Burundi, a clear cut recommendation for USAID at this time is difficult. The current Belgian project has been fraught with problems--lack of adequate facilities, lack of counterparts and trainees to replace ex-patriates. Professor Tack indicated that the Belgians will probably renew the current project for another five (5) years. It would appear that currently Belgium is rather firmly entrenched in both higher education and research. It would appear that development of extension is an easier entry point; however, in the long run linkages among teaching (all levels--for example, competent technical school graduates should also have an opportunity for a university education), research, and extension will have to be made.
5. USAID should consider the possibility of some assistance in the area of planning, project analysis, and management. As indicated in the CDSS training and improved data base are probably where efforts should be directed. USAID Ghana's management training project and the USAID Botswana's planning project should be examined for results to date and possible approaches. USDA's Development Project Management Center (AID centrally funded) might also be tapped.
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However, before making specific recommendations the social science analysis of the ag sector analysis should be studied, results of other donor efforts to date should be more carefully reviewed than was possible at this time and perhaps some small pilot efforts will need to be tested. Radio and other audio-visual approaches seem also to have merit.

8. USAID Burundi should carefully analyze all potential project efforts with respect to impacts on women. A serious effort to look at this dimension in all projects would appear preferable to having a "token women's project". As indicated earlier some small pilot efforts specifically in the WID area could be useful however.
9. USAID Burundi should also be certain that all its efforts in the agricultural sector also take into account nutrition and consumption effects. This more integrated approach is probably preferable to a nutrition project per se.

## SOURCES OF INFORMATION

Interviews conducted in the following organizations:

1. Faculty of Agriculture, University of Burundi
2. African Institute for Social and Economics Development (INADES)
3. Institute of Agricultural Science of Burundi (ISABU)
4. Ministry of Agriculture, Livestock, and Rural Development
5. Ministry of Education, including BER and BEPES
6. Ministry of Planning
7. Ministry of Rural Affairs
8. Ministry of Social Promotion
9. UNDP, UNICEF, FAG, UNESCO

Field visits were made to Gitega region including ITAB, to Karuzi including EPA, and to Rutegama

Readings:

1. AID Circular Airgram 385, Draft Strategy Statement for Education and Human Resources for the Africa Bureau, 9/21/78
2. Foreign Area Studies, Area Handbook for Burundi; Washington, Nov. 1969
3. Hall, C. Darrows, "Possibilities for U.S. AID Agricultural Projects in Burundi in Light of Burundi's Agricultural Situation", Sept. 1975 USAID Report Bujumbura
4. Rapport d'activite pour l'annee academique 1977-1978. Universite Du Burundi, Faculte Des Sciences Agronomiques
5. "Quinquennal de Developpement Economeque et Social du Burundi", 1978-1982
6. USAID, CDSS/Burundi 1973
7. World Bank, Economic Memorandum - Burundi April 1978

Information was also obtained from draft reports of some of the other team members or in conversations with these team members.