

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

UGANDA POSTS AND TELECOMMUNICATIONS CORPORATION
MINISTRY OF WORKS, TRANSPORT AND COMMUNICATIONS
THE REPUBLIC OF UGANDA

MASTER PLAN STUDY
FOR
TELECOMMUNICATIONS NETWORK
IN
THE REPUBLIC OF UGANDA

FINAL REPORT

— Vol. 2 —

(Supporting)

November 1994

NIPPON TELECOMMUNICATIONS CONSULTING CO., LTD.

Tokyo, Japan

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All prices and costs used in this report are those prevailing in December 1993, excepting the case otherwise stated. They are also assumed to be constant during the whole project period.
Exchange Rate: US\$1 = Ugandan Shillings 1,190 (December 1993)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

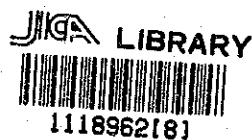
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1. Field Survey Reports

1.1 Field Survey Team and Schedule

The field survey comprised the following three teams:

Team-1 : Demand and Socio-Economic survey for Northern and Eastern regions
(Arua, Moroto, Soroti districts for sample areas from 25th October through 13th November)

Team-2 : Demand and Socio-Economic survey for Central and Western regions
(Mpigi, Kabalore and Rukungiri districts for sample areas from 20th October through 16th November)

Team-3 : Telecom. facility survey for major exchanges and transmission links
(Mbale, Tororo, Jinja, Kampala, Entebbe, Masaka, Mbarara and Kabale from 15th November to 27th November)

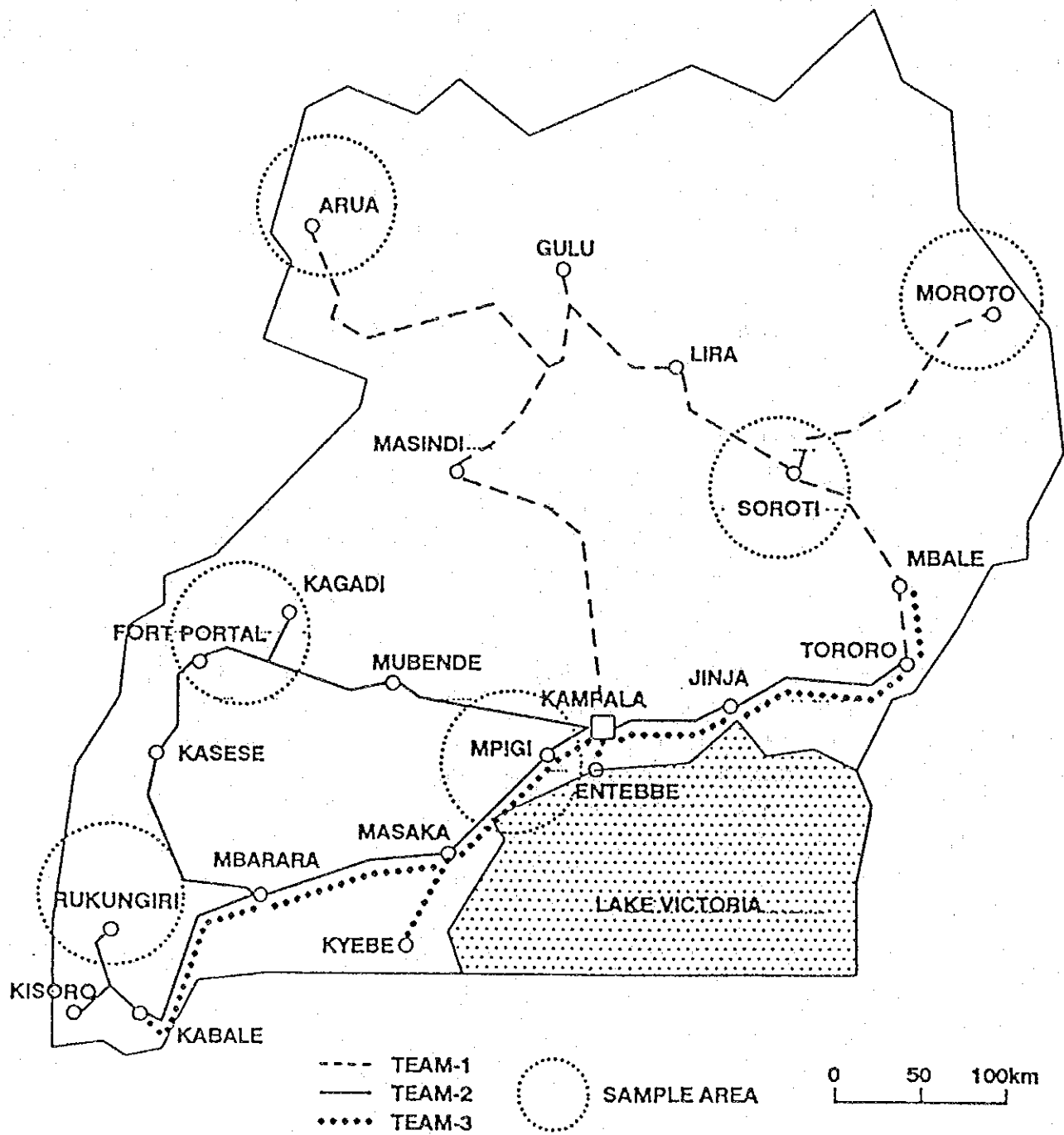


Figure 1-1 Sample Areas and Field Survey Routes

19 th November ,1993

REPORT ON TELEPHONE DEMAND FORECAST FIELD SURVEY FOR THE
LONG TERM TELECOMMUNICATION NETWORK MASTER PLAN---TEAM-1.

1 General

The team, composed of Mr. T.Iida, Mr.T.Kuroda, Mr.N.Opio and Mr.R.B.Kizito, surveyed the Northern and Eastern regions of the country. The sample areas were: ARUA, SOROTI AND MOROTO Districts.

Detailed rural field demand surveys were carried out in the three sample areas while existing telecommunication installations were inspected. Discussions and some interviews, concerning telecommunication services and development in general, were carried out with the District authorities for the purpose of estimating the demand and confirming the rural sample areas(counties).

Data in the form of questionnaires was collected, to be used as inputs for demand forecasting.

2 Arua Sample Area.

Arua town is about 553 km North west of Kampala. Its the headquarters of Arua District and it serves as the main link point between Uganda, Sudan and Zaire. The District covers an area of about 7,830 sq km with 8 counties.

The main economic activities are basically agricultural with emphasis on : Tobacco, Beans, Maize, Rice, Cassava, Sim Sim, Fishing, etc.

The rural sample areas selected in this District were Koboko and Madi-Okollo Counties.

a) Development

The Town was hit during the 1979 war, however, some development has taken place and business has picked up. Border trade activities keep the town busy throughout.

The town is served with UEB commercial power Generator from 7.00 pm to 11.30 pm.

b) Telephone Facilities/Services

Arua is served by a 150 lines manual switchboard with 96 connected subscribers and 21 waiters. Out of the 1200 terminated pairs, only 110 are usable.

The district is linked to Kampala by a 3 single channel motorolla Radio link via Kigulya/Masindi. During our visit, the radio Terminals were still in Central Repair Depot (CRD) for repair, leaving the Radio Call as the only communication means in use. It was observed that the District is experiencing the isolation problem. Its hoped that this

problem will be solved when the Radio link is restored and planned automatic exchange is in place.

c) Problems:

- i) The local cable network has never been rehabilitated since 1979 war.
- ii) Lack of materials e.g Drop wires, Open wires, Poles, etc.

3 Koboko.

Koboko Town is located about 39 km North of Arua. Its a border town with Sudan in the north and Zaire in the east. Its the Sub-District headquarter of Arua District. It was a full District before 1979 war. Besides, its a county headquarter of Koboko county with 3 sub-counties. The basic activity in the county is agriculture with emphasis on : Tobacco, Cassava, Beans and Sorghum.

a) Development.

The town was badly hit during 1979 war and most prominent buildings were destroyed. Some few buildings are now under construction. The town presently accommodates some NGO's who are taking care of the refugees from Sudan. The UEB power installations were destroyed during the war.

b) Telecommunication Facilities/Services.

The Town is served by a Radio call which was lacking a proper antenna. A sub-Post Office still exists and its operational.

4 Rhino-Camp.

Its a trading center located on the river side about 71 km east of Arua. Economic activities in the area include growing of cotton, sim-sim, sorghum, cassava and fishing.

a) Development.

The Town has a few permanent commercial buildings. There is hope that the fishing industry will grow up with time. Prominent waiters are UCB branch office, Catholic Mission and a cotton Ginery. Commercial Power has never been installed in the area.

b) Services.

Only a sub-Post Office exists.

5 Madi-Okollo.

Okollo is the county headquarter of Madi-Okollo county with 5 sub -counties. Its located about 53 km on the Arua--Pakwach main road.

a) Development.

No trading center exists and no immediate commercial building construction in plan. Commercial power has never existed in the area.

b) Services.

A Sub-Post Office exists in the county headquarter building.

6 Yumbe.

Yumbe town is the headquarter of Aringa county with 5 Sub-Counties. Its located about 75 km North East of Arua Town.

a) Development.

The trading center is mainly composed of semi-permanent buildings. Prominent tenancies are Government offices, UCB and some NGO's. The area lacks commercial power.

b) Services.

Only a Sub- Post Office exists.

7 Moyo.

Moyo town is the headquarter of Moyo District. Besides, its a link point between Uganda and Sudan. Prominent tenancies include government offices, UCB, Institutions, large shops, NGO's, etc.

The town is served by a 100 lines manual switchboard (11A) with 51 connections and a Radio call in addition. Power in the town is provided by the UEB generator.

8 Gulu.

Gulu town is about 356 km North of Kampala. Its the headquarter of Gulu District and a telecommunications switching center for Northern region. The town was hit during the recent liberation wars.

The main economic activity in the District is agriculture with emphasis on: Millet, Groundnuts, Maize, Sweet potatoes, Tobacco, Cotton, Sim-sim, Cassava, etc.

The town is served by a 400 lines manual switchboard with 249 connections and 3 waiters. It was noted that the local cable network need rehabilitation.

9 Lira.

Lira town is the administrative center for Lira District located about 146 km from Gulu. Agriculture is the main economic activity in the District with emphasis on: cotton, millet, coffee, sorghum, Maize, cassava, sim-sim, etc. Business in the town was quite promising. There are some developmental activities in and around the town.

The town is served by a 300 lines manual switchboard (ERICSON) with 116 connections. Parented to the exchange are Apac, Aduku, Aboke and Dokolo exchanges. The later is not operational and it needs immediate rehabilitation in order to meet the demand in the area.

The poor local cable network makes the services rather unreliable.

10 Soroti Sample Area.

Soroti Town is an administrative center for Soroti District. The District consists of two Sub-Districts namely Katakwi and Kaberamaido. The sample areas for Demand Forecast were Serere, Kabiramaido and Katakwi.

a) Development.

The development of the economic activities in the District especially in rural areas was retarded by rebel activities following the liberation wars. However, the rural people have now settled and agricultural activities have now taken off. Business, Institutions, Schools, etc. are now operational.

b) Telephone facilities/Services.

Soroti is served by a 400 lines manual switchboard with 330 subscribers connected. Out of a total of 630 terminated pairs at the MDF, only 380 are usable. Cable rehabilitation scheme has been planned by UPTC.

The exchange is linked to Kampala by 2 Radio channels, 11 channels via Mbale and 4 channels via Kapchorwa. These radio systems are very old with very high failure rate.

The engine generator of 3.75 KVA capacity exists as a standby in case of commercial power failure.

11 Katakwi.

This is a Sub-District headquarter and a proposed full District located about 51 km on Soroti Moroto road. There exists Police Post, Health Center, Senior Secondary school, Technical institute and Government Departments. Economic activities in the area include agriculture and livestock.

The main trading center consists of about 40 shops but not well stocked. About 2 km away, There exists another trading center namely Ochorimongin with about 10 shops. The potential subscribers in the area are estimated to a figure of 30.

Telephone facilities/Services.

The town used to be served by a 50 line manual switchboard which was damaged during 1979 war. The radio mast is intact but the feeder cable was cut. The engine generator was vandalized and there is no commercial power.

12 Serere.

This is a county headquarter about 27 km South-West of Soroti. There exists Serere Research Station under Ministry of Agriculture, Kidetok Girls Sec. school, Kamodo Sec. School, Police station and a Catholic Mission.

The people are resettling in the area and there are signs of restocking of livestock. Agricultural activities are also taking off. Products include cotton, millet, sorghum, sim-sim and sweet potatoes. Commercial power is now under rehabilitation. Potential subscribers in the area are estimated to 40.

Telephone Facilities/Services.

There existed a 50 line manual switchboard but destroyed during the war. The town was linked to Soroti by an open wire line.

13 Kaberamaido.

This is a Sub-District headquarter comprising of 2 counties. There exists a Town Board, Police station, Kaberamaido Sec. School, a Technical Institute, Ginery, Health center and a Mission. The trading center consists of about 60 shops most of which are not stocked. There is a lot of agricultural activities going on in the area. Fishing is carried out at the lake Kyoga showers. Feeder Roads have been graded and rehabilitation for commercial power is scheduled for 1994.

Telephone Facilities/Services.

There existed a 50 line manual switchboard but was damaged in the 1986 liberation war. The carrier equipment was also destroyed. The MDF rack and the cable terminations seem to be OK. The exchange had 24 subscribers before but now the number of potential subs is estimated to be 40.

14 Otuboi.

This is a Sub-County headquarters consisting of a Trading center, Lwala Sec. School, TTC and a Catholic mission.

Services.

There existed a Switchboard parented to Soroti exchange with only 2 subscribers and it was damaged during the war in 1986. The room where both Postal & Telecom. services were operating has been allocated as a shop. The people in the area felt concerned about the allocation.

15 Moroto Sample Area.

Moroto town is located about 535 km North East of Kampala. Its the headquarter of Moroto District which consists of 5 counties. The main economic activity in the area is cattle keeping (Pastoralism). However, Government has started seriously encouraging agricultural activities in the District to supplement the livestock industry. Unfortunately, the area has suffered a long drought this year causing a very poor harvest.

There are a few permanent commercial buildings on the main street. Prominent tenancies in the town include Government offices, UCB Branch office, Karamoja Development Agency (KDA), Catholic Mission, Lutheran World Federation (LWF), a Technical School, etc. UEB commercial power is available but limited to six hours at night.

The rural sample areas selected were Bokora County and Nakapiripiriti Sub-District.

Telephone Facilities/Services.

The District is served by a 300 line manual switchboard with only 120 terminations at the MDF and 116 connected subscribers. This necessitates both rehabilitation and expansion of the local cable network.

The District is linked to Kampala by a 2 single channel Motorola Radio link via Kapchorwa but not very reliable. This keeps the District isolated most of the time.

16 Kangole.

Kangole trading center is located about 24 km from Moroto on Moroto Soroti road. Its the headquarter of Bokora county which consists of 6 Sub-Counties. In addition to livestock, some agricultural activities are now coming up in the area.

Services.

This area/county has no telecommunication services apart from the Radio Call belonging to LWF. There is even no commercial power in the area.

17 Nakapiripirit.

The town is located about 83 km from Moroto on Moroto -Mbale road. Formerly the headquarter of Nakapiripiriti District up to 1979. Presently its a Sub-District headquarter of Moroto District with 3 Counties. The main economic activity in the area is agriculture.

Most government buildings were vandalized during the 1979 war. Commercial activities in the small semi-permanent building trading center are not very promising.

Services.

Before 1979 war the area was served by a 50 line switchboard which was then cannibalized to scrap level. About 20 subscribers existed by then. The wooden mast together with the Yagi antennas are still existing. The rest of the equipment were looted. The local cable network still exists.

18 Kotido.

Kotido town is located about 95 km North of Moroto in the North-East of Uganda. Its the administrative center for Kotido District which consists of 3 counties. The main economic activity in the area is cattle keeping. agricultural activities are just coming up. Prominent tenancies in the town include Government offices, UCB Branch office, Catholic mission, NGO's, etc.

Services.

The District is presently served by one Radio Call and a Sub-Post Office. Both the Radio Call and the Sub Post Office are operating in the District administrative building situated 1 km away from the trading center. This inconveniences both our staff and customers, resulting in loss of revenue. It was noted that the District is rather isolated.

19 Masindi.

Masindi town is the headquarter of Masindi District. Its situated about 213 km North West of Kampala. The town is served by a 300 line manual switchboard with 231 connected subscribers. A Digital switch is planned under the "Ten Town Korean Project" but the cable network is very poor.

20 Kigumba.

This is a busy Trading center situated about 64 km from Masindi. Its served by a 50 lines manual switchboard with 13 connected subscribers. Its linked to Kampala by a single channel Radio via Kigulya/Masindi. The Telephone operator emphasized the need for a direct channel to Kampala as most of the traffic is destined to Kampala. There is no local cable network existing.

21 Nakasongola

This is a sub-District 119 Km North of Kampala. The trading center consists of a few shops which are not well stocked. There are some Government offices, Police Post and some schools.

The economic actives in the district include fishing, agriculture and cattle keeping. The products include coffee, cotton, fish, milk, skins & hides.

Telephone services

The is a 100 line switchboard with 32 subscribers connected and an overhead open wire carrier cct links it to Bombo exchange. This cct is frequently out of order. There is no commercial power in the area.

22 Luwero

This is a District H/Q 53 Km North of Kampala on Kla-Gulu road. The town is growing very fast. There are a lot of new buildings and shops which are stocked with commercial goods. There are government offices, Police Post, NGO's and schools.

Telephone services

There is a 70 line switchboard with 45 subscribers connected and an overhead open wire cct links it to Bombo exchange. A new building has been constructed and it will house both Postal and telecommunication services. A Digital switch is planned to be installed under the Korean ten town project.

23 Kitgum

This is a District H/Q 463 Km North of Kampala. It consists of four counties which include Aruu, Agago, Lmwo and chua. The area was affected by rebel activities and cattle rustling by the Karimojong between 1987-1991 and this retarded the economic development. However, agriculture has picked up and products include sim-sim, sorghum, rice, beans and others. Business is also picking up, some shops are well stocked and new buildings are being constructed. Government offices, schools and some NGO's are fully operating.

Telephone services

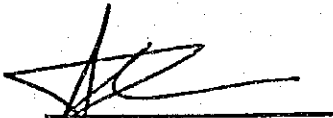
There is 110 a line switchboard with 87 subscribers connected to it. The MDF has 240 pairs terminated but the underground cable network is very poor. A single channel radio system links the area to Gulu exchange but constantly out of order. Radio call services exist but unreliable. This keeps the District isolated most of the time. There is no national power grid but the town is served by UEB power generator for eight hours of the day.

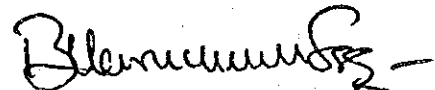
24 Hoima

This is a District H/Q 203 Km from the capital Kampala. The town is expanding and some shops are well stocked. Government offices, schools and NGO's are operating. Most of the people depend on agriculture and fishing.

Telephone services

There is a 300 line switchboard with 168 subscribers connected to it. The MDF has 800 pairs terminated to it but the OSP cable network is poor. An open overhead wire cct links the area to Kampala via Kigulya/Masindi but not reliable.


N. Opio.
SE/LNP


R. Bwewussa-Kizito.
Ag. SEE/STATISTICS.

C C GM/EP&C.
C C C/Planning.
C C PTE/N&D

1.3 Report of Team-2

Field Survey For Collection Of Data Carried Out In Some Western Districts And Mpigi Between 20th Oct. to 16th Nov. 1993

A field survey for the purpose of collecting data to be applied in drawing a master plan exercise for telecommunications in the country by the JICA team², which comprises 2 Japanese and 2 UPTC counterparts, has been carried out in the above mentioned Districts between 20th Oct. to 16th Nov. 1993.

The Districts covered so far comprise Mpigi, Kisoro, Rukungiri, Kaborole and Kibale respectively.

The method we used in this exercise differs slightly from the ones we follow while carrying out surveys to determine the demand forecast. Whereas the method we use, we have to move from tenancy to tenancy examining the telecommunications potentiality, in this one we have just carried out people had to be given questionnaires which were already prepared.

In selected areas questionnaires were randomly given to various people and asked to fill in order to determine the trend of development. A bit of emphasis was put on Administrators of the areas in question, such as District Administrator, County chiefs, Sub-County Chiefs or RCS (Resistance Councillors) where need arose.

We thought the administrators are the custodian of data, relating to population, agricultural production, labor sectors, industries and quite conversant with all the offices in their areas.

It should be noted that before questionnaires were given out a thorough briefing had to be given in which the purpose and intention of the survey was spelt, emphasizing the necessity to have the form well filled, at the same time questions from the public were warmly welcomed.

During the same exercise an attempt was made to visit some telecommunications installations to observe what facilities did exist and how they performed. This however included postal facilities well.

Analysis of the areas

1. Kisoro Town

Kisoro Township is situated about 80 km west of Kabale Township in highly mountainous region of Kigezi. Development which appeared to have been rapid, temporarily halted due to civil war that is being waged in the neighboring Rwanda territory. At the time of our visit, all shops were virtually closed which was a sign of poor business compared to previous survey when business appeared brisk.

Kisoro enjoys the service of a departmental post office with 199 postal boxes. There is a manual exchange 11A PBX parented to Kabale, in addition to a Radio Call. Kisoro formerly a county, affiliated to Kabale, has of recent been elevated to District status. Being a border town therefore, development is almost a sure fact. So it is highly recommended that modern telecommunications facilities are accorded to it, Main cash crops are Beans and Irish potatoes.

2. Bunagana Town (Kisoro)

This is a border trading center to Zaire situated about 8 Km north-west of Kisoro Town. As a gateway to Zaire, much economic activities are envisaged. Currently the trading center comprises poorly constructed building, but the trend can easily change considering the fact that this is a border town. Many vehicles are bound to stop in this trading center pending necessary clearance, hence need for better communication. It is therefore highly recommended to have a PCO installed as an interim measure.

3. Mpigi District

Mpigi township which is the seat of the district is situated about 33.6 Km west of Kampala city along Kampala-Masaka road. The trading center is bound to develop due to decentralization of Administration taking place. There is a post office (Departmental) with 100 postal Boxes fitted. There is also a manual exchange parented to Kampala with about 52 subscribers and estimated 81 waiters. Commercial Bank among other infrastructure is also worth mentioning. Main products include coffee, beans, maize and diary farming. No development plan was so far disclosed but since decentralization is taking place one is bound to be drawn. A modern facility in telecommunication is therefore recommended.

4. Buwama Town

This is a developing trading center situated about 64 Km from Kampala along Kampala-Masaka road in Mawokota county. There is a police post, coffee factory and schools. A few people had telephone connections from Mitala-Maria manual exchange, but all these were destroyed during the civil war. The few people interviewed expressed willingness to have telephone service rehabilitated.

5. Kabasanda Town

Kabasanda trading center is situated 14 Km west of mpigi township and about 9.6 Km to Kibibi in Butambala county. Kabasanda happens to be the seat of Butambala county headquarters.

The trading center is rapidly growing. Potential telephone subscribers worth mentioning include Butambala Technical Institute currently with 250 boarding students and 3 day scholars, Kabasanda Muslim Boarding School, St Joseph clinic and Abesigwa Co-operative Society.

There is a postal agency situated at the Technical Institute with already about 100 postal boxes fitted. Due to lack of keys the said boxes are not yet hired out, but arrangements are being made to solve this problem. Coffee and Bananas are the main cash crops being supplemented by sweat potatoes and pineapples for subsistence living.

6. Kibibi Town

This is a more developed trading center compared to Kabasanda situated about 14.4 Km from Kabasanda and within Butambala county. Kibibi's economic life drastically went down after Idi Amin had expelled Asians in 1972 who were occupying most of the shops in the area.

According to recent demand survey carried out it appears Kibibi has once more sprang back to economic life. Shops are generally fully stocked and the road to Mpigi via Kabasanda is good.

Potential subscribers worth mentioning include, Bugoye coffee factory, Kibibi Boarding secondary school, police station, Sub-county headquarter, Kibibi roman catholic primary school, and Kibibi muslim Boarding Primary school among others. there is a post office and operational radio call. Coffee remains the main cash crop supplemented with Bananas and Pineapples.

7. Fort Portal Town

It is the administrative headquarters of Kabarole district. As an administrative center it goes without saying that nearly all the government offices are housed in this town. Telecommunicationwise, Fort portal is served with 600 line exchange C23 with about 446 connections and 109 waiters. This exchange is due for either replacement with bigger capacity putting into consideration the present demand. The regional post office is currently fitted with 800 post boxes.

8. Butiiti Town

Butiiti trading center is situated 37 Km east of Fort Portal along the Fort Portal-Mubende Kampala road, in Mwenge county. Butiiti has not fully recovered from the damages of civil war, as there was no remarkable development seen. The PBX no 11a which was being operated here was as a results of the civil war removed and it is safely stored in one of the shops within the trading center premises. The potential subscribers to mention include St Augustine T.T.C. and Demonstration primary school Butiiti Parish, Hima and Mwenge Tea companies, Oruha and Kyehara forest station among others.

The existing telecommunication facility is a single line connected on telephone and parented to Kyenjojo. Source of income for people here appears to be derived mainly from providing labor in tea estates and Forestry departments. Within the same exchange area there is Kaihura trading center which is also developing even faster than Butiiti.

9. Kyenjojo Town

The trading center is strategically situated 48 Km east of Fort Portal along Fort Portal-Mubende Kampala road, in Mwenge county. There has not been remarkable development if you compare the previous survey carried out in 1973 and this visit. This slow development is partly attributed to poor road network especially the Mubende-Fort portal road which is no good. However the trend is likely to change now that arrangements to tarmac this road are under way.

The facilities so far found include a single line terminated on a telephone and parented to Fort portal. There is a Post office (departmental). According to RTM in the area, soon a PBX 11a will be rehabilitated hence get subscriber connected also.

10. Kijura Town

This is a small trading center situated 26 Km east of Fort Portal. It comprises only few small houses of low grade. The residents in this area, however, are the workers of the two giant tea estates i.e. TAMTECO (The Toro and Mityana Tea Company Limited) Kijura estate and Kijura Tea Co. Ltd. Both managers of the mentioned tea estates have ever expressed anxiety of having modern telephones extended to this area. I hope everything possible will be made to assist on this matter. Kijura tea co. currently owns a Radio call. Police post in the area is without any kind of communication other than travel by public means.

11. Kagadi Town

The trading center is fast growing situated about 90 Km from Kyenjojo within the new created Kibale district. Before the civil wars, Kagadi used to have a manual exchange but this was discontinued and all the trunk from Kenjojo destroyed.

People generally expressed anxiety to have the telephone service rehabilitated, something which should be thought about. Among the firm waiters for service include Kagadi hospital, Commercial Bank, Sub-county headquarters and a primary school.

Currently the area is enjoying the services of a post office and Radio call. Main source of income are beans and cotton.

12. Ishasha Town

Ishasha which is popularly known as " border customs post " is situated 106 Km north west of Kabale via Kanungu and Kihhi. The area derives its importance from being a border customs post to Zaire. There is not much trading going on here as most of the traffic witnessed here is always in transit. We were told that the state of the road from Katunguru to this place is very rough and has contributed to poor economic life in this area. However this being a border post it is recommended that communication of modern type is provided other than the Radio call currently in the area.

Potential subscribers would include Police Post, Customs office and Immigration office. There is no post office here as all matters related to postal are transacted at Kihhi and Rukungiri.

13. Kihihi Town

Kihihi trading center is situated about 90 Km north of Kabale town in Kinkizi county. The trading center being a border town to Zaire is bound to develop even faster. There were a lot of building construction going on and residents appeared largely bent on trading activities compared to agricultural ones.

Easy means of communication appears difficult for people of Kihihi as one has to travel to Rukungiri or Kabale if one wanted to make a telephone call.

The infrastructure include Piped water, post office and Sub-county headquarter. Quite good number of shops are engaged in both retail and wholesale business. It is recommended that telephone exchange is installed in the area with minimum delay.

14. Kambuga Town

Kambuga trading center is situated about 81 Km from Kabale town along Kabale-Rukungiri road in Kinkizi county. Shops which were quite few are generally constructed of temporary materials such as Mud and wattle. Access roads to Rukungiri and Kabale are quite rough, this may be contributing to poor economic activities in this trading center. People here are supposed to be earning their income from production of beans and sorghum.

The only prominent tenancy is Kambuga hospital which apparently is already served by Radio call service. There is also a postal agency and a Radio call which is equally housed in Kambuga hospital. No development plans were disclosed so far.

15. Rukungiri Town

Rukungiri trading center is located 100 Km north of Kabale town. It is the Administrative center for Rukungiri district. Commercially, Rukungiri town had all the signs of a smooth developing center judging from the old buildings that are being demolished and instead being replaced by new ones.

In addition to Government offices, there are many institutions around the town such as Makobere high school, Kinyasano boarding primary school, Nyakibale boarding primary school, Nyakibale hospital and stores not mentioned.

Telecommunications present facilities include a newly installed 1000 line exchange C23. There are at the moment about 84 working subscribers and 30 recorded for the service as waiters. There is also full fledged departmental post office with 200 Postal boxes fitted.

23. Nov. 1993

J. L. Kalete
STC / Dev.
J.L. Kalete

CC. Manager EP + C

CC. C / P

CC. PTE / N + D

1.4 Data Collection

The main bulk of data collection field work covered the period from 25 Oct. to 13 Nov. 1993.

The alternative method of telephone was examined through interviews conducted in the areas targeted. The interviews, conducted during the field surveys, were designed to determine the amount residents must pay as the opportunity cost used in economic analysis.

The survey covered over 120 samples, which consisted of ordinary households and offices/shops. Due to the insufficient postal and telephone service in Uganda, it was difficult to use mail or telephone interview schemes to collect data from scattered/rural residents. Following Tables shows the obtained pure data until Dec. 1993.

The field survey was conducted along the following flow chart.

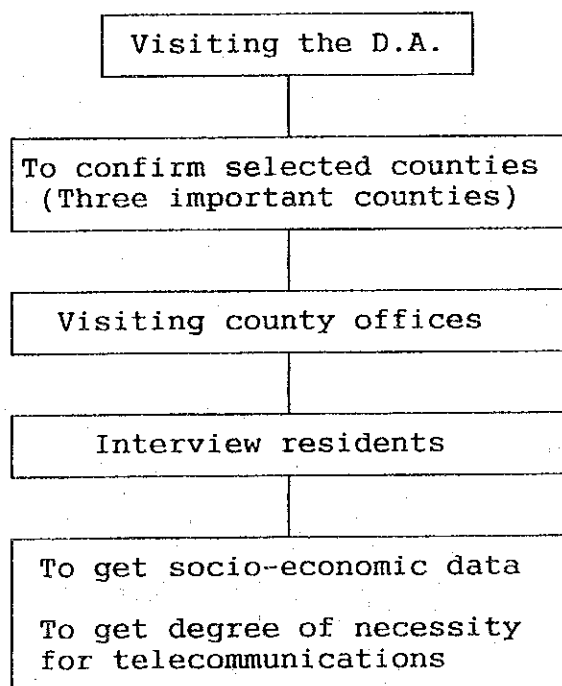


Figure 1-2 Flow Chart of the Field Survey

1.5 Questionnaires and Result

Questionnaire to office/shop

AREA
DATE

Q1. Office/shop type

Q2. Size of office/shop

Q3. Number of staffs

Q4. Budget

(1) Total Revenue (USH/month)

(2) Total Expenditure (USH/month)

Q5. What is your communication media/means ?

(1) Telephone (DEL/PL)
Number of telephone (lines)

(2) H.F.Radio ()

(3) Letter or Telegram ()

(4) Travel(Auto mobil) ()

(5) Other ()

Q6. OA Facilities

(1) Fax ()

(2) Telex ()

(3) Typewriter ()

(4) Personal Computer ()

Q7. Number of letters

(1) Incoming (/month)

(2) Outgoing (/month)

Q8. Telephone;

Frequency (times/day)

Cost (Appro. Ush /month)

How many telephone lines do you want ? (lines)

Q9. How much do you pay for the premium if telephone is installed with priority ?

Installation Fee (Ush)

Rental Fee (Ush)

Call charge Fee (Ush)

Q10. What is the reason that you do not order telephone installation ?

- (1) It is not necessary ()
- (2) It is too expensive ()
- (3) It is no practicable ()
- (4) It is no information ()
- (5) Others()

If you use the alternative communication method to telephone, please answer to the next page.

Q11. Alternative Method to telephone(if any)

| Item | |
|----------------------------|-----|
| Travel | () |
| Postal service | () |
| Other communication method | () |
| Nothing | () |

Regarding the above alternative method;

- (1) Travel
 - Distance ()
 - Transportation (Vehicle/Bus/Bicycle)
 - Travelling expenses (Ush /travel)
 - Average travelling time (hrs)
 - Frequency (/month)
- (2) Postal Service
 - Distance ()
 - Average Cost (Ush /month)
 - Frequency (/month)
- (3) Other communication method
 - Communication method ()
 - Expenses (Ush /month)
 - Average time (hrs)
 - Frequency (/month)
- (4) Premium for telephone (Ush /telephone)

How much do you pay for the premium if your telephone is installed with priority ?

 - Installation Fee (Ush)
 - Rental Fee (Ush)
 - Call charge Fee (Ush)

Table 1-1 Result of Questionnaire to Office/Shop (1/5)

| No. | District | County | Type | No. staff | Revenue Ush Mil | Expenditure Ush Mil | Q5 | Others | Q6 | Incoming | Outgoing | Frequency |
|-----|-----------|-----------|------------|-----------|-----------------|---------------------|--------|-------------|-------|----------|------------|-----------|
| 1 | MPIGI | MAWOKOTA | DRUG SHOP | 4 | 0.6 | 0.54 | 110010 | - | 10000 | 2 | 2 | 1 |
| 2 | MPIGI | MAWOKOTA | RETAIL | 1 | 0.3 | 0.2775 | 110010 | - | 10000 | 5 | 5 | 4 |
| 3 | MPIGI | MAWOKOTA | RETAIL | 2 | 1 | 0.9 | 110000 | - | 10000 | 20 | 5 | 5 |
| 4 | MPIGI | MAWOKOTA | BANK | 16 | - | - | 110010 | - | 10010 | 50 | 50 | 10 |
| 5 | MPIGI | MAWOKOTA | RESTAURANT | 15 | 0.9 | 0.6 | 111000 | - | 10000 | 20 | 30 R. CALL | 4 |
| 6 | MPIGI | MUTAMBALA | OFFICE | 1 | - | - | - | - | 10000 | 500 | 500 | - |
| 7 | MPIGI | MUTAMBALA | RETAIL | 2 | 0.3 | 0.2 | 100010 | - | 10000 | - | - | - |
| 8 | MPIGI | MUTAMBALA | SCHOOL | 719 | 3.456 | 3.2 | 101011 | - | 10010 | 10 | 15 | - |
| 9 | MPIGI | MUTAMBALA | PETROL ST. | 5 | 0.4 | 0.15 | 100110 | - | 10010 | 100 | 40 | - |
| 10 | MPIGI | MUTAMBALA | WORK SHOP | 5 | 0.1 | 0.05 | 101110 | - | 10000 | 15 | 30 | - |
| 11 | RUKUNGIRI | RUJUMBURA | BAT SHOP | 8 | 20 | 10.5 | 110110 | - | 10010 | 12 | 12 | 5 |
| 12 | RUKUNGIRI | RUJUMBURA | HOTEL | 9 | 0.8 | 0.4 | 110110 | - | 10000 | 20 | 30 | 3 |
| 13 | RUKUNGIRI | RUJUMBURA | HOSPITAL | 193 | 162 | 169 | 110111 | - | 10011 | 600 | 300 | 15 |
| 14 | RUKUNGIRI | RUJUMBURA | RETAIL | 2 | 0.4 | 0.15 | 100111 | BICYCLE | 10000 | 15 | 10 | - |
| 15 | RUKUNGIRI | KINKIJI | HOSPITAL | 117 | 0.455 | 1.14 | 101110 | - | 10010 | 80 | 40 | - |
| 16 | RUKUNGIRI | KINKIJI | RETAIL | 1 | 0.1 | 0.08 | 100110 | - | 10000 | 10 | 6 | - |
| 17 | RUKUNGIRI | KINKIJI | RETAIL | 2 | 0.2 | 0.01 | 100110 | - | 10000 | 6 | 10 | - |
| 18 | RUKUNGIRI | KINKIJI | SHOP | 2 | 0.2 | 0.8 | 100110 | - | 10000 | 20 | 30 | - |
| 19 | RUKUNGIRI | KINKIJI | WHOLE SALE | 3 | 3 | 2.5 | 100110 | - | 10000 | 5 | 5 | - |
| 20 | RUKUNGIRI | KINKIJI | FILLING ST | 4 | 1 | - | 100010 | - | 10000 | - | - | - |
| 21 | RUKUNGIRI | KINKIJI | OFFICE | 7 | - | - | 101110 | - | 10000 | 20 | 5 | - |
| 22 | RUKUNGIRI | KINKIJI | OFFICE | 12 | - | - | 101000 | R. CALL | 10000 | 80 | 35 | - |
| 23 | RUKUNGIRI | KINKIJI | OFFICE | 3 | - | - | 100110 | - | 10000 | 10 | 10 | - |
| 24 | KABAROLE | MWENGE | RETAIL | 2 | 0.2 | 0.1 | 100110 | - | 10000 | 4 | 10 | - |
| 25 | KABAROLE | MWENGE | COLLEGE | 200 | 2.4 | 2.3 | 110101 | R. CALL | 10011 | 150 | 180 | - |
| 26 | KABAROLE | MWENGE | OFFICE | 22 | 0.33 | 0.2 | 101100 | - | 10000 | 20 | 30 | - |
| 27 | KABAROLE | MWENGE | OFFICE | 5 | 1 | 0.85 | 100110 | - | 10000 | 30 | 22 | - |
| 28 | KABAROLE | MWENGE | SCHOOL | 300 | - | - | 100110 | - | 10000 | 40 | 60 | - |
| 29 | KABAROLE | MWENGE | RETAIL | 1 | 0.5 | 0.1 | 100110 | - | 10000 | 3 | 4 | - |
| 30 | KABAROLE | MWENGE | RETAIL | 3 | 0.27 | 0.18 | 110110 | - | 10000 | 5 | 3 | - |
| 31 | KABAROLE | MWENGE | RETAIL | 1 | 0.3 | 0.2 | 100110 | - | 10000 | 1 | 3 | - |
| 32 | KABAROLE | MWENGE | OFFICE | 4 | - | - | 100110 | - | 10000 | - | - | - |
| 33 | KIBALE | BUYAGA | BANK | 8 | - | - | 101100 | R. CALL | 10010 | 10 | 10 | - |
| 34 | KIBALE | BUYAGA | RETAIL | 2 | 2.5 | 2.3 | 101110 | R.C(5000) | 10000 | 6 | 4 | - |
| 35 | KIBALE | BUYAGA | RETAIL | 2 | 0.6 | 0.15 | 101111 | S. DELIVERY | 10000 | 15 | 6 | - |
| 36 | KIBALE | BUYAGA | RETAIL | 2 | 0.4 | 0.2 | 101110 | R.C(7300) | 10000 | 6 | 14 | - |

Table 1-2 Result of Questionnaire to Office/Shop (2/5)

| No. | Cost | No. of line | Install. | Premium | Rental | Call | Q10 | Alternative method (Travel) | | Time | Frequency | Alternative method (Postal) | | No. 2 | |
|-----|-------|-------------|----------|---------|--------|------|-----|-----------------------------|-----------|--------|-----------|-----------------------------|----------|--------|-----------|
| | | | | | | | | Distance | Type | | | Expende | Distance | | Cost/CARD |
| 1 | 15000 | 1 | 15000 | 400 | 100 | 1 | 1 | 30 | BUS (KLA) | 2000 | 1 | 10 | 0.5 | 130 | 2 |
| 2 | 5000 | 2 | 20000 | 1000 | 100 | 3 | 3 | 300 | BUS | 12000 | 6 | 1 | 0.5 | 130 | 6 |
| 3 | 5000 | 3 | - | - | - | 3 | 3 | 50 | VEH (KLA) | 1500 | 1.5 | 4 | 0.5 | 130 | 5 |
| 4 | 35000 | 2 | 50000 | 3000 | 300 | - | - | 30 | BUS (KLA) | 2500 | 2 | 22 | 0.5 | 130 | 22 |
| 5 | 40000 | 3 | 30000 | 2000 | 500 | 3 | 3 | 65 | BUS (KLA) | 3000 | 2 | 4 | 0.25 | 130 | 15 |
| 6 | - | 2 | 40000 | 10000 | - | - | 3 | 26 | BUS | 3200 | 4 | 4 | - | - | - |
| 7 | - | 1 | 9000 | 1000 | - | 3 | 3 | 57 | BUS | 5000 | 8 | 5 | - | - | - |
| 8 | - | 2 | 30000 | 3000 | - | 3 | 3 | 115 | BUS | 5000 | 6 | 4 | 1 | 6000 | 10 |
| 9 | - | 2 | 40000 | 2500 | - | 3 | 3 | 115 | BUS | 5000 | 6 | 10 | 0.1 | 1000 | 20 |
| 10 | - | 2 | 30000 | 10000 | - | 3 | 3 | 115 | BUS | 5000 | 12 | 8 | 0.8 | 1200 | 12 |
| 11 | 60000 | 3 | 30000 | - | - | 4 | 4 | 400 | BUS (KLA) | 7000 | 5 | 3 | 0.5 | 2000 | 12 |
| 12 | 6000 | 2 | 30000 | 5000 | 300 | - | - | 400 | BUS (KLA) | 15000 | 5 | 5 | 0.1 | 1500 | 30 |
| 13 | - | 10 | 50000 | 800 | - | - | - | 400 | VEH | 40000 | 8 | 2 | - | - | - |
| 14 | - | 1 | 15000 | 3000 | - | - | 2 | 400 | BUS (KLA) | 44000 | 5 | 4 | 0.5 | - | - |
| 15 | - | 3 | 50000 | - | - | - | - | 470 | BUS (KLA) | 26000 | 12 | 2 | 60 | 8000 | 4 |
| 16 | - | 1 | 9000 | 800 | 100 | 3 | 3 | 60 | BUS | 3000 | 2 | 8 | 0.2 | 1000 | 6 |
| 17 | - | 1 | 25000 | 1000 | - | 3 | 3 | 80 | BUS (KLA) | 36000 | 24 | 2 | 0.4 | 3000 | 12 |
| 18 | - | 2 | 100000 | 20000 | - | 3 | 3 | 320 | BUS (KLA) | 45000 | 24 | 4 | 0.5 | 6000 | 30 |
| 19 | - | 1 | 9000 | 1800 | 100 | 3 | 3 | 470 | BUS (KLA) | 20000 | 12 | 4 | 0.1 | 130 | 5 |
| 20 | - | 1 | 5000 | 1000 | 50 | 3 | 3 | 72 | BUS | 6000 | 2 | 1 | - | - | - |
| 21 | - | 3 | - | - | - | - | - | 400000 | BUS | 400000 | - | 4 | 16 | 9000 | 2 |
| 22 | - | 1 | - | - | - | - | - | 44 | BUS | 11000 | 12 | 3 | 11 | 5000 | 2 |
| 23 | - | 1 | - | - | - | - | - | 430 | BUS (KLA) | 100000 | 24 | 2 | - | - | - |
| 24 | - | 1 | 30000 | 1000 | - | 3 | 3 | 23 | BUS | 3000 | 2 | 3 | 0.4 | - | - |
| 25 | - | 1 | - | - | - | 2 | 2 | 44 | VEH | 3500 | 3 | 8 | 2 | 200000 | 4 |
| 26 | - | 3 | 50000 | 2500 | - | 3 | 3 | 317 | BUS | 200000 | 12 | 1 | 96 | 6000 | 10 |
| 27 | - | 1 | 50000 | 5000 | - | 3 | 3 | 315 | BUS (KLA) | 14000 | 12 | 4 | 5 | 1000 | 4 |
| 28 | - | 1 | 30000 | 1500 | - | 3 | 3 | 44 | BUS | 3500 | 6 | 4 | 0.1 | - | - |
| 29 | 8000 | 1 | 30000 | 1000 | - | 3 | 3 | 300 | BUS (KLA) | 20000 | 24 | 2 | 0.05 | - | - |
| 30 | - | 1 | 26000 | 2000 | - | 4 | 4 | 300 | BUS (KLA) | 20000 | 24 | 2 | 0.2 | - | - |
| 31 | - | 1 | 10000 | 2000 | - | 3 | 3 | 300 | BUS (KLA) | 20000 | 24 | 1 | 0.1 | - | - |
| 32 | - | 1 | - | - | - | 5 | 5 | 42 | BUS | 5000 | 2 | 5 | 0.1 | - | - |
| 33 | - | 1 | FAIR | FAIR | FAIR | 3 | 3 | - | - | - | - | 4 | 0.1 | - | - |
| 34 | - | 1 | 25000 | 2000 | 100 | 3 | 3 | 320 | BUS (KLA) | 40000 | 24 | 4 | 0.1 | - | - |
| 35 | 6000 | 1 | 30000 | 5000 | - | 3 | 3 | 320 | BUS (KLA) | 32000 | 24 | 3 | 0.2 | - | - |
| 36 | - | 2 | 30000 | 5000 | - | - | - | 320 | BUS (KLA) | 25000 | 24 | 2 | 0.2 | - | - |

Table 1-3 Result of Questionnaire to Office/Shop (3/5)

| No. | District | County | Type | No. staff | Revenue Ush. Mil | Expenditure Ush. Mil | Q5 Others | Q6 | Incoming | Outgoing | Frequency |
|-----|----------|----------|------------|-----------|------------------|----------------------|-------------------|-------|----------|----------|-----------|
| 37 | KABAROLE | BURAHYA | OFFICE | 250 | - | - | 101111 R.C COURIE | 11111 | 900 | 1500 | - |
| 38 | KABAROLE | BURAHYA | OFFICE | 6 | - | - | 100110 | 10000 | 4 | 10 | - |
| 39 | ARUA | ARUA | SHOP | 3 | 1.74 | 1.651 | 110010 R.C(16000) | 10000 | - | - | 5 |
| 40 | ARUA | ARUA | RESTAURANT | 5 | 0.5 | 0.44 | 110110 R.C(6000) | 10010 | 2 | 2 | 3 |
| 41 | ARUA | ARUA | STORE | 2 | 2.5 | 0.2 | 111116 R.C(64000) | 10000 | 12 | 1 | 4 |
| 42 | ARUA | ARUA | OFFICE | 3 | 0.45 | 0.27 | 101110 R.C(6000) | 10000 | 15 | 40 | - |
| 43 | ARUA | ARUA | HOTEL | 12 | 0.2 | 0.16 | 110110 R.C(6000) | 10000 | 4 | 4 | 2 |
| 44 | ARUA | MADI-OKL | RETAIL | 2 | 200 | 158 | 100010 | 10000 | - | - | - |
| 45 | ARUA | MADI-OKL | COTTON GE. | 200 | 2 | 2 | 100011 COURIER | 10010 | 30 | 50 | - |
| 46 | ARUA | MADI-OKL | BANK | 4 | 0.15 | 0.05 | 100010 | 10010 | 30 | 30 | - |
| 47 | ARUA | MADI-OKL | RETAIL | 3 | 0.4 | - | 100010 | 10000 | - | - | - |
| 48 | ARUA | KOBOKO | OFFICE | 5 | 0.4 | - | 100010 | 10000 | - | - | - |
| 49 | ARUA | KOBOKO | SHOP | 4 | 0.6 | 0.54 | 100010 | 10000 | 3 | 5 | - |
| 50 | ARUA | KOBOKO | HOTEL | 4 | 0.15 | 0.1 | 100010 | 10000 | 15 | 20 | - |
| 51 | SOROTI | KABERA. | RETAIL | 8 | 0.45 | 0.4 | 100110 | 10000 | - | - | - |
| 52 | SOROTI | KABERA. | RETAIL | 2 | 0.055 | 0.045 | 100010 | 10000 | - | - | - |
| 53 | SOROTI | KABERA. | RETAIL | 2 | 2.4 | 1.95 | 100010 | 10000 | - | - | - |
| 54 | SOROTI | KABERA. | OFFICE | 3 | 0.9 | 0.45 | 100110 | 10000 | 2 | 3 | - |
| 55 | SOROTI | SOROTI | HOTEL | 3 | 0.9 | 0.33 | 110100 | 10000 | 4 | 6 | 5 |
| 56 | SOROTI | SOROTI | CLINIC | 5 | 0.7 | 0.5 | 100110 S.D(12000) | 10000 | 10 | 15 | - |
| 57 | SOROTI | SOROTI | RETAIL | 3 | 0.4 | 0.3 | 110100 S.D(7000) | 10000 | 2 | 5 | 15 |
| 58 | SOROTI | SOROTI | RETAIL | 1 | 0.45 | 0.3 | 110100 | 10000 | 4 | 3 | 5 |
| 59 | SOROTI | SOROTI | HOTEL | 6 | 0.3 | 0.25 | 110110 S.D(14400) | 10010 | 5 | 20 | 5 |
| 60 | SOROTI | SERERE | RETAIL | 1 | 0.06 | 0.035 | 100001 | 10000 | - | - | - |
| 61 | SOROTI | SERERE | OFFICE | 180 | - | - | 100000 | 10000 | 20 | 10 | - |
| 62 | SOROTI | SERERE | OFFICE | 6 | - | - | 100110 | 10000 | 20 | 30 | - |
| 63 | SOROTI | SERERE | SCHOOL | 22 | - | - | 100110 R.CALL | 10010 | 1000 | 40 | - |
| 64 | MOROTO | BOFORA | OFFICE | 47 | - | - | 101010 R.CALL | 10010 | - | - | - |
| 65 | MOROTO | MOROTO | HOTEL | 10 | - | - | 110110 | 10010 | 5 | 2 | 15 |
| 66 | MOROTO | MOROTO | OFFICE | 46 | - | - | 110110 R.C(5000) | 10011 | 150 | 30 | 4 |
| 67 | MOROTO | MOROTO | P. STATION | 5 | 12 | 8 | 110110 R.C(5000) | 10000 | 12 | 15 | 20 |
| 68 | MOROTO | MOROTO | RETAIL | 2 | 0.3 | 0.24 | 100110 | 10000 | 5 | 2 | PCO 1 |

Table 1-4 Result of Questionnaire to Office/Shop (4/5)

| No. | Cost | No. of line | Install. | Premium | Rental | Call | Q10 | Alternative method (Travel) | Distance | Type | Expense | Time | Frequency | Distance | Alternative method (Postal) | Cost/CARD | Frequency |
|-----|-------|-------------|----------|---------|--------|------|-----|-----------------------------|----------|-----------------|---------|------|-----------|----------|-----------------------------|-----------|-----------|
| 37 | - | 15 | 30000 | - | 2000 | - | - | 300000 | 3 | 300 BUS(KLA) | 300000 | 24 | 4 | - | - | 330000 | 30 |
| 38 | - | 1 | - | - | - | - | - | 4000 | 3 | 27 BUS | 4000 | 5 | 5 | - | - | - | - |
| 39 | 10000 | 1 | FAIR | FAIR | FAIR | FAIR | - | 20000 | - | 500 BUS(KLA) | 20000 | 20 | 2 | - | - | 100 | 2 |
| 40 | 9000 | 1 | FAIR | 1000 | FAIR | FAIR | - | 20000 | - | 500 BUS(KLA) | 20000 | 20 | 4 | - | - | 10000 | 2 |
| 41 | 3200 | 1 | 40000 | 1000 | 200 | 200 | - | 152000 | 5 | 320 VEH(KLA) | 152000 | 6 | 8 | - | - | 6000 | 30 |
| 42 | - | 2 | 25000 | 500 | 100 | 100 | - | 20000 | - | 500 BUS(KLA) | 20000 | 20 | 4 | - | - | 200 | 1 |
| 43 | 10000 | 1 | 25000 | 800 | 25 | 25 | - | 600 | 3 | 20 VEH(ARUA) | 600 | 1 | 8 | - | - | - | - |
| 44 | - | 1 | 18000 | 800 | 40 | 40 | - | 16800 | 3 | 134 VEH(ARUA) | 16800 | 4 | 8 | - | - | - | - |
| 45 | - | 1 | 20000 | 5000 | 100 | 100 | - | 5000 | 3 | 124 VEH(ARUA) | 5000 | 4 | 4 | - | - | - | - |
| 46 | - | - | FAIR | ANY | - | - | - | 24000 | 3 | 1138 BUS(KLA) | 24000 | 24 | 1 | - | - | - | - |
| 47 | - | 1 | FAIR | 1000 | - | 100 | - | 7000 | 3 | 120 BUS(ARUA) | 7000 | 4 | 6 | - | - | - | - |
| 48 | - | 1 | - | - | - | - | - | 26000 | 3 | 1300 BUS(KLA) | 26000 | 24 | 5 | - | - | 2000 | 9 |
| 49 | - | 1 | 10000 | 2000 | 150 | 150 | - | 20000 | 3 | 1104 BUS(KLA) | 20000 | 20 | 2 | - | - | 2000 | 30 |
| 50 | - | 1 | FAIR | FAIR | FAIR | FAIR | - | 4000 | 3 | 144 BUS(SRT) | 4000 | 4 | 4 | - | - | - | - |
| 51 | - | 1 | 11050 | 800 | 80 | 80 | - | 7000 | 3 | 350 BUS(MBALE) | 7000 | 12 | 2 | - | - | - | - |
| 52 | - | 1 | 30000 | 5000 | 200 | 200 | - | 13000 | 3 | 144 BUS(SRT) | 13000 | 12 | 8 | - | - | - | - |
| 53 | - | 1 | 20000 | 3000 | 250 | 250 | - | 7000 | 3 | 350 BUS(MBALE) | 7000 | 12 | 8 | - | - | - | - |
| 54 | - | 1 | 20000 | 4000 | 60 | 60 | - | 7000 | 3 | 144 BUS(SRT) | 7000 | 4 | 5 | - | - | 300 | 4 |
| 55 | 20000 | 1 | 30000 | 2000 | 100 | 100 | - | 4000 | 3 | 200 BUS(SRT) | 4000 | 3 | 8 | - | - | 2000 | 10 |
| 56 | - | 1 | 5000 | 6000 | 5000 | 5000 | - | 4000 | 5 | 200 BUS(SRT) | 4000 | 3 | 1 | - | - | 1000 | 4 |
| 57 | 10000 | - | 25000 | 1500 | 100 | 100 | - | 7000 | - | 340 VEH(MALABA) | 7000 | 6 | 5 | - | - | 1600 | 8 |
| 58 | 15000 | - | 30000 | 800 | 200 | 200 | - | 32000 | - | 200 VEH(MBALE) | 32000 | 3 | 1 | - | - | 6000 | 30 |
| 59 | 12000 | 2 | 30000 | 1000 | 100 | 100 | - | 12000 | - | 734 BUS(KLA) | 12000 | 13 | 1 | - | - | 3600 | 12 |
| 60 | - | 1 | 5000 | 500 | 50 | 50 | - | - | - | 50 *BICYCLE | - | 3 | 8 | - | - | - | - |
| 61 | - | 3 | - | - | - | - | - | 16000 | - | 524 BUS(ENTEBE) | 16000 | 20 | 3 | - | - | 72000 | 12 |
| 62 | - | 1 | 5000 | 300 | 20 | 20 | - | - | 3 | 50 *BICYCLE | - | 3 | 4 | - | - | 1500 | 4 |
| 63 | - | 3 | 15000 | 800 | 200 | 200 | - | 3000 | 3 | 50 BUS(SRT) | 3000 | 4 | 4 | - | - | 2000 | 4 |
| 64 | - | 1 | 15000 | 500 | 100 | 100 | - | 2000 | 3 | 50 VEH(MOROTO) | 2000 | 1.5 | 30 | - | - | - | - |
| 65 | 10000 | 1 | 10000 | 800 | 50 | 50 | - | 26000 | - | 1070 BUS(KLA) | 26000 | 24 | 2 | - | - | 600 | 12 |
| 66 | 50000 | 1 | 30000 | 800 | 100 | 100 | - | 150000 | - | 1070 VEH(KLA) | 150000 | 16 | 2 | - | - | 12000 | 4 |
| 67 | 90000 | 1 | 10000 | 800 | 80 | 80 | - | 10000 | 2 | 546 BUS(MBALE) | 10000 | 14 | 3 | - | - | 25000 | 8 |
| 68 | 2400 | - | 10000 | 800 | 50 | 50 | - | 10000 | 2 | 546 BUS(MBALE) | 10000 | 14 | 3 | - | - | 500 | 1 |

Table 1-5 Result of Questionnaire to Office/Shop (5/5)

| No. | District | Country | Type | No. staff | Revenue Ush. Mil | Expenditur Ush. Mil | Q5 | Others | Q6 | Incoming | Outgoing | Frequency | Cost |
|-----|----------|---------|-------------|-----------|---------------------|------------------------|--------|------------|-------|----------|----------|-----------|-------|
| 1 | KAMPALA | KAMPALA | Shop | 2 | - | - | 100110 | - | 10000 | - | - | - | - |
| 2 | KAMPALA | KAMPALA | Saloon Off | 5 | - | - | 100011 | Courier | 10000 | - | - | - | - |
| 3 | KAMPALA | KAMPALA | Shop | 5 | - | - | 100111 | Courier | 10000 | - | - | - | - |
| 4 | KAMPALA | KAMPALA | Office | 6 | - | - | 100111 | Courier | 10010 | - | - | - | - |
| 5 | KAMPALA | KAMPALA | Shop(stall) | 2 | - | - | 100111 | Courier | 10000 | - | - | - | - |
| 6 | KAMPALA | KAMPALA | Shop | 8 | - | - | 100110 | - | 10000 | - | - | - | - |
| 7 | KAMPALA | KAMPALA | Office | 6 | 4 | 3 | 110111 | Courier | 11011 | - | 15 | 300000 | - |
| 8 | KAMPALA | KAMPALA | Both | 10 | - | - | 110001 | Fax | 11011 | - | 0.1 | 100000 | - |
| 9 | KAMPALA | KAMPALA | Shop | 6 | - | - | 110111 | Speed Del. | 10000 | 5 | 5 | - | 4 |
| 10 | KAMPALA | KAMPALA | Hotel | 9 | - | - | 110111 | Speed Del. | 10000 | 15 | 7 | 5 | - |
| 11 | KAMPALA | KAMPALA | Shop | 3 | - | - | 110111 | Speed Del. | 10010 | 10 | 20 | 10 | 10000 |
| 12 | KAMPALA | KAMPALA | Shop | 2 | - | - | 110001 | Speed Del. | 10000 | - | - | 0.6 | 5000 |
| 13 | KAMPALA | KAMPALA | Shop | 4 | - | - | 110111 | Air | 10000 | 5 | 5 | - | 10000 |

| No. of Line | Install. | Premiun Rental | Call | Q10 | Distance (km) | Alternative Method(Travel) | | | Alternative Method(CARD) | | | Alternative Method(Poste) | | | Alternative Method(Other) | | | |
|-------------|----------|-------------------|------|-----|------------------|----------------------------|---------|-----------|--------------------------|------|-----------|---------------------------|------------|--------|---------------------------|--------|----------|------|
| | | | | | | Expcnce | Time | Frequency | Distance | Cost | Frequency | Method | Expcnses | Time | Frequency | Method | Expcnses | Time |
| 1 | 80000 | 1500 | 100 | 5 | 200 | Vehicle | 20000 | 4 | 4 | 0.1 | 3000 | 5 | - | - | - | - | - | - |
| 2 | 120000 | 2000 | 100 | 5 | 200 | Vehicle | 50000 | 4 | 4 | - | - | - | - | - | - | - | - | - |
| 3 | 100000 | 2000 | 100 | 5 | 100 | Vehicle | 10000 | 3 | 5 | 0.1 | 2500 | 8 | Courier | 20000 | 4 | 5 | 5 | |
| 4 | 100000 | 1500 | 100 | 5 | 200 | Vehicle | 20000 | 4 | 6 | 0.2 | 3000 | 4 | Courier | 15000 | 3 | 5 | 5 | |
| 5 | 75000 | 1500 | 100 | 5 | 22 | Vehicle | 1000 | 1.5 | 4 | 1 | 2000 | 5 | DHL | 30000 | 8 | 1 | 1 | |
| 6 | 70000 | 2000 | 100 | 3 | 288 | Bus | 12000 | 8 | 2 | 4 | 4800 | 8 | - | - | - | - | - | |
| 7 | 100000 | 20000 | 100 | 3 | 200 | Vehicle | 5500 | 3 | 2 | 2 | 12000 | 30 | Courier | 6000 | 3 | 1.5 | 1.5 | |
| 8 | 150000 | 2500 | 50 | 5 | 10 | Vehicle | 10000 | 2 | 30 | 0.5 | 20000 | 30 | - | - | - | - | - | |
| 9 | 70000 | 1000 | 100 | 0 | 2 | Vehicle/Bu | 600 | 0.5 | 30 | 1 | 200 | 5200 | Speed Del. | 700 | 12 | 0.3 | 0.3 | |
| 10 | - | - | - | 1 | 5 | Vehicle | 2000 | 1 | 12 | 1.5 | 1200 | 4 | Speed Del. | 1000 | 24 | 4 | 4 | |
| 11 | 100000 | 2000 | 100 | 0 | U. K. | - | \$900 | 9 | 3.3 | 1 | 1600 | 8 | - | 100000 | 72 | 3 | 3 | |
| 12 | 80000 | 1500 | 50 | 5 | 3 | Vehicle | 600 | 2 | 8 | - | - | - | Courier | 5000 | 24 | 1 | 1 | |
| 13 | - | - | - | 0 | London | Vehicle | 2000000 | - | 0.2 | 200 | Yards | 4 | - | - | - | - | - | |

Questionnaire to household

Area
Date

- Q1. Age ()
- Q2. Employment ()
- Q3. How long have you been living here ? (Years)
- Q4. What is your family's total income in monthly bases ?
(Appro. Ush /month)
- Q5. Personal belongings
- | | |
|------------------|------------|
| (1) Telephone | (DEL/PL) |
| (2) Radio | () |
| (3) T.V. Set | () |
| (4) Refrigerator | () |
| (5) Motorbike | () |
| (6) Automobile | () |
- Q6. Where have you got the telephone ?
- | |
|------------|
| (1) House |
| (2) Office |
| (3) Others |
- Q6.1 How many times do you use the telephone in a day ?
- Q6.2 How much do you pay for the telephone call ?
(Ush /month)
- Q7. What do you do when have to make a phone call ?
- Use;
- | |
|---------------------------------------------|
| (1) Public phone |
| (2) Friends or relatives who have telephone |
| (3) Others |
- Q8. Do you order telephone installation ? (Yes/No)
- Q9. What is the reason that you do not order telephone installation ?
- | |
|--------------------------|
| (1) It is not necessary |
| (2) It is too expensive |
| (3) It is no practicable |
| (4) It is no information |
| (5) Others |

Q10. How much do you pay for the premium if telephone is installed with priority ?

- (1) Installation Fee (Ush /line)
- (1) Charge fee (Ush /call)
- (2) Rental Fee (Ush)

If you use the alternative communication method to telephone, please answer to the next page.

Q11. Alternative Method to telephone(if any)

Item

- Travel ()
- Postal service ()
- Other communication method ()
- Nothing ()

Regarding the above alternative method;

(1) Travel

- Distance ()
- Transportation (Vehicle/Bus/Bicycle)
- Travelling expenses (Ush /travel)
- Average travelling time (hrs)
- Frequency (/month)

(2) Postal Service

- Distance ()
- Average Cost (Ush /month)
- Frequency (/month)

(3) Other communication method

- Communication method ()
- Expenses (Ush /month)
- Average time (hrs)
- Frequency (/month)

(4) Premium for telephone (Ush /telephone)

How much do you pay for the premium if your telephone is installed with priority ?

- Installation Fee (Ush)
- Rental Fee (Ush)
- Call charge Fee (Ush)

Table 1-6 Result of Questionnaire to Household (1/3)

| No. | District | County | Type(OCP.) | Income(M) | Age | Belongings | Tele.exp | Electric | Q 789 | Install. | Premium | Rental | Call |
|-----|-----------|-------------|------------|-----------|-----|------------|----------|----------|-------|----------|---------|--------|------|
| 1 | ARUA | ARUA | BUSINESS | 15000 | 23 | 1111000 | - | 12000 | 1123 | 50000 | 1500 | 1500 | 350 |
| 2 | ARUA | ARUA | SHOP | 60000 | 36 | 1101001 | 20000 | 16000 | 1010 | 40000 | 1000 | 1000 | 200 |
| 3 | ARUA | ARUA | SELF.EMP. | 30000 | 53 | 1010000 | - | - | 1113 | 10000 | 5000 | 5000 | 5 |
| 4 | ARUA | ARUA | TECHNICIAN | 30000 | 40 | 1010000 | - | - | 1110 | 40000 | 1500 | 1500 | 100 |
| 5 | ARUA | OKOLO | BUSINESS | 50000 | 35 | 1010010 | - | - | 1313 | 1500 | 1500 | 1500 | 100 |
| 6 | ARUA | KOBOKO | BUSINESS | 100000 | 36 | 1010010 | - | - | 1001 | 15000 | 1500 | 1500 | 200 |
| 7 | ARUA | KOBOKO | C.CHIEF | 20000 | 50 | 1010010 | - | - | 1013 | 5000 | 2000 | 2000 | 100 |
| 8 | ARUA | KOBOKO | REV. ASST. | 20000 | 28 | 1010010 | - | - | 1013 | 5000 | 3000 | 3000 | 500 |
| 9 | SOROTI | KABERAWAIDO | C.CHIEF | 30000 | 37 | 1010000 | - | - | 1023 | 20000 | 800 | 800 | 80 |
| 10 | SOROTI | KABERAWAIDO | SELF.EMP | 30000 | 40 | 1010010 | - | - | 1013 | 10000 | 2000 | 2000 | 50 |
| 11 | SOROTI | KABERAWAIDO | RETIRED | 20000 | 60 | 1011010 | - | - | 1013 | 20000 | 5000 | 5000 | 100 |
| 12 | SOROTI | KABERAWAIDO | CLERK | 35000 | 30 | 1010000 | - | - | 1023 | 50000 | 4000 | 4000 | 75 |
| 13 | SOROTI | SOROTI | BUSINESS | 50000 | 54 | 1111101 | 50000 | 18000 | 1410 | 8000 | 1000 | 1000 | 100 |
| 14 | SOROTI | SOROTI | BUSINESS | 100000 | 60 | 1111000 | 7000 | 5000 | 1410 | 20000 | 1000 | 1000 | 50 |
| 15 | SOROTI | SOROTI | DRIVER | 30000 | 30 | 1110000 | 15000 | 10000 | 1000 | 20000 | 1000 | 1000 | 200 |
| 16 | SOROTI | SOROTI | SELF.EMP | 30000 | 45 | 1010000 | - | 5000 | 1122 | 10000 | 2000 | 2000 | 300 |
| 17 | SOROTI | SOROTI | BUSINESS | 15000 | 48 | 1010100 | - | 4000 | 1023 | 10000 | 1000 | 1000 | 100 |
| 18 | SOROTI | SERERE | P. FARMER | 40000 | 43 | 1111100 | *150 | *800 | 1023 | 10000 | 1000 | 1000 | 100 |
| 19 | SOROTI | SERERE | TEACHER | 180000 | 46 | 1010000 | - | 3000 | 1024 | 15000 | 1000 | 1000 | 50 |
| 20 | MOROTO | BOKORA | P. FARMER | 20000 | 42 | 1010000 | - | - | 1023 | 10000 | 500 | 500 | 50 |
| 21 | MOROTO | MOROTO | SECRETARY | - | 46 | 1111101 | 40000 | - | 1000 | 10000 | 800 | 800 | 50 |
| 22 | MPIGI | MAWOKOTA | COOPERATOR | 60000 | 68 | 1110000 | 30000 | 6000 | 1310 | 30000 | 500 | 500 | 1500 |
| 23 | MPIGI | MAWOKOTA | SELF.EMP | 40000 | 66 | 1111100 | 10000 | 10000 | 1000 | 30000 | 1000 | 1000 | - |
| 24 | MPIGI | MAWOKOTA | P. FARMER | 50000 | 85 | 1011000 | 10000 | 10000 | 1222 | 21000 | 800 | 800 | - |
| 25 | MPIGI | MAWOKOTA | TELEPHONIS | 85000 | 32 | 1011000 | - | 4000 | 1312 | 90000 | 2000 | 2000 | - |
| 26 | RUKUNGIRI | RUJUMBULA | SELF.EMP | 60000 | 73 | 1111101 | - | 25000 | 1000 | - | - | - | - |
| 27 | RUKUNGIRI | RUJUMBULA | SELF.EMP | 70000 | 33 | 1010100 | - | 40000 | 1310 | 30000 | 1500 | 1500 | - |
| 28 | RUKUNGIRI | RUJUMBULA | HANKER | 400000 | 40 | 1010000 | 37000 | 4500 | 1000 | 20000 | 500 | 500 | - |
| 29 | RUKUNGIRI | RUJUMBULA | SELF.EMP | 30000 | 37 | 1010000 | - | - | 1112 | 4000 | 800 | 800 | 100 |
| 30 | RUKUNGIRI | KINKIZI | NURSE | 50000 | 47 | 1010000 | - | - | - | 30000 | 1500 | 1500 | 100 |
| 31 | RUKUNGIRI | KINKIZI | FARMER | 60000 | 50 | 1010000 | - | - | 1023 | 30000 | 1000 | 1000 | 200 |
| 32 | RUKUNGIRI | KINKIZI | BUSINESS | 100000 | 29 | 1010000 | - | - | 1023 | 5000 | 1200 | 1200 | 50 |
| 33 | RUKUNGIRI | KINKIZI | P. FARMER | 50000 | 66 | 1010000 | - | - | 1023 | 5000 | 1000 | 1000 | - |
| 34 | RUKUNGIRI | KINKIZI | BUSINESS | 10000 | 48 | 1010000 | - | - | 1323 | 31000 | 1000 | 1000 | - |
| 35 | RUKUNGIRI | KINKIZI | HOUSEWIFE | 2000000 | 19 | 1010001 | - | - | 1323 | 41000 | 1500 | 1500 | - |
| 36 | KABAROLE | MWENGE | C. OFFICER | 80000 | 45 | 1110001 | - | 5000 | 1125 | - | - | - | - |
| 37 | KABAROLE | MWENGE | BUSINESS | 50000 | 48 | 1110000 | - | - | 1025 | - | - | - | - |
| 38 | KABAROLE | MWENGE | BUSINESS | 60000 | 59 | 1010110 | 9600 | - | 1110 | 10000 | 1000 | 1000 | - |
| 39 | KABAROLE | MWENGE | BUSINESS | 50000 | 43 | 1010000 | - | - | 1123 | 30000 | 1000 | 1000 | - |
| 40 | KABAROLE | MWENGE | P. FARMER | 100000 | 56 | 1110000 | 20000 | - | 1215 | 50000 | 1600 | 1600 | - |
| 41 | KABAROLE | MWENGE | N. R. C | 300000 | 52 | 1010001 | - | - | 1123 | 40000 | 1000 | 1000 | 60 |
| 42 | KABAROLE | MWENGE | PASTOR | 200000 | 40 | 1110000 | - | - | 1113 | 10000 | 1000 | 1000 | - |
| 43 | KABAROLE | MWENGE | BUSINESS | 100000 | 38 | 1010000 | - | - | 1113 | 30000 | 5000 | 5000 | - |
| 44 | KABAROLE | MWENGE | BUSINESS | - | 65 | 1010001 | - | - | 1113 | FAIR | FAIR | FAIR | - |
| 45 | KIBALE | BUYAGA | SELF.EMP | 100000 | 35 | 1010000 | - | - | 1310 | 20000 | 1000 | 1000 | 50 |
| 46 | KIBALE | BUYAGA | BUSINESS | 70000 | 31 | 1011010 | - | - | 1323 | 9000 | 1700 | 1700 | - |
| 47 | KIBALE | BUYAGA | BUSINESS | 600000 | 27 | 1010010 | 8600 | - | 1113 | 80000 | 7500 | 7500 | - |
| 48 | KIBALE | BUYAGA | BUSINESS | 720000 | 38 | 1010001 | RC15230 | - | 1013 | 50000 | 3000 | 3000 | - |
| 49 | KABAROLE | BURAHYA | BUSINESS | 10000 | 30 | 1010000 | - | - | 1223 | 25000 | 1000 | 1000 | - |
| 50 | KABAROLE | BURAHYA | BUSINESS | 90000 | 40 | 1010010 | - | 1500 | 1323 | 9000 | 200 | 200 | - |
| 51 | KABAROLE | BURAHYA | BUSINESS | 5000 | 30 | 1010000 | - | - | 1323 | 30000 | 1000 | 1000 | - |
| 52 | MPIGI | MUTAMBALA | TEACHER | 100000 | 41 | 1011001 | - | 25000 | 1323 | 60000 | - | - | - |
| 53 | MPIGI | MUTAMBALA | BUSINESS | 30000 | 42 | 1011001 | - | 4000 | 1313 | 26000 | 1000 | 1000 | - |
| 54 | MPIGI | MUTAMBALA | P. FARMER | 60000 | 50 | 1010000 | - | 2500 | 1313 | 2000 | 200 | 200 | - |
| 55 | MPIGI | MUTAMBALA | P. FARMER | 40000 | 45 | 1010000 | - | 2000 | 1113 | 30000 | 2000 | 2000 | - |

No. 1

Table 1-7 Result of Questionnaire to Household (2/3)

| No. | Alternative | Distance | Type | Alternative Method (Travel) | | Alternative Method (Postal) | | Alternative Method (Others) | No. 2 | | | | |
|-----|-------------|----------|---------------|-----------------------------|------|-----------------------------|----------|-----------------------------|-------|-------------|-----------|-------------|------|
| | | | | Expenditure | Time | Frequency | Distance | | | Cost | Frequency | Expenditure | Time |
| 1 | 1110 | 1 | BICYCLE | 3000 | 6 | 30 | 1.5 | 5000 | 4 | R. CALL | 42000 | 0.42 | 6 |
| 2 | 1000 | 326 | BICYCLE | 25000 | 12 | 2 | 1 | 1400 | 7 | R. CALL | 12000 | 1 | 4 |
| 3 | 1010 | 1000 | BUS (KLA) | 4000 | 20 | 1 | - | - | - | R. CALL | 300 | 0.05 | 1 |
| 4 | 1010 | 134 | BUS (ARUA) | 26000 | 4 | 8 | - | - | - | - | - | - | - |
| 5 | 1100 | 1300 | BUS (KLA) | 5000 | 24 | 3 | 0.2 | 300 | 1 | - | - | - | - |
| 6 | 1100 | 120 | BUS (ARUA) | 5000 | 4 | 4 | 0.2 | 400 | 8 | - | - | - | - |
| 7 | 1100 | 120 | BUS (ARUA) | 5000 | 4 | 4 | 0.2 | 200 | 4 | R. CALL | 6250 | 6 | 1 |
| 8 | 1110 | 120 | VEHICLE (AR) | 10000 | 14 | 1 | 0.5 | 300 | 1 | - | - | - | - |
| 9 | 1110 | 432 | VEHICLE (NB) | 3000 | 14 | 1 | 0.5 | 900 | 3 | - | - | - | - |
| 10 | 1100 | 144 | BUS (SRTI) | 4000 | 4 | 2 | 0.5 | 800 | 4 | - | - | - | - |
| 11 | 1100 | 144 | BUS (SRTI) | 4000 | 4 | 4 | 0.5 | 200 | 1 | - | - | - | - |
| 12 | 1100 | 144 | BUS (SRTI) | 4000 | 4 | 4 | 0.5 | 200 | 1 | - | - | - | - |
| 13 | 1110 | 732 | BUS (KLA) | 12000 | 16 | 1 | 2 | 1500 | 4 | S. DELIVERY | 700 | - | 1 |
| 14 | 1100 | 732 | BUS (KLA) | 12000 | 16 | 1 | 0.5 | 3600 | 4 | S. DELIVERY | 4000 | - | 4 |
| 15 | 1110 | 732 | BUS (KLA) | 14000 | 16 | 5 | 1 | 50 | 12 | TELEX | 1000 | - | 4 |
| 16 | 1110 | 60 | BUS (KATARKW) | 2000 | 2 | 1 | 3 | 200 | 1 | S. DELIVERY | 500 | - | 1 |
| 17 | 1010 | 60 | BUS (SERERE) | 2000 | 3 | 1 | 4 | 200 | 15 | S. DELIVERY | 150 | - | 1 |
| 18 | 1100 | 60 | VEH (SRTI) | 2000 | 3 | 8 | - | - | - | R. CALL | - | - | - |
| 19 | 1010 | 60 | VEH (SRTI) | 2000 | 3 | 4 | - | - | - | R. CALL | - | - | - |
| 20 | 1090 | 30 | VEH (MOROFO) | 2000 | 1 | 1 | - | - | - | R. CALL | - | - | - |
| 21 | 1110 | 1070 | BUS (KLA) | 40000 | 16 | 4 | 2 | - | - | R. CALL | - | - | - |
| 22 | 1000 | 65 | BUS (KLA) | 2000 | 2 | 12 | 1.6 | 1600 | 30 | - | - | - | - |
| 23 | 1100 | 34 | BUS (KLA) | 2500 | 2 | 1 | 1.3 | 600 | 8 | - | - | - | - |
| 24 | 1100 | 35 | BUS (KLA) | 2300 | 3 | 3 | 1.3 | 2000 | 1 | - | - | - | - |
| 25 | 1100 | 36 | VEH (KLA) | 5000 | 10 | 4 | 0.5 | 10000 | 4 | - | - | - | - |
| 26 | 1100 | 400 | BUS (KLA) | 7000 | 5 | 1 | 0.5 | - | 4 | - | - | - | - |
| 27 | 1000 | 400 | BUS (KLA) | 7000 | 5 | 2 | - | - | 4 | - | - | - | - |
| 28 | 1000 | 400 | BUS (KLA) | 8000 | 7 | 2 | - | - | 4 | - | - | - | - |
| 29 | 1110 | 30 | BUS (MBALAL) | 4000 | 2 | 2 | 0.2 | - | - | R. CALL | 1000 | - | 4 |
| 30 | 1100 | 30 | BUS (MBALAL) | 3000 | 2 | 1 | 0.1 | 2000 | 15 | - | - | - | - |
| 31 | 1110 | 72 | BUS (RUK) | 6000 | 6 | 1 | 0.4 | 1000 | 1 | - | - | - | - |
| 32 | 1110 | 40 | BUS (KLA) | 14000 | 24 | 2 | 0.3 | 100 | 5 | - | - | - | - |
| 33 | 1100 | 45 | BUS (RUK) | 8500 | 12 | 1 | 0.4 | 400 | 4 | - | - | - | - |
| 34 | 1100 | 380 | BUS (KLA) | 20000 | 24 | 4 | 0.4 | 200 | 30 | - | - | - | - |
| 35 | 1100 | 270 | BUS (KLA) | 17000 | 6 | 3 | 0.2 | 1000 | 3 | - | - | - | - |
| 36 | 1000 | 270 | BUS (KLA) | 17000 | 6 | 3 | - | - | - | - | - | - | - |
| 37 | 1000 | 317 | BUS (KLA) | 18000 | 5 | 4 | 10 | 1000 | 1 | - | - | - | - |
| 38 | 1100 | 44 | BUS (RUK) | 3500 | 8 | 4 | 88 | 4500 | 25 | - | - | - | - |
| 39 | 1100 | 325 | BUS (KLA) | 20000 | 6 | 2 | 3 | 1000 | 4 | - | - | - | - |
| 40 | 1100 | 300 | BUS (KLA) | 18500 | 6 | 4 | 0.2 | 1000 | 8 | - | - | - | - |
| 41 | 1100 | 320 | BUS (KLA) | 15000 | 24 | 1 | 0.2 | - | - | R. CALL | 7000 | - | 1 |
| 42 | 1110 | 320 | BUS (KLA) | 12500 | 24 | 5 | 0.2 | - | - | R. CALL | 8000 | - | 8 |
| 43 | 1110 | 320 | BUS (KLA) | 80000 | 24 | 4 | 0.6 | - | - | R. CALL | - | - | - |
| 44 | 1100 | 26.5 | BUS | 1500 | 1.5 | 8 | 26.5 | - | - | - | - | - | - |
| 45 | 1110 | 27 | BUS | 2000 | 1.5 | 1 | 1.5 | 500 | 8 | - | - | - | - |
| 46 | 1110 | 27 | BUS | 1800 | 1.5 | 2 | 27 | - | - | - | - | - | - |
| 47 | 1110 | 57 | BUS | 2500 | 4 | 8 | 0.3 | - | - | R. CALL | 700 | - | 4 |
| 48 | 1110 | 57 | BUS | 2000 | 4 | 12 | 1.5 | 2000 | 30 | R. CALL | 600 | - | 12 |
| 49 | 1110 | 48 | BUS | 1500 | 2 | 2 | 0.2 | - | - | R. CALL | 600 | - | 5 |
| 50 | 1110 | 48 | BUS | 1750 | 2.5 | 1 | 0.2 | - | - | R. CALL | 1000 | - | 1 |

Table 1-8 Result of Questionnaire to Household (3/3)



| No. | District | Country | Type(OC.P.) | Income(M) | Age | Belongings | Tele.exp | Electric | Q 789 | Premium | Rental | Call |
|-----|----------|---------|-------------|-----------|-----|------------|----------|----------|-------|---------|--------|------|
| 1 | KAMPALA | KAMPALA | R. Officer | 500000 | 27 | 1000000 | - | - | 1120 | 90000 | 1500 | 50 |
| 2 | KAMPALA | KAMPALA | Business | - | 35 | 1000000 | - | - | 1121 | 80000 | 2000 | 100 |
| 3 | KAMPALA | KAMPALA | Business | - | 50 | 1000000 | - | - | 1110 | 100000 | 2000 | 50 |
| 4 | KAMPALA | KAMPALA | Technician | - | 35 | 1000000 | - | - | 1115 | 120000 | 100 | 2000 |
| 5 | KAMPALA | KAMPALA | Sales-man | - | 28 | 1000000 | - | - | 1122 | 80000 | 1500 | 50 |
| 6 | KAMPALA | KAMPALA | Clergyman | - | 30 | 1000000 | - | - | 1122 | 60000 | 1500 | 50 |
| 7 | KAMPALA | KAMPALA | Shopkeeper | - | 30 | 1000000 | - | - | 1110 | 130000 | 2500 | 100 |
| 8 | KAMPALA | KAMPALA | Accountant | - | 34 | 1000000 | - | - | 1110 | 120000 | 2000 | 200 |
| 9 | KAMPALA | KAMPALA | Acc. Clerk | - | 30 | - | 12000 | - | 1000 | 100000 | 5000 | 200 |
| 10 | KAMPALA | KAMPALA | Business | - | 30 | 1111000 | 10000 | - | 1000 | 110000 | 1500 | 50 |
| 11 | KAMPALA | KAMPALA | Shopkeeper | - | 40 | - | 12000 | - | 1000 | 120000 | 200 | 100 |
| 12 | KAMPALA | KAMPALA | Driver | - | 37 | - | 12000 | - | 1000 | 25000 | 400 | 900 |
| 13 | KAMPALA | KAMPALA | Shopkeeper | - | 32 | - | 12000 | - | 1000 | 13000 | 400 | 300 |
| 14 | KAMPALA | KAMPALA | Sales-man | - | 55 | - | - | - | 1000 | 13000 | 400 | 100 |
| 15 | KAMPALA | KAMPALA | Shopkeeper | - | 40 | - | 12000 | - | 1000 | 120000 | 200 | 100 |

| No. | Alternativ | Distance | Alternative Method(Travel) | Expense | Time | Frequency | Alternative Method(Postal) | Distance Cost | Frequency | Alternative method(Others) | Expenses | Time | Frequency |
|-----|------------|----------|----------------------------|---------|------|-----------|----------------------------|---------------|-----------|----------------------------|----------|------|-----------|
| 1 | 1100 | 200 | Ve./Bus | 10000 | 3 | 2 | 150 | 0.5 | 15 | - | - | - | - |
| 2 | 1010 | 200 | Vehicle | 20000 | 24 | 5 | - | - | - | Speed del. | 10000 | - | 2 |
| 3 | 1100 | 80 | Vehicle | 6000 | 3 | 4 | 2000 | 0.1 | 4 | - | - | - | - |
| 4 | 1010 | 80 | Vehicle | 6000 | 2 | 2 | - | - | - | Courier | 30000 | - | 8 |
| 5 | 1001 | 3 | Vehicle | 600 | 0.5 | 25 | 1500 | 0.1 | 10 | Speed del. | 5000 | - | 2 |
| 6 | 1100 | 276 | Vehicle | 20000 | 8 | 4 | 2000 | 0.2 | 4 | - | - | - | 3.5 |
| 7 | 1010 | 200 | - | 12000 | 8 | 4 | - | - | - | Speed del. | 10000 | - | 4 |
| 8 | 1100 | 100 | Vehicle | 8000 | 4 | - | 2000 | 0.4 | 4 | - | - | - | - |
| 9 | 1100 | 3 Miles | - | 1000 | 0.75 | 30 | 30000 | 3 Miles | 30 | - | - | - | - |
| 10 | 1100 | 5 | Vehicle | 1000 | 2.5 | 20 | 300 | 200 | 3 | - | - | - | - |
| 11 | 1110 | 80 | Vehicle | 6000 | 3 | 4 | 2000 | 0.1 | 4 | Speed del. | 5000 | - | 24 |
| 12 | 1110 | 50 | - | 7000 | 4 | 8 | 3000 | 0.2 | 3 | Speed del. | 6000 | - | 24 |
| 13 | 1100 | 50 | Vehicle | 5000 | 4 | 9 | 5000 | 0.5 | 5 | Speed del. | 4000 | - | 120 |
| 14 | 1110 | 1 | Vehicle | 4000 | 9 | 5 | 4000 | 0.3 | 8 | Speed del. | 9000 | - | 72 |
| 15 | 1110 | 80 | Vehicle | 6000 | 3 | 1 | 2000 | 0.1 | 4 | Speed del. | 5000 | - | 24 |

2. Network Expansion Plan

2.1 Network Structure Plan

NETWORK STRUCTURE PLAN WITH SUPPLY VOLUME FOR EACH RTM AREAS

LEGEND:  ... MSU
 ... RSU
 //*** ... Supply Volume in year 2000/2005/2010

| RTM Area | Supply Volume | | | MSU | RLU |
|-----------------|---------------|----------------|----------------|-----------|-----------|
| | 2000 | 2005 | 2010 | | |
| Kampala Central | 33,819 | 49,115 | 70,590 | 1 | 7 |
| Kampala Rural | 4,703 | 10,884 | 17,608 | 4 | 10 |
| Jinja | 6,262 | 12,779 | 19,099 | 2 | 8 |
| Mbale | 5,202 | 9,186 | 14,173 | 4 | 6 |
| Masaka | 2,993 | 5,329 | 8,102 | 1 | 6 |
| Mbarara | 5,448 | 8,265 | 12,680 | 2 | 7 |
| Fort Portal | 3,831 | 6,343 | 10,264 | 2 | 3 |
| Gulu | 3,744 | 6,708 | 11,583 | 3 | 5 |
| Total | 66,002 | 108,609 | 164,099 | 19 | 52 |

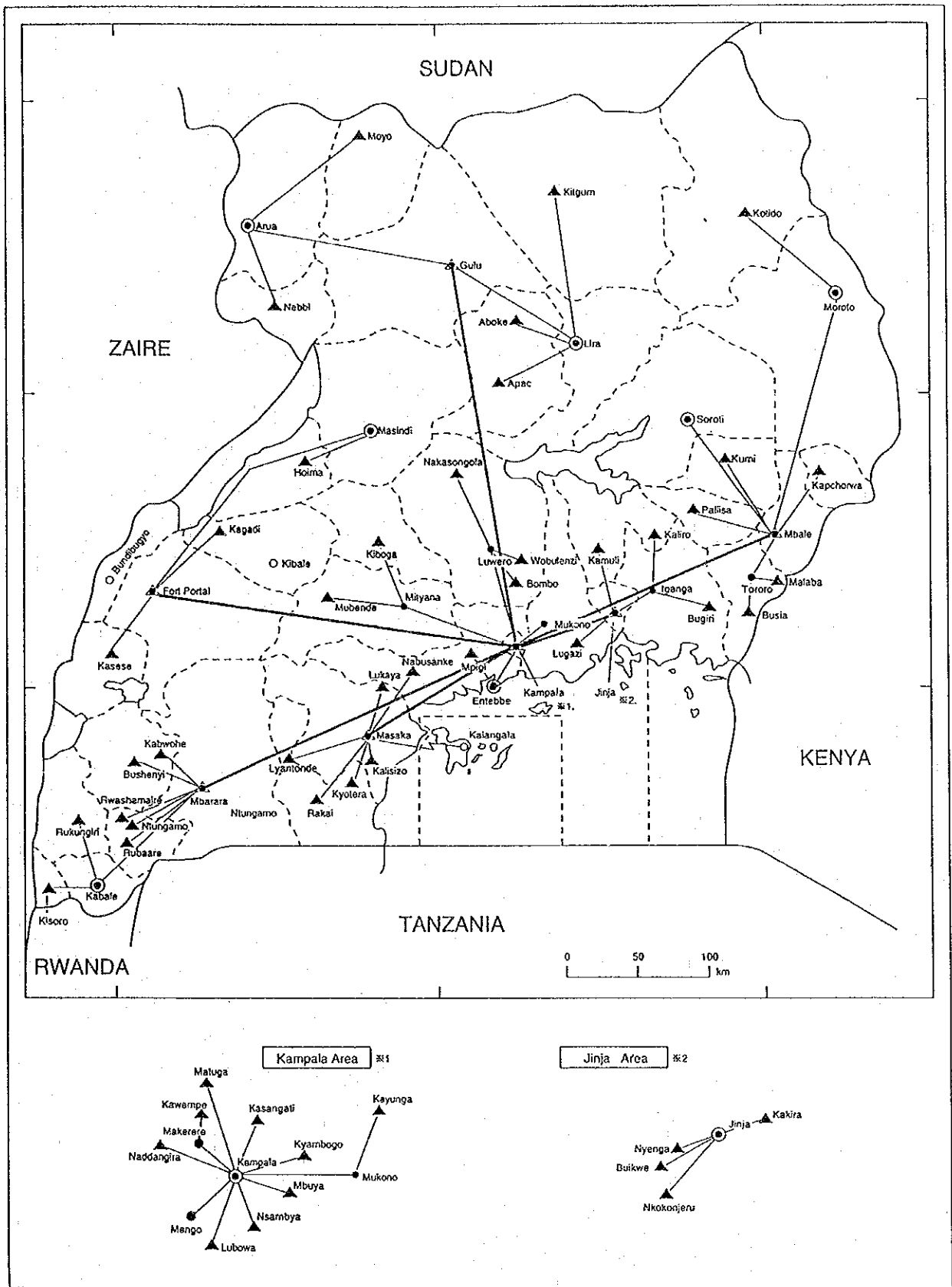


Figure 2-1 Sites of Switching Facilities

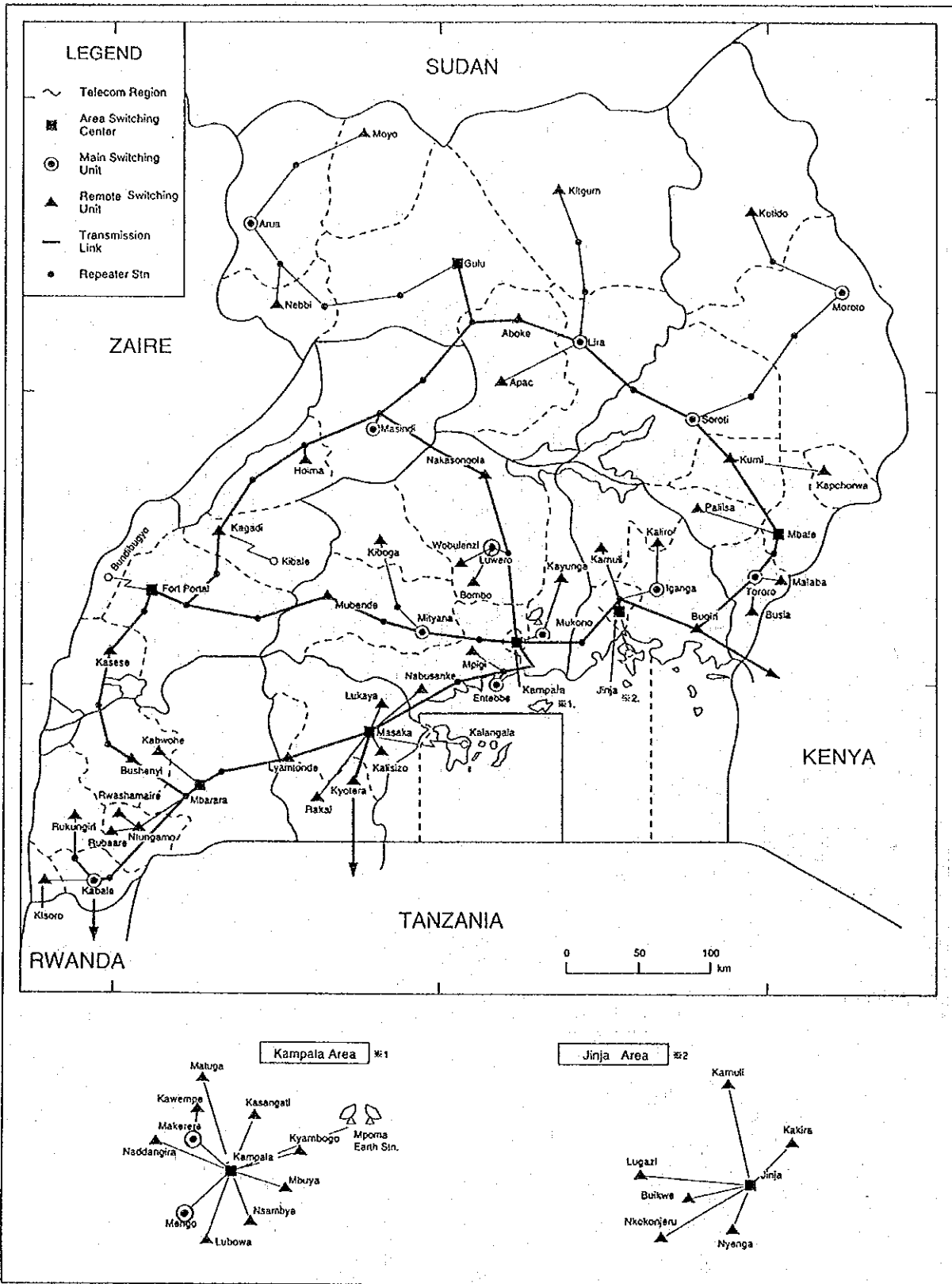


Figure 2-2 Telecommunication Network in 2010

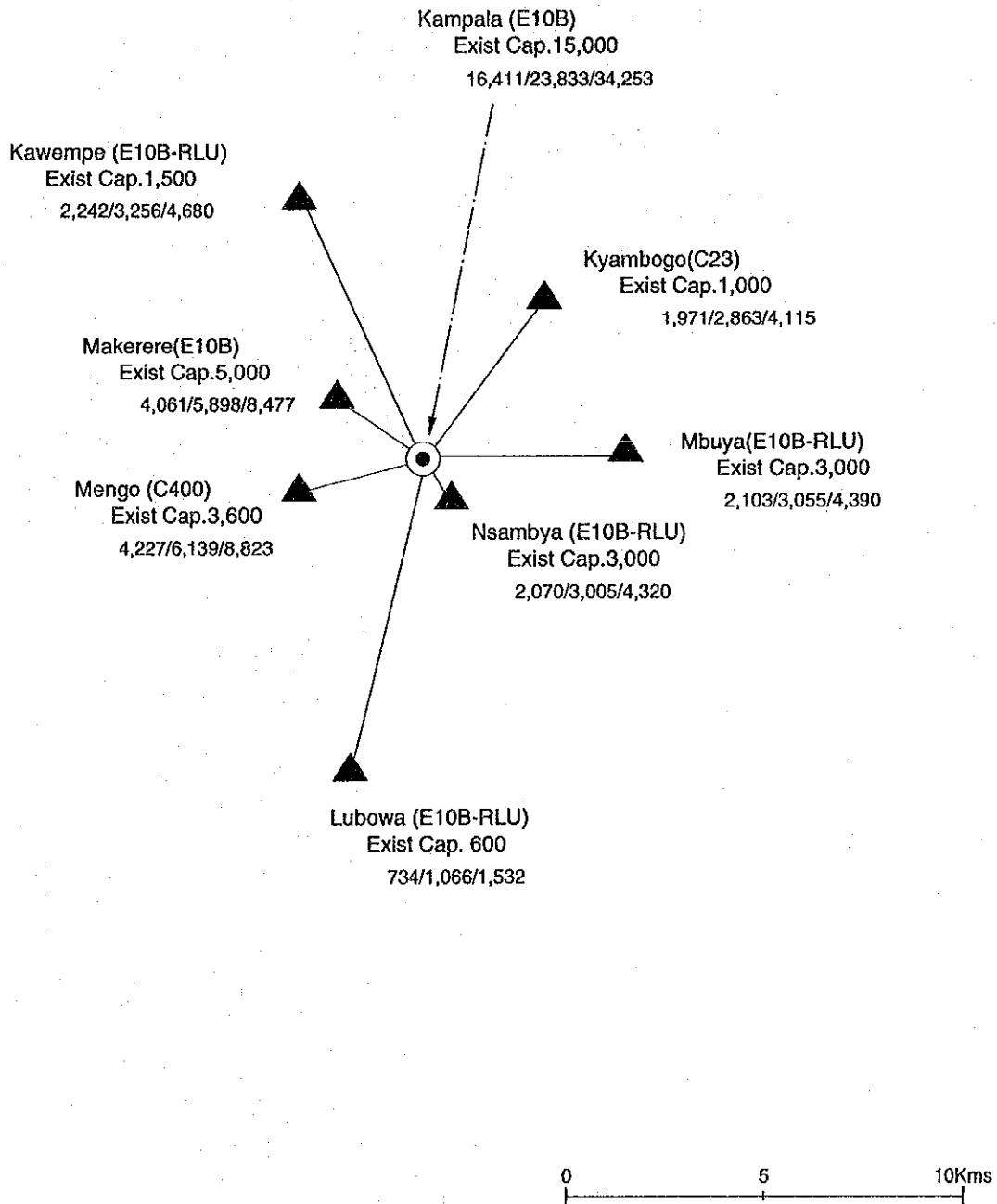


Figure 2-3 Switching Network Plan (1/8: Kampala Central)

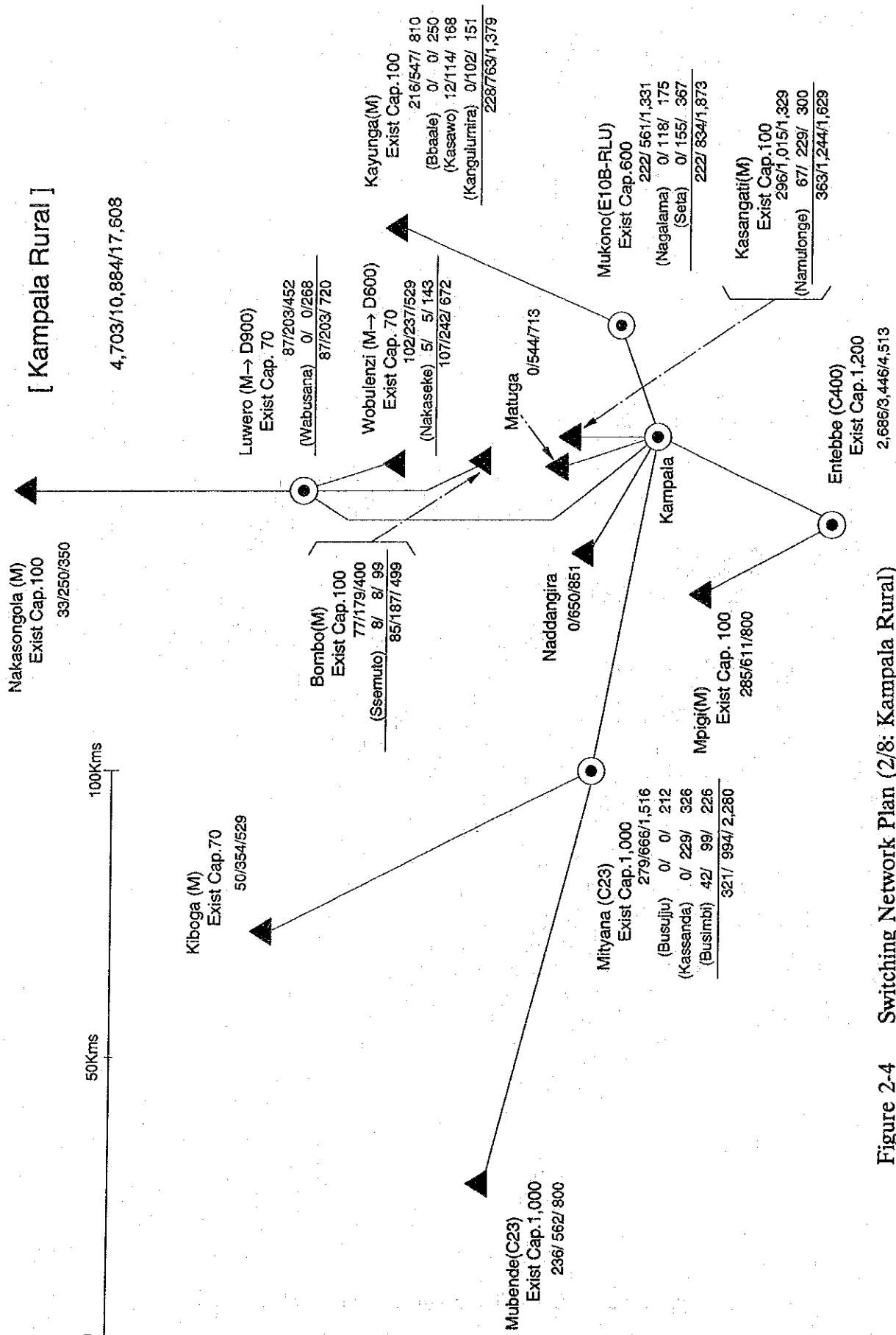


Figure 2-4 Switching Network Plan (2/8: Kampala Rural)

[Jinja Area]

6,262/12,779/19,099

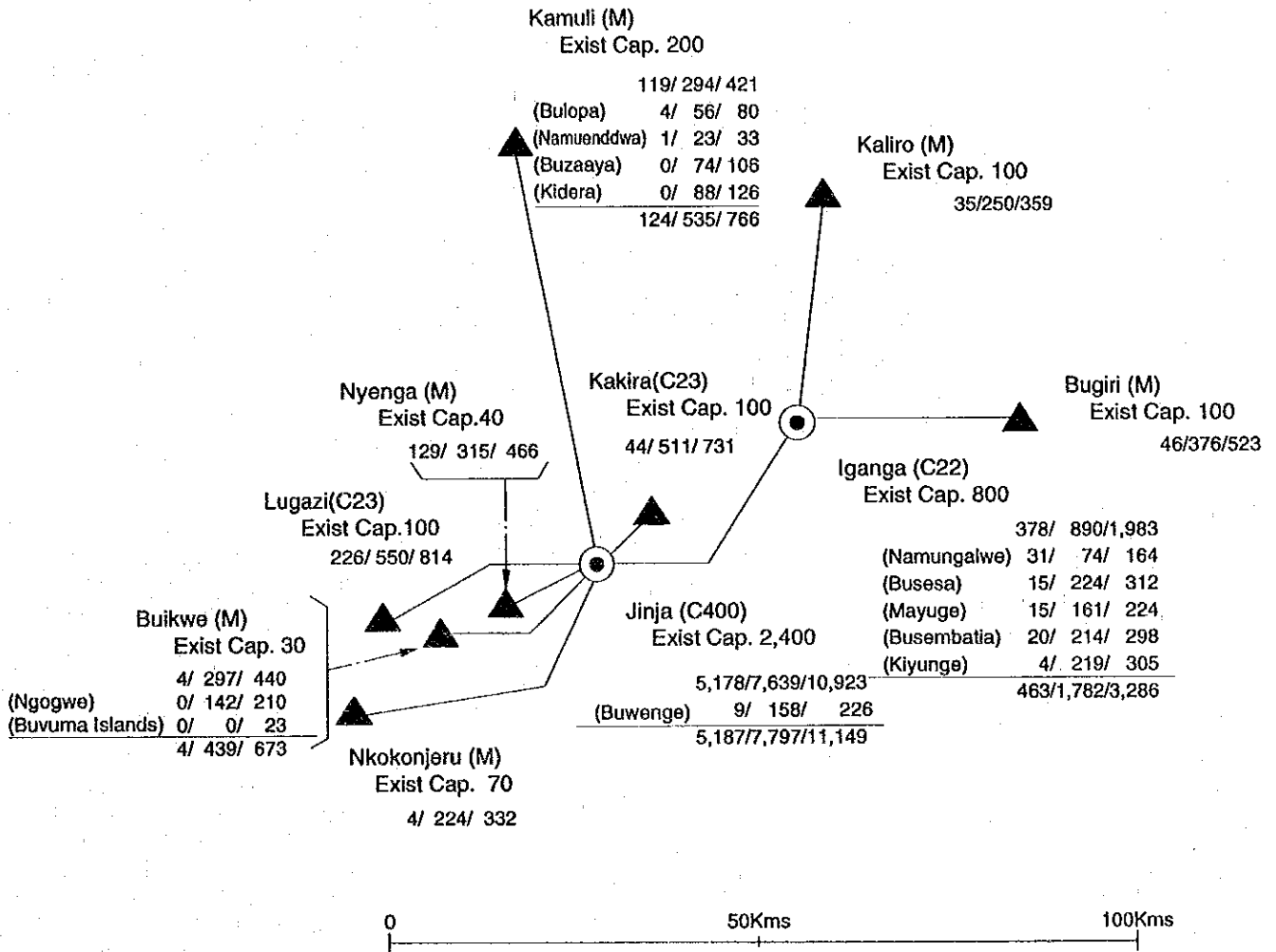


Figure 2-5 Switching Network Plan (3/8: Jinja)

[Mbale Area]

5,202/9,186/14,173

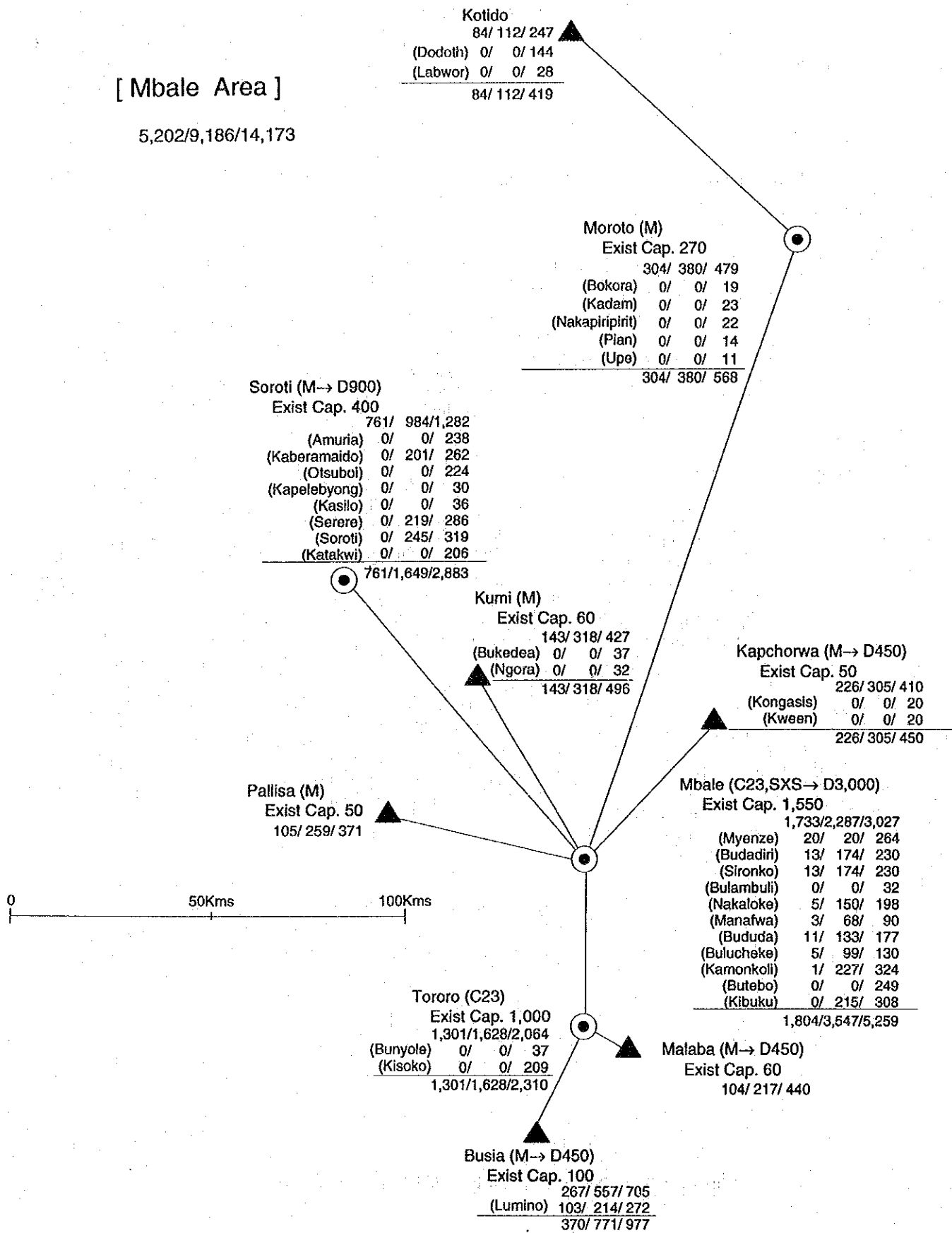
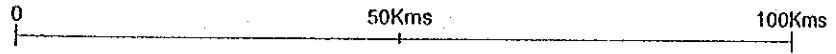


Figure 2-6 Switching Network Plan (4/8: Mbale)



[Masaka Area] 2,993/5,329/8,102

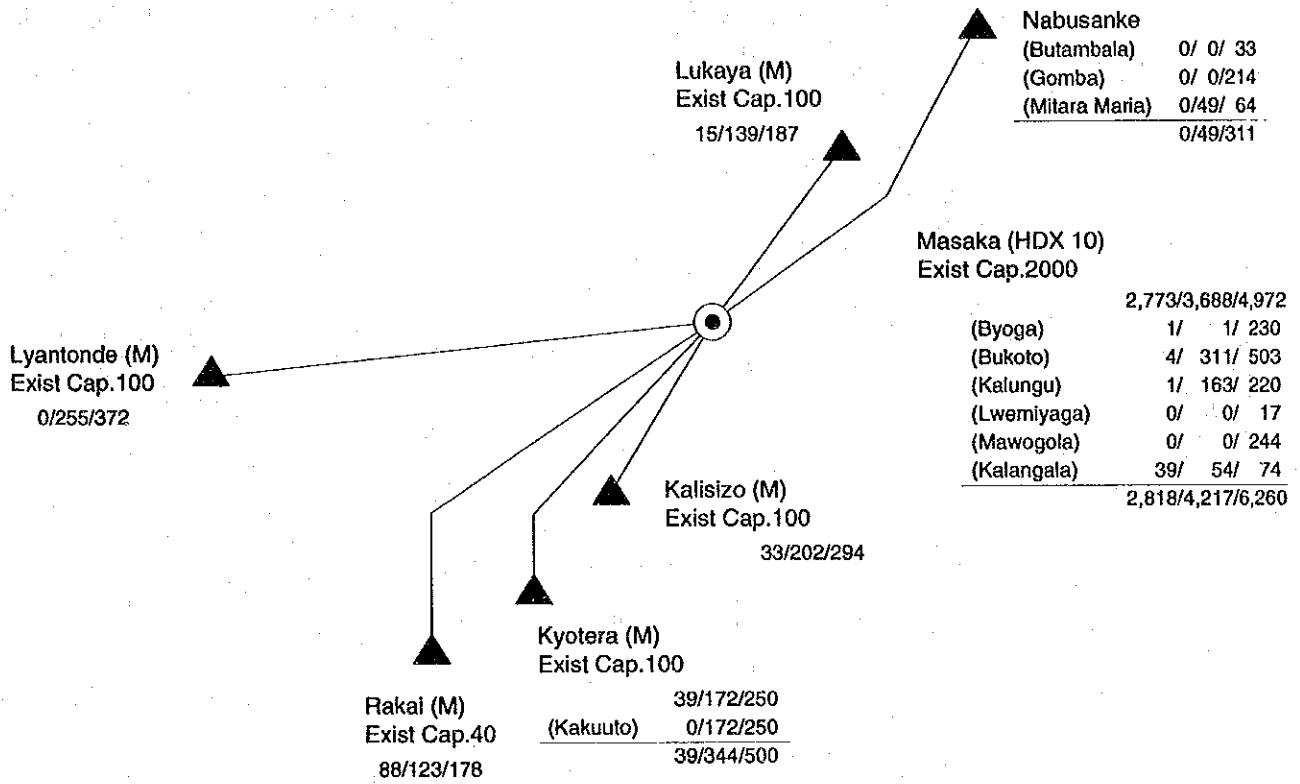


Figure 2-7 Switching Network Plan (5/8: Masaka)

[Mbarara Area] 5,448/8,265/12,680

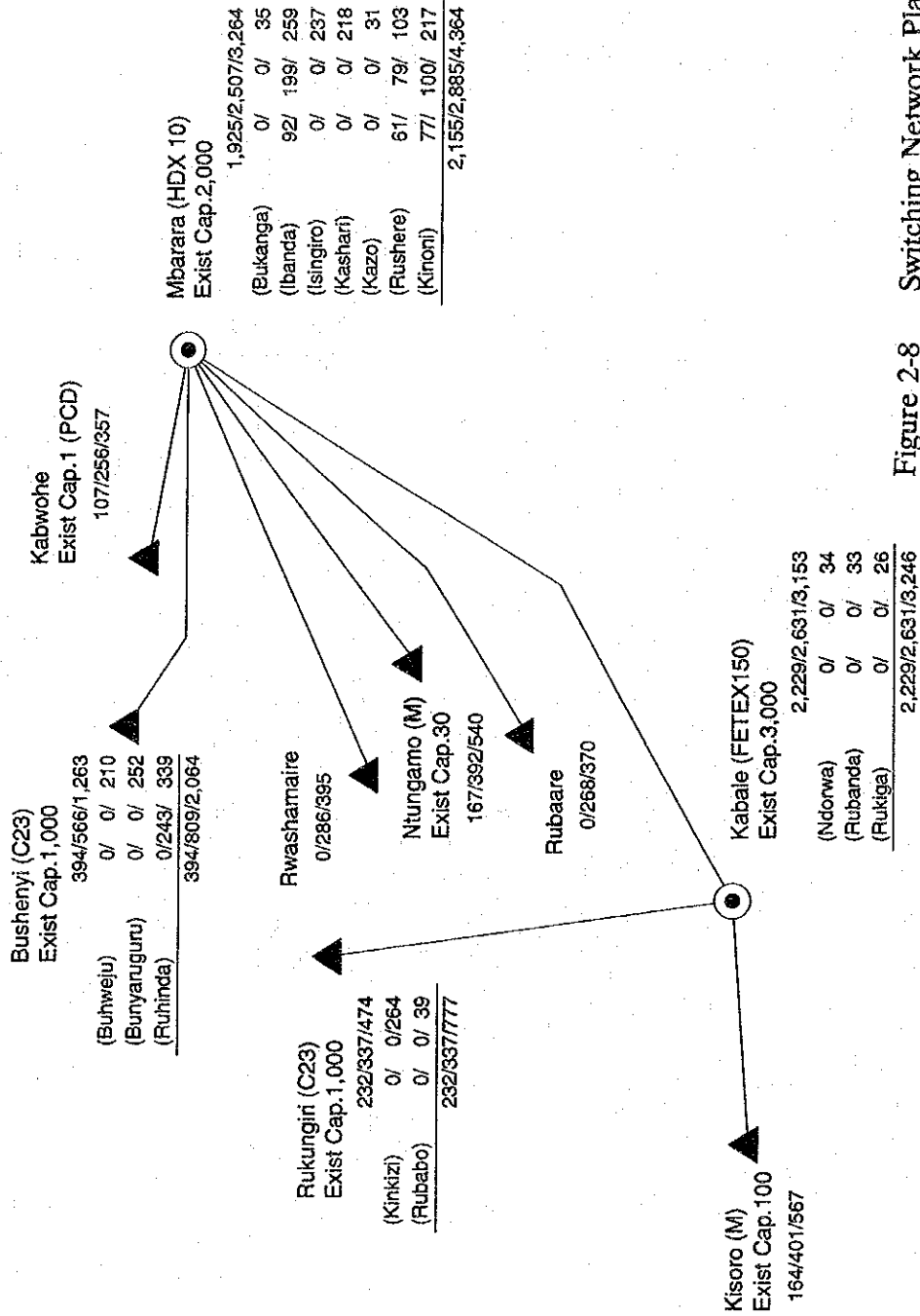
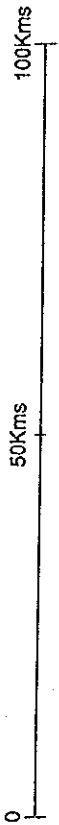
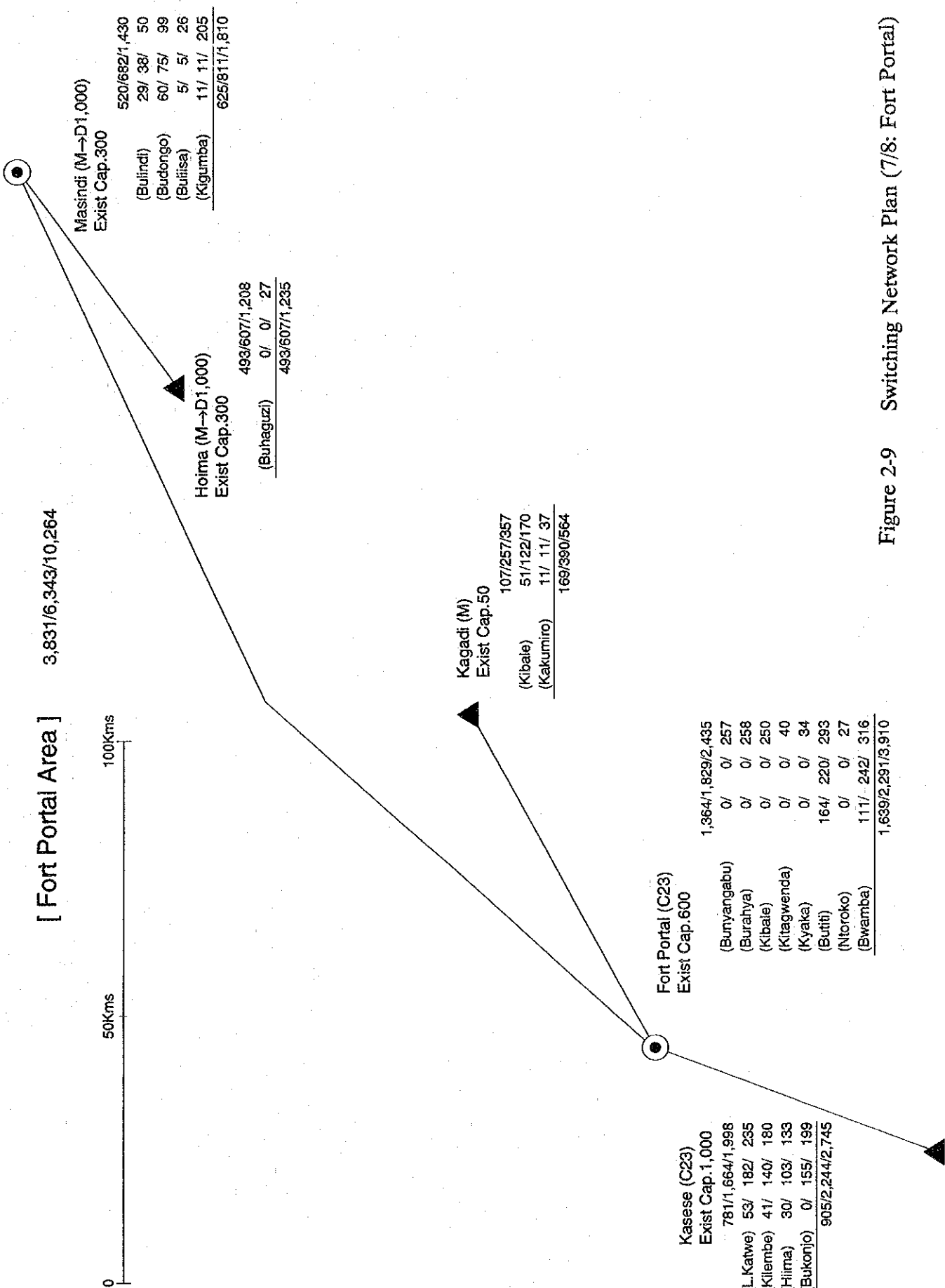
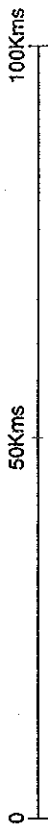


Figure 2-8 Switching Network Plan (6/8: Mbarara)

[Fort Portal Area]

3,831/6,343/10,264



Masindi (M→D1,000)
Exist Cap.300

| | |
|-----------|----------------------|
| (Bulindi) | 29/ 38/ 50 |
| (Budongo) | 60/ 75/ 99 |
| (Buliisa) | 5/ 5/ 26 |
| (Kigumba) | 11/ 11/ 205 |
| | <u>625/811/1,810</u> |

Hoima (M→D1,000)
Exist Cap.300

| | |
|------------|----------------------|
| (Buhaguzi) | 0/ 0/ 27 |
| | <u>493/607/1,208</u> |
| | <u>493/607/1,235</u> |

Kagadi (M)
Exist Cap.50

| | |
|------------|--------------------|
| (Kibale) | 107/257/357 |
| (Kakumiro) | 51/122/170 |
| | <u>11/ 11/ 37</u> |
| | <u>169/390/564</u> |

Fort Portal (C23)
Exist Cap.600

| | |
|--------------|--------------------------|
| (Bunyangabu) | 1,364/1,829/2,435 |
| (Burahya) | 0/ 0/ 257 |
| (Kibale) | 0/ 0/ 258 |
| (Kitagwenda) | 0/ 0/ 250 |
| (Kyaka) | 0/ 0/ 40 |
| (Butiti) | 0/ 0/ 34 |
| (Ntoroko) | 164/ 220/ 293 |
| (Bwamba) | 0/ 0/ 27 |
| | <u>111/-242/ 316</u> |
| | <u>1,639/2,291/3,910</u> |

Kasese (C23)
Exist Cap.1,000

| | |
|-----------|------------------------|
| (L.Katwe) | 781/1,664/1,998 |
| (Kilembe) | 53/ 182/ 235 |
| (Hiima) | 41/ 140/ 180 |
| (Bukonjo) | 30/ 103/ 133 |
| | <u>0/ 155/ 199</u> |
| | <u>905/2,244/2,745</u> |

Figure 2-9 Switching Network Plan (7/8: Fort Portal)

[Gulu Area] 3,744/6,708/11,583

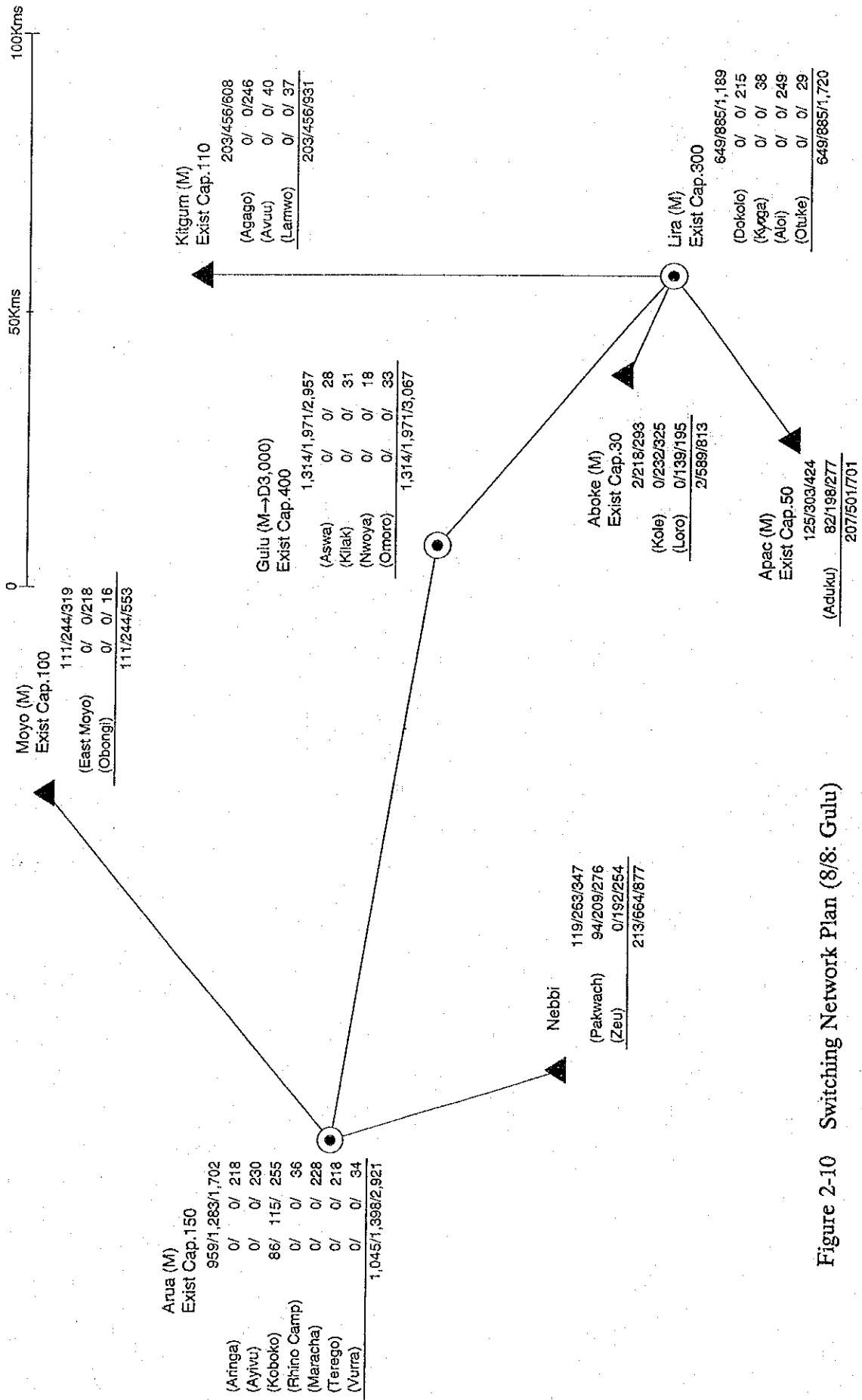
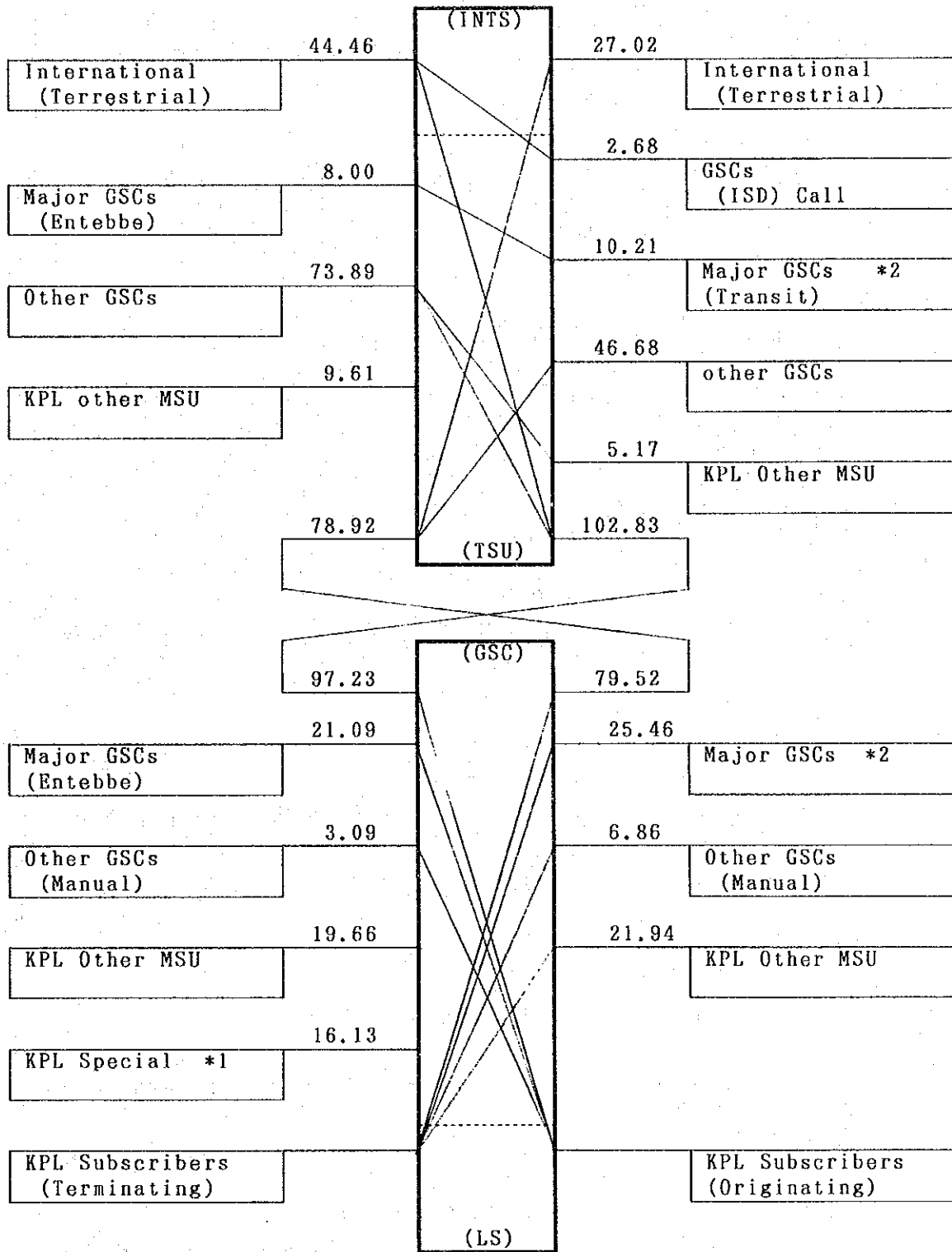


Figure 2-10 Switching Network Plan (8/8: Gulu)

2.2 Traffic Data and Analysis



*1 ; Ints Operator/National Operator/Coin Box/UPTC PBX

*2 ; Entebbe/Jinja/Kabale

(May 1993)

Figure 2-11 Kampala Traffic Flow

Table 2-2 Estimate Formula for Traffic Matrix

| TSU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|-------------|-------|-------|-----|-----|-------|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-------|-----|
| | KLA | ENT | MTA | MSK | JJA | IGA | MBL | SRI | MOT | TOR | GLU | LRA | AUA | FPL | MDI | MBR | KBA |
| 1 Kampala | +8.81 | -3.65 | 0 | 0 | -1.41 | 0 | +3.44 | K3 | K3 | K3 | K3 | K3 | K3 | 0 | K3 | -1.87 | 0 |
| 2 Entebbe | 0 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 3 Mityana | 0 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 4 Masaka | 0 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 5 Jinja | +4.70 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 6 Iganga | 0 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 7 Mbale | 0 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 8 Soroti | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 9 Moroto | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 10 Tororo | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 11 Gulu | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 12 Lira | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 13 Arua | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 14 F.Portal | 0 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 15 Masindi | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 16 Mbarara | -2.82 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |
| 17 Kabale | 0 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 | K3 |

Estimate Formula of Traffic Matrix ; $T_{ij} = K_n * S_i^{0.492} * S_j^{0.485} * D_{ij}^{-0.124} + Adj.$

- T_{ij} : Traffic between Exchange i and Exchange j
- S_j : Number of Subscribers of Exchange j
- S_i : Number of Subscribers of Exchange i
- D_{ij} : Distance between Exchange i and Exchange j
- K_n : at above table column value $K_3 \dots K_n = 0.003$ and $Adj. = 0$
- : at above table column value no $K_3 \dots K_n = 0.0072$ and $Adj. =$ value at the column

Table 2-3 Distance between Major Exchanges in Km

| GSC | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | KLA | ENI | MTA | MSK | JJA | IGA | MBL | SRI | MOT | TOR | GLU | LRA | AUA | FPL | MDI | MR | KBA |
| 1 Kampala | 30 | | 61 | 121 | 75 | 103 | 199 | 191 | 332 | 181 | 281 | 215 | 350 | 267 | 180 | 142 | 334 |
| 2 Entebbe | | 58 | | 92 | 94 | 127 | 217 | 220 | 363 | 201 | 298 | 245 | 366 | 250 | 197 | 216 | 312 |
| 3 Mityana | | | 89 | 89 | 130 | 160 | 243 | 226 | 371 | 238 | 263 | 223 | 315 | 199 | 146 | 193 | 294 |
| 4 Masaka | | | | | 191 | 219 | 318 | 307 | 450 | 291 | 359 | 313 | 380 | 201 | 224 | 130 | 219 |
| 5 Jinja | | | | | | 33 | 129 | 146 | 276 | 109 | 284 | 202 | 380 | 335 | 216 | 319 | 404 |
| 6 Iganga | | | | | | | 91 | 123 | 247 | 79 | 272 | 190 | 387 | 354 | 228 | 342 | 438 |
| 7 Mbale | | | | | | | | 94 | 168 | 42 | 287 | 191 | 417 | 443 | 278 | 443 | 528 |
| 8 Soroti | | | | | | | | | 147 | 129 | 187 | 99 | 330 | 388 | 209 | 417 | 517 |
| 9 Moroto | | | | | | | | | | 208 | 262 | 195 | 417 | 518 | 338 | 560 | 661 |
| 10 Tororo | | | | | | | | | | | 311 | 223 | 444 | 432 | 294 | 418 | 512 |
| 11 Gulu | | | | | | | | | | | | 90 | 156 | 384 | 136 | 427 | 512 |
| 12 Lira | | | | | | | | | | | | | 235 | 338 | 145 | 402 | 503 |
| 13 Arua | | | | | | | | | | | | | | 270 | 171 | 400 | 481 |
| 14 F.Portal | | | | | | | | | | | | | | | 198 | 148 | 213 |
| 15 Masindi | | | | | | | | | | | | | | | | 279 | 377 |
| 16 Mbarara | | | | | | | | | | | | | | | | | 103 |
| 17 Kabale | | | | | | | | | | | | | | | | | |

Table 2-4 Estimated Telephone Traffic between Major Exchanges in Year 2000

| | | (Erlang) | | | | | | | | | | | | | | | | Total/ | |
|-------------|----------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---------------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 66,002 /Subs. |
| No. | From | KLA | ENT | MTA | MSK | JJA | IGA | MBL | SRI | MOT | TOR | GLU | LRA | AUA | FPL | MDI | MBR | KBA | Total/ |
| No. | To | 34,944 | 2,971 | 607 | 2,993 | 5,718 | 544 | 2,278 | 761 | 988 | 1,775 | 1,314 | 1,061 | 1,369 | 2,713 | 1,118 | 2,823 | 2,625 | 66,002 /Subs. |
| 1 | Kampala | --- | 34.9 | 16.2 | 32.6 | 46.1 | 14.4 | 30.2 | 6.5 | 4.4 | 10.0 | 8.2 | 7.6 | 8.1 | 28.1 | 8.0 | 29.2 | 26.9 | 311.3 |
| 2 | Entebbe | 48.1 | --- | 2.0 | 4.2 | 5.8 | 1.8 | 3.3 | 1.9 | 1.3 | 3.0 | 2.4 | 2.3 | 2.4 | 3.6 | 2.4 | 3.7 | 3.4 | 91.8 |
| 3 | Mityara | 16.6 | 2.1 | --- | 2.0 | 2.6 | 0.8 | 1.5 | 0.9 | 0.6 | 1.4 | 1.2 | 1.1 | 1.1 | 1.7 | 1.1 | 1.7 | 1.6 | 38.0 |
| 4 | Masaka | 33.1 | 4.2 | 2.0 | --- | 5.4 | 1.7 | 3.2 | 1.9 | 1.3 | 2.9 | 2.4 | 2.2 | 2.4 | 3.7 | 2.4 | 4.0 | 3.6 | 76.2 |
| 5 | Jinja | 52.8 | 5.8 | 2.6 | 5.3 | --- | 2.9 | 4.9 | 2.8 | 1.9 | 4.4 | 3.4 | 3.2 | 3.3 | 4.7 | 3.2 | 4.9 | 4.6 | 110.6 |
| 6 | Iganga | 14.8 | 1.8 | 0.8 | 1.7 | 2.9 | --- | 1.6 | 0.9 | 0.6 | 1.5 | 1.1 | 1.0 | 1.1 | 1.5 | 1.0 | 1.5 | 1.4 | 35.3 |
| 7 | Mbale | 27.3 | 3.3 | 1.5 | 3.2 | 4.9 | 1.6 | --- | 1.9 | 1.3 | 3.2 | 2.2 | 2.0 | 2.1 | 2.9 | 2.0 | 3.0 | 2.8 | 65.3 |
| 8 | Soroti | 6.7 | 2.0 | 0.9 | 1.9 | 2.8 | 0.9 | 1.9 | 0.8 | 0.8 | 1.6 | 1.3 | 1.3 | 1.3 | 1.7 | 1.2 | 1.8 | 1.7 | 29.8 |
| 9 | Mbroto | 4.5 | 1.3 | 0.6 | 1.3 | 1.9 | 0.6 | 1.3 | 0.8 | --- | 1.1 | 0.9 | 0.9 | 0.9 | 1.2 | 0.8 | 1.2 | 1.2 | 20.5 |
| 10 | Tororo | 10.2 | 3.0 | 1.3 | 2.9 | 4.5 | 1.5 | 3.2 | 1.6 | 1.1 | --- | 1.9 | 1.8 | 1.9 | 2.6 | 1.8 | 2.7 | 2.5 | 44.3 |
| 11 | Gulu | 8.3 | 2.5 | 1.1 | 2.4 | 3.4 | 1.1 | 2.2 | 1.3 | 0.9 | 1.9 | --- | 1.7 | 1.8 | 2.3 | 1.7 | 2.3 | 2.2 | 37.2 |
| 12 | Lira | 7.8 | 2.3 | 1.1 | 2.2 | 3.2 | 1.0 | 2.1 | 1.3 | 0.9 | 1.8 | 1.7 | --- | 1.6 | 2.1 | 1.5 | 2.1 | 2.0 | 34.5 |
| 13 | Arua | 8.3 | 2.4 | 1.1 | 2.4 | 3.4 | 1.1 | 2.1 | 1.3 | 0.9 | 1.9 | 1.8 | 1.6 | --- | 2.4 | 1.7 | 2.4 | 2.2 | 36.9 |
| 14 | F Portal | 28.6 | 3.6 | 1.7 | 3.7 | 4.8 | 1.5 | 2.9 | 1.7 | 1.2 | 2.6 | 2.3 | 2.1 | 2.4 | --- | 2.3 | 3.7 | 3.4 | 68.5 |
| 15 | Masindi | 8.2 | 2.4 | 1.1 | 2.4 | 3.3 | 1.0 | 2.0 | 1.2 | 0.8 | 1.8 | 1.7 | 1.5 | 1.7 | 2.3 | --- | 2.2 | 2.1 | 35.6 |
| 16 | Mbarara | 28.8 | 3.7 | 1.7 | 4.0 | 4.9 | 1.5 | 3.0 | 1.8 | 1.2 | 2.7 | 2.3 | 2.1 | 2.4 | 3.7 | 2.2 | --- | 3.8 | 69.7 |
| 17 | Kabale | 27.4 | 3.4 | 1.6 | 3.6 | 4.6 | 1.4 | 2.8 | 1.6 | 1.1 | 2.5 | 2.2 | 1.9 | 2.2 | 3.4 | 2.1 | 3.8 | --- | 65.8 |
| Total | | 331.6 | 78.8 | 37.3 | 75.8 | 104.4 | 34.6 | 68.3 | 29.5 | 20.2 | 44.0 | 36.9 | 34.2 | 36.7 | 68.1 | 35.3 | 70.2 | 65.4 | 1,171.3 |
| Total/Subs. | | 0.009 | 0.027 | 0.062 | 0.025 | 0.018 | 0.064 | 0.030 | 0.039 | 0.052 | 0.025 | 0.028 | 0.032 | 0.027 | 0.025 | 0.032 | 0.025 | 0.025 | 0.018 |

Table 2-5 Estimated Telephone Traffic between Major Exchanges in Year 2005

| No. To | No. From | (Erlang) | | | | | | | | | | | | | | | | | Total/Total/ | |
|--------------|----------|----------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|--------------|-------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | | |
| 1 Kampala | 54,032 | 4,057 | 1,910 | 5,329 | 10,371 | 2,408 | 4,429 | 1,649 | 1,649 | 492 | 2,616 | 1,971 | 2,431 | 2,306 | 4,925 | 1,418 | 4,896 | 3,369 | 108,609 | 0.010 |
| 2 Entebbe | --- | 519 | 35.1 | 53.4 | 77.3 | 36.9 | 49.3 | 11.8 | 6.1 | 14.9 | 12.3 | 14.1 | 12.9 | 46.6 | 11.1 | 48.4 | 37.6 | 519.8 | 0.033 | |
| 3 Mityara | 65.4 | --- | 4.2 | 6.6 | 9.1 | 4.3 | 5.4 | 3.3 | 1.7 | 4.2 | 3.5 | 4.0 | 3.7 | 5.6 | 3.1 | 5.7 | 4.5 | 134.0 | 0.044 | |
| 4 Masaka | 36.0 | 4.2 | --- | 4.6 | 6.1 | 2.9 | 3.7 | 2.3 | 1.2 | 2.9 | 2.5 | 2.8 | 2.6 | 4.0 | 2.2 | 4.0 | 3.1 | 84.8 | 0.024 | |
| 5 Jinja | 54.3 | 6.6 | 4.5 | --- | 9.5 | 4.6 | 5.9 | 3.6 | 1.9 | 4.6 | 3.9 | 4.4 | 4.2 | 6.5 | 3.5 | 6.9 | 5.4 | 130.1 | 0.018 | |
| 6 Iganga | 84.3 | 9.0 | 6.0 | 9.5 | --- | 7.9 | 9.1 | 5.5 | 2.8 | 7.1 | 5.5 | 6.4 | 5.7 | 8.5 | 4.9 | 8.5 | 6.9 | 187.5 | 0.038 | |
| 7 Mbale | 37.7 | 4.3 | 2.9 | 4.6 | 8.0 | --- | 4.7 | 2.8 | 1.4 | 3.7 | 2.7 | 3.2 | 2.8 | 4.1 | 2.4 | 4.2 | 3.4 | 92.7 | 0.026 | |
| 8 Soroti | 46.7 | 5.4 | 3.7 | 5.9 | 9.1 | 4.6 | --- | 3.8 | 2.0 | 5.3 | 3.6 | 4.3 | 3.8 | 5.4 | 3.1 | 5.4 | 4.4 | 116.5 | 0.034 | |
| 9 Moroto | 12.1 | 3.3 | 2.3 | 3.7 | 5.6 | 2.8 | 3.9 | --- | 1.2 | 2.9 | 2.4 | 2.9 | 2.4 | 3.4 | 2.0 | 3.4 | 2.7 | 56.8 | 0.062 | |
| 10 Tororo | 6.3 | 1.7 | 1.2 | 1.9 | 2.9 | 1.4 | 2.0 | 1.2 | --- | 1.5 | 1.3 | 1.5 | 1.3 | 1.8 | 1.0 | 1.8 | 1.5 | 30.4 | 0.027 | |
| 11 Gulu | 15.2 | 4.2 | 2.8 | 4.6 | 7.2 | 3.7 | 5.3 | 2.9 | 1.5 | --- | 2.8 | 3.2 | 2.9 | 4.2 | 2.4 | 4.2 | 3.4 | 70.6 | 0.030 | |
| 12 Lira | 12.6 | 3.5 | 2.5 | 3.9 | 5.6 | 2.7 | 3.7 | 2.4 | 1.3 | 2.8 | --- | 3.2 | 2.9 | 3.8 | 2.3 | 3.7 | 3.0 | 59.6 | 0.028 | |
| 13 Arua | 14.4 | 4.0 | 2.8 | 4.4 | 6.4 | 3.2 | 4.3 | 2.8 | 1.4 | 3.2 | 3.1 | --- | 3.0 | 4.2 | 2.5 | 4.1 | 3.3 | 67.2 | 0.027 | |
| 14 F. Portal | 13.2 | 3.7 | 2.6 | 4.2 | 5.8 | 2.8 | 3.8 | 2.4 | 1.3 | 2.9 | 2.9 | 3.0 | --- | 4.2 | 2.4 | 4.0 | 3.2 | 62.4 | 0.024 | |
| 15 Masindi | 47.4 | 5.6 | 4.0 | 6.5 | 8.5 | 4.1 | 5.4 | 3.4 | 1.8 | 4.2 | 3.8 | 4.2 | 4.2 | --- | 3.4 | 6.5 | 5.2 | 118.2 | 0.037 | |
| 16 Mbarara | 11.3 | 3.1 | 2.2 | 3.5 | 4.9 | 2.4 | 3.1 | 2.0 | 1.0 | 2.4 | 2.3 | 2.5 | 2.4 | 3.4 | --- | 3.3 | 2.6 | 52.8 | 0.024 | |
| 17 Kabale | 48.3 | 5.7 | 4.0 | 6.9 | 8.6 | 4.1 | 5.4 | 3.3 | 1.8 | 4.2 | 3.6 | 4.1 | 4.0 | 6.5 | 3.3 | --- | 5.7 | 119.3 | 0.029 | |
| | 38.3 | 4.5 | 3.1 | 5.4 | 6.9 | 3.3 | 4.4 | 2.7 | 1.5 | 3.4 | 3.0 | 3.3 | 3.2 | 5.2 | 2.6 | 5.7 | --- | 96.6 | 0.018 | |
| Total | 543.6 | 120.6 | 83.8 | 129.5 | 181.4 | 91.7 | 119.2 | 56.3 | 29.8 | 70.2 | 59.1 | 66.8 | 61.9 | 117.6 | 52.2 | 119.6 | 95.9 | 1,999.4 | 0.018 | |
| Total/Subs. | 0.010 | 0.030 | 0.044 | 0.024 | 0.017 | 0.038 | 0.027 | 0.034 | 0.061 | 0.027 | 0.030 | 0.027 | 0.027 | 0.024 | 0.037 | 0.024 | 0.028 | 0.018 | 0.018 | |

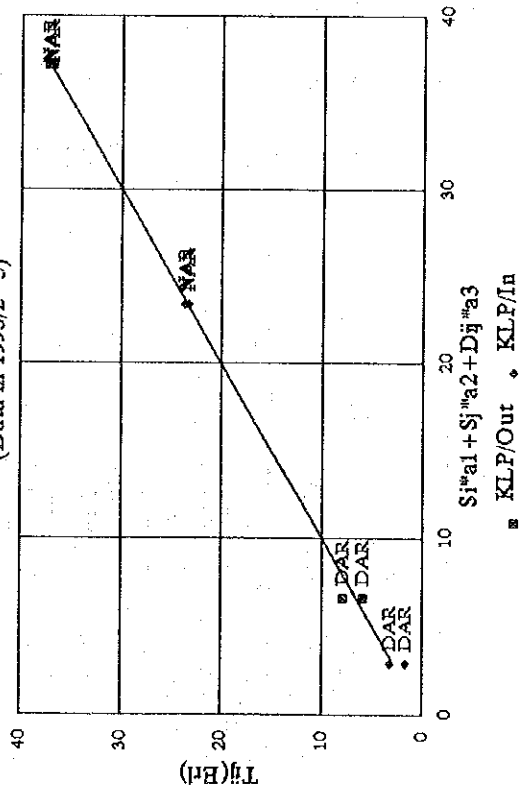
Table 2-6 Estimated Telephone Traffic between Major Exchanges in Year 2010

| No. | | (Erlang) | | | | | | | | | | | | | | | | | Total/ | |
|-------------|----------|----------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|-------|
| No. To | From | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | Total/ | |
| | | KLA | ENT | MTA | MSK | JJA | IGA | MBL | SRI | MOT | TOR | GLU | LRA | AUA | FPL | MDI | MBR | KBA | Total/ | |
| 1 | Kampala | 79,276 | 5,313 | 3,609 | 8,102 | 14,931 | 4,168 | 6,576 | 2,883 | 987 | 3,727 | 3,067 | 4,165 | 4,351 | 7,219 | 3,045 | 8,090 | 4,590 | 164,099 | |
| 2 | Entebbe | --- | --- | 6.5 | 9.2 | 12.4 | 6.4 | 7.5 | 5.0 | 2.8 | 5.7 | 4.9 | 5.9 | 5.7 | 7.7 | 5.2 | 8.3 | 6.0 | 778.2 | |
| 3 | Mityara | 86.7 | 6.5 | --- | 7.7 | 9.9 | 5.1 | 6.1 | 4.1 | 2.3 | 4.6 | 4.1 | 4.9 | 4.8 | 6.5 | 4.4 | 6.9 | 5.0 | 185.6 | |
| 4 | Masaka | 80.4 | 9.2 | 7.6 | --- | 13.9 | 7.3 | 8.7 | 5.8 | 3.3 | 6.7 | 5.9 | 7.0 | 7.0 | 9.7 | 6.2 | 10.8 | 7.7 | 142.2 | |
| 5 | Jinja | 119.4 | 12.3 | 9.8 | 13.9 | --- | 12.4 | 13.1 | 8.6 | 4.7 | 10.1 | 8.2 | 9.9 | 9.4 | 12.2 | 8.4 | 13.0 | 9.5 | 197.1 | |
| 6 | Ganga | 59.4 | 6.4 | 5.1 | 7.3 | 12.5 | --- | 7.4 | 4.7 | 2.6 | 5.7 | 4.4 | 5.4 | 5.0 | 6.5 | 4.5 | 6.9 | 5.1 | 275.0 | |
| 7 | Mbale | 68.3 | 7.4 | 6.1 | 8.7 | 13.2 | 7.4 | --- | 6.1 | 3.4 | 7.7 | 5.5 | 6.7 | 6.2 | 7.9 | 5.5 | 8.4 | 6.2 | 149.1 | |
| 8 | Soroti | 19.2 | 5.0 | 4.1 | 5.9 | 8.7 | 4.8 | 6.2 | --- | 2.3 | 4.5 | 3.9 | 4.9 | 4.3 | 5.4 | 3.8 | 5.7 | 4.2 | 174.7 | |
| 9 | Moroto | 10.6 | 2.8 | 2.3 | 3.3 | 4.8 | 2.6 | 3.4 | 2.3 | --- | 2.5 | 2.2 | 2.7 | 2.5 | 3.1 | 2.1 | 3.2 | 2.4 | 92.6 | |
| 10 | Tororo | 21.9 | 5.7 | 4.6 | 6.7 | 10.2 | 5.7 | 7.7 | 4.5 | 2.5 | --- | 4.1 | 5.0 | 4.7 | 6.0 | 4.1 | 6.4 | 4.7 | 52.9 | |
| 11 | Gulu | 18.8 | 4.9 | 4.2 | 5.9 | 8.3 | 4.4 | 5.5 | 3.9 | 2.2 | 4.1 | --- | 5.1 | 4.9 | 5.7 | 4.1 | 5.8 | 4.3 | 104.6 | |
| 12 | Lira | 22.6 | 5.9 | 4.9 | 7.0 | 10.0 | 5.4 | 6.7 | 4.9 | 2.6 | 5.0 | 5.1 | --- | 5.4 | 6.6 | 4.8 | 6.8 | 5.0 | 92.2 | |
| 13 | Arua | 21.7 | 5.7 | 4.8 | 7.0 | 9.5 | 5.0 | 6.2 | 4.3 | 2.5 | 4.7 | 4.8 | 5.4 | --- | 6.9 | 4.8 | 6.9 | 5.1 | 108.6 | |
| 14 | F.Portal | 68.9 | 7.7 | 6.5 | 9.7 | 12.3 | 6.5 | 7.9 | 5.4 | 3.1 | 6.0 | 5.6 | 6.5 | 6.9 | --- | 6.0 | 10.0 | 7.3 | 105.3 | |
| 15 | Masindi | 19.8 | 5.2 | 4.5 | 6.3 | 8.5 | 4.5 | 5.5 | 3.8 | 2.1 | 4.1 | 4.1 | 4.8 | 4.8 | 6.0 | --- | 6.1 | 4.5 | 176.2 | |
| 16 | Mbarara | 75.9 | 8.2 | 6.9 | 10.8 | 13.1 | 6.9 | 8.4 | 5.6 | 3.2 | 6.4 | 5.8 | 6.8 | 6.9 | 10.0 | 6.1 | --- | 8.4 | 94.7 | |
| 17 | Kabale | 53.8 | 6.0 | 5.0 | 7.7 | 9.6 | 5.1 | 6.2 | 4.2 | 2.4 | 4.7 | 4.3 | 5.0 | 5.1 | 7.3 | 4.4 | 8.4 | --- | 189.4 | |
| Total | | 806.5 | 171.7 | 140.7 | 196.2 | 268.8 | 147.7 | 177.1 | 91.9 | 52.1 | 103.9 | 91.5 | 108.0 | 104.8 | 175.3 | 94.0 | 189.4 | 138.1 | 3,057.7 | |
| Total/Subs. | | 0.010 | 0.032 | 0.039 | 0.024 | 0.018 | 0.035 | 0.027 | 0.032 | 0.053 | 0.028 | 0.030 | 0.026 | 0.024 | 0.024 | 0.031 | 0.023 | 0.030 | 0.019 | 0.030 |

Table 2-7 Regional Telephone Call Analysis

| No. | Measured on/at | Section | | Working Circuit (chs) | Measured Traffic T _{ij} (Erf) | Rejected Calls (%) | Origin'd Traffic T _{ij} (Erf) | Subs (Out) S _i | Subs (In) S _j | Section Distance D _{ij} (km) | Estimated T _{ij} (Erf) | Adjust. for Esti. T _{ij} | |
|-----|----------------|----------|--------------|-----------------------|----------------------------------------|--------------------|----------------------------------------|---------------------------|--------------------------|---------------------------------------|---------------------------------|-----------------------------------|-------|
| | | Out | In | | | | | | | | | | |
| 1 | 93.5(KPLT) | Kampala | KPL Nairobi | NAR | 58 | 35.20 | 11 | 37.25 | 12,782 | 118,383 | 500 | 37.18 | 0.06 |
| 2 | 93.5(KPLT) | Kampala | KPL D'Salaam | DAR | 19 | 5.70 | 9 | 5.97 | 12,782 | 40,915 | 1,100 | 6.61 | -0.65 |
| 3 | 93.2(KPLT) | Kampala | KPL Nairobi | NAR | 56 | 35.41 | 8 | 36.89 | 12,769 | 118,265 | 500 | 37.14 | -0.26 |
| 4 | 93.2(KPLT) | Kampala | KPL D'Salaam | DAR | 18 | 7.01 | 24 | 7.97 | 12,769 | 40,874 | 1,100 | 6.60 | 1.37 |
| 5 | 93.5(KPLT) | Nairobi | NAR Kampala | KPL | 68 | 23.63 | 0 | 23.63 | 118,383 | 12,782 | 500 | 23.35 | 0.28 |
| 6 | 93.5(KPLT) | D'Salaam | DAR Kampala | KPL | 29 | 1.74 | 6 | 1.79 | 40,915 | 12,782 | 1,100 | 2.93 | -1.13 |
| 7 | 93.2(KPLT) | Nairobi | NAR Kampala | KPL | 67 | 23.23 | 0 | 23.23 | 118,265 | 12,769 | 500 | 23.32 | -0.09 |
| 8 | 93.2(KPLT) | D'Salaam | DAR Kampala | KPL | 29 | 2.86 | 28 | 3.33 | 40,874 | 12,769 | 1,100 | 2.92 | 0.41 |

Regional Telephone Call Traffic
(Data in 1993/2-5)



3. Facility Provision Plan

3.1 Switching Expansion Plan

Table 3-1 Switching Expansion Plan (1/8: Kampala 1/2)

| ASC | Exchange | | Unit | Type | Existing Capacity | E.C.s | Phase-I | | Phase-II | | Phase-III | | Total L.U. (2009/2010) | No. of sub. (2009/2010) |
|-------------|---------------|----------|----------|--------|-------------------|----------|---------|-----|----------|-----|-----------|--------|------------------------|-------------------------|
| | Name | | | | | | Replace | New | Replace | New | Replace | New | | |
| Kampala | Kampala (MSU) | I | E10B | 15,000 | 9,669 | (15,000) | 20,000 | | | | | 0 | 0 | |
| | | II | ESS | | | | | | | | | 10,000 | 35,000 | 34,253 |
| | Lubowa | R-I | E10B-RLU | 600 | 75 | (600) | | | | | | 600 | 1,600 | 0 |
| | | R-II | ESS-RLU | | | | 1,000 | | | | | | 1,532 | 1,532 |
| | Makerere | I | E10B | 5,000 | 687 | (5,000) | | | | | | | 0 | 0 |
| | | R-II | ESS-RLU | | | | 4,000 | | | | | 2,500 | 8,500 | 8,477 |
| | Kawempe | R-I | E10B-RLU | 1,500 | 196 | (1,500) | | | | | | | 0 | 0 |
| | | R-II | ESS-RLU | | | | 3,000 | | | | | 1,000 | 5,000 | 4,680 |
| | Mengo | I | C400 | 3,600 | 396 | (3,600) | | | | | | | 0 | 0 |
| | | R-II | ESS-RLU | | | | 5,000 | | | | | 2,000 | 9,000 | 8,823 |
| | Naambya | R-I | E10B-RLU | 3,000 | 905 | (3,000) | | | | | | | 0 | 0 |
| | | R-II | ESS-RLU | | | | 2,000 | | | | | 1,500 | 4,500 | 4,320 |
| | Kyambogo | I | C23 | 1,000 | 206 | (1,000) | | | | | | | 0 | 0 |
| | | R-II | ESS-RLU | | | | 2,000 | | | | | 1,500 | 4,500 | 4,115 |
| Mbuya | R-I | E10B-RLU | 3,000 | 719 | (3,000) | | | | | | | 0 | 0 | |
| | R-II | ESS-RLU | | | | 2,000 | | | | | 1,500 | 4,500 | 4,390 | |
| Kasangati | R-I | M | 100 | 53 | (100) | | | | | | | 0 | 0 | |
| | R-II | ESS-RLU | | | | 1,000 | | | | | 700 | 1,700 | 1,629 | |
| Matuga | R-I | M | (70) | | | | | | | | | 0 | 0 | |
| | R-II | ESS-RLU | | | | | | | | | 800 | 800 | 713 | |
| Naaddangira | R-I | M | (50) | | | | | | | | | 0 | 0 | |
| | R-II | ESS-RLU | | | | | | | | | 900 | 900 | 851 | |
| Sub Total | | | | 32,800 | 12,906 | (32,800) | 40,000 | 0 | 15,400 | 0 | 20,600 | 76,000 | 73,783 | |

Phase-I : 1994/1995 - 1999/2000
Phase-II : 2000/2001 - 2004/2005
Phase-III : 2005/2006 - 2009/2010

Table 3-2 Switching Expansion Plan (2/8: Kampala 2/2)

| ASC | Exchange | | Existing Capacity | E.C.s | Phase-I | | Phase-II | | Phase-III | | Total L.U. (2009/2010) | No. of sub. (2009/2010) | | |
|-------------------|---------------|----------|-------------------|--------|----------|----------|----------|---------|-----------|--------|---------------------------|----------------------------|---------|-----|
| | | | | | Replace | | New | | Replace | | | | New | |
| | | | | | Unit | Type | Replace | New | Replace | New | | | Replace | New |
| Kampala | Luwero (MSU) | I | M | 70 | 41 | (70) | | | | | 0 | 0 | | |
| | | II | ESS | | | On-going | 900 | | | | 900 | 720 | | |
| | Wobulenzi | I | M | 70 | 29 | (70) | | | | | 0 | 0 | | |
| | | R-II | ESS-RLU | | | On-going | 600 | | 100 | | 700 | 672 | | |
| | Bombo | I | M | 100 | 22 | | | (100) | | | 0 | 0 | | |
| | | R-II | ESS-RLU | | | | | | 500 | | 500 | 499 | | |
| | Nakasongola | I | M | 100 | 33 | | | (100) | | | 0 | 0 | | |
| | | R-II | ESS-RLU | | | | | | 400 | | 400 | 350 | | |
| | Mityana (MSU) | I | C23 | 1,000 | 180 | | | (1,000) | | | 0 | 0 | | |
| | | II | ESS | | | | | | 2,500 | | 2,500 | 2,290 | | |
| | Kiboga | I | M | 70 | 48 | | | (70) | | | 0 | 0 | | |
| | | R-II | ESS-RLU | | | | | | 600 | | 600 | 529 | | |
| Mubende | I | C23 | 1,000 | 86 | | | | | | 0 | 0 | | | |
| | II | ESS-RLU | | | | | | | | 800 | 800 | | | |
| Mukono (MSU) | R-I | E10B-RLU | 600 | 206 | (600) | | | | 800 | 800 | 800 | | | |
| | II | ESS | | | | | | | 1,900 | 1,900 | 1,873 | | | |
| Kayunga | I | M | 100 | 71 | (100) | | | | | 0 | 0 | | | |
| | R-II | ESS-RLU | | | | | | | 800 | 1,400 | 1,379 | | | |
| Entebbe (MSU) | I | C400 | 1,200 | 1,000 | (1,200) | | | | | 0 | 0 | | | |
| | II | ESS | | | | | | | 3,000 | 5,000 | 4,513 | | | |
| Mpigi | I | M | 100 | 50 | (100) | | | | | 0 | 0 | | | |
| | R-II | ESS-RLU | | | | | | | 800 | 800 | 800 | | | |
| Sub Total | | | 4,410 | 1,766 | (2,140) | 7,100 | (1,270) | 5,000 | 3,400 | 15,500 | 14,415 | | | |
| Kampala ASC Total | | | 37,210 | 14,672 | (34,940) | 47,100 | (1,270) | 20,400 | (1,000) | 91,500 | 98,198 | | | |

Phase-I : 1994/1995 - 1999/2000
Phase-II : 2000/2001 - 2004/2005
Phase-III : 2005/2006 - 2009/2010

Table 3-3 Switching Expansion Plan (3/8: Jinja)

| ASC | Exchange | | Existing Capacity | E.C.s | Phase-I | | Phase-II | | Phase-III | | Total L.U. (2009/2010) | No. of sub. (2009/2010) |
|-----------------|-------------|----------|-------------------|-------|---------|---------|----------|---------|-----------|---------|------------------------|-------------------------|
| | Name | Unit | | | Type | Replace | New | Replace | New | Replace | | |
| Jinja | Jinja (MSU) | I | C400 | 2,400 | 1,231 | (2,400) | | | | | 0 | 0 |
| | | II | ESS | | | | | | | 3,700 | 11,500 | 11,149 |
| | Lugazi | I | C23 | 100 | 73 | (100) | | | | | 0 | 0 |
| | | R-II | ESS -RLU | | | | | | | 300 | 900 | 814 |
| | Bukwe | I | M | 30 | 4 | | | (30) | | | 0 | 0 |
| | | R-II | ESS -RLU | | | | | | 700 | | 700 | 673 |
| | Nkokonjeru | I | M | 70 | 4 | | | (70) | | | 0 | 0 |
| | | R-II | ESS -RLU | | | | | | 400 | | 400 | 332 |
| | Kakira | I | C23 | 100 | 39 | (100) | | | | | 0 | 0 |
| | | R-II | ESS -RLU | | | | | | | 300 | 800 | 731 |
| | Kamuli | I | M | 200 | 34 | (200) | | | | | 0 | 0 |
| | | R-II | ESS -RLU | | | | | | | 300 | 300 | 766 |
| Nyenge | I | M | 70 | 19 | | | (70) | | | 500 | 466 | |
| | R-II | ESS -RLU | | | | | | | 800 | 0 | 0 | |
| Iganga (MSU) | I | C22 | 800 | 203 | (800) | | | | | 0 | 0 | |
| | II | ESS | | | | | | | 1,500 | 3,300 | 3,296 | |
| Kaliro | I | M | 100 | 35 | | | (100) | | | 0 | 0 | |
| | R-II | ESS -RLU | | | | | | | 400 | 400 | 359 | |
| Bugiri | I | M | 100 | 46 | | | (100) | | | 0 | 0 | |
| | R-II | ESS -RLU | | | | | | | 600 | 600 | 523 | |
| Jinja ASC Total | | | 3,970 | 1,688 | (3,600) | 7,900 | (370) | 5,900 | 6,100 | 19,900 | 19,093 | |

Phase-I : 1994/1995 - 1999/2000
Phase-II : 2000/2001 - 2004/2005
Phase-III : 2005/2006 - 2009/2010

Table 3-4 Switching Expansion Plan (4/8: Mbale)

| ASC | Exchange | | Existing Capacity | E.C.s | Phase-I | | Phase-II | | Phase-III | | Total L.U. (2009/2010) | No. of sub. (2009/2010) | |
|-----------------|--------------|----------|-------------------|-------|----------|----------|----------|---------|-----------|---------|------------------------|-------------------------|-------|
| | Name | Unit | | | Type | Replace | New | Replace | New | Replace | | | New |
| | | | | | | | | | | | | | |
| Mbale | Mbale (MSU) | I | SxS | 800 | 281 | (800) | | | | | 0 | 0 | |
| | | II | C23 | 800 | 417 | (800) | | | | | 0 | 0 | |
| | | III | ESS | | | On-going | 3,000 | | | | 2,300 | 5,300 | 5,259 |
| | Kumi | I | M | 60 | 45 | (60) | | | | | | 0 | 0 |
| | | R-II | ESS -RLU | | | | 500 | | | | | 500 | 496 |
| | Palisa | I | M | 50 | 16 | (50) | | | | | | 0 | 0 |
| | | R-II | ESS -RLU | | | | 400 | | | | | 400 | 371 |
| | Kapchorwa | I | M | 100 | 36 | (100) | | | | | | 0 | 0 |
| | | R-II | ESS -RLU | | | On-going | 450 | | | | | 450 | 450 |
| | Tororo (MSU) | I | C23 | 1,000 | 331 | (1,000) | | | | | | 0 | 0 |
| | | II | ESS | | | On-going | 2,000 | | | | 500 | 2,500 | 2,310 |
| | Busia | I | M | 100 | 55 | (100) | | | | | | 0 | 0 |
| R-II | | ESS -RLU | | | On-going | 450 | | | 550 | | 1,000 | 977 | |
| Malaba | I | M | 60 | 30 | (60) | | | | | | 0 | 0 | |
| | R-II | ESS -RLU | | | On-going | 450 | | | | | 450 | 440 | |
| Soroti (MSU) | I | M | 400 | 199 | (400) | | | | | | 0 | 0 | |
| | II | ESS | | | On-going | 900 | | | 1,000 | | 2,900 | 2,883 | |
| Moroto (MSU) | I | M | 270 | 98 | (270) | | | | | | 0 | 0 | |
| | II | ESS | | | On-going | 600 | | | | | 600 | 568 | |
| Kotido | I | M | (50) | | | | | | | | 0 | 0 | |
| | R-II | ESS -RLU | | | | | | | 500 | | 500 | 419 | |
| Mbale ASC Total | | | | 3,640 | 1,488 | (3,640) | 8,750 | 0 | 2,050 | 3,800 | 14,800 | 14,173 | |

Phase-I : 1984/1985 - 1999/2000
Phase-II : 2000/2001 - 2004/2005
Phase-III : 2005/2006 - 2009/2010

Table 3-5 Switching Expansion Plan (5/8: Masaka)

| ASC | Exchange | | Existing Capacity | E.C.s | Phase-I | | Phase-II | | Phase-III | | Total L.U. (2009/2010) | No. of sub. (2009/2010) |
|-------------------|--------------|-----------|-------------------|-------|---------|---------|----------|---------|-----------|---------|------------------------|-------------------------|
| | Name | Unit | | | Type | Replace | New | Replace | New | Replace | | |
| Masaka | Masaka (MSU) | I | MDX10 | 553 | | | | | | | 0 | 0 |
| | | II | ESS | 2,000 | | | | | | | 6,500 | 6,280 |
| | | I | PCC | 1 | | | | | | | 0 | 0 |
| | | R-II | ESS - RLU | | | | | | | | 4,500 | 0 |
| | | I | M | 100 | | | | | | | 400 | 372 |
| | | R-II | ESS - RLU | | | | | | | | 400 | 0 |
| | | I | M | 40 | | | | | | | 500 | 500 |
| | | R-II | ESS - RLU | | | | | | | | 200 | 0 |
| | | I | M | 100 | | | | | | | 300 | 178 |
| | | R-II | ESS - RLU | | | | | | | | 200 | 0 |
| | I | M | 100 | | | | | | | 300 | 294 | |
| | R-II | ESS - RLU | | | | | | | | 200 | 187 | |
| | I | M | | | | | | | | 400 | 311 | |
| | R-II | ESS - RLU | | | | | | | | 400 | 0 | |
| Masaka, ASC Total | | | 2,341 | 645 | 0 | 0 | (2,341) | 6,500 | 2,000 | 8,500 | 8,102 | |

Phase-I : 1994/1995 - 1999/2000
 Phase-II : 2000/2001 - 2004/2005
 Phase-III : 2005/2006 - 2009/2010

Table 3-6 Switching Expansion Plan (6/8: Mbarara)

| ASC | Exchange | | Existing Capacity | E.C.e | Phase-I | | Phase-II | | Phase-III | | Total L.U. (2009/2010) | No. of sub. (2009/2010) |
|-------------------|---------------|------|-------------------|-------|---------|---------|----------|---------|-----------|---------|---------------------------|----------------------------|
| | Name | Unit | | | Type | Replace | New | Replace | New | Replace | | |
| Mbarara | Mbarara (MSU) | I | HDx10 | 876 | | | | | | | 0 | 0 |
| | | II | ESS | | | | (2,000) | | | | 4,500 | 4,364 |
| | | I | C23 | 96 | | | (1,000) | | | | 0 | 0 |
| | | R-II | ESS - RLU | | | | | | | | 2,500 | 2,064 |
| | | I | M | 30 | | | (30) | | | | 0 | 0 |
| | | R-II | ESS - RLU | | | | | | | | 600 | 540 |
| | | I | PCO | 1 | | | (1) | | | | 0 | 0 |
| | | R-II | ESS - RLU | | | | | | | | 400 | 357 |
| | | R-I | ESS - RLU (NEW) | | | | (NEW) | | | | 400 | 395 |
| | | R-I | ESS - RLU (NEW) | | | | (NEW) | | | | 400 | 370 |
| Kabale (MSU) | | I | FETEX150 | 636 | | | | | | (3,000) | 0 | 0 |
| | | II | ESS | | | | | | | 3,500 | 3,500 | 3,245 |
| | | I | C23 | 79 | | | | | | (1,000) | 0 | 0 |
| | | R-II | ESS - RLU | | | | | | | 800 | 800 | 777 |
| Kisoro | | I | M | 66 | | | | | | (100) | 0 | 0 |
| | | R-II | ESS - RLU | | | | | | | 600 | 600 | 567 |
| Mbarara ASC Total | | | | 7,131 | 1,771 | 0 | (3,031) | 5,800 | (4,100) | 7,900 | 13,700 | 12,680 |

Phase-I : 1994/1995 - 1999/2000
Phase-II : 2000/2001 - 2004/2005
Phase-III : 2005/2006 - 2009/2010

Table 3-7 Switching Expansion Plan (7/8: Fort Portal)

| ASC | Exchange | | Existing Capacity | E.C.s | Phase-I | | Phase-II | | Phase-III | | Total L.U. (2009/2010) | No. of sub. (2009/2010) |
|-----------------------|-------------------|------|-------------------|-------|---------|---------|----------|---------|-----------|---------|------------------------|-------------------------|
| | Name | Unit | | | Type | Replace | New | Replace | New | Replace | | |
| Fort Portal | Fort Portal (MSU) | I | C23 | 600 | 443 | (600) | | | | | 0 | 0 |
| | | II | ESS | | | | 2,300 | | | 1,700 | 4,000 | 3,910 |
| | Kaseee | I | C23 | 1,000 | 230 | (1,000) | | | | | 0 | 0 |
| | | R-II | ESS - RLU | (50) | | | 2,300 | | | 700 | 3,000 | 2,745 |
| Masindi (MSU) | Ksgadi | I | M | | | | | | | | 0 | 0 |
| | | R-II | ESS - RLU | 300 | 206 | (300) | | | | 600 | 600 | 584 |
| | Hoima | I | ESS | 300 | 166 | (300) | | | | | 1,900 | 1,810 |
| | | R-II | ESS - RLU | | | | 1,000 | | | 900 | 1,900 | 1,810 |
| Fort Portal ASC Total | | | | 2,200 | 1,045 | (2,200) | 6,600 | 0 | 600 | 10,800 | 10,284 | |

Phase-I : 1994/1995 - 1999/2000
Phase-II : 2000/2001 - 2004/2005
Phase-III : 2005/2006 - 2009/2010

Table 3-8 Switching Expansion Plan (8/8: Gulu)

| ASC | Exchange | | Existing Capacity | E.C.s | Phase-I | | Phase-II | | Phase-III | | Total L.U. (2009/2010) | No. of sub. (2009/2010) |
|------|----------------|------------|-------------------|-----------|---------|----------|----------|---------|-----------|---------|---------------------------|----------------------------|
| | Name | Unit | | | Type | Replace | New | Replace | New | Replace | | |
| Gulu | Gulu (MSU) | I | M | 400 | 245 | (400) | | | | | 0 | 0 |
| | Lira (MSU) | II | ESS | | | On-going | | | | | 3,100 | 3,067 |
| | | I | M | 300 | 114 | (300) | | | | | 0 | 0 |
| | | II | ESS | | | | | | | | 1,800 | 1,720 |
| | | Kigum | I | M | 110 | 53 | (110) | | | | 0 | 0 |
| | | | R-II | ESS - RLU | | | | | | | 500 | 1,000 |
| | | Apac | I | M | 50 | 23 | (50) | | | | 0 | 0 |
| | | | R-II | ESS - RLU | | | | | | | 200 | 700 |
| | | Aboke | I | M | 30 | | | (30) | | | 0 | 0 |
| | | | R-II | ESS - RLU | | | | | | | 900 | 900 |
| | | Arua (MSU) | I | M | 150 | 96 | (150) | | | | 0 | 0 |
| | | | II | ESS | | | | | | | 1,500 | 3,000 |
| | Nebbi | I | M | (50) | | | | | | 0 | 0 | |
| | | R-II | ESS - RLU | | | | | | | 800 | 900 | |
| | Moyo | I | M | 100 | 51 | | | | | 0 | 0 | |
| | | R-II | ESS - RLU | | | | | | | 600 | 600 | |
| | Gulu ASC Total | | | 1,140 | 582 | (1,010) | 7,000 | (30) | 1,500 | 3,500 | 12,000 | 11,583 |
| | Grand Total | | | 57,632 | 21,891 | (45,390) | 77,350 | (7,042) | 42,750 | 50,900 | 171,000 | 164,099 |

Phase-I : 1994/1995 - 1999/2000
Phase-II : 2000/2001 - 2004/2005
Phase-III : 2005/2006 - 2009/2010

3.2 Local Network Expansion Plan

Table 3-9 Local Network Expansion Plan (Cable and DMARS) (1/6: Kampala)

| Exchange Name | Existing Cable(P) | Phase-I | | Phase-II | | Phase-III | | Total (2009/2010) | |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----------|
| | | Add Cable (Pairs) | No.of SUB (DMARS) | Add Cable (Pairs) | No.of SUB (DMARS) | Add Cable (Pairs) | No.of SUB (DMARS) | Cable Pairs | DMARS SUB |
| Kampala | 31,200 | | | 1,300 | | 13,000 | | 45,500 | |
| Makerere | 9,000 | | | | | 2,700 | | 11,700 | |
| Kawempe | 2,600 | 1,300 | | | | 1,300 | | 6,500 | |
| Mengo | 8,000 | | | 1,100 | | 2,600 | | 11,700 | |
| Nsambya | 4,400 | | | | | 1,500 | | 5,900 | |
| Kyambogo | 4,400 | | | | | 1,500 | | 5,900 | |
| Mbuya | 3,400 | | | 500 | | 2,000 | | 5,900 | |
| Lubowa | 1,600 | | | | | 500 | | 2,100 | |
| Kasangati | | 1,300 | | 500 | 229 | | 71 | 1,800 | 300 |
| Matugga | | | | 1,100 | | | | 1,100 | |
| Naddangira | | | | 1,100 | | | | 1,100 | |
| Luwero | | 600 | | | | | | 600 | 268 |
| Wobulenzi | | 700 | | | | | | 700 | 143 |
| Bombo | | | | 600 | | | | 600 | 99 |
| Nakasongola | | | | 500 | | | | 500 | |
| Mitayana | (1,010) | | 100 | 2,000 | 228 | | 436 | 2,000 | 764 |
| Kiboga | | | | 700 | | | | 700 | |
| Mubende | 1,010 | | | | | | | 1,010 | |
| Mukono | 1,200 | | | | | 600 | | 1,800 | 542 |
| Kayunga | 4,800 | 1,100 | | | | | | 1,100 | 569 |
| Entebbe | 300 | 800 | | | | 1,100 | | 5,900 | |
| Mpigi | | | | | | | | 1,100 | |
| Sub Total | 71,610 | 5,000 | 100 | 10,700 | 946 | 26,800 | 1,639 | 114,110 | 2,685 |

Phase-I : 1994/1995 – 1999/2000
Phase-II : 2000/2001 – 2004/2005
Phase-III : 2005/2006 – 2009/2010

Table 3-10 Local Network Expansion Plan (Cable and DMARS) (2/6: Jinja)

| Exchange Name | Existing Cable(P) | Phase - I | | Phase - II | | Phase - III | | Total (2009/2010) | |
|---------------|-------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|-----------|
| | | Add Cable (Pairs) | No. of SUB (DMARS) | Add Cable (Pairs) | No. of SUB (DMARS) | Add Cable (Pairs) | No. of SUB (DMARS) | Cable Pairs | DMARS SUB |
| Jinja | 6,200 | | | 1,800 | 158 | 5,000 | 68 | 15,000 | 226 |
| Lugazi | | 800 | | | | 300 | | 1,100 | |
| Buikwe | | | | 600 | 142 | | 91 | 600 | 233 |
| Nkokonjeru | | | | 500 | | | | 500 | |
| Nyenga | | | | 700 | | | | 700 | |
| Kakira | (200) | | | | | 300 | | 1,000 | |
| Kamuli | | | | | 241 | 200 | 104 | 600 | 345 |
| Iganga | (200) | | 30 | | 862 | 1,400 | 441 | 2,600 | 1,333 |
| Bugiri | | | | | | 700 | | 700 | |
| Kaiiro | | | | | 36 | 500 | | 500 | 36 |
| Sub Total | 8,200 | 3,100 | 30 | 4,800 | 1,439 | 7,200 | 704 | 23,300 | 2,173 |

Phase - I : 1994/1995 - 1999/2000

Phase - II : 2000/2001 - 2004/2005

Phase - III : 2005/2006 - 2009/2010

Table 3-11 Local Network Expansion Plan (Cable and DMARS) (3/6: Mbale)

| Exchange Name | Existing Cable (P) | Phase-I | | Phase-II | | Phase-III | | Total (2009/2010) | |
|---------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|-----------|
| | | Add Cable (Pairs) | No. of SUB (DMARS) | Add Cable (Pairs) | No. of SUB (DMARS) | Add Cable (Pairs) | No. of SUB (DMARS) | Cable Pairs | DMARS SUB |
| Mbale | | 3,000 | 1,240 | | 992 | | | 4,000 | 2,232 |
| Kumi | | 600 | | | 69 | | | 600 | 69 |
| Palisa | | 500 | | | | | | 500 | |
| Kapachorwa | (120) | 600 | | | 40 | | | 600 | 40 |
| Tororo | (1,000) | 2,200 | | 500 | 246 | | | 2,700 | 246 |
| Busia | (120) | 600 | 100 | 400 | 58 | | | 1,000 | 272 |
| Malaba | (300) | 600 | | | | | | 600 | |
| Soroti | (2,000) | 1,200 | 665 | 500 | 936 | | | 1,700 | 1,601 |
| Moroto | | 700 | | 400 | 89 | | | 700 | 89 |
| Kotibo | | | 100 | | 72 | | | 400 | 172 |
| Sub Total | | 10,000 | 200 | 1,300 | 2,019 | 1,500 | 2,502 | 12,800 | 4,721 |

Phase-I : 1994/1995 -- 1999/2000

Phase-II : 2000/2001 -- 2004/2005

Phase-III : 2005/2006 -- 2009/2010

Table 3-12 Local Network Expansion Plan (Cable and DMARS) (4/6: Masaka, Mbarara)

| Exchange Name | Existing Cable(P) | Phase - I | | Phase - II | | Phase - III | | Total (2009/2010) | |
|------------------|-------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------|
| | | Add Cable (Pairs) | No. of SUB (DMARS) | Add Cable (Pairs) | No. of SUB (DMARS) | Add Cable (Pairs) | No. of SUB (DMARS) | Cable Pairs | DMARS SUB |
| Masaka | (2,800) | 2,600 | 50 | 2,200 | 479 | 1,700 | 759 | 6,500 | 1,288 |
| Lyantonde | | | | 500 | | | | 500 | |
| Kyotera | | | | 400 | | | | 400 | |
| Kalisizo | | | | 400 | 172 | | 78 | 400 | 250 |
| Lukaya | | | | 300 | | | | 300 | |
| Nabusanké | | | | 200 | | | 247 | 200 | 247 |
| Rakai | | | 200 | 300 | (200) | | | 300 | 200 |
| Sub Total | | 2,600 | 250 | 4,300 | 651 | 1,700 | 1,084 | 8,500 | 1,985 |
| Mbarara | (2,010) | 2,600 | 150 | 700 | 228 | 1,000 | 722 | 4,300 | 1,100 |
| Bushenyi | (250) | | | 800 | 243 | 900 | 558 | 1,700 | 801 |
| Ntungamo | | | 200 | 800 | (200) | | | 800 | 200 |
| Kabwohe | | | 200 | 500 | (200) | | | 500 | 200 |
| Rwashamairé | | | | 500 | | | | 500 | |
| Rubaare | | | | 500 | | | | 500 | |
| Kabale | (2,410) | | | 1,100 | | 3,000 | 93 | 4,100 | 93 |
| Rukungiri | (1,100) | | | | | 700 | 303 | 700 | 303 |
| Kisoro | | | 200 | | | 800 | (200) | 800 | 200 |
| Sub Total | | 2,600 | 750 | 4,900 | 471 | 6,400 | 1,676 | 13,900 | 2,897 |

Phase-I : 1994/1995 - 1999/2000
Phase-II : 2000/2001 - 2004/2005
Phase-III : 2005/2006 - 2009/2010

Table 3-13 Local Network Expansion Plan (Cable and DMARS) (5/6: Fort Portal)

| Exchange Name | Existing Cable(P) | Phase-I | | Phase-II | | Phase-III | | Total (2009/2010) | |
|---------------|-------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|-----------|
| | | Add Cable (Pairs) | No. of SUB (DMARS) | Add Cable (Pairs) | No. of SUB (DMARS) | Add Cable (Pairs) | No. of SUB (DMARS) | Cable Pairs | DMARS SUB |
| Fort portal | (1,200) | 2,400 | 390 | | 72 | 800 | 1,013 | 3,200 | 1,475 |
| Kasese | (1,000) | 2,600 | 140 | | 440 | | 167 | 2,600 | 747 |
| Kagadi | | | | 500 | 122 | | 85 | 500 | 207 |
| Masindi | (1,400) | 900 | | | 129 | 1,000 | 251 | 1,900 | 380 |
| Hoima | (1,320) | 800 | | | | 800 | 27 | 1,600 | 27 |
| Sub Total | | 6,700 | 530 | 500 | 763 | 2,600 | 1,543 | 9,800 | 2,836 |

Phase-I : 1994/1995 – 1999/2000

Phase-II : 2000/2001 – 2004/2005

Phase-III : 2005/2006 – 2009/2010

Table 3-14 Local Network Expansion Plan (Cable and DMARS) (6/6: Gulu)

| Exchange Name | Existing Cable(P) | Phase-I | | Phase-II | | Phase-III | | Total (2009/2010) | |
|---------------|-------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|-----------|
| | | Add Cable (Pairs) | No. of SUB (DMARS) | Add Cable (Pairs) | No. of SUB (DMARS) | Add Cable (Pairs) | No. of SUB (DMARS) | Cable Pairs | DMARS SUB |
| Gulu | | 3,900 | | | | | 110 | 3,900 | 110 |
| Lira | | 1,200 | | | | 400 | 531 | 1,600 | 531 |
| Apac | | 600 | 90 | | 108 | | 79 | 600 | 277 |
| Aboke | | | | 400 | 371 | | 149 | 400 | 520 |
| Kitgum | | 600 | | | | 200 | 323 | 800 | 323 |
| Arua | | 1,700 | 90 | | 25 | 600 | 1,104 | 2,300 | 1,219 |
| Nebbi | | 500 | 100 | | 301 | | 129 | 500 | 530 |
| Moyo | | | 200 | 500 | | | 34 | 500 | 234 |
| Sub Total | | 8,500 | 480 | 900 | 805 | 1,200 | 2,459 | 10,600 | 3,744 |
| Total | 79,810 | 38,500 | 2,340 | 27,400 | 7,094 | 47,400 | 11,607 | 193,110 | 21,041 |

Phase-I : 1994/1995 - 1999/2000

Phase-II : 2000/2001 - 2004/2005

Phase-III : 2005/2006 - 2009/2010