ADMINISTRATION AND POPULATION

1. INTRODUCTION

1.1 GENERAL

The data of administration and population within the Study Area were mainly collected from Kibungo Prefecture and Communal Office. The data of 1988 are latest and basic calculations/examinations for the water supply planning is estimated, mainly using the data between 1983 and 1988 of Communal Office.

The Kibungo Prefecture has a total area of 4,134 km2 with a population of 433 thousand in 1988. Population density is estimated at about 162 persons per km2. Average size of household range from 7.5 to 12. More than 90% of the population are engaged in agriculture. The capital of the Prefecture is the town of Kibungo located at the southern center and sub-capital is in the town of Rwamagana located at north-western part in the Prefecture.

In the social-cultural-economic context, the Kibungo Prefecture could not be divided in the same way as the similar physical condition throughout the Prefecture.

1.2 SETTLEMENT PATTERN

In general, villages are developed along main roads and ridge lines, particularly on relatively mild topographic areas of approximately 1,500 m elevation. Public facilities, such as hospitals, schools and public offices, are also located in 1,500 to 1,600 m elevations. Heavily populated Rwamagana, Kibungo, Fukue, Zaza, Nushiri, and Kirehe are also located on that elevation range.

Housing, in general, is sparsely located on the elevation ranges of 1,400 m to 1,500 m and 1,600 m to 1,700 m. Exceptions to this are to communes of Sake and Rutonde where the housing is concentrated on the 1,400 m to 1,500 m elevation range. Housing in the Rusumo commune is concentrated on the 1,600 m to 1,700 m elevation range.

Concentrated housing is rarely seen above the 1,700 m elevation. In the Rusumo commune, however, there is a small village developed above the 1,700 m level. Except in the Rusumo commune, housing concentrations are not seen.

As described above, the variation of housing distribution at different elevations is a feature of the Study Area.

2. ADMINISTRATION

2.1 GENERAL

The Study Area is administratively located in the jurisdiction of Kibungo Prefecture. Kibungo Prefecture consists of 11 communes which are subdivided into 120 administrative sectors and 695 Cellules of the Revelational Movement for National Development (M.R.N.D.).

Each Commune is ruled under a Bourgmestre who has been nominated by President, assisted by a Communal Council, a technical commission and councilors. The detailed administrative division of the Kibungo Prefecture is as given in Data Book and outline is presented in Fig. D.1 and Table D.1. The administrative units are summarized as below:

	Commune	Number of Sectors	Number of Cellules
1	BIRENGA	12	59
2	KABARONDO	10	58
3	KAYONZA	10	100
4	KIGARAMA	13	70
5	MUGESERA	15	75
6	MUHAZI	11	66
7	RUKARA	12	60
8	RUKIRA	8	38
9	RUSUMO	9	51
10	RUTONDE	12	66
11	SAKE	8	52
	TOTAL	120	695

Source : Monographie de la Prèfecture de Kibungo 1987

There are two Sub-prefectural offices in Kibungo Prefecture which assist the prefectural administration of Kibungo Prefectural Office. The one is Rwamagana sub-prefecture which administrate to Kayonza, Muhazi, Rukara and Rutonde. The other is Kirehe which administrate to Rukira and Rusumo.

2.2 PERSONNEL AND BUDGET OF COMMUNE

The personnel of each communal office are shown in Table D.1. Number of persons in communal office range from 33 to 51 and one or two managers of water administration (Fountainea) is assigned in each Commune.

The annual budgets of communal administrations range from 10 million to 22 million FRW (1988) as in Table D.2. The highest budget is 21,885,000 FRW of Kigarama Commune and the lowest is 9,790,000 FRW of Rukira Commune.

3. POPULATION

3.1 POPULATION PATTERN

Kibungo Prefecture consists mostly of the rural areas and only Kibungo, Rwamagana, Sake and Zaza are major town areas. Less than 10 % of whole population are living in the town areas. The rest are generally living in small settlement and/or farmhouse scattered on hilly land. The town of Rwamagana has the biggest population of some 10,000 also, the town of Kibungo has the population of some 5,000 as of 1988.

The population of each age-groups is as below:

Age-group under 15-years old: 104,104 (25%)
Age-group under 25-years old: 216,449 (52%)
Age-group over 25-years old: 197,362 (48%)

The population of younger age-groups is dominant in the Study Area reflecting a population pattern at a National level.

The distribution of population is outlined as below:

Commune	Area (km2)	Popuration 1983	Popuration 1988	Popuration Increase	Density 1983	Density 1988
1 BIRENGA	263.6	33,307	43,413	10,106	126.35432	164.69271
2 RUKIRA	253.2	30,344	35,970	5,626	119.84202	142.06161
3 RUSUMO	788.8	46,972	64,103	17,131	59.548681	81.266480
4 SAKE	146.1	34,118	40,841	6,723	233.52498	279.54140
5 MUGESERA	144.1	41,509	46,128	4,619	288.05690	320.11103
6 KIGARAMA	273.3	35,597	39,559	3,962	130.24881	144.74570
7 KABARONDO	160.3	27,531	31,975	4,444	171.74672	199.46974
8 KAYONZA	190.0	23,760	25,953	2,193	125.05263	136.59473
9 RUTONDE	93.7	27,726	31,024	3,298	295.90181	331.09925
10 MUHAZI	91.6	33,499	38,478	4,979	365.70960	420.06550
11 RUKARA	261.6	31,542	35,541	3,999	120.57339	135.86009
TOTAL	2,666.6	365,905	432,985	67,080	2,037	2,356

Source : Monographie dela Prefecture de Kibungo 1988

The population data of each Sector are given in Table D.3 and the density is as shown in Fig. D.1. The population size of commune and secteur are some 25 - 45 thousand and some 3,000 - 4,000 respectively.

The population density of Muhazi Commune, highest within the Prefecture, is 420 persons per km2 and that of Rusumo Commune is lowest of 81 persons per km2. The population density of secteurs range from 100 to 1,000 persons per km2. The areas of high population density are Muhazi, Rutonde, Mugesera and Sake communes, and the density in each secteur range from 300 to 1,000 inhabitants per km2.

3.2 POPULATION GROWTH RATE AND PATTERN

The average population growth rate in Kibungo Prefecture from 1982 to 1988 is estimated as 3.3 percent.

The population growth rate of Rusumo Commune is highest rate in Kibungo Prefecture and it is 6.5 percent on account of the many immigrants from other prefectures. The immigrants have been entering the communes of low population such as Rusumo, Rukira, Birenga, Kayonza and Kigarama as settlers.

The growth rate of each commune is calculated from average growth rate between 1982 to 1988 as given below.

Commune	Population Growth Rate
Birenga	2.79%
Rukira	4.27%
Rusumo	6.48%
Sake	3.77%
Mugesera	2.21%
Kigarama	2.30%
Kabarondo	3.18%
Kayonza	1.82%
Rutonde	2.20%
Muhazi	3.04%
Rukara	2.49%

The population of each secteur in the year 2000 are estimated using the population in 1988 and the calculated growth rate of each commune. Estimated population of the year 2000 which will be applied to the water supply plan is 653,508.

PERSONNEL OF COMMUNE OFFICE

	BIRENGA	RUKIRA	RUSUMO	SAKE	MUGESERA	KIGARAMA	KABARONDO	KAYONZA	RUTONDE	MUHAZI	RUKARA	Total
Bourgmestre	1	1	1	0	0	1	1	1	1	1	1	9
Sub Bourgmestre	3	2	2	2	3	3	2	2	3	2	3	27
Assemblyman	12	9	10	13	15	11	12	7	9	12	8	118
Secretary	1	1	1	1	1	1	1	1	1	1	1	11
C.C.D.F.P	1	1	1	1	1	1	1	1	1	1	1	11
Accountant	1	1	1	1	2	1	1	1	1	1	1	12
Cashier	1	1	1	1	1	1	1	1	1	1	1	11
Investigator	1	1	1	1	1	1	0	1	1	1	1	10
Tax collector	4	3	3	3	4	4	2	2	3	1	2	31
Veterinarian	0	1	0	0	1	0	1	1	1	0	2	7
Policeman	13	15	16	9	10	12	8	6	8	8	9	114
Fountainea	1	2	2	1	1	1	1	1	0	1	1	12
Driver	2	2	4	1	3	1	1	1	1	1	1	18
Typist	2	1	1	1	3	1	1	1	1	1	1	14
Messenger	1	1	1	1	1	1	1	1	1	1	1	11
Watchman	0	2	0	6	3	2	2	4	1	5	1	26
Dietitian	3	2	2	2	1	1	0	1	0	1	2	15
Total	47	46	47	44	51	43	36	33	34	39	37	457

Table D.1

Table D.2

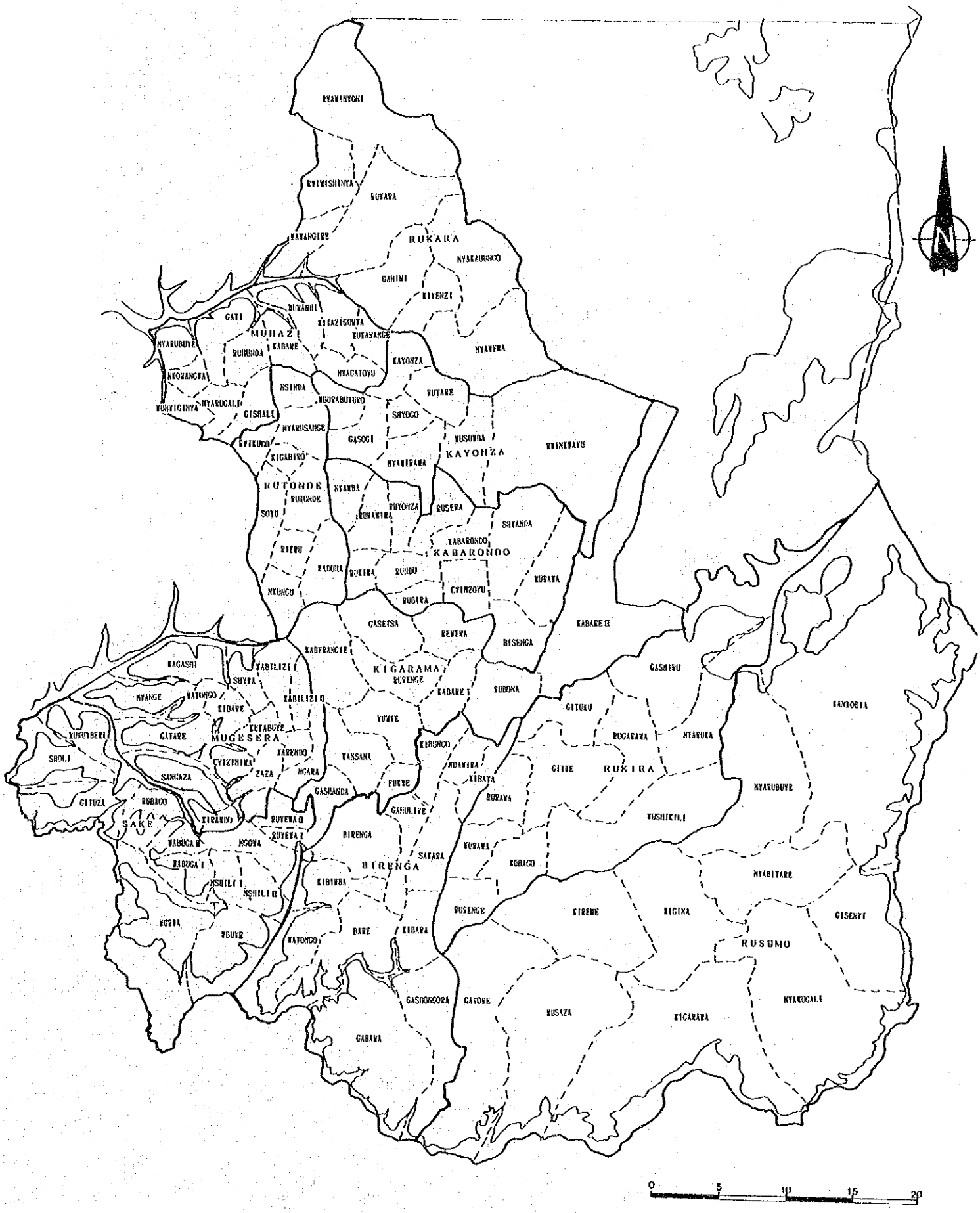
Budget of Each Commune (1987)

Commune	Ordinary Budget			Tentative Budget			Revised Budget			Recorded Budget			Annual Revenue		
	Estimation	Actual	%	Estim.	Actual	%	Estim.	Actual	%	Estim.	Actual	%	Estimation	Actual	%
1 BIRENGA	12.447.257	11.631.835	63.0	5.931.680	73.450	1.23	3.622.666	3.534.879	97.52	—	12.736.826	—	28.601.611	27.976.990	99.9
2 RUKIRA	11.986.750	11.764.807	98.0	7.300.915	4.233.195	57.0	670.250	3.867.088	577.0	—	9.790.234	—	19.957.915	29.653.324	148.6
3 RUSUMO	15.084.750	23.304.881	153.0	14.014.039	3.050.380	21.7	901.357	6.135.358	680.7	—	14.988.226	—	13.946.626	26.485.737	180.0
4 SAKE	8.719.400	9.014.431	103.0	4.697.770	4.943.671	112.0	721.259	696.087	75.5	—	19.779.140	—	14.188.429	34.433.329	242.5
5 MUGESERA	9.686.350	7.417.824	76.5	3.098.400	1.626.415	52.4	626.865	5.597.153	892.8	—	14.521.237	—	13.411.615	29.162.629	217.0
6 KIGARAMA	9.265.090	7.881.253	85.0	4.548.799	6.745.263	148.0	596.096	4.669.331	783.0	—	21.885.367	—	14.409.985	41.181.214	285.72
7 KABARONDO	9.800.600	10.470.907	107.0	4.652.235	3.351.874	85.0	3.868.638	4.475.659	101.0	—	16.201.015	—	16.201.015	18.321.473	188.0
8 KAYONZA	8.930.450	7.361.124	85.0	4.345.000	978.588	25.0	673.176	3.157.797	415.6	—	14.988.226	—	13.946.626	26.485.737	190.0
9 RUTONDE	7.713.650	9.606.460	124.0	1.694.000	4.629.648	73.0	480.900	2.783.167	578.0	—	20.586.984	—	9.888.550	37.603.299	380.0
10 MUHAZI	12.248.200	10.362.668	84.6	3.300.000	5.673.065	177.0	601.308	4.074.195	677.0	—	19.297.367	—	1.604.952	39.407.295	247
11 RUKARA	8.069.855	8.535.622	105.7	1.980.190	2.114.490	106.78	571.452	3.156.447	552.0	—	12.157.697	—	10.621.497	25.964.255	24.0
TOTAL	114.452.352	117.351.812	120.0	55.463.028	37.420.339	67.0	13.333.967	42.147.161	316.0	—	183.467.595	—	189.397.355	380.086.907	503.0

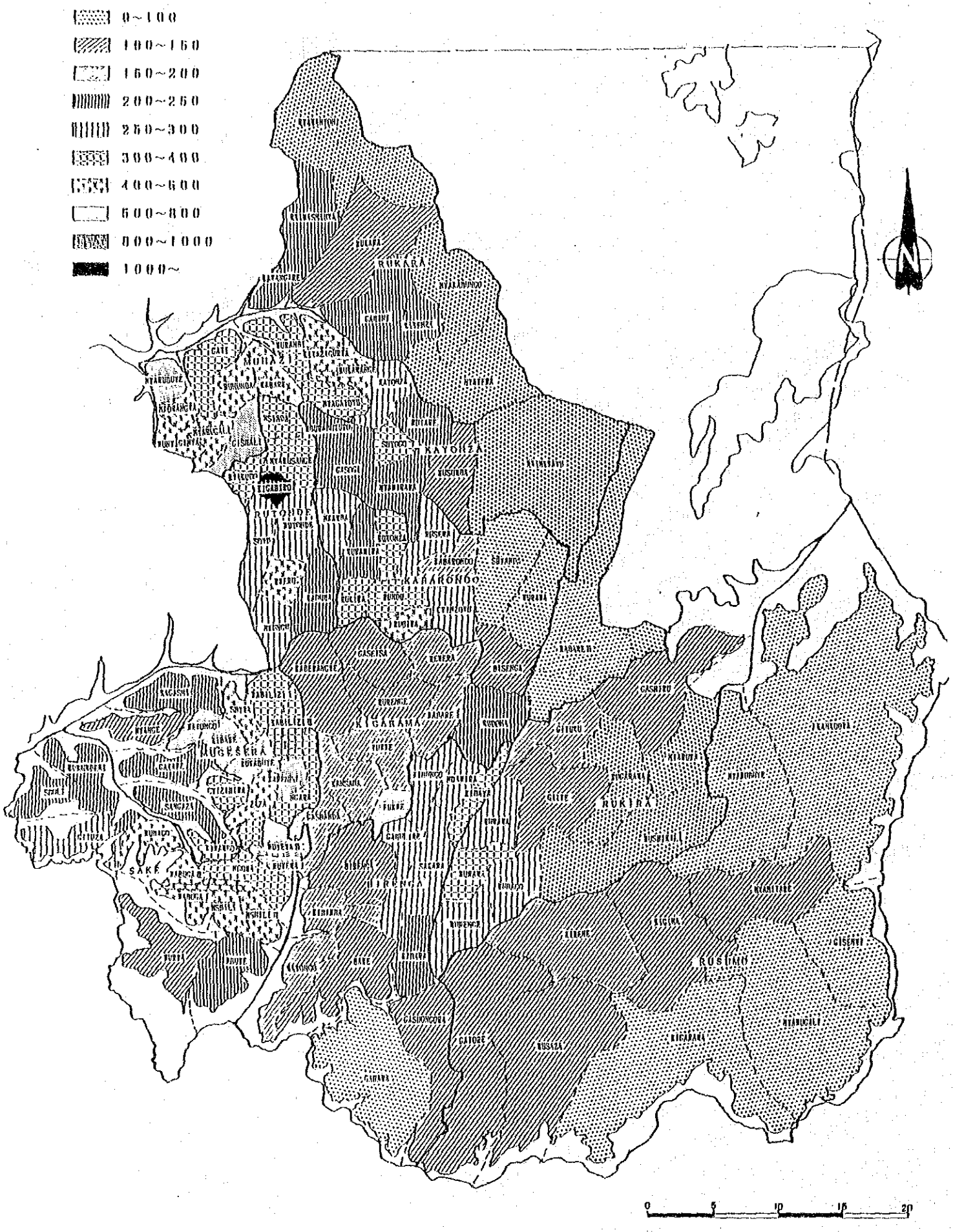
ESTIMATION OF POPULATION GROWTH

Commune	Area (km2)	Population 1982	1983	1984	1985	1986	1987	1988	Growth rate	Estimated Population 1990	1995	2000
BIRENGA	263.6	37,550	39,307	40,435		41,091	42,119	43,413		45,869	52,635	60,399
			4.68%	2.87%		0.81%	2.50%	3.07%	2.79%			
RUKIRA	253.2	28,301	30,344	31,902		33,996	34,974	35,970		39,107	48,201	59,409
			7.22%	5.13%		3.28%	2.88%	2.85%	4.27%			
RUSUMO	788.8	44,399	46,972	49,010		54,763	59,516	64,103		72,680	99,484	136,174
			5.80%	4.34%		5.87%	8.68%	7.71%	6.48%			
SAKE	146.1	32,695	34,118	35,276		38,067	39,357	40,841		43,978	52,917	63,673
			4.35%	3.39%		3.96%	3.39%	3.77%	3.77%			
MUGESERA	144.1	40,091	41,509	42,460	No data	45,236	45,538	46,128		48,189	53,755	59,963
			3.54%	2.29%	is	3.27%	0.67%	1.30%	2.21%			
KIGARAMA	273.3	34,407	35,597	36,610	available	38,607	38,900	39,559		41,400	46,385	51,970
			3.46%	2.85%		2.73%	0.76%	1.69%	2.30%			
KABARONDO	160.3	26,551	27,531	28,004		29,748	30,509	31,975		34,041	39,809	46,554
			3.69%	1.72%		3.11%	2.56%	4.81%	3.18%			
KAYONZA	190.0	23,406	23,760	23,933		24,589	25,159	25,953		26,906	29,446	32,224
			1.51%	0.73%		1.37%	2.32%	3.16%	1.82%			
RUTONDE	93.7	27,117	27,726	28,339		29,858	30,561	31,024		32,404	36,129	40,282
			2.25%	2.21%		2.68%	2.35%	1.52%	2.20%			
MUHAZI	91.6	32,197	33,499	34,500		36,550	37,486	38,478		40,853	47,452	55,117
			4.04%	2.99%		2.97%	2.56%	2.65%	3.04%			
RUKARA	261.9	30,683	31,542	32,446		34,066	34,797	35,541		37,333	42,218	47,743
			2.80%	2.87%		2.50%	2.15%	2.14%	2.49%			
TOTAL	2666.6	357,397	371,905	382,915		406,571	418,916	432,985				
			4.06%	2.96%		3.09%	3.04%	3.36%	3.30%	462,761	548,431	653,508

Source:Annual Report of Each Commune, 1984



Administration Boundaries in the KIBUNGO Prefecture



Population Density of Each Secteur

APPENDIX E

SOCIO-ECONOMY

TABLE OF CONTENTS

LIST OF TABLE

LIST OF FIGURE

SOCIO-ECONOMY

1. GENERAL ECONOMIC SITUATION

1.1 ECONOMIC STRUCTURE AND ACTIVITIES

Economy of Kibungo Prefecture, dominated by agriculture, presumably employs around 65% of the labor force.

Other industries including the home industry, local manufacturing, transportation services, building and commerce and public services still remain at their initial stage of development playing a rather minor role in the overall economic operations of the Prefecture. These sectors of the industry employ less than 3% of the total labor force within the Prefecture (see Table E.1).

The Kibungo Prefecture has few enterprise. The number of workers employed in the enterprises is considered to be only less than 1,000 workers as of 1987, whereas the advanced prefectures of Kigali, Butare and Ruhengeri, have more than a few thousand workers in the enterprises.

Around 30% of the labor force is presumed to be unemployed(see Table E.1).

1.2 ECONOMIC ACTIVITIES OF EACH SECTOR OF INDUSTRY

(1) Agriculture

Kibungo Prefecture's population distribution is the same as country's. 90% of the people scatter in rural areas. Most of the people are engaged in farming and stock farming which form the Prefecture's economic foundation.

Kibungo Prefecture is the No.1 banana producing prefecture in the country. It also produces coffee, the country's No.1 export item. In 1986 the country produced 47,800 tons of coffee of which 41,800 tons were exported. 86% of the country's export income was derived from the export of coffee.

The Prefecture is the country's leading producer of peanuts, manioc (cassava), bananas and maize. Rukara, Rusumo, and Mugesera are well-known stock farming communes. Production and cultivated area of principal crops are as follows:

Crops	Cultivated area (ha)	Production (ton)	Unit Yield (ton/ha)
Banana	74,415	1,054,747	14.173
Haricot bean	54,443	53,275	0.978
Pea	2,134	1,814	0.850
Soybean	845	1,084	1.282
Peanut	11,257	11,043	0.980
Sorghum	37,391	74,080	1.981
Maize	4,865	7,180	1.475
Sweet potato	11,600	115,521	9.987
Potato	1,400	11,200	8.000
Cassava	17,542	309,846	17.662
Coffee	5,343	3,648	402 gr/tree
Fruits	901	8,436	9,363
Vegetables	425	20,748	48.819
Ignames	92	854	9.283
Taro	232	2,245	9.677
Rice	-	420	-

Source : Monographie de la Prefecture de Kibungo 1987

Number of livestock in Kibungo Prefecture are as below:

Livestock		Nombers (heads)
French	English	
Vaches	:Cow	15,889
Genisses	:Young Cow	9,401
Taureaux	:Bull	711
Taurillones	:Young Bull	3,426
Boeufs	:Cattle	497
Bouvillons	:Ox	1,021
Veaux Males	:Calf(m)	3,762
Veaux Femmeles	:Calf(f)	4,542
Total		39,299

Source : Monographie de la Prefecture de Kibungo 1987

The other information around agricultural sector is given in Table E.2.

(2) Fishery

Fisheries in the Prefecture rely mainly on the freshwater fish caught in lakes. The fish catch in Ihema Lake in Akagera National Park and in the Mugesera and Sake lakes in the western part of the prefecture is high (approx. 490 tons annually). In Rwanda, only at Lake Kivu located in the western part of the country is the fish catch higher. The haul in the Prefecture is as below:

INLAND FISHERY INDUSTRY

Lake	Commune	Haul
MUHAZI	MUHAZI	*
	RUKARA	19,711
MUGESERA	MUGESERA	150,420
	SAKE	51,182
SAKE	SAKE	61,507
BIRIRA	SAKE	11,607
KYANBEI	RISUMO	*
MUPANGA	RISUMO	14,048
NASHO	RISUMO	11,806
IHEMA	KAYONZA	168,438
TOTAL		488,719

(3) Manufacture

Industrial activities in the Prefecture are not very prosperous.

The Rwanda Paper Company at Zaza in the commune of Mugesera is the only factory in the Prefecture. This company manufactures insulation panel boards and cardboard using papyrus materials.

Other manufacture is still initial level of development.

(4) Handicraft

Sewing, embroidery and brick making are conducted mainly in the Rwamagana City. Corporations for the manufacture and sales of these handicraft items were recently established and their business has been steadily improving. Most of the activities is carried out by craftsman groups as given in Table E.3.

(5) Mining

The Rwinkwavu mine (in Kayonza Commune) -- once the largest mine in the country -- has been shut down since 1986. Only the Muve mine in the commune of Sake is still producing small amounts of tin and tungsten.

(6) Commerce

Major commercial activities in the Prefecture are carried out by Trafipro's, a wholesale company of a cooperative nature having the largest distribution network in Rwanda. It has branches in Kibungo City, Rwamagana and Zaza. The circumstance of shop sales in Rwamagana is outlined as below:

THE CIRCUMSTANCES SALES OF RUMAWAGANA SHOP

List of Articles	Monthly Sum
BASKET	163,711
KNITTING	107,750
EMBROIDERY	105,900
WOODWORK	68,200
LEAD WORK	109,605
MANUFACTURE	68,200
TIMBER	8,390
OTHER	27,220
TOTAL	658,976

Other commercial activities include Soquakoki (a beer wholesale company), Pharmacies Sokophaki (a medicine supply wholesale company), 34 outdoor markets that are periodically opened in each of the communes, 9 wholesale markets and 12 gasoline stands (see Table E.4).

(7) Tourist Industry

In contrast with the Volcano National Park located in the north-western part of the country, Kibungo Prefecture has the Akagera National Park, the major tourist attraction in the country. This park is the habitat of African representative animals. The money spent by the tourists visiting the park contributes importantly to the country's foreign currency earnings.

(8) Financial Activities

Financial activities have been mainly conducted by commercial bank. Management fee of existing water supply systems is usually collected by communal organization and also deposited to commercial bank such as "La Banque Comerciale du Rwanda (BCR)" and "La Banque de Kigali". Bank within the Study Area is listed in Table E.5.

1.3 INCOME CHARACTERISTICS

Household-economy had been examined through the interview survey to inhabitants in 1989 and 1990 by the Study Team. Total sample number of the interview survey is 252 samples and the results are outlined in Table F.3 of Appendix F and detailed in Data Book.

According to the interview survey results, the income of salaried persons in the Prefecture range from about 5,000 to 12,000 FRW a month. The income of farmers is estimated to range from 1,000 to 5,000 FRW a month.

In Kibungo Prefecture, the results of an interview survey shows the average labor's wage of fermer level to be 5,000 FRW a month (65 US$) and more than 9,500 (125 US$) a month for a salaried person.

The people who will receive the rural water supply services are mostly farmers. It is considered that the average income needed to study the Rural Water Supply (Phase III) should be 3,000 FRW (40 US$) per month per household in 1990, while per capita GNP/year of Rwanda was 310 US$ in 1987.

1.4 MARKETING

Agricultural products comprising banana, coffee, fruits, vegetable and livestock including goats, cows are the major products to be marketed in the Kibungo Prefecture. However, major portion of the products is for home consumption is usually put on market. Imported goods such as clothes are place on market mainly through Kigali.

The agricultural products and livestock are brought to market mainly by producers. Imported goods are mainly handled by private middlemen.

Many cooperations and production groups of agriculture and other industries have been organized (see Table E.6) and a few products are brought to markets by them. The number of groups (including cooperations) is 169 groups and joining members are more than 40,000 persons as in Table E.6.

The transactions are mainly made in marches which are traditional market-system in rural area of Rwanda. 43 marches (markets) have been conducted the transactions and a marketing area covers two or three secteurs, usually within a open space beside a main road. Most of marches (markets) are opened on weekly basis. In dense populated areas such as Kibungo, Murindi, Kabarondo and Rwamagana areas, the markets are opened more frequently.

Marketing structure and organization is still initial level of development and the transport/communication facilities for market is quite inadequate. Then marketing systems in the Prefecture are yet to be developed both from the viewpoints of institution and facilities.

Locations and day of open the markets in the Prefecture is listed in Table E.4.

1.5 PRICE CHARACTERISTICS

Marketing price of agricultural products which are main products in the Study Area, are considered to be stable within these years, though decreasing of the price is recorded between 1985 and 1986.

Seasonal fluctuation in the price of the agricultural products has been found, though the price of major agricultural products is controlled by the Central Government (MINAGRI). The price is usually lower than the controlled price. The market prices of main agricultural products are given as below:

banana	: 6 - 12	FRW/kg
kidney been	: 35 - 55	FRW/kg
peanut	: 120	FRW/kg
coffee	:200 -350	FRW/kg
rice	: 60 - 80	FRW/kg (price in 1987)

Price fluctuations of other products and goods on the market are mostly similar to those of agricultural products.

The wages of labor is 200 to 500 FRW per day in 1988 and in general, wages are lower in rural area than in urban-suburban area.

2. SOCIAL SERVICE AND INFRASTRUCTURE

Condition and characteristics of administration and population in the Study area are discussed in Appendix D. The remaining parts of social conditions are described in the Section.

2.1 DESCRIPTION ON EACH SECTOR OF SOCIAL SERVICE

(1) Education

In the Study Area, most of the primary schools are located in each Secteur and managed by the commune or the catholic church. The approximate number of pupil is 80,000 and the percentage in the total population indicates about 20% in Kibungo Prefecture (see Table E.7).

Secondary schools are located only in Birenga, Kigarama, Muhazi, Mugesera, Rukara, Rukira and Rutonde Communes. Another educational facility is the vocational training school, also located in each commune. There is no high educational facility in Kibungo Prefecture. The detailed condition of education facilities are given in Table E.8.

(2) Health

There are 34 medical institutions in Kibungo Prefecture. These institutions consist of four (4) hospitals, 11 public health centers, six (6) dispensaries, 12 service nutrition centers and one (1) sanatorium (see Table E.10 and Fig. E.1).

The main causes of morbidity and mortality in Kibungo Prefecture are malaria, diarrhea and pneumonia etc., as shown in Table below. And there are many water-borne diseases such as typhoid, amoebic dysentery, bacillary dysentery and schistosomiasis etc.

Ten Main Causes of Morbidity in Rwanda, 1988

Name of Causes	RWANDA		KIBUNGO	
	No. of Case	%	No. of Case	%
1. Malaria	1,101,280	69.8	115,691	77.0
2. Diarrhea Disease	153,097	9.7	14,040	9.3
3. Pneumonia	128,210	8.1	6,497	4.3
4. Gastritis	98,316	6.2	5,142	3.4
5. Venereal	45,033	2.9	1,590	1.1
6. Chicken Pox	13,163	0.8	681	0.5
7. Malnutrition	13,210	0.8	734	0.5
8. Car Accident	11,557	0.7	1,342	0.9
9. Parotitis	7,688	0.5	1,666	1.1
10. Fever	7,802	0.5	2,904	1.9
Total	1,579,356	100.0	150,287	100.0

SOURCE: MINISANTE, 1989

Ten Main Causes of Death in Rwanda, 1988

Name of Causes	No. of Case	%
1. Malaria	1,703	57.4
2. Pneumonia	387	13.0
3. Diarrhea Disease	269	9.1
4. Malnutrition	160	5.4
5. Car Accident	125	4.2
6. Tuberculosis	85	2.9
7. Measles	75	2.5
8. Fever	72	2.5
9. Cirrhosis	48	1.6
10. Venereal	43	1.4
Total	2,967	100.0

SOURCE: MINISANTE, 1989

According to the annual report of Kibungo Prefecture, there are only four hospitals with 549 beds in the Prefecture, which were located in Kibungo, Rwamagana, Rwinkuwabu and Gahini.

Number of public health center and dispensary is insufficient for increasing patients, and also doctor and medical staff. It is required to promote the expansion of receiving vaccination, the education for social public health and the improvement of environmental health.

In addition, the facilities such as drinking water supply system and electrification within the medical institution are still low level. Improvement of the existing inadequate conditions in the institutions is strongly required by most of the medical stuff in the Study Area.

2.2 INFRASTRUCTURE

(1) Roads

Main roads in the Study Area are shown in Table E.11 and Fig. E.3. The total length of main roads in the Study Area is 431.3 km in 1989 and are classified into three types, an international road, national road and communal road. The international road includes an asphalt pavement, however, other roads are not paved and they are impossible during the rainy season.

These main roads are maintained by the Road Division in MINITRAPEE. Other local roads are maintained by each commune. The local roads are mainly constructed or improved by service working called UMUGANDA. Most of them are along the ridge, and a few roads are along the water source such as river and lake because almost people is living along the ridge or the side of the hill.

(2) Electrification

Rwanda contains four hydroelectric power plants and one thermal power plant in GATSATA. The total plant capacity is 28.69 MW.

There are two transformer substation in Kibungo Prefecture. One in Kabarondo and another one in Rwinkwavu and the operation/management are conducted by ELECTROGAZ.

Kabarondo station supplies to Kabare and normal technique school in Kigarama commune, Kibungo City, Karembo and Zaza's paper mill in Mugesera Commune and Sake Commune by electric power of 70/30 KV. Rwinkuwavu station supplies Rwinkuwavu mines, Akagera hotel and Ihema fishery center further by 70/15 KV.

further by 70/15 KV.

Power transmission lines in the Study Area are insufficient. Almost communes are not electrified, especially, RUKIRA, RUKARA, RUSUMO and so on.

Electrification has made little progress due to lack of a power distribution system and budget, though the Government has been making efforts to increase power supply in the Prefecture. It is only expected that a proposed power transmission line in the northern part of the Study Area (Rukira Commune) will be implemented by Belgian Aid in 1991.

The transmission line for electric power in the Study Area is presented in Fig. E.4.

(3) Transportation and Telecommunication

Main transportation means are bus and taxi for the National/Communal roads. Bus-transportation is operated by ONATRACOM and taxi-transportation is operated by commercial groups.

As of 1987, The existing bus-transportation routes in the Study Area are seven (7) and the routes under planning three (3) as shown in below:

Existing Route
- .Kibungo - Rusumo
- .Kibungo - Bare
- .Kibungo - Mupanga
- .Kibungo - Ruwamagana
- .Kibungo - Sake
- .Kibungo - Nyamata
- .Nyamata - Kigali

Planned Route
- .Kibungo - Kabarondo - Nyakora
- .Kibungo - Gituku - Rusumo
- .Kibungo - Rusozi - Rushyonga - Murindi

Telecommunication network are hardly available in the Prefecture except telephone service among Kibungo, Rwamagana and Kigali. The communication capacity therefore is considered to be still poor.

(4) Rural Water Supply

A few existing piped water supply systems and hand-pump wells serve domestic water within the Study Area. Around 80 Secteurs are not served by any water supply system against to around 40 Secteurs which are covered with the

piped system and hand-pump wells. The detail description and evaluation are given in Appendix F "Existing Water Supply System".

2.3 SOCIO-ECONOMICAL CLASSIFICATION OF THE STUDY AREA

The Prefecture could be classified into five development orders;

higher district center(H),
district center(D),
locality town(LT),
service village(Vs),
farming village(Vf)

The classification is mainly taking account of population scale, public service level, socio-economic activities and conditions of infra-structure.

Locality town (LT) and service village (Vs) are further sub-divided into three and two groups respectively, based on population accumulation and public service level;

Locality Town
- High accumulation and high service level..... LT1
- Medium accumulation and high service level..... LT2
- Medium accumulation and medium service level... LT3

Service Village
- Medium accumulation and high development potential Vs1
- Medium to low accumulation and low development potential Vs2

The classification and spatial distribution are taken into consideration to decide a service level water supply system for Phase III and are presented in Table L.1 and Fig. L.1 of Appendix L.

Population by Occupation

	Public Services			Company Employee			Agriculture			Manufacture		
	man	woman	total	man	woman	total	man	woman	total	man	woman	total
BIRENGA	257	110	367	7	4	11	13.440	15.366	28.806	140	0	140
RUKIRA	111	51	162	6	0	6	9.293	9.007	18.300	61	16	77
RUSUMO	213	75	288	15	7	22	14.031	14.003	28.034	244	0	244
SAKE	131	102	233	198	12	210	9.149	11.553	20.702	157	68	225
MUGESERA	300	110	410	7	4	11	11.443	13.600	25.043	657	59	716
KIGARAMA	391	150	541	60	16	76	9.413	8.633	18.046	320	48	368
KABARONDO	211	60	271	37	3	40	6.279	7.772	14.051	28	0	28
KAYONZA	241	56	297	72	4	76	6.384	8.306	14.690	88	42	88
RUTONDE	254	156	410	31	3	34	9.703	10.359	20.062	63	25	88
MURAZI	203	58	261	55	3	58	6.438	6.644	13.082	110	109	219
RUKARA	291	86	153	72	17	89	9.363	10.809	20.172	193	102	295
Total	2.603	1.014	3.393	560	73	633	104.936	116.052	220.988	2.061	469	2.488

	Merchant			Unemployee			Others			Total		
	man	woman	total	man	woman	total	man	woman	total	man	woman	total
BIRENGA	39	1	40	1.615	1.269	2.884	30	41	71	15.528	16.791	32.319
RUKIRA	33	0	33	4.848	5.517	10.365	0	0	0	14.352	14.591	28.943
RUSUMO	79	0	79	7.185	7.076	14.261	0	0	0	21.767	21.161	42.928
SAKE	23	16	39	5.850	5.598	11.458	25	21	46	15.533	17.470	33.003
MUGESERA	62	0	62	5.892	5.763	11.655	0	0	0	18.361	19.536	37.897
KIGARAMA	110	19	129	4.533	6.867	11.500	38	17	55	14.965	15.750	30.715
KABARONDO	23	1	14	4.979	5.649	10.628	0	0	0	11.557	13.485	25.042
KAYONZA	19	0	19	1.497	1.506	3.003	24	2	26	8.325	9.916	18.241
RUTONDE	172	24	196	2.132	2.140	4.272	108	73	181	12.463	12.780	25.243
MURAZI	16	0	16	8.436	8.497	16.933	10	3	13	15.268	15.314	30.582
RUKARA	18	1	19	2.717	2.744	5.461	0	0	0	12.654	13.759	26.413
Total	594	62	646	49.784	52.726	102.420	235	157	392	160.773	170.553	331.326

Outline of Agricultural Activities

SUMMARY LIST OF COOPERATION PASTURAGE

Commune	Stock Farm	Area (Ha)	Domestic animal (large-sized)	Domestic animal (small-sized)	Breeder
BIRINGA	15	189.60	478	—	177
RUKIRA	3	2,780.00	708	—	—
RUSUMO	11	3,278.90	938	—	112
SAKE	13	1,425.41	362	—	108
MUGESERA	6	346.97	—	—	—
KIGARAMA	1	136.50	—	—	—
KABARONDO	7	2,301.87	604	—	86
KAYONZA	6	188.60	109	22	98
RUTONDE	10	259.80	106	—	98
MUHAZI	10	280.46	45	16	22
RUKARA	6	417.61	—	—	—
TOTAL	88	△13,312.12	3,350	38	701
		△11,605.72			

THE OTHER FARM PRODUCE

Farm Produce	Area (Ha)	Output (kg)
FRUIT	900.54	8,436.080
VEGETABLES	425.16	20,747.870
YAM	91.80	853.000
TARO	232.00	2,245.700
RICE	—	420.225

COFFEE

Commune	Production(t)
BIRENGA	465.580
RUSUMO	805.300
RUKIRA	470.000
SAKE	377.500
MUGESERA	282.000
KIGARAMA	525.000
KABARONDO	346.658
KAYONZA	172.008
RUTONDE	84.700
MUHAZI	162.291
RUKARA	81.000
TOTAL	3,772.037

CIRCUMSTANCES OF AFFORESTATION

Commune	Plant Area (1988)
BIRENGA	384.81
RUKIRA	318.65
RUSUMO	452.19
SAKE	301.47
MUGESERA	340.19
KIGARAMA	611.70
KABARONDO	445.16
KAYONZA	280.72
RUTONDE	186.50
MUHAZI	305.83
RUKARA	318.99
TOTAL	3,946.21

LIST OF CRAFTSMAN GROUP

Commune	Group	Activity
1. BIRENGA	KODUKI	EMBROIDERY, RATTAN WORK, SEWING
	A. M. B. M.	FITTINGS, CABINET WORK
	A. JE. ME. MU.	FITTINGS, CABINET WORK
	C. CJ. KI	BUILDING, CABINET WORK
	IS. A. KI	CRAFTSMAN COOPERATION
2. KAYONZA	A. JE. FI. KA	EMBROIDERY, RATTAN WORK
3. NIGARAMA	C/F/J	MASON, CABINET WORK, SEWING
4. MUHAZI	ATACOMU	FIGRED BOROCADE
	C. P. J	MANUFACTURE of SHOES
5. MUGEZERA	A. P. A. KI	EMBROIDERY, RATTAN WORK, SEWING
6. RUKARA	Cordonnrerie	MANUFACTURE of SHOES
	COFABRIKA	MANUFACTURE of BRICK
	Tubbanzo-Twubaku	MASON, CABINET WORK
7. RUKIRA	ABANABIMANA	CABINET WORK
	A. J. C. RU	CABINET WORK
8. RUSUMO	A. J. de NYARUBUYE	CABINET WORK
9. RUTONDE	U. G. A	EMBROIDERY, RATTAN WORK
	H. V. P/R/	EMBROIDERY, SEWING, RATTAN WORK, KNITTING
10. SAKE	ABANATENGUMAN	CABINET WORK
	RUKOMA	MANUFACTURE of BRICK, POTTERY, SCULPTURE

KIBUNGO MARKET CIRCUMSTANCES

Commune	Site	Distance from KIBUNGO (km)	Open (day)	Market assortment
1. BIRENGA	GIBUNGO	3	WED, SAT	Central Market
	MUTENDERI	18	MON	Market
	GAHARA	26	FRI	Market
	SAKARA	16	FRI	Market
	DAGAZA	30	WED	Market
2. RUKIRA	RUKIRA	20	MON	Market
	MURINDI	72	WED, SUN	Wholesale Market
	GIZUKU	31	FRI	Market
	RURENGE	34	SAT	Market
3. RUSUMO	NYAMUGARI	57	MON	Market
	NUGANDA	38	MON	Market
	NYAKARANBI	45	WED	Market
	RUSHONGA	68	FRI	Wholesale Market
	KYANZI	62	SAT	Market
	NYARUTHUNGA	42	SAT	Market
4. SAKE	MABUKA	29	FRI	Market
	RUBONA	60	WED	Market
	JARAMA	45	MON	Market
	GAHUNZO	—	FRI	Market
5. MUGESERA	NUGOMA	28	SAT	Market
	SANGAZA	—	MON	Market
	NYANGE	—	WED	Market
	KARENBO	22	MON	Wholesale Market
	KIZIBIRA	—	SAT	Market
6. KIGARAMA	REMERA	10	FRI	Wholesale Market
	CHARUBARE	27	WED	Market
	KIRUWA	—	SAT	Market
	KIBINBA	16	WED	Market
7. KABARONDO	KABAROND	18	MON, THU	Wholesale Market
	RURAMIRA	36	WED	Market
	BUKUNBIYA	35	SUN	Market
8. KAYONZA	KAYONZA	30	MON	Wholesale Market
	NYANKORA	39	FRI	Market
	NUKONDOU	24	WED	Market
9. RUTONDE	RUMAWAGANA	54	WED, SAT	Wholesale Market
10. MUHAZI	GISHARI	69	MON	Market
	KABARE	—	SUN	Market
	MURANBI	—	SUN	Market
	KIRUHURA	—	FRI	Market
11. RUKARA	KATUBANBA	54	WED	Wholesale Market
	NYAWERA	—	SAT	Market
	KAWANZIRE	—	FRI	Market
	KARANBI	—	MON	Market

Banking Facilities in KIBUNGO Prefecture

Banking Facilities	Commune	Site
1. B. C. R. BANK	: BIRENGA	: KIBUNGO
2. C. C. RUMAWAGANA BANK	: RUTONDE	: RUMAWAGANA
3. KIGALI BANK	: RUTONDE	: RUMAWAGANA
4. C. N. MUTENDERI BANK	: BIRENGA	: MUTENDERI
5. C. N. RUKIRA BANK	: RUKIRA	: RUKIRA
6. SAKE BANK	: SAKE	: SAKE
7. C. N. KARENBO BANK	: MUGESERA	: KARENBO
8. GABORORO BANK	: KIGARAMA	: GABORORO
9. RUSUMO BANK	: RUSUMO	: RUSUMO
10. NUKANBA, KABARONDO BANK	: KABARONDO	: KABARONDO
11. RUWYINKUWABU BANK	: KAYONZA	: RUWYINKUWABU
12. RUKARA BANK	: RIKARA	: RIKARA

Activities of Cooperative Group in KIBUNGO Prefecture Table E.6

ORIGINAL COOPERATION

Enterprise	Number of Cooperation (1988)	Number of Member (1988)	Number of Cooperation (1989)	Number of Member (1989)	Rate of Increas Member
FARM PRODUCE CIRCULATION	27	11,581	27	11,678	97
SAVING, LOAN	11	15,740	11	19,060	3,320
DOMESTIC ANIMAL (large-sized)	1	30	1	30	—
RAISED BEE	1	30	1	30	—
AGRICULTURE	1	30	1	30	—
MANUFACTURE of BRICK	1	9	1	9	—
FISHERY INDUSTRY	1	25	1	77	—
TOTAL	43	27,399	42	30,868	3,469

ASSOCIATE COOPERATION

Enterprise	Number of Cooperation (1988)	Number of Member (1988)	Number of Cooperation (1989)	Number of Member (1989)	Rate of Increas Member
FARM PRODUCE CIRCULATION	15	2,193	15	2,674	481
NECESSARIES SUPPLY	2	1,485	2	1,537	52
PRODUCTION of PINEAPPLE JUICE	1	172	1	172	—
FISHERY INDUSTRY	1	32	2	39	7
DOMESTIC INDUSTRY GOODS	2	18	2	18	—
QUARRY	1	35	1	35	—
DOMESTIC ANIMAL (large-sized)	5	108	5	108	—
FARM PRODUCE	3	77	3	77	—
TOTAL	30	4,120	31	4,660	540

NON-COOPERATIVE GROUP

Enterprise	Number of Group (1988)	Number of Member (1988)	Number of Groupe (1989)	Number of Member (1989)	Rate of Increas Groupe	Menber
FARM PRODUCTION	44	1,321	67	1,622	23	301
DOMESTIC ANIMAL (large-sized)	3	55	8	152	5	97
SAND REMOVAL	1	10	1	10	—	—
OTHER PRODUCE CIRCULATION	1	7	1	7	—	—
MANUFACTURE of BRICK	3	34	5	77	2	43
DOMESTIC INDUSTRY GOODS	1	7	2	31	1	24
RAISED BEE	2	38	4	68	2	30
SAVING, LOAN	2	2,403	4	3,886	2	1,483
FISHERY INDUSTRY	—	—	4	100	4	100
TIN CIRCULATION	—	—	1	117	1	117
TOTAL	57	3,875	96	117	39	2,078

PRIMARY SCHOOL IN KIBUNGO PREFECTURE

COMMUNE	SECTOR	NAME	NO. OF STUDENT 1989	2000	GROWTH-R
BIRENGA	Bare	MUNZIGIRA	629	851	(2.79%)
	Bare	BARE	876	1,186	
	Birenga	KAZO	966	1,307	
	Birenga	MULINJA	625	846	
	Gahara	RUBIMBA	631	854	
	Gahara	GAHARA	893	1,209	
	Gahara	MUGOGO	603	816	
	Gahulire	GAHULIRE	696	942	
	Gashongora	BUTEZI	141	191	
	Gashongora	GASHONGORA	641	868	
	Kibara	KIBARA	260	352	
	Kibaya	KIBAYA III	746	1,010	
	Kibimba	KIBIMBA	1,117	1,512	
	Kibungo	KIBUNGO	1,332	1,803	
	Matongo	MATONGO	673	911	
	Sakara	SAKARA	1,126	1,524	
	SUB TOTAL	(16)	11,955	16,182	
RUKIRA	Mubago	NYAHEBARE	446	706	(4.27%)
	Gashiru	RWAMAMUHANGA	574	909	
	Gituku	GITUKU	497	787	
	Gitwe	NYINYA	509	806	
	Murama	RUKIRA	1,087	1,722	
	Mushikili	MUSHIKILI	395	626	
	Mushikili	BISAGARA	148	234	
	Ntaruka	NTARUKA	136	215	
	Ntaruka	RUGOMA	1,106	1,752	
	Rugarama	RUGARAMA	356	564	
	Rurama	BULIBA	432	684	
	Rurenge	RURENGE PR	361	572	
	Rurenge	RURENGE CATH	467	740	
	SUB TOTAL	(13)	6,514	10,317	
RUSUMO	Gatore	CURAZO	450	898	(6.48%)
	Gatore	RWANTONDE	835	1,666	
	Gatore	GATORE	1,156	2,306	
	Gisenyi	PAYSANNAT L	205	409	
	Kankobwa	KANKOBWA	565	1,127	
	Kankobwa	NYAKABUNGO	524	1,045	
	Kankobwa	NYABIGEGA	207	412	
	Kankobwa	PAYSANNAT D	802	1,600	
	Kankobwa	MPANGA	124	247	
	Kigarama	KIYANZA	182	363	
	Kigarama	KABARE	499	996	
	Kigarama	KIGARAMA	647	1,291	
	Kigarama	MUKOMA	118	235	
	Kigina	NYAKILIBA	523	1,043	
	Kigina	KIGINA	1,368	2,729	
	Kigina	RUSUMO	646	1,289	
	Kirehe	MURAMBI	467	932	
	Kirehe	KIREHE	1,350	2,693	
	Kirehe	NYAWERA	432	862	
	Kirehe	KADUHA	254	507	
	Musaza	MUSAZA	796	1,588	
	Nyabitare	NYABITARE	803	1,602	
	Nyamugali	NYAMATETE	590	1,178	
	Nyamugali	NYAMIYAGA	715	1,427	
	Nyamugali	PAYSANNAT G	663	1,323	
	Nyarubuye	NYARUBUYE	1,097	2,189	
	SUB TOTAL	(26)	16,018	31,957	

(continue)

SAKE	Gituza	GITUZA	524	787	(3.77%)
	Murwa	JARAMA	912	1,370	
	Rukumberi	RUKUMBERI	1,130	1,698	
	Sholi	RWINTASHYA	602	905	
	Nshili II	NSHILI	800	1,202	
	Ngoma	KANAZI	552	829	
	Mabuga II	RUKOMA	1,046	1,572	
	Mabuga II	BITARE	746	1,121	
	Rubago	RUBAGO	330	496	
	Sholi	SHOLI	239	359	
	Mbuye	MBUYE	245	368	
	SUB TOTAL	(11)	7,126	10,707	
MUGESERA	Zaza	ZAZA A	1,206	1,534	(2.21%)
	Zaza	ZAZA B	867	1,103	
	Nyange	NYANGE	1,114	1,417	
	Kabilizi I	KABILIZI	769	978	
	Sangaza	SANGAZA	679	864	
	Gatare	GATARE	718	913	
	Nyange	KABINDI	590	751	
	Shywa	SHYWA	521	663	
	Kagashi	KAGASHI	322	410	
	Kibara	KIBARE	322	410	
	Ngara	NGARA	289	368	
	Kabilizi I	KABILIZI I	456	580	
	Kagashi	NTAGA	323	411	
	SUB TOTAL	(13)	8,176	10,402	
KIGARAMA	Kansana	KANSANA	1,107	1,422	(2.30%)
	Rubona	GAHIMA	805	1,034	
	Fukwe	KARAMA	624	801	
	Rubona	RUBONA	728	935	
	Remera	REMERA	716	919	
	Rurenge	MUHIRE	559	718	
	Kaberangwe	KIRWA	689	885	
	Vumwe	MUSYA	439	564	
	Kabare I	KABARE	856	1,099	
	Kabare I	KIGARAMA	665	854	
	Kabare II	KIBAYA	621	797	
	Kabare II	NYAMUGALI	1,005	1,291	
	Gasetsa	GASETSA	729	936	
	Cashanda	RUSHENYI	310	398	
	Cashanda	KIBURARA	502	645	
	SUB TOTAL	(15)	10,355	13,298	
KABARONDO	Kabarondo	KABARONDO	384	542	(3.18%)
	Ruramira	RURAMIRA	1,312	1,851	
	Cyinzovu	CYINZOVU	551	778	
	Murama	MURAMA	291	411	
	Shyanda	RUSAVE	494	697	
	Rubira	RUBIRA	1,004	1,417	
	Rukira	RUGAMBIRA	501	707	
	Bisenga	MUKO	684	965	
	Rundu	RUGWAGWA	370	522	
	Shyanda	SHYANDA	154	217	
	SUB TOTAL	(10)	5,745	8,107	
KAYONZA	Gasogi	GIKAYA	494	603	(1.82%)
	Kayonza	KAYONZA	849	1,035	
	Musumba	NYAGASAMBU	696	849	
	Nyamirama	NYAMIRAMA	725	884	
	Rutare	RUTARE	390	476	
	Rwinkwavu	GISHANDA	543	662	
	Rwinkwavu	RWINKWAVU	866	1,056	
	Rwinkwavu	RWINKWAVU PR	390	476	
	Rwinkwavu	GIHINGA	468	571	
	Rwinkwavu	RWINKWAVU CA	597	728	
	Rwinkwavu	NKONDO	434	529	4022
	Shyogo	SHYOGO	626	763	
	SUB TOTAL	(12)	7,078	8,632	

SECONDARY SCHOOL IN KIBUNGO PREFECTURE

COMMUNE	SECTOR	NAME
MUGESERA	Zaza	ECOLE NORMALE PRIMAIRE
	Zaza	EUROPE SCOLAIRE
	Zaza	PETIT SEMINAIRE
KIGARAMA	Kabare	ECOLE NORMALE TECHNIQUE
BIRENGA	Kibungo	ECOLE TECHNIQUE OFFICIELLE
RUTONDE	Kigabiro	ECOLE DE SCIENCE INFIRMIERES
	Kigabiro	ECOLE D'ECONOMIE ET DE COMMERCE
RUKARA	Gahini	ECOLE DES LETHE
	Gahini	PETIT SEMINAIRE
BIRENGA	Kibungo	ASPEK
MUHAJI	Mukarange	INSTITUT PAROISSIAL
RUKIRA	Gitwe	APACOPE GITWE

SOURCE: KIBUNGO PREFECTURE

Vocational Training Center(CCDFP/CSDFP)

Commune	Secteur	Location
1. BIRENGA	kibungo	Musamvu
	Gahara	Butama
	Sakara	Sakara
	Kibimba	Kibimba
2. RUKIRA	Gitwe	Gitwe
	Rurama	Rurama
3. RUSUMO	Kigina	Rwanteru
	Kirehe	Kirehe
	Musaza	Musaza
	Gisenyi	Kigongi
	Nyarubuye	Nyarubuye
4. SAKE	Rubago	Rubago
	Nshili	Nshili
	Mbuye	Mbuye
5. MUGESERA	Kibare	Kibare
	Nyange	Nyange
	Gatare	Gatare
	Karembo	Karembo
	Sangaza	Sangaza
6. KIGARAMA	Gasetsa	Gasetsa
	Rubona	Rubona
	Yumwe	Yumwe

Vocational Training Center(CCDFP/CSDFP)

Commune	Secteur	Location
7. KABARONDO	Ruramira	Ruramira
	Chinzovu	Chinzovu
	Rubira	Rubimba
	Bisenga	Bisenga
	Nkamba	Nkamba
8. KAYONZA	Nyamirama	Nyamirama
	Kayonza	Kayonza
	Rwinkwavu	Rwinkwavu
	Musumba	Musumba
	Rwinkwavu	Nyankora
9. RUTONDE	Nsinda	Nsinda
	Kigabiro	Rwamagana
	Kaduha	Kaduha
	Nkungu	Nkungu
10. MUHAZI	Nyarugali	Nyarugali
	Ruhunda	Ruhunda
	Murambi	Murambi
	Nkonmangwa	Nkonmangwa
	Mukarange	Mukarange
11. RUKARA	Rukara	Karubamba
	Kiyenzi	Nyagahandagaza
	Rwimishinya	Rwimishinya
	Gahini	Gahini
	Ryamanyoni	Ryamanyoni
Total		46

Public Hall

Commune	Name
BIRENGA	KODUKI
MUGESERA	AFKI
KAYONZA	AJEFIKA
RUTONDE	A.F.A.R
MUHAZI	ATACOMU
Total	5

PUBLIC HEALTH FACILITIES IN KIBUNGO PREFECTURE

COMMUNE	SECTOR	NAME	BED NO.	EXT. WATER SUPPLY
BIRENGA	Kibungo	HOSPITAL KIBUNGO	212	KIGUNGO SYSTEM
	Bare	DISP. MUTENDERI		
	Bare	S.N. MUTENDERI		
	Gahara	S.N. GAHARA		
RUKIRA	Murama	DISP. RUKIRA		
		DISP. MULINDI		
	Murama	S.N. RUKIRA		
RUSUMO	Kigina	C.S. RUSUMO		
	Nyarubuye	C.S. NYARUBUYE		
	Nyarubuye	C.S. NASHO		
	Kirehe	DISP. KIREHE		KIREHE SYSTEM
	Kirehe	S.N. KIREHE		
	Kigina	S.N. RUSUMO		
	Nyarubuye	S.N. NYARUBUYE		
SAKE	Mabuga II	C.S. RUKOMA		SAKE SYSTEM
	Murwa	C.S. JARAMA		SAKE SYSTEM
	Mabuga II	DISP. RUKUMBERI		SAKE SYSTEM
	Mabuga II	S.N. RUKOMA		SAKE SYSTEM
	Murwa	S.N. JARAMA		SAKE SYSTEM
MUGESERA	Zaza	C.S. ZAZA		ZAZA SYSTEM
	Nyange	DISP. NYANGE		
	Zaza	S.N. ZAZA		ZAZA SYSTEM
KIGARAMA	Kabare I	C.S. KIRMA		
KABARONDO	Kabarondo	C.S. KABARONDO		KIBUNGO EXT.
KAYONZA	Rwinkwavu	HOSPITAL RWINKWAVU	68	
RUTONDE	Kigabiro	HOSPITAL RWAMAGANA	213	RWAMAGANA SYSTEM
	Kigabiro	S.N. RWAMAGANA		RWAMAGANA SYSTEM
		C.S. MUNYAGA		
MUHAZI	Gishali	SANA. GISHALI	177	RWAMAGANA SYSTEM
	Mukarange	C.S. MUKARANGE		
	Mukarange	S.N. MUKARANGE		
RUKARA	Gahini	HOPSPITAL GAHINI	106	
	Rukara	C.S. RUKARA		
	Rukara	S.N. RUKARA		

NO. OF FACILITY IN EACH COMMUNE

COMMUNE	HOSPITAL	SANATORIUM	C. SANTE	DISPENSARYS.	NUTRITION
BIRENGA	1			1	2
RUKIRA				2	1
RUSUMO			3	1	3
SAKE			2	1	2
MUGESERA			1	1	1
KIGARAMA			1		
KABARONDO			1		
KAYONZA	1				
RUTONDE	1		1		1
MUHAZI		1	1		1
RUKARA	1		1		1
TOTAL	4	1	11	6	12

	TOTAL
HOSPITAL	4
CENTRE DE SANTE	11
DISPENSARY	6
SERVICE NUTRITION	12
SANATORIUM	1

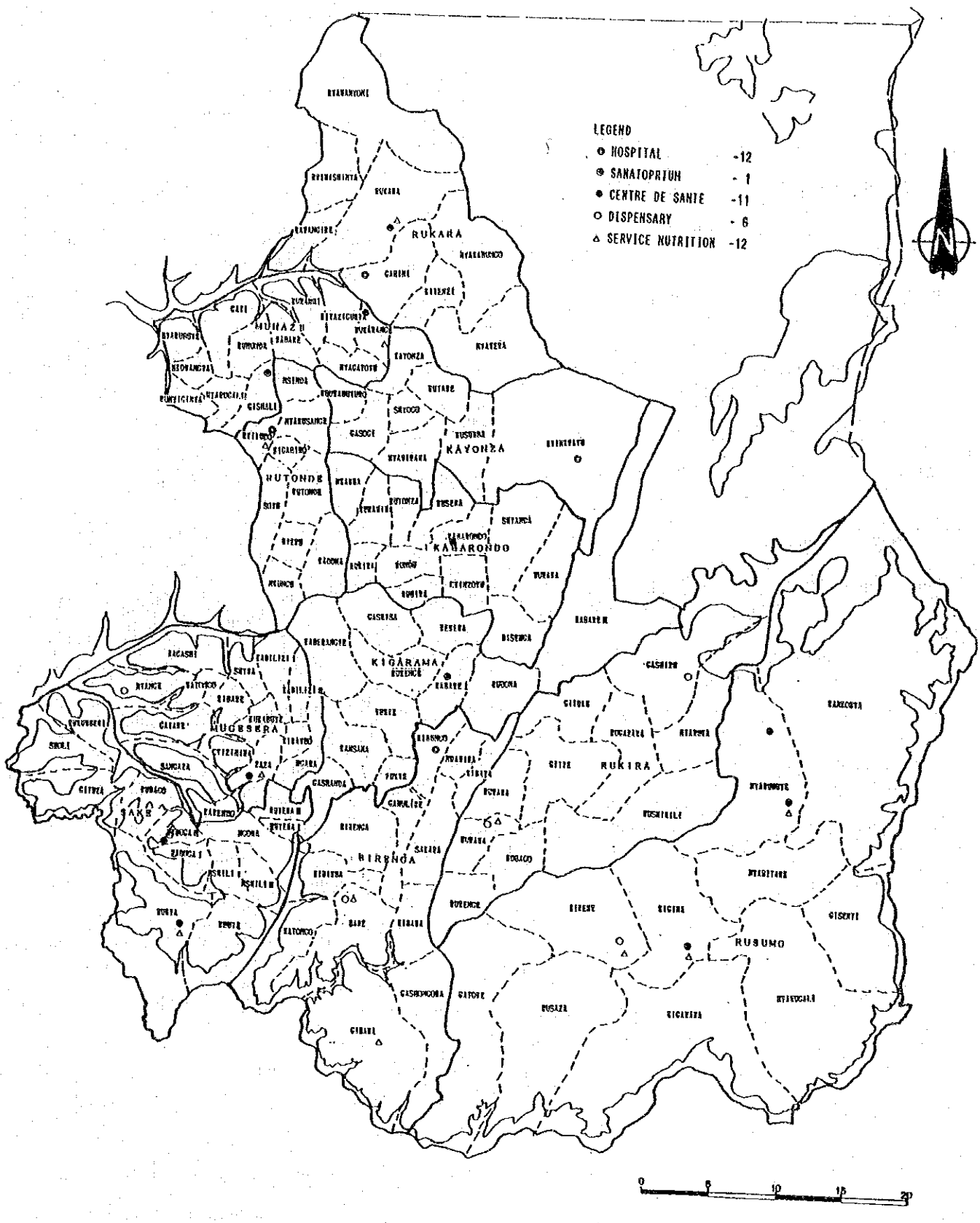
SOURCE: RAPPORT ANNUEL, 1988, MINISANTE

Table E.11

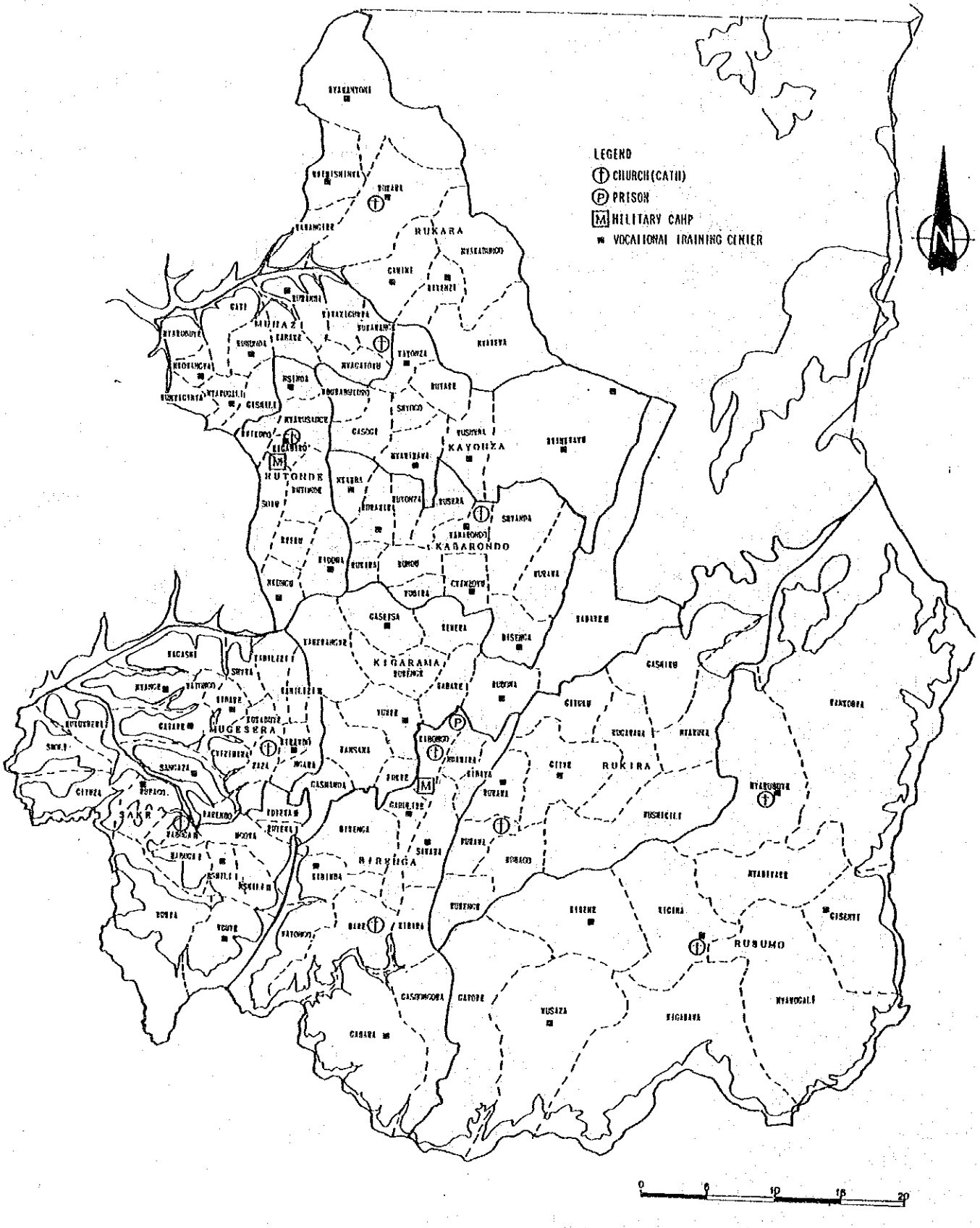
Main Roads in the Study Area

Route No.	Classification	Route	Length (km)
2	International road	GASI-KAYONZA-NYAMAREBE	37.8
7	- do -	KAYONZA-RUSUMO	92.5
40	National road	NSHILI-ZAZA-KARENBO-RUHOGO	18.0
40	- do -	AKAGERA-SAKE-NSHILI-RUHOGO-KIBUNGO	42.5
40	- do -	ZAZA-PAPETERIE	6.0
107	Communel road	KAYONZA-NYAWERA-NYAMIYAGA	29.0
50	- do -	KABARONDO-HOTEL AKAGERA	37.0
56	- do -	RUKIRA-NTARUKA-KANKOBWA-RWAMAGANA	53.0
62	- do -	RWAMAGANA-NKUNGU-KIRWA-KARENBO	29.7
66	- do -	RANGO-MUTENDERI-AKAGERA RIVER	30.0
67	- do -	RUHIMBO-GISHALI-NSINDA	9.0
68	- do -	RUKONGI-RUKUMBERI	10.0
75	- do -	KARAMA-VUMWE-KIRWA	13.1
76	- do -	GAHINI-KARUBANDA-KAWANGIRE	23.7
Total Length of International roads in the Study Area			130.3
Total Length of International roads in Rwanda			898.9
Total Length of National roads in the Study Area			66.5
Total Length of National roads in Rwanda			2,437.8
Total Length of Communel roads in the Study Area			234.5
Total Length of Communel roads in Rwanda			1,861.7
Total Length of All Main Roads in the Study Area			431.3
Total Length of All Main Roads in Rwanda			5,198.4

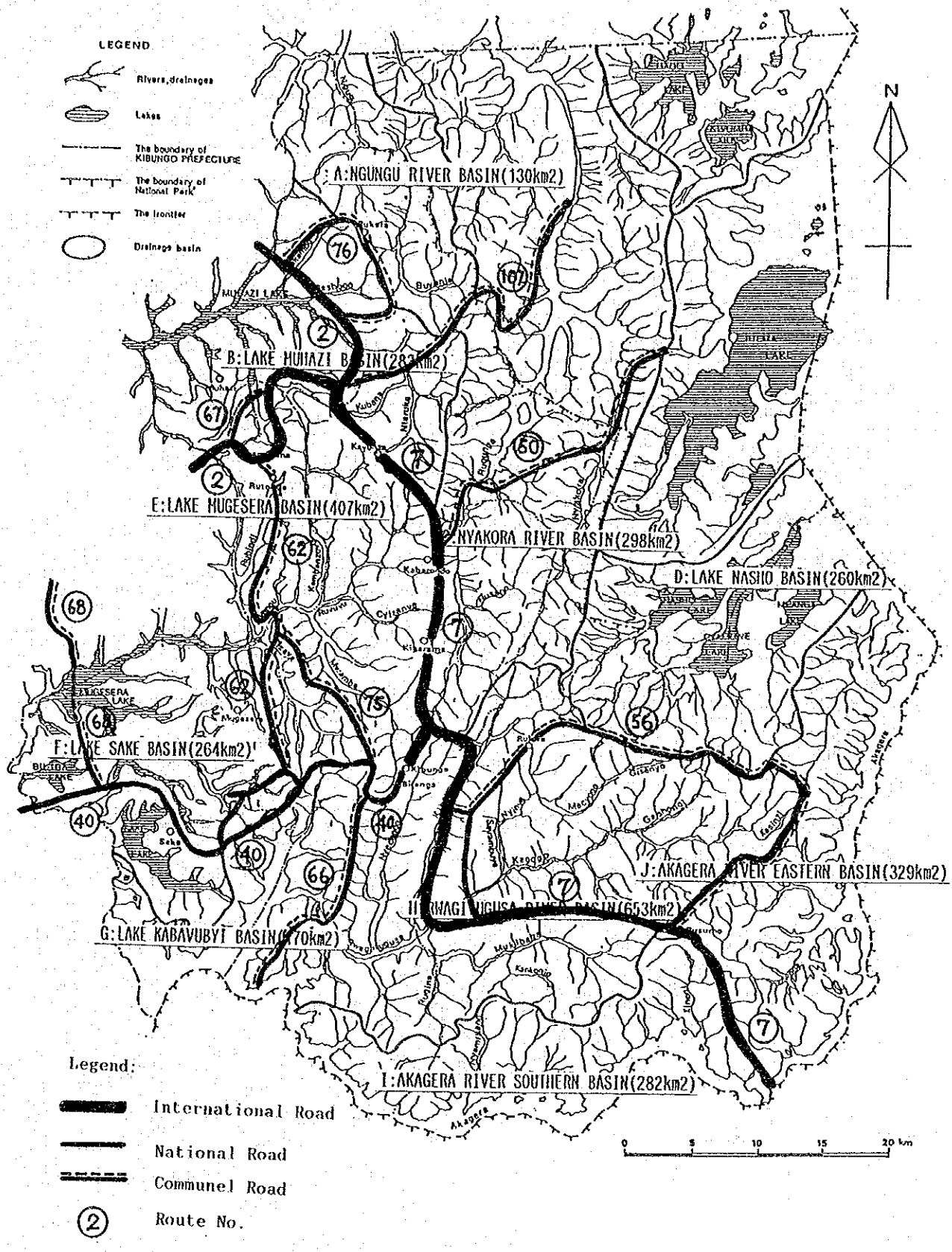
Source : Road Division in MINITRAPEE,1989



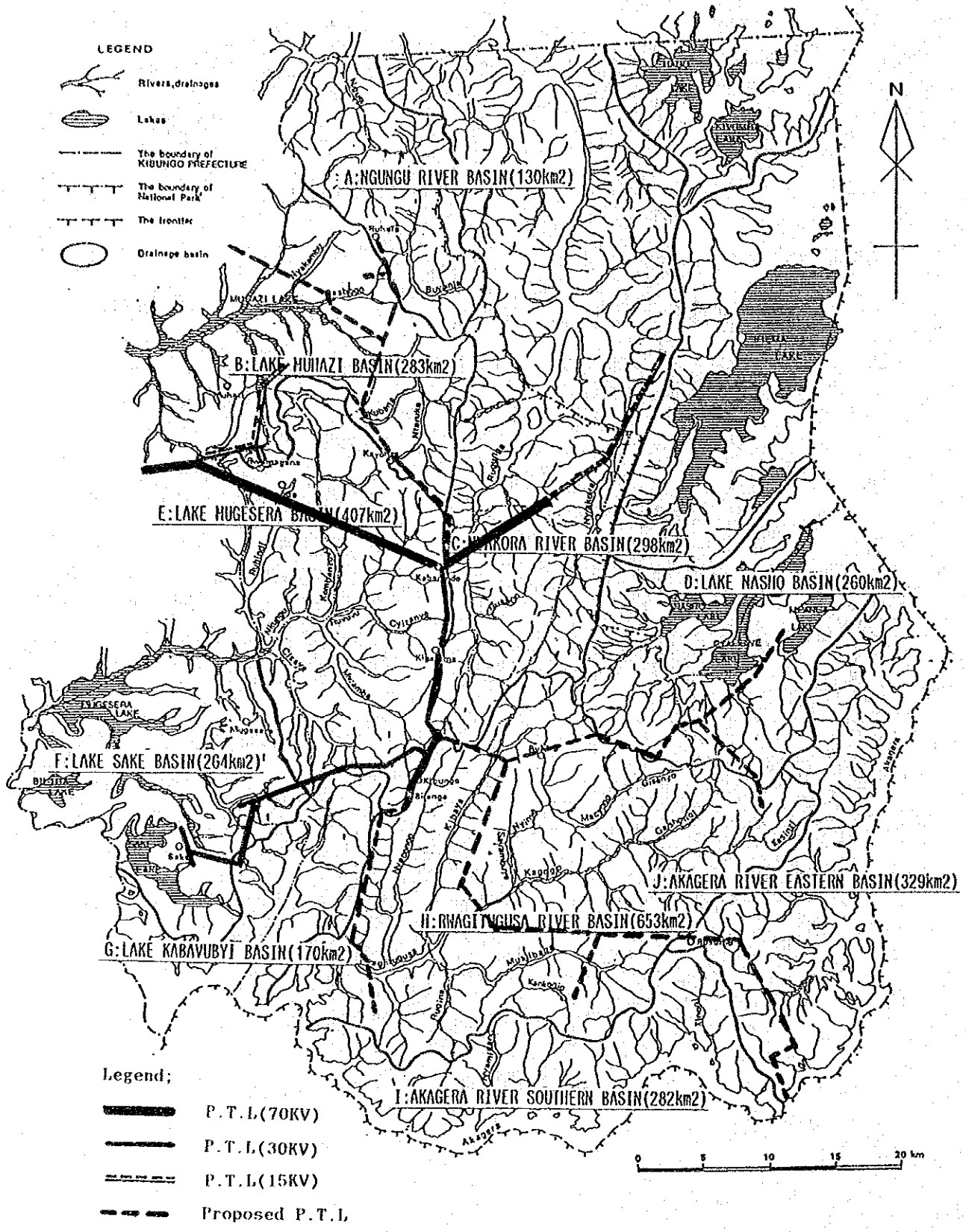
Location of Public Health Facilities



Location of Social Service Facilities



Main Road Network in the Study Area



Power Transmission Line(P.T.L) in the Study Area

APPENDIX F

EXISTING WATER SUPPLY SYSTEM

TABLE OF CONTENTS

LIST OF TABLE

LIST OF FIGURE

APPENDIX F

EXISTING WATER SUPPLY SYSTEM

1. GENERAL

The residents in the Study Area live on the mid-slopes or hill tops which makes it difficult to adopt a centralized water supply method. Most residents would fetch water from a long distance(2 to 3 km).

Springs and lakes are the main sources of existing water supply systems in Kibungo Prefecture.

The service level of the existing systems is mostly the public standpipe method with distribution pipes. Only the water supply systems in Kibungo and Rwamagana cities are managed and operated by ELECTROGAZ.

Kibungo City's water source is a spring. The water is treated with chlorine. Rwamagana City's water source is Muhazi Lake. After treating the lake water it is conveyed to the city. These two water supply systems are designed to meet 1995 demands.

The water supply system constructed with assistance from AIDR intakes water from a spring and distributes it through pipes by gravity flow. During dry seasons there is less spring water and some of the system's public standpipes dry up. Further, due to poor management and maintenance work and aging, some facilities are not fully functional because of damage or deterioration. Thirteen heavily deteriorated facilities are being rehabilitated with financial assistance from IDA.

Seventy-two wells were bored with grant aid from Japan (Rural Water Supply Project, Phase I) as a water supply project using groundwater as the source.

In the communes of Rukara, Kabarondo, Birenga and Rusumo, rainwater harvesting facilities using the roofs of such public facilities as hospitals can be seen. But, these facilities are for supplementary use and the communes rely on other water sources during dry seasons.

ELECTROGAZ is expanding the Kibungo City's water supply system to include Kigarama. MINITRAPEE will improve the Kabarondo water supply system in the near future.

2. DEVELOPMENT ORGANIZATION

The following development organizations are responsible for the water supply facilities in the Study Area:

(1) MINITRAPEE

MINITRAPEE is an organization responsible for the country's rural water supply. The actual work related to the rural water supply is conducted by the General Director of Water of MINITRAPEE

The Planning Department is in charge of the study and planning of rural water supply development projects. The Rural Water Supply Department is in charge of project construction and the operation and maintenance of the water supply facilities.

A branch of the General Director of Water is located in the Kibungo Prefectural Government Office. These is one officer stationed at the branch office.

(2) ELECTROGAZ

ELECTROGAZ is a public corporation that is under the jurisdiction of MINITRAPEE. It is responsible for the development, operation and maintenance of the electricity, water, and gas supply facilities in the urban areas.

In the Study Area, ELECTROGAZ is in charge of the development, operation, and maintenance of urban water supply facilities in Rwamagana and Kibungo.

(3) A.I.D.R.

A.I.D.R. is a non-governmental Belgian organization which contributed greatly to the development of rural water supply in Rwanda. Until 1985 when the organization was dissolved, it carried out many rural water supply development projects, and conducted the operation and maintenance of water supply facilities.

Most of the piped water supply systems utilizing springs in Kibungo Prefecture were developed by A.I.D.R.

(4) Others

The following Government agency is related to the development of the rural water supply:

Name	Item
MINIPLAN	: To give the fund to the rural water supply project
MININTER	: To give the fund to the small sigh rural water supply project
MINAGRI	: The rural water supply improvement relaled the rural district development project

3. EXISTING WATER SUPPLY FACILITIES

3.1 UN-PIPED WATER SUPPLY SYSTEMS

(1) Springs

According to the feasibility study report prepared in 1985, 257 improved springs were in use in Kibungo Prefecture. The number of springs in each commune is shown in the following Table.

Commune	No. of Spring
1. BIRENGA	35
2. KABARONDO	16
3. KAYONZA	8
4. KIGARAMA	32
5. MUGESERA	61
6. MUHAZI	8
7. RUKARA	6
8. RUKIRA	10
9. RUSUMO	30
10. RUTONDE	34
11. SAKE	17
TOTAL	257

Source : The Study on the Rural Water Supply Project in the Eastern Region, 1985 Final Report (JICA)

Springs having some water yields provide good quality of domestic water to some portion of residents with non-piped and piped water supply systems, mainly developed by NGO, such as AIDR etc. However, newly development potentiality is not considered to be high.

During 1988 to 1992, UNICEF has been carrying out spring surveys and is in the process of preparing a base data of spring conditions that will incorporate the use of springs throughout the country, including Kibungo Prefecture.

(2) Handpumps (Phase I Project)

The installation of handpumps for the Phase I Project was proposed in the Feasibility Study for the Rural Water Supply Project that was conducted in 1985.

During the 1987-89 period, 71 handpump units were installed with grant aid cooperation from the Government of Japan(the handpump locations are shown in the Data Book).

An evaluation report regarding the pumps was issued by MINITRAPEE/GTZ in January 1991. The report pointed out the water quality problems of the wells which are located nearby stagnant surface water.

(3) Rainwater Harvesting

There are several rainwater harvesting facilities in the Study Area. The roofs of churches and hospitals were used for the harvesting. These facilities are used as supplemental water sources.

As a modern facility, an FRP made 50 m3 tank was installed at the Herb Medicine Treatment Center in Birenga under the Phase I Project.

3.2 PIPED WATER SUPPLY SYSTEMS

(1) Urban Water Supply Systems

In Kibungo and Rwamagana cities -- the most urbanized areas in the Study Area -- there are two urban water supply systems provided with water treatment facilities that are managed by ELECTROGAZ(see Figs. F.1 and F.2).

They were constructed with financial assistance from WHO and the World Bank. An outline of the facilities is shown in the following Table:

Item	KIBUNGO	RWAMAGANA
Water Source	Protected Spring	MUHAZI LAKE
Design Water Supply Amount	250 m3/day	500 m3/day
Reservoir Capacity	250 m3	600 m3
Design Popuration	7,300 persons	17,100 persons
Construction Cost	160.5 Million RWF	220.9 Million RWF
Construction Cost per capita	21,990 RWF	12,920 RWF
Completed year	1982	1986

The designed water supply amount and the actual supply amount of those systems are shown in the following Table. The actual water supply amount is approximately 40% of the designed supply amount. The difference between the designed water supply amount and the actual water supply amount is thought to result from the residents reliance on other water sources because they are unable to afford the water fees of the supply systems.

Item		KIBUNGO	RWAMAGANA
Design Water Supply Amount	1985	250m3/day	500m3/day
	1995	450m3/day	1,200m3/day
Production Actual Results	1987	102m3/day	187m3/day
	1988	113m3/day	171m3/day
Selling Actual Results	1987	81m3/day	115m3/day
	1988	86m3/day	108m3/day

Source : MINIRAPLE/ELECTROGAS

Following water fee systems of Kibungo and Rwamagana urban water supply facilities are adopted. In addition, water has been supplied at KIOSK, at cost of 2 FRW per a jerican (20 litter).

Fee by Amount (RWF/m3)		Special Fee (RWF/Month)		Facility Lump Sun (RWF)	
0-25m3	40	1/2" or 3 m3/hr	20	Family	1,000
25-60m3	60	3/4" or 5 m3/hr	40		
60-100m3	80	1 or 10 m3/hr	60	Commerce	3,000
More than 100m3	90	1' 1/2" or 20 m3/hr	80		
		2 or 30 m3/hr	100	Industry	6,000

Source : 1989 ELECTROGAZ

(2) Rural Water Supply Systems

The piped rural water supply systems confirmed in the Study Area are as shown in Table F.1 and Fig. F.3. Most of these systems were constructed by A.I.D.R. in the 1970's.

Only a few of the systems are equipped with pumps while the majority of them use improved springs located at relatively high elevations and effective water distribution by gravity flow(no pumps required). The

operation and maintenance costs for this system are low and it is the most suitable type in the Study Area. Unfortunately, many of the existing water supply facilities are heavily deteriorated and are in need of repair work.

3.3 SERVICE COVERAGE AND POPULATION SERVED

According to the existing data/information, the amount and population served by existing water supply facilities in the Study Area are summarized as a follow:

System	Production (m3/day)	Population	
		Existing Data	Estimation
Spring	(9,128)	(118,670)	-
Hand-pump	640	46,280	33,065
Urban piped supply system	750	24,400	26,078
Rural piped supply system	3,477	52,770	46,332
Total		123,450	105,475

*( ):Information of Commune Office

Total beneficiaries are estimated as 123,450 persons(28.5% in Kibungo Prefecture). However, the population who is served drinking water by the existing systems, is considered to be around 105,500 persons (24.3% in the Prefecture) based on the results of field survey and evaluation of existing conditions (see Table L.2).

1) Non-piped water supply system

The service coverage and population served by a non-piped water supply system are estimated as below:

.Spring	257 points	-
.Hand-pump	71 wells	33,065 beneficiaries
.Rainwater harvesting	6 facilities	-

2) Piped water supply system

The coverage and beneficiaries are outlined in Table F.1.

Total production of the facilities is 4,227 m3/day and beneficiaries are 72,410 persons (17% of total population in Kibungo Prefecture).

4. SURVEYS ON DOMESTIC WATER USE CONDITIONS

To learn about the water supply conditions in the Study Area, the following three types of field surveys were conducted:

i) A questionnaire survey was conducted among the residents to learn of water use conditions and to determine their awareness of the water supply systems. Approximately 250 replies were received.

ii) Surveys on the conditions of the existing water supply systems (7 systems).

iii) Hearing surveys concerned with the water supply administration's present conditions, policies, future plans, and willingness (asked of commune office personnel and the officers in charge of the water supply).

The survey results and their analyses are clarified below:

4.1 RESULTS OF THE QUESTIONNAIRE SURVEY

An outline of the survey results is shown in Tables F.2. Details are provided in the Data Book. The results are analyzed as follows:

- The types of water sources presently being used by the residents and the level of resident satisfaction are summarized in the following Table. The water supply source most preferred by residents is the public standpipe connected to a pipeline. Conversely, the residents are seemingly unsatisfied with the use of surface water(lakes and rivers) and direct spring water use.

- Of the surveyed water supply sources, 28% were public standpipes, 9% were wells, 7% were improved springs, and 56% were direct intake of surface water.

- Depending on the season, some residents must use water sources other than spring water or surface water.

- Many people who live in areas having poor water supply conditions or low level water supply facilities are willing to pay an annual water fee of approximately 2,000 FRW per family. 57% of the residents would not object paying 2,000 FRW per family annually for the operation and maintenance costs of water supply facilities.

Anquatc Results of Present Water Supply Conditions

(Sample: 252, Unit: %)

Question Items	Answer	Traditional Source				Improved Source		Piped System		Average
		Lake-W	Swamp-W	River-W	Spring	Imp.-Sprg	Well	Pub.-F	House-F	
Distance to water source	0.5km>	0.0	0.0	18.2	18.8	30.0	25.0	52.6	0.0	26.4
	0.5>1.0k	33.3	0.0	18.2	16.7	10.0	33.3	21.1	0.0	18.6
	1.0>1.5k	11.1	27.3	18.2	22.9	10.0	16.7	13.2	0.0	17.9
	1.5>2.0k	22.2	18.2	9.1	18.8	10.0	25.0	2.6	100.0	14.3
	2.0km<	33.3	54.5	36.4	22.9	40.0	0.0	10.5	0.0	22.9
Other water-source in dry-period	yes	100.0	90.9	81.8	95.8	90.0	91.7	84.2	0.0	90.0
	no	0.0	9.1	9.1	2.1	10.0	0.0	15.8	0.0	7.1
	?	0.0	0.0	9.1	2.1	0.0	8.3	0.0	100.0	2.9
Satisfaied with water supply	yes	11.1	9.1	36.4	45.8	60.0	75.0	68.4	100.0	50.0
	no	88.9	90.9	54.5	54.2	40.0	25.0	31.6	0.0	49.3
	?	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.7
Can you pay W-fee of 2,000F/an/f	yes	66.7	45.5	81.8	54.2	70.0	58.3	52.6	0.0	57.1
	no	11.1	54.5	9.1	43.8	30.0	41.7	34.2	0.0	35.7
	?	22.2	0.0	9.1	2.1	0.0	0.0	13.2	100.0	7.1
Water Vol. for one person/day(litter)	5 litr>	22.2	27.3	9.1	18.8	0.0	41.7	10.5	0.0	17.1
	5-10	44.4	72.7	63.6	37.5	70.0	33.3	44.7	100.0	47.1
	10-15	11.1	0.0	18.2	33.3	10.0	25.0	28.9	0.0	24.3
	15-20	11.1	0.0	9.1	2.1	10.0	0.0	5.3	0.0	4.3
	>20	11.1	0.0	0.0	8.3	10.0	0.0	10.5	0.0	7.1

4.2 RESULTS OF WATER USE CONDITION SURVEYS OF EXISTING WATER SUPPLY FACILITIES

The survey results are shown in Table F.4 and Fig. F.4. The surveyed facilities were located at the following seven sites:

Public Standpipe

i) Nyakora No.1 Fountain
ii) Nyakora No.2 Fountain
iii) Rwamagana "Water Selling KIOSK"
iv) Zaza Public Standpipe

Handpump well

v) No.1603002(II-Zone of Phase I)
vi) No.1608002(III-Zone of Phase I)
vii) No.1610010(IV-Zone of Phase I)

The surveyed water use patterns are shown in Fig. F.4. The peak demand occurs during the following two time zones:

First peak : 6:00 - 10:00
Second peak: 14:00 - 18:00

The reason why the water use amount at the handpump locations varies so much is because of the selection of surveyed wells. Among the wells listed in the Phase I Project Evaluation Report prepared by MINITRAPEE, only one well having good water quality, one having relatively poor water quality were selected for the survey.

By comparing the designed water supply amount to the actual water use conditions, the following conclusions were obtained:

- From 60 to 70% of the designed water supply amount is obtained from public standpipes that require the payment of water fees.
- 100%, or more, of the designed water supply amount that is obtained from the wells or public standpipes having good water quality is free of charge.
- The use rate of wells -- wells constructed under the Phase I Project -- having poor water qualities is low. However, the wells reported as being abandoned were still being used at a rate of about 15% of the designed water supply amount.

4.3 HEARING SURVEY RESULTS CONCERNED WITH THE WATER SUPPLY ADMINISTRATION

The hearing survey results are given in Table F.5.

In the Rusumo Commune, attempts to conduct the hearing survey proved to be futile.

The water supply administrators' views concerning the water fee system and the operation and maintenance of the water supply facilities are clarified in Section 8, "Organization and System Operation".

Problems related to each commune's sanitation and water supply conditions are clarified in the following Table:

Problem of Water Supply Hygenic Condit.	Water source
[RUKARA]	
Lack of drinking water & poor water supply facilities water & poor	Lake, River Rain... some (Public Faci.) Spr..15(401/fm)
[MUHAZI]	
Water related disease of Diarrhea, shortage/bad quality of drinking water & animal risk at lake shore	Direct from Lake I-Spr....27
[MUGESERA]	
Bad quality of lake water, poor sanitation & shortage of drinking water	Lake.....many Spr/I-Spr..35
[SAKE]	
Poor/bad drinking water & many water-related disease coused by river/lake water	Lake..8 secteur Spr....13 I-Spr..17
[KAYONZA]	
Lack of drinking water(& bad quality of river/lake water)	Spr/I-Spr..75 Rain, Well..10

Problem of Water Supply Hygenic Condit.	Water source
[RUTONDE]	
Poor drinking water & bad quality of river/lake water drinking	I-Spr/Spr..36 Well.....8 Riv/Lake(5sctrs)
[KABARONDO]	
Poor drinking water & bad quality of swamp water	Spr, I-Spr..93 Well.....14 Rain, Swamp...6
[KIGARAMA]	
Poor drinking water & bad quality of swamp water	Spr, I-Spr..22 I-Spr.....38 HP.....21
Poor medical facilities	Rain, Swp
[RUKIRA]	
Poor drinking water source, bad quality of swamp water, poor medical facilities & insects/disease problem at swamps	Spr....49 I-Spr..25(911fm) ‹total=32.61/sec HP.....8(324fm)
[BIRENGA]	
Poor drinking water of existing piped-system	SP(Kibungo) Spr, I-Spr..65 Well, HP...99 River, Swp..13 Rain(pub. facil.)
[RUSUMO]	
No datum is avalable on account of no answer	

According to the Table Rukira, Muhazi, Mugesera, Sake, Rutonde and Kabarondo Communes have the worst sanitation and water supply conditions. The following areas require urgent improvements be made to the water supply conditions:

	High Priority Area to Improve
RUKARA	GAHINI, KWANGIRE, KIYENZI, RUKARA, RWIMISHINYA, RYAMANYONI
MUHAZI	GATI, KITAZIGURWA, MUKARANGE, MURANBI, NKOMANGWA, NYAGATOVU, NYARUBUYE
MUGESERA	GATARE, KAGASHI, KIRAMBO, MATONGO, NYANGE, SANGAZA
SAKE	GITUZA, MBYE, MURWA, NSHILI-2, RUBAGO, RUKUMBERI, RUYEMA-2, SHOLI
KAYOUZA	NYANIRAMA, RUTARE, SHYOGO
RUTONDE	KADUHA, NKUNGU, RUTONDE, RWERU, SOVU
KABARONDO	BISENGA, MURAMA, RUBIRA, RUNDU, RURAMIRA, RUSERA, RUYOUZA, SHUANDA

5. EVALUATION OF EXISTING WATER SUPPLY SYSTEMS

5.1 UN-PIPED WATER SUPPLY SYSTEMS

(1) Protected Springs

In general, spring water is of good quality. The springs are located in comparatively high elevation areas and it is therefore possible to effect water distribution by gravity flow. Thus, there is a high potential for the development of springs as the water sources of rural water supply systems. Most of the springs in the Study Area are already developed as the water sources for existing water supply systems.

From the field surveys it was noted that the previously reported capacities of the springs were exaggerated. This was particularly true of the dry season capacities.

As the existing water supply systems have the following problems, there are some difficult problems remaining for establishing a plan to supply safe, reliable domestic water to the residents:

- Springs having large and stable yields are already being used as water sources for the existing piped water supply systems. Unused springs only have a small amount of unstable yield.

- Many of the springs are not provided with a means for retaining water quality. There are to preventative measures against sewer inflow and animal intrusion. Possible water contamination from these two sources is of great concern.

- Access to many springs from the villages is poor. Since 1988 UNICEF has been carrying out spring surveys and is in the process of preparing a rural water supply development plan that will incorporate the use of springs throughout the country, including Kibungo Prefecture. This work is schedule for completion in 1992.

(2) Handpumps

In January 1991, MINITRAPEE and GTZ conducted field surveys on the 71 wells equipped with handpumps that were constructed under the Phase I Project. Their Evaluation Report based on the surveys can be summarized as follows:

1) Wells having no water quality problems: 12
2) Wells having water that either emits a bad smell or has an iron taste: 16

3) Wells with water that is turbid or has an Unpleasant odor: 22
4) Abandoned wells having muddy water: 17
5) Damaged wells: 3

This Field Study also found water quality problems in certain wells. The problems are thought to be caused by the following:

- Wells having poor water qualities are located in vicinities of dead water marshes. Aquifers below the marshes undoubtedly contain water of poor quality.
- The materials used in the handpumps installed in poor quality water were low-grade.
- There were problems with the wells' filter material and filter type.

As determined from the results of the water use condition surveys delineated in Section 4.2, area residents are even highly dependent on water that has slightly poor water quality. Thus, it can be evaluated that the handpumps installed by the Phase I Project contribute greatly to the residents.

The results of the evaluation made by MINITRAPEE and GTZ does not indicate any adversity to the installation of handpumps. The evaluation results should be reflected in future handpump installation.

(3) Rainwater Harvesting

During the dry season (July through September), the rainfall in Kibungo Prefecture is negligible. The rainwater harvesting method is beset with the problem of supplying stable domestic water throughout the year because of the limited storage tank capacity and the difficulty in maintaining safe water quality.

Yet, this method has a high potential for development as a supplemental water supply system.

The rainwater harvesting facility installed to the Herb Medicine Treatment Center under the Phase I Project is not functioning satisfactorily because of the insufficient cross section areas of the water harvesting troughs.

When designing the water harvesting facilities it will be of utmost importance to take the areas' rainfall patterns into account.

5.2 PIPED WATER SUPPLY SYSTEMS

(1) Urban Water Supply Systems

The existing urban water supply systems were installed in the Kibungo and Rwamagana prefectures from 1982 to 1986 under the Local City Water Supply System Construction and Improvement Project and backed by the World Bank. The Project design was prepared by BCEON, a French consultant firm, and Project construction was undertaken by the ABAY Company, a Belgian contractor.

Both water supply systems are under the management of ELECTROGAZ. Their operation and maintenance conditions are quite good. A water fee collection system has been adopted for the water supply systems.

(2) Rural Water Supply Systems

The water sources for Kibungo Prefecture's rural water supply systems are springs having good water quality. The water is distributed by gravity flow. Most of the water supply systems were constructed and managed by A.I.D.R., a Belgian non-governmental organization. Because of financial problems, A.I.D.R. terminated the system's operation and maintenance work in 1985.

Presently, these systems show signs of heavy deterioration -- some have been abandoned because of the extent of damage.

Thus, the rural water supply systems' rehabilitation project is being planned with the assistance of the International Development Association. The following 11 water supply facilities in Kibungo Prefecture will be rehabilitated under the project.

i) Fukuwe-Rwintare
ii) Gahini
iii) Nasho I
iv) Nasho II
v) Rukira
vi) Rusumo I(Nyakiziba)
vii) Rusumo I(Nyakagezi)
viii) Rusumo II(Kamombo I)
ix) Rusumo II(Kamombo II)
x) Akagera A
xi) Akagera B

The rural water supply systems that will not be covered by the rehabilitation project(IDA) are indicated below:

xii) Akagera C (Nyokibatika):
This system is under the management of the Rusumo Commune. It has been in operation since 1982 and has recently been rehabilitated. Presently, no major problems exist in the system.

xiii) Kirehe:
This is a new system that was completed in 1989. So far, no problems have been experienced. Since a diesel engine operated pump is employed, the securing of fuel oil is of primary concern. Thus, it would be important to strengthen the system's operation and maintenance by establishing a water management committee.

xiv) Rusumo BGM:
This system was installed as a part of the Agricultural Development Project in the Minagri Area with assistance from Italy.

In this system, a spring is used as the water source and the water is distributed by gravity flow. Due to the insufficient amount of water yield the public standpipes installed at the downstream reaches of the system do not receive water. It will be necessary therefore to develop an additional water source.

xv) Musaza Bas:
This is a gravity flow type water supply system using spring water. The distribution pipe is damaged at many points. Water does not reach most of the public standpipes installed in the downstream reaches of the pipeline.

xvi) Rukara:
This is a relatively new system that was constructed in 1986. Since it is difficult to obtain fuel oil for the pump's diesel engine because of financial problems, the system's operation is halted frequently. Thus, it will be necessary to strengthen the operation and management structure and establish a water fee collection system.

xvii) Zaza:
This system went into operation in 1957. Since it was rehabilitated in 1988, the condition of the facilities is quite good.

A water management committee exists and a water fee collection system has been established. However, some public elementary schools have been refusing to pay the fee.

xviii) Kamushikuzi:
This is a gravity flow type distribution system using spring water. The system's facilities have practically all been abandoned because of their heavily deteriorated condition.

xix) Sake:
In this system the distributed water is pumped from a spring. Since the facilities are 10 years old, they are somewhat deteriorated. Many of the public standpipes receive no water because of the damaged distribution pipes. The yield of the spring is not sufficient, but the water quality is very good.

xx) Nyankora:
Construction of this system took place in 1989 with the grant aid cooperation of the Government of Japan.

Groundwater is pumped up into a tank by an electric motor operated pump. The water is then distributed to each public standpipe. Some of the cocks are damaged, but water is supplied by operating the valves and by adopting an hour-restricted water supply system.

A water fee collecting system has not yet been established.

For the resident's independent management of the system in the future, it would be necessary to strengthen the operation and maintenance system and establish a water fee collecting system.

6. CLASSIFICATION OF EXISTING WATER SUPPLY SYSTEMS

By taking into consideration the basic policies of the Phase III Project, the existing water supply systems can be divided into the following three classes according to the conditions of the facilities and their operation and maintenance system. The evaluation results are presented in Table F.6.

Class	Facility Condition	Operation and Maintenance System
A	No problem exists in water qualities and yield amount. Present facilities will be usable even after the year 2000.	Operation and maintenance system is established and the existing facilities are well kept.
B	Some problems exist in water qualities and yield amount. Present facilities will be usable by conducting rehabilitation work.	Water management committee and water fee collection system are already established, but some problem exist in the management.
C	Due to the lack of water yield and facility deterioration, thorough rehabilitation or reconstruction of the facilities and needed.	No water management committee exists and the entire facility operation and maintenance work is carried out by the Government.

7. DEVELOPMENT PLANS AND ACTIVITIES

7.1 DESCRIPTION OF DEVELOPMENT PLANS AND ACTIVITIES

The following projects in the Study Area are either in the planning or construction stage (see Fig. F.5)

(1) Rural Water Supply Project (Phase II) in the Eastern Region

This is a project that was proposed in the feasibility study conducted in 1985 for the Rural Water Supply Project in the Eastern Region. By utilizing the know-how accumulated during the Phase I Project, it is planned to implement this Project by the Government of Rwanda itself using equipment units to be provided by grant aid cooperation from the Government of Japan.

According to the request contents, 114 wells will be constructed and about 67,000 residents will be supplied with water from the wells.

The Phase II Project was reviewed under this Study and the following problems were found:

- Because the existing road conditions in the Project Area are extremely poor, local costs, such as for access road construction, would be very high.

- As the levels of operating techniques for electrical prospecting, study data analyses, and engineering capabilities are insufficient for promptly dealing with problems that may occur during well drillings, it would be necessary to dispatch a hydrogeologist and a well drilling specialist from Japan.

The Phase II Project was initially planned to be provided with equipment units under Japanese grant aid cooperation. The plan was later changed to make project construction come under the grant aid cooperation. The preparation of the basic design of the Phase II Project is scheduled to start after the draft final report of the Phase III Project study has been submitted.

(2) IDA's Rehabilitation Project

This project was planned for the rehabilitation of the rural water supply facilities located in 214 areas throughout Rwanda. The Project study was carried out with financial assistance from IDA (International Development Organization).

In the Kibungo Prefecture, 14 water supply systems were studied, of which the following 11 areas (the locations are in Fig. F.6) were rehabilitated:

Commune	Name of Systems	No.	No. of Fountain
Kigarama	Fukwe-Rwintare	76 16-A2	9
Rukara	Gahini	77 16-A4	1
Rukira	Nasho I (BGM)	78 16-A5	4
Rukira	Rukira	79 16-A6	17
Rusumo	Rusumo I (S.Nyakiziba)	80 16-A71	4
Rusumo	Rusumo I (S.Nyakagezi)	81 16-A72	6
Rusumo	Rusumo II (S.Kamombo II)	82 16-A81	6
Rusumo	Rusumo II (S.Kamombo I)	83 16-A82	3
Rusumo	Akagera (A), BGM	84 16-N1	6
Rusumo	Akagera (B)	85 16-N2	14
Rukira	Nasho II	86 16-N4	9

The formal name of the Project was the Rehabilitation des Adductions d'eau en Milieu Rural au Rwanda. The Project study was made by a Swiss consultant firm and MINITRAPEE. Project construction was conducted by A.I.D.R. and financed by IDA.

Rural water supply systems located throughout the country were rehabilitated under this project.

(3) Urban Water Supply System Development Project in Kibungo

The purpose of this project is to extent the water supply pipeline from an existing water tank located in Kibungo to Kirwa via Kabare, Kigarama, and Kaseisa. Project construction is being conducted by ELECTROGAZ.

The pipeline is laid parallel to the national highway in the section from Kibungo to Kigarama. Four water supply kiosks were constructed in the section by September 1990. However, water has not yet been supplied to these kiosks.

(4) Rural Water Supply Development Project in Kabarondo

This project is being implemented by MINIPLAN. Project construction is progressing.

In this water supply system, spring water will be pumped up into a tank. The designed daily water supply amount is 340 m3. The water will be supplied through kiosks.

(5) UNICEF's Rural Water Development Project (1988-1992)

Implementation of this project started in 1988. Under the project a thorough investigation of springs located throughout the country, the establishment of rural water supply plans using the spring water, and the study on water supply facility management and operating systems are being conducted.

In Kibungo Prefecture, the spring investigation is being carried out.

(6) Muhazi Rural Water Supply Project

The purpose of this project is to supply 600 m3/day of water to Muhazi West Area under the Urban Water Supply Facility Expansion Project in Rwamagana.

The estimated cost for the rural water supply project is approximately 50 million FRW. MINIPLAN's budgetary fund will be allotted to cover the cost.