### 1.2.2. Water Potential

#### (1) Aquifer Characteristics

No pumping test data are found in the project area, even though about five hundred (500) boreholes have been constructed. Borehole yield is normally estimated by the borehole development, therefore, the quantity of the records is not accurate and no drawdown data. The lack of the important data gives difficulty for the borehole design, siting and drilling procedure, especially in highly weathered formations and fine grained sedimentary formations. The accumulation of correct data including pumping test is required for the economical project cost.

Results of the pumping test of the test boreholes are shown in Table 1.1.13. The pumping tests are performed in the aquifers of Buganda-Toro System, and transmissivity ranges from 0.5 to 68.9 $m^2$/day. Yield ranges from 0.6 to 7.2 $m^3$/hr and drawdown from 3.6 to 24.0 m. Aquifers are in fractures of the rocks which are generally discontinuous and small scale, therefore, the capacity of aquifers in the area is generally low.

#### (2) Potential of Aquifers

Based on the specific capacity obtained by the test boreholes and the existing borehole records, the yield for the respective hydrogeological unit has been assessed in Table 1.2.5. The table shows that the high potential area is located in the north-west of Kiboga where Gneiss Complex and Bugada-Toro System are distributed, and the estimated average yield is 2.1 to 2.5 $m^3$/hr.

The second potential area is distributed in Mubende which is underlain by Mityana Series. Two test boreholes were dry, however, it is believed that high yield will be obtained when siting and drilling methods are built firmly.

The low potential area is located in the west and centre of Mubende where Buganda-Toro System is distributed. Buganda-Toro System in the area is mostly composed of deep and fine grained rocks, such as schist, phyllite and amphybolite, and yield is low even aquifers in coarse sandstone or cracky quartzite.

Successful rate of boreholes are estimated from the existing borehole records and test boreholes as shown in Table 1.2.5. The successful rate differs in the geology and location as shown in the table, that is, Buganda-Toro System in Mubende is lowest and Gneiss Complex in Mpigi is highest. The rate, however, is affected largely by siting method, drilling technique and drilling experiences in the area. The rate will be improved when technique of above three points are built firmly.

The rate in each district estimated is as follows:

| District | Successful Rate |
|---|---|
| Mpigi | 80% |
| Mubende | 60% |
| Kiboga | 70% |

### (3) Surface Water

Small scale dams are proposed for the low groundwater potential villages. Inflow to dams per unit catchment area is calculated as follows:

The data of mean monthly rainfall, runoff coefficient and evapotranspiration evaluated in above paragraph, 1.2.1. Water Balance, are employed for the estimation of mean inflow (see Table 1.2.6.). Runoff coefficient is 21.4%. The results of calculation of inflow are shown in Table 1.2.6. The table shows that the peak of inflow are during March-May and August-November.

Table 1.2.6. reveals that cumulative inflow from unit catchment area to a dam reaches 171,000 $m^3$/year.

**Table 1.2.6. Inflow per Unit Catchment Area**

| Month | Rainfall in Kiboga (mm) | Evapotranspiration in Kiboga (mm) | Inflow ($1000m^3/km^2$) | Cumulative Inflow ($1000m^3/km^2$) |
|---|---|---|---|---|
| Jan. | 5.8 | 7.0 | 0 | 0 |
| Feb. | 82.3 | 23.0 | 12.69 | 12.69 |
| Mar. | 98.8 | 26.4 | 15.49 | 28.18 |
| Apr. | 116.8 | 46.2 | 15.11 | 43.29 |
| May. | 276.4 | 61.9 | 45.90 | 89.19 |
| Jun. | 19.3 | 18.4 | 0.19 | 89.38 |
| Jul. | 82.3 | 22.3 | 12.84 | 102.22 |
| Aug. | 117.3 | 43.1 | 15.88 | 118.10 |
| Sept. | 74.7 | 36.5 | 8.17 | 126.27 |
| Oct. | 109.7 | 58.4 | 10.98 | 137.25 |
| Nov. | 226.8 | 64.1 | 34.82 | 171.53 |
| Dec. | 5.3 | 6.4 | -0.24 | 171.29 |
| Jan. | 5.8 | 7.0 | -0.26 | 171.03 |
| Total | 1215.5 | 413.6 | | |

(4) **Rainwater Resources**

A study of the rainwater balance was carried out in order to evaluate the potential of rainwater harvesting in the study area.

The daily rainfall records in the selected consecutive years which include the most drought year at Entebbe (1985 to 1987), Mubende (1983 to 1984) and Kiboga-G (1969 to 1971) stations were used for the study. The effective daily rainfalls were estimated as 0.9 of rainfall more than 1.0 mm/day.

The water consumption and roof area of typical household were assumed to be 0.10 $m^3$/day (5 person x 0.02 $m^3$/day) and 40 $m^2$ respectively.

Differential mass-curves of water balance are shown in Figures 1.2.2. to 1.2.4. The required storage capacity of rain-tanks is deemed the minimum value of a mass-curve.

Thus, the capacities of rain-tanks per typical household reach to 13 $m^3$ in Entebbe, 9 $m^3$ in Mubende and 15 $m^3$ in Kiboga. The figures show that the rainwater harvesting system is to be applied to a supplemental measure but not to the substantial rural water supply system.

RAIN FALL AMOUNT (mm) IN ENTENBE FROM 1985 THROUGH 1994

| YEAR | RAIN FALL AMOUNT, mm |
|---|---|
| 1985 | 1421.20 |
| 1986 | 1248.60 |
| 1987 | 1686.60 |
| 1988 | 1785.60 |
| 1990 | 1540.40 |
| 1992 | 1274.40 |
| 1993 | 1332.80 |
| 1994 | 1673.70 |

DAILY CONSUMPTION OF RAIN WATER ADJUSTED TO 0.1 CUBIC METER (FAMILY OF FIVE)
STORAGE CAPACITY ADJUSTED TO A ROOF AREA OF 40 SQUARE METERS

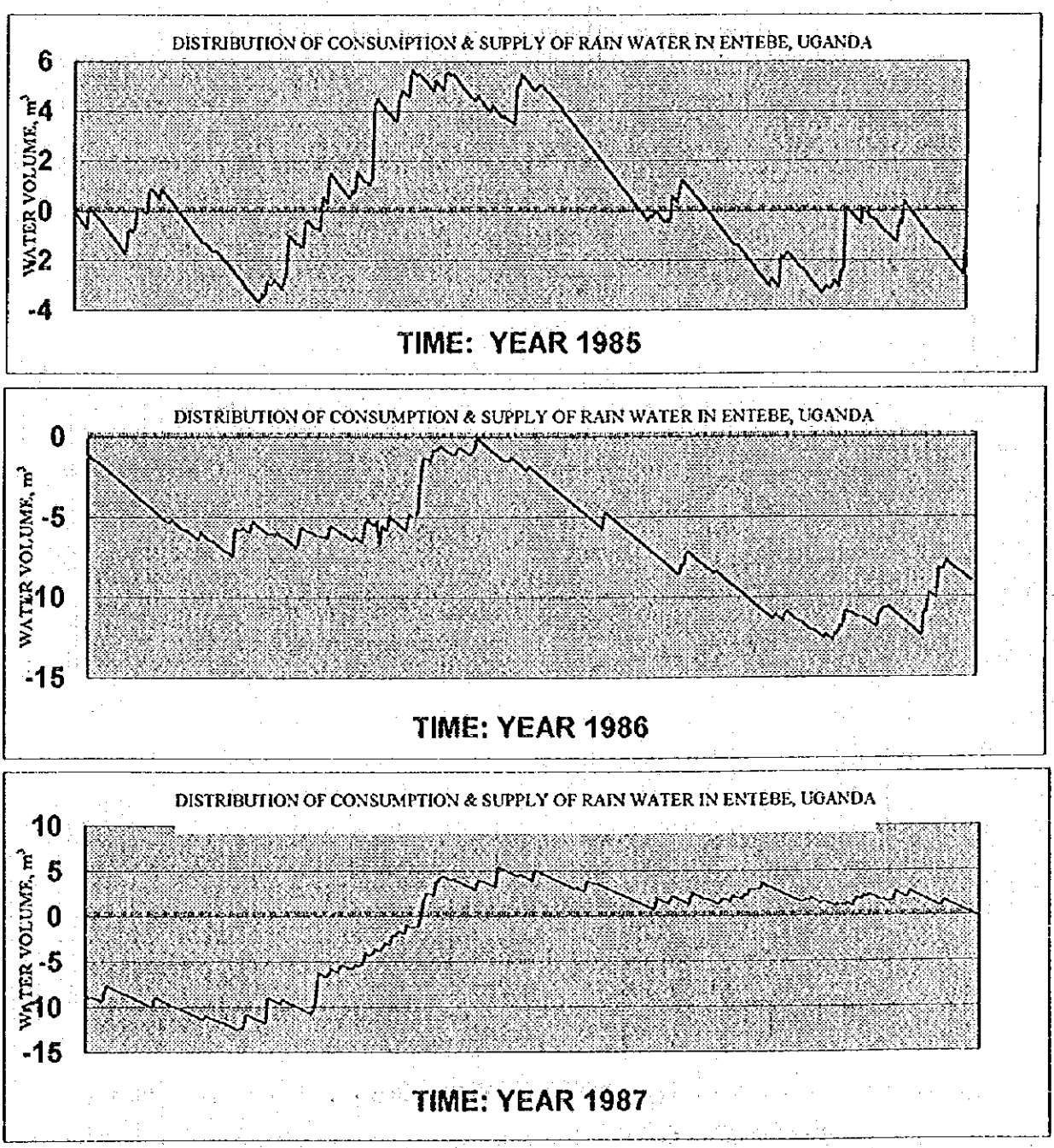


**Figure 1.2.2. Differential Curves of Rain Water Balance at Entebbe, Uganda for 1985, 1986 and 1987 Calendar Years**

RAIN FALL AMOUNT (mm) IN MUBENDE FROM 1982 THROUGH 1995

| YEAR | RAIN FALL AMOUNT, mm |
|---|---|
| 1982 | 798.5* |
| 1983 | 1000.80 |
| 1984 | 1114.70 |
| 1989 | 1189.10 |
| 1990 | 1276.70 |
| 1994 | 1249.10 |
| 1995 | 1123.80 |

**Insuficient Data*

DAILY CONSUMPTION OF RAIN WATER ADJUSTED TO 0.1 CUBIC METER (FAMILY OF FIVE)
STORAGE CAPACITY ADJUSTED TO A ROOF AREA OF 40 SQUARE METERS

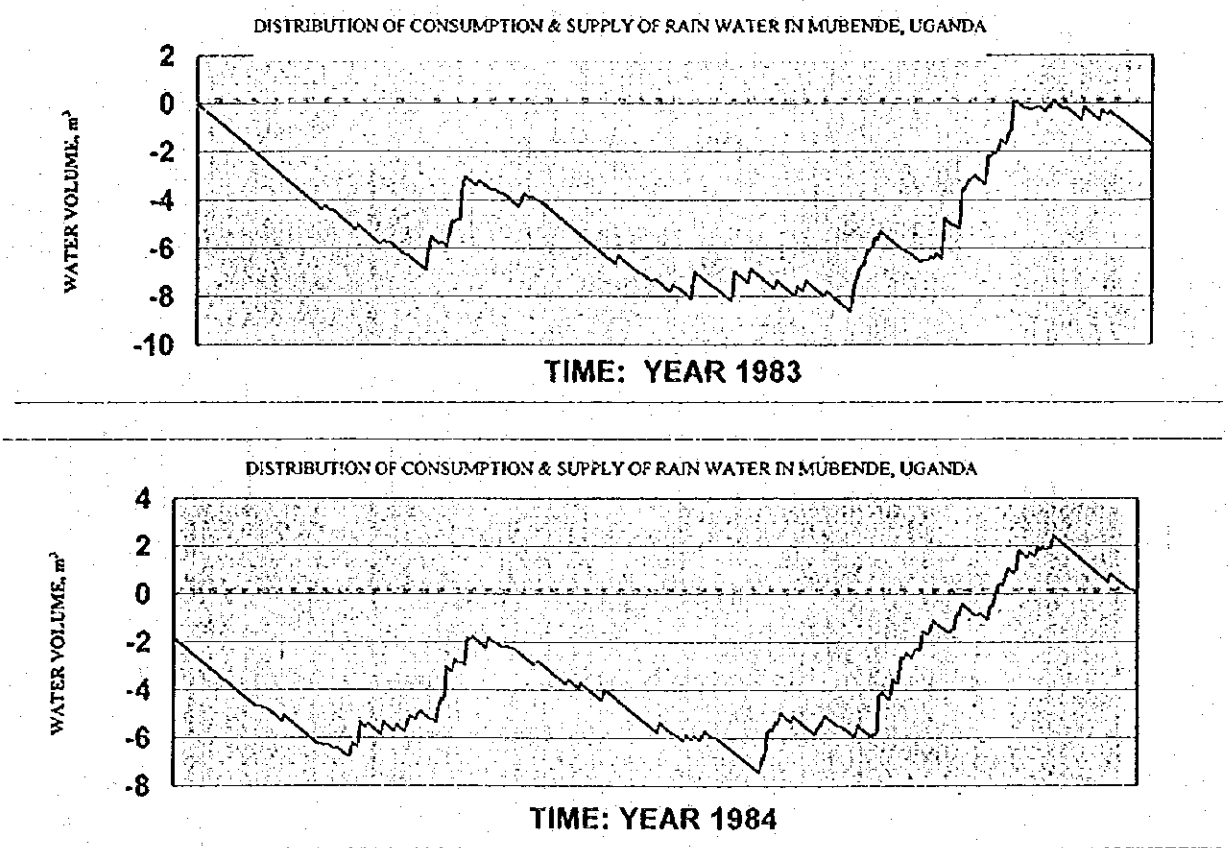


**Figure 1.2.3. Differential Curves of Rain Water Balance at Mubende, Uganda for 1983 and 1984 Calendar Years**

RAIN FALL AMOUNT (mm) IN KIBOGA-G FROM 1944 THROUGH 1977

| YEAR | RAIN, | YEAR | RAIN,m | YEAR | RAIN,m | YEAR | RAIN,m | YEAR | RAIN,mm |
|---|---|---|---|---|---|---|---|---|---|
| 1944 | 1229.90 | 1952 | 843.00 | 1960 | 881.40 | 1968 | 1047.20 | 1976 | 923.20 |
| 1945 | 770.90 | 1953 | 100.60 | 1961 | 1493.30 | 1969 | 1089.80 | 1977 | 1002.60 |
| 1946 | 890.30 | 1954 | 1053.60 | 1962 | 1031.20 | 1970 | 753.60 | | |
| 1947 | 967.00 | 1955 | 712.70 | 1963 | 1280.50 | 1971 | 1139.80 | | |
| 1948 | 1049.50 | 1956 | 1204.70 | 1964 | 1274.90 | 1972 | 1780.50 | | |
| 1949 | 774.70 | 1957 | 1073.90 | 1965 | 1005.40 | 1973 | 1225.60 | | |
| 1950 | 1283.70 | 1958 | 991.90 | 1966 | 1209.50 | 1974 | 970.10 | | |
| 1951 | 2080.30 | 1959 | 1045.50 | 1967 | 1365.80 | 1975 | 1037.80 | | |

DAILY CONSUMPTION OF RAIN WATER ADJUSTED TO 0.1 CUBIC METER (FAMILY OF FIVE)
STORAGE CAPACITY ADJUSTED TO A ROOF AREA OF 40 SQUARE METERS

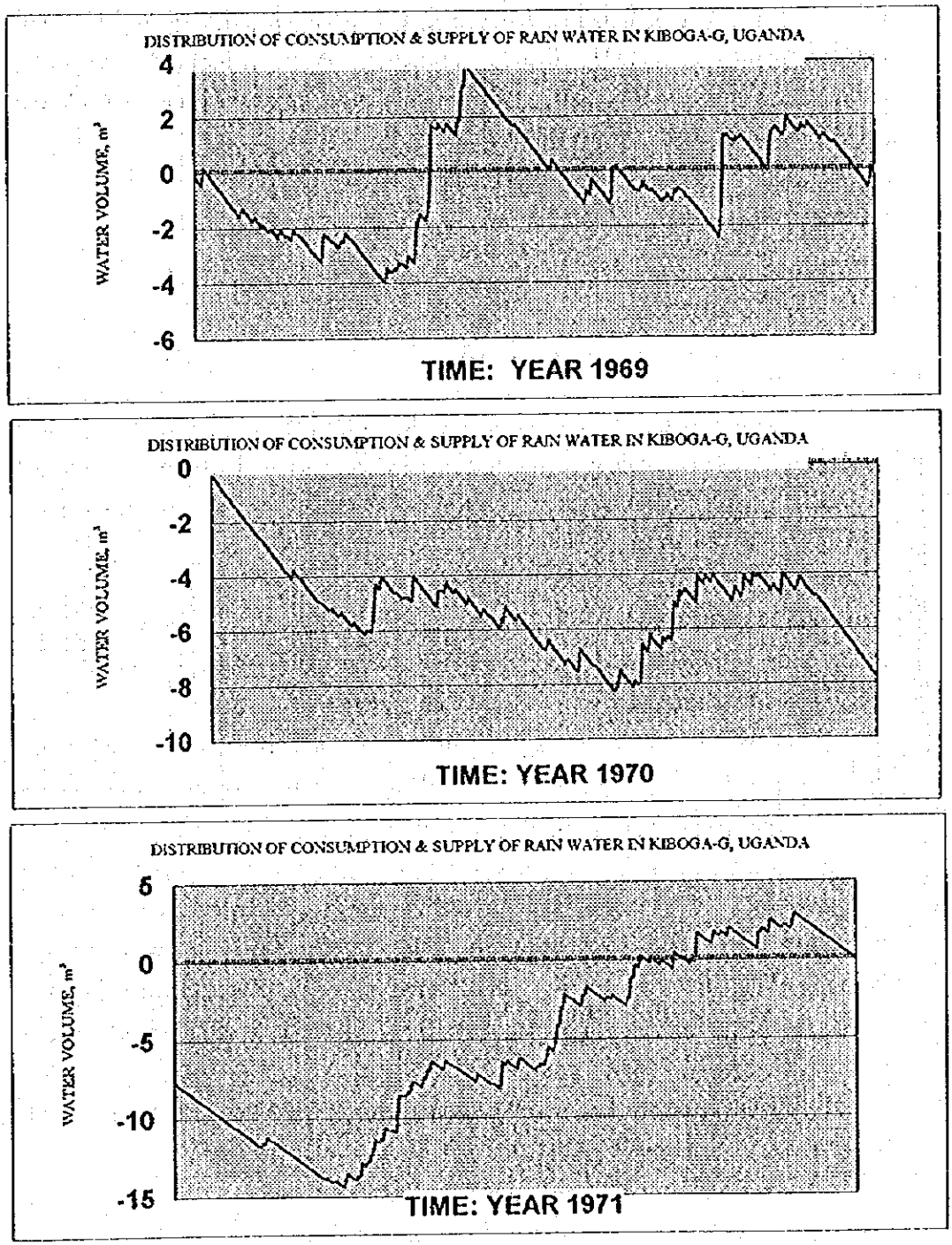


**Figure 1.2.4. Differential Curves of Rain Water Balance at Kiboga-G, Uganda for 1969, 1970 and 1971 Calendar Years**

## 1.3. Environmental Impact Assessment

### 1.3.1. Introduction

During the Stage One, the initial environmental study is carried out based on the Guideline of Environmental Consideration for Groundwater Development prepared by JICA. Two items are classified in class C by the scoping which means that detailed impact by facility construction is unknown at present and further study is required. The items are (1) Vested water rights and (2) Groundwater Quantity and Quality.

The detail study on the selected two items is performed in Stage Two and recommendations are made.

### 1.3.2. Vested Rights

**(1) Terms of Reference**

Unknown impact factor on vested rights by facility construction is: when a borehole is drilled nearby a shallow well, the reduction of yield of the existing shallow well is expected, and TOR is: study of construction method and design of shallow well, hydrogeology and possibility of the influence by drilling.

**(2) Conditions of Shallow Well**

Shallow well is normally dug manually in soft layers, and the digging stops when the bottom of the hole encounter with rock. Maximum depth of the hole generally does not exceed 20 m and the wall is protected by reinforced concrete rings. Majority of shallow wells do not equip handpump. Numbers of shallow wells with handpumps are 11 and without handpump are 60 in the project area.

Those wells are normally constructed along streams, and pump water in alluvium and/or highly weathered bed of rocks. The water quality of many wells is muddy in colour and smelled, especially in rain season, because of infiltration of muddy surface water. Some of them are dry during dry season in which many rivers are dried up. Influence radius by pumping will not exceed more than 20 m considered from maximum depth and observation of utilising conditions of users.

It is considered that some boreholes will be constructed near shallow wells and give water level influence when adequate borehole design is not applied.

(3) Recommendation

1. confirmation of location and aquifer of shallow well
2. appropriate borehole design, that is, installation of blank casing more than 30m and cement grouting of 6 m below ground surface.

### 1.3.3. Groundwater Quantity and Quality

(1) Term of Reference

Unknown impact factor is: when new boreholes are constructed in the area where boreholes are concentrated in limited area, the influence on water quantity and quality is expected by those new boreholes, and

TOR is: identification of those areas and survey present conditions, and study of natural conditions, such as topography, hydrogeology and so forth.

(2) Identification of the Area and Their Conditions

Mityana town in Mubende District and Kiboga town in Kiboga District are identified as boreholes are concentrated in limited areas and environmental impact is expected.

(a) Mityana Town

Three boreholes are proposed in the town. The town is the highly populated commercial area and has one private piped water supply facility, and has already 16 boreholes and eight protected springs, however, half of the existing boreholes are not functioning at the time of October 1995.

Ten boreholes including two private motoring boreholes exist within 3 $km^2$ in the town centre. Water level of ten boreholes measured in October 1995 are 2 to 11.5 m lower than the DWD record measured immediately after the construction. Although long term measurements of water level are needed for the evaluation of present groundwater potential in the town, drop of the water levels comes presumably from concentration and overpumping of the existing boreholes.

(b) Kiboga Town

The area has three functioning boreholes and six boreholes are newly proposed, and these are located within 1.5 $km^2$. The town has also piped water supply facility for the hospital of which source is springs and many protected springs. The groundwater potential in the area is low and water quality is poor as stated in Chapter 1.1.4. It is considered that new six boreholes will affect the present groundwater conditions.

### (3) Recommendation

As mentioned in the previous paragraph, the existing boreholes in Mityana and Kiboga town will be influenced by the new boreholes in both water quality and quantity. Alternative water resources should be designed in both town in stead of borehole construction.

## 1.4. Groundwater Monitoring

Increasing population and poor water supply conditions in the study area will require a number of boreholes in the future. As mentioned in the Chapter 1.3., some town's groundwater table is affected by overpumping. Groundwater conservation management is necessary to allow groundwater development within a permissible limit and to avoid such case mentioned above. Groundwater potential in the area is low, therefore, monitoring of water level, rainfall, river runoff and groundwater quality are required for sustainable groundwater development.

A monitoring system required is as follows:

| | | |
|---|---|---|
| - rainfall; | representative points in the districts | 1 stations |
| - river runoff; | representative rivers in the study area | 5 catchment areas |
| - groundwater level; representative basin | | 10 stations |
| - water quality; representative basin | | 10 stations |

# CHAPTER TWO : SOCIAL ENVIRONMENT AND USER'S PARTICIPATION

## 2.1. Existing Social Environment

### 2.1.1. Existing Social and Environmental Health in the Study Area

The present environmental health conditions in the project area are unsatisfactory from a health and hygienic point of view. A large percentage (70 percent) of the population live under crowded conditions in mud houses with poor ventilation, especially in Kiboga (81 percent), but also in Mubende (73 percent) and Mpigi (60 percent). Poverty with poor housing conditions and crowding enhance the transmission of disease. Especially if the hygiene is poor.

Hygienic practices require knowledge, but they also require water. The majority of the project population has access to a protected water source, but walking distances are often long and the availability of water poor, in both quantity and quality. Few people within the project area have access to an improved water source, with plenty of water all year around. Further in areas with cattle, it is not uncommon for animals and human to share the water source.

The prevalence of diarrhoea is high in the study area, due to inadequate access to safe water, inadequate sanitation, crowding, poverty and poor hygiene practices. The inventory study found that about 20 percent of all families had a member, who had had diarrhoea last week.

Poor environmental sanitation with unhygienic disposal of human excretae, garbage and refuse is common practices through out the project area. This enhance the breeding of flies and other vectors of disease. Malaria is highly prevalent in the study area. To some extent due to poor environmental sanitation enhancing the breeding of the malaria mosquitoes close to housing areas. The morbidity and mortality due to malaria is high, especially in the non-immune; children under five and "immigrants".

Malaria and diarrhoea are among the leading causes of mortality in the study area[1], and along with intestinal worms and upper respiratory tract infections further among the five leading causes of morbidity in the project area.

Malnutrition is an other prevalent problem, mainly due to inadequacy of food, lack of knowledge and increased exposure to infections. Malnutrition enhance the susceptibility to infections. Infections decrease absorption and/or increase metabolism. Infections enhance malnutrition. The self-reinforcing "malnutrition-morbidity circle" is established. Chronic malnutrition (stunting) is a more prevalent problem than acute malnutrition (wasting), but the problem is less recognized, as the stunted child have normal proportions, but height for age measures far below the ideal.

The combined high prevalence of malaria and malnutrition is the main reason for the high prevalence of anemia, especially in children under five and "mothers to be". The high mortality, especially from severe anemia is a major problem in the study area.

Also the prevalence of intestinal worms are high especially where poor sanitation, poor hygiene, poverty and crowding enhance the chance of infection and reinfection. Other helminthic infections are bilharzia, which are endemic in certain areas where people use streams as alternative water sources.

The incidence and prevalence of upper and lower respiratory infections is high, due to crowding, poor housing with poor ventilation and poverty.

In conclusion: The majority of the morbidity and mortality in the study area is poverty related and could have been prevented or benefited from early identification and cure with basic treatment. Better housing, clean water in plenty, appropriate sanitation, the use of mosquito nets and a well balanced adequate daily diet are all factors which, combined through community development, would have a large impact on the health and soico-economi in the study area.

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[1] Excluding HIV and AIDS

### 2.1.2. Hygiene Education

The WATSAN/WES project under UNICEF has attempted to integrate hygiene education in all activities, but in general hygiene education is not consistently conveyed to the communities in the study area.

The tap of all handpumps (U1 to U3) do not fit the jerry cans used for water collection. Most communities therefore use simple a tract made from the top of an old plastic bottle as a funnel. The tract, which rarely is cleaned, is often left on the ground or used for drinking.

The plastic jerry can, most commonly used for water collection, is rarely washed. Further they are difficult to clean, and hence, mainly remain clean as long as they are new.

Most HH (85 percent) stated that the jerry cans used for water collection remained with their original lid. But it was the general impression, when seeing the water collectors in the village, that most jerry cans had no lids, and it was not at all uncommen to see a dirty local banana stuck into the opening of the jerry can as a lid.

Improved access to safe water will naturally enhance the living conditions for some of the people in the project area. But for others the distance to the water source might not decrease considerable, and the saving in time spend on water collection might be limited.

In areas where traditional water sources are within shorter walking distance, these might be preferred. This should be prevented through hygiene education leading to improved awareness of the diseases related to these sources. The transmission of water-based and some water-related vector-borne diseases, such as bilharzia can be decreased this way.

The provision of a water supply with improved quality of drinking water will prevent the transmission of water-borne diseases provided that the water supply remains safe, and the individual practices appropriate water hygiene, so that the water does not get contaminated when collected or stored in the home.

An improved water supply can get contaminated if poorly maintained and operated. The motivation of the community to maintain and protect their water source is therefore of critical importance, not only to ensure a sustainable reduction in water borne diseases, but

also to prevent an increase in the incidence of water-related vector-borne diseases by avoiding stagnant water around the water source, which serves as a breeding ground for mosquitoes.

Finally, a water supply with plenty of water within a short walking distance will help to diminish the burden of water-washed diseases in the community, if people are motivated through hygiene education to use more water for personal hygiene.

As all water-borne and faecal-disposal, as well as some water-based diseases, depend on contamination of the environment with human waste, not only the provision, but also the hygienic use of adequate sanitation along with improved environmental hygiene is crucial. This is only ensured through intensive hygiene education.

The installation of a safe, plentiful and easily accessible water supply combined with adequate sanitation in a rural community will have a positive health impact only if combined with effective hygiene education.

Hygiene education is the teaching of the principles of maintaining health by personal and environmental cleanliness. The concept includes hygiene education to increase the usage and coverage of sanitation. Hygiene education is of major importance; to motivate the project population for appropriate utilization and maintenance of the installed water and sanitation facilities and to ensure maximum health impact from the installed facilities.

### 2.1.3. Guideline for Sanitary Facility

The provision and use of adequate sanitation facilities is important to decrease faecal contamination of the environment. Further sanitation facilities provide privacy and protect against the rain. Increased use of improved sanitation would decrease the prevalence of worms, especially if combined with hand washing after defecation. Increased use of hygienic sanitation facilities would decrease the prevalence of hookworm, especially if combined with increased use of foot wear. But mainly, sanitation is an essential component in most water projects, as it decrease the faecal contamination of the environment. This is, especially important for protected springs and shallow wells, but also for deep water sources, such as BHs.

The promotion of rural sanitation facilities is mainly the responsibility of MOH. The Public Health rules of 1968, state that "...it is the duty of every household to provide and maintain a proper sanitary pit-latrine"... It goes on to stay that ..."any person who contravenes or fails to comply with any provision of these rules commits an offense and shall be liable." The Public Health rules of 1968 have earlier been strongly enforced by the health Inspectorate staff from MOH. This effectively ensures a high sanitation coverage, but not necessarily a high utilisation, in rural areas in Uganda.

The law is still at force, but the MOH now recommend that sanitation should be implemented through community participation as a part of over all development. The communities should be educated to achieve an awareness of the importance of sanitation for health. Once willing to improve their sanitary situation based on improved awareness, they should be enabled to plan and implement improved sanitation. To assist the implementation of this approach, the MOH's health directorate has developed "The National Sanitation Guideline".

The present National Sanitation Guidelines were developed in July 1992 by a committee chaired by the Chief Health Inspectors Office, MOH. Other participants included; the Health Education Unit and the CDD/ARI programme both under MOH, the major stakeholders in rural water and sanitation, namely UNICEF, RUWASA and DWD, representatives for Uganda's National Organisation for Community Based Health Care (UCBHCA), AMREF and AVSI.

The National Sanitation Guidelines are specially developed for rural and peri-urban areas and provide guidance on operational issues during management of sanitation activities aimed to improve the health of people in Uganda. The main strategy is to ensure community participation and involvement. The guidelines recognise that all communities have a capacity to solve their problems and must be given an opportunity to asses and analyse their problems and take action.

To maximise the use of limited resources all health intervention (including water projects) and CBHC programmes should have a component of sanitation and hygiene education should be an integrated component of all sanitation programmes. Women should be mobilised and involved. The selected technology should be appropriate; locally acceptable and affordable.

The National Guidelines provide detailed technical designs for san-plats, slabs and VIP with considerations for difficult terrain, e.g. rocky, sandy or water logged areas. HH level and Institutions. Further it includes technical designs and recommendations for the construction of other basic sanitation facilities, such as refuse and waste water disposals.

Most water projects earlier demanded a certain percentage of sanitation coverage before the installment of improved water sources could take place in the community. Sanitation was a pre-condition for water. This increased coverage, but not utilisation.
Presently most projects aim to promote improved sanitation in the community through health education, to enhance the awarenees of the importance for health and increased utilisation. The suggested technology should be at a cost the community can afford, therefore, it has become increasingly common to broaden the concept of hygienic latrines at HH level, to include the improvement and hygienic use of traditional latrines, in addition to the improvement of excreta disposal facilities by installation of a san-plat. The use of hygienic traditional latrines are by most projects seen as an improvement when compared to the existing situation. It is therefore expected to have a positive impact on the health of the population. The National Guidelines recommend the san-plat for use at HH level if affordable, else improved traditional latrines.

### 2.1.4. Sanitation and Environmental Hygiene

The Health Inspectorate in the MOH has developed standardized national sanitation guidelines. The guidelines include general recommendations and detailed designs for sanitation plat-forms (san-plats), slabs and VIP. These guidelines are presently being revised and adapted to decentralisation. The main strategy is promotion of improved latrines and environmental sanitation through health education. The chosen approach should ensure community participation and fully utilise the potential community resources.

The main pre-fabric designs for sanitation are; (1) cement and ferro-cement sanitation plat forms (san-plats) and (2) concrete slabs. Both has a small squat holes, "foot steps" and a lid. Both san-plats and slabs are easy to clean, safe for even small children and re-useable. The small squat hole prevents children from falling into the pit. The "foot-steps" enable the visitor to "hit the hole" even in darkness. The lid prevents flies from entering the pit. The technology has been found to be in agreement with traditional technology.

Due to their lighter weight and lower production costs, san-plats are recommended, as the most appropriate technology for household sanitation. In areas with termites, slabs are, however, often used as san-plats.

Slabs are properly more durable than san-plats, but expensive to produce and difficult to transport, due to a much higher weight. Hence, they are mainly recommended for use in Ventilated Improved Pit-latrines (VIP) for institutional latrines. These VIPs has a ventilation pipe. This minimize the odours and number of flies found in latrines with numerous users, were the use of a lid, is not always the practice.

Full or partial support is provided for construction of latrines in public premises, especially at primary schools and health facilities. This is done to promote the use of hygienic improved latrine facilities.

The GOU has encouraged privatisation of the manufacturing and selling of san-plats and slabs, but san-plat and slab production is heavily subsidized. These construction subsidies are regulated through the GOU. It is the aim to eliminate all subsidies by year 2000.

Presently san-plats and slabs are produced from central or decentralised district based casting yards. District based casting yards with no technical and administrative support from donors or NGO often face severe production difficulties. Main reasons being limited poorly paid staff with limited technical qualifications, lack of transport and lack of a continuous adequate supply of construction materials. Distribution of san-plats and slabs within the district is often also problematic, due to lack of transport and poor curing leading to a high percentage of breakage during transport. Hence, decentralisation of production to one or more so-called decentralised casting yards within the district has been recommended. Decentralised casting yards are, however, not independent, but rely heavily on district facilities and resources. The outcome is, therefore, often a minimised to none production of reduced quality san-plats or slabs from these yards.

To ensure women's participation some projects have involved women's groups in the production of san-plats and slabs. The project then purchase the products at production cost and re-sell at subsidized prices to HH level. This is, however, not sustainable .The privatisation of sanitation still awaits a market demand for a successful implementation. Presently it is expected that the demand for pre-fabric sanitation designs will decrease when subsidies are eliminated and the consumer has to pay full cost. The concept of

improved hygienic latrines has, therefore, recently been broadened to include the improvement and hygienic use of traditional latrines. The hygienic use of traditional latrines is an improvement as compared with the present sanitation situation. The improvement of traditional latrines with a simple cement floor padded directly on the dirt ground facilitate the daily cleaning. The use of a lid on the drop hole keep flies away and a small drop-hole ensure that the improved traditional latrine is safe for even small children. The long-term effect might then be an increased demand for pre-fabric sanitation facilities, easy to use and clean , safe for children and re-usable.

### 2.1.5. Existing Water Supply and Sanitation

#### (1) Donors and International NGOs Active in WES-Activities in the Study Area

WES-UNICEF is the main "external" actor within the water and sanitation in the study area in all three districts (please refer to chapter 2.5). Only one International NGO is presently working within the WES-UNICEF umbrella programme, namely: Associazionale Volontari per il Servizio Internationale (AVSI) in Mpigi.. Other international NGOs with WES activities in the study area are; Action Aid Uganda (AAU) and the Italian Cooperation for Development (ICD) and World Vision International (WVI) and FOSCIV.

**(a) Associazionale Volontari per il Servizio Internationale (AVSI)**

AVSI is an Italian NGO, which assists WES activities in Mpigi from 1994 to 1997. They plan to protect 180 springs, construct 30 shallow wells, rehabilitate 154 BHs, cast and sell 3,500 latrine slabs, construct 170 demo latrines and train local staff to support the development of a CBMS in the district. The majority of equipment and materials is provided by UNICEF, AVSI gives technical and administrative assistance to district WES staff.

**(b) Action Aid Uganda (AAU)**

AAU is an European International NGO active in Mityana (since 1982) and Buwekula County (since 1988), both in Mubende. AAU works, through indigenous NGOs, in coordination with the district. AAU has protected 180 springs in Kakindu, Busimbi and Butayunja SC (Mityana County) About 50 of these springs are working another 20 has been made into shallow wells. AAU has, through community participation, constructed 36 valley tanks/dams with shallow wells in Kasambya and Kitenga SC in Buwekula County. During the present phase-out until 1998, AAU aims to build local capacity for sustainability.

(c) Italian Cooperation for Development (ICD)

ICD is an Italian NGO, active in Mubende. IDA drilled 59 BHs and equipped them with U1-HPs in 1960's. Fifty of these are still functional. IDA has since assisted the district to replace all the U1 with U3 HPs (45 BHs) and rehabilitated the 30 BHs with U2.
WVI supported this with social mobilisation to establish a CBMS.

(d) World Vision International (WVI)

WVI was active under WES-UNICEF in Mubende and Kiboga from 1991 to 1993. WVI protected 356 springs in Mubende and 33 in Kiboga; constructed a district depot for spare-parts, two slab-casting yards in each district; casted 2,386 san-plats and 892 VIP slabs and built 69 VIP and 32 san-plat demo-latrines. They estimate that 1,049 HH latrines with slabs/san-plats were constructed and 1,989 traditional pit-latrines improved. WVI trained all district-extension staff; 240 caretakers and 40 HPM, 240 VWC chairpersons and 500 Community leaders. The majority of the equipment, materials and money for training was provided by UNICEF. WVI gave technical and administrative assistance.

WVI is still active in Gombe and Buwama SC in Mpigi and Bukomero SC in Kiboga. The present project focuses on improvement of primary schools and health facilities. WVI has constructed three BHs and protected one spring in Gombe SC.

(e) FOSCIV (AVSI)

FOSCIV is an Italian NGO in Hoima. FOSCIV has trained some masons in Butemba and Nsambya SC in Kiboga.

Finally Finish Aid has earlier assisted Mpigi with protection of 128 springs, construction of 42 wells and five BHs and solar power water supply at a HC.

(2) Other External Assistance Relevant for the WES Activities in the Study Area are;

(a) The National Community Based Health Care Programme (CBHC), MOH. CBHC is implemented by GOU and multiple local NGOs and women's groups throughout the study area. A key component in CBHC is WES-related activities, (b) The National programme for Control of Diarrhoeal Diseases and Acute Respiratory Infections (CDD/ARI). A key component is WES activities. The effectiveness of the ORT programme dependents on the availability of clean water and hygiene, (c) The District Health Service Project (DHSP), WB and other donors will start to support district capacity building in Mubende and

Kiboga during 1996 and Mpigi during 1997 (d) ILO has constructed 28 hand dug wells out of 40 planned in Masulita SC, (e) The National Adult literacy Programme under UNICEF and MGCD. Relevant for environmental health education.

## 2.2. The Pilot Study

### 2.2.1. Guideline for the Pilot Study

A pilot study was done to assess the impact of training on the communities willingness and ability to improve the environmental health in their community and take responsibility for the O&M of their new BH.

Five communities were included in the pilot study. The main selection criteria were:

(a) The communities selected from each district should be from the same SC.
(b) The communities should be easy accessible for drilling rig and heavy vehicles.
(c) Deep ground water should be available and hydrogeological investigations should predict successful drilling.
(d) The communities should have a stable population of 200 to 400 people.
(e) The communities should be motivated and interested in receiving a borehole.

The five communities were split into priority and pilot communities. In the three priority communities, two from Mpigi and one from Kiboga, drilling was done without any training intervention. In the two pilot communities, one from Mubende and one from Kiboga, training was given before and after drilling.

After initial information meetings with all districts, SCs, Parishes and Communities, the activities for the two pilot communities took place as follows:

(a) Baseline
(b) Training of trainers from SC and parish level
(c) BH sited, drilled and pump-tested
(d) Training of the community and selection of WUC with Caretakers.
Training of WUC, Caretakers and HPM
(e) BH fully installed

(f) Follow-up training in O&M of the WUC with caretakers, the HPM and some selected key persons from the earlier trained SC and Parish

(g) Monitoring and evaluation

### 2.2.2. Training Intervention to the Pilot Communities

The training of the pilot villages was done by two local external facilitators, specialized in PROWWESS[2], environmental health and O&M. The training materials used were internationally developed, but adapted culturally for local use. Key-persons at SC and parish level were trained as trainers during a two day course. After the BH had been successfully pump tested, the community, the WUC and the Caretakers were trained for two days. Finally a one day training in O&M of HPs were held for WUC and Caretakers after the HP had been installed on the BH. District extension workers were invited to participate in all training.

The general training covered environmental health, community participation and O&M. The participants developed a detailed plans for improvement of the environmental health in their community. This included the improved O&M of the improved water sources. The communities were taught how to select the WUC and encouraged to re-select the WUC yearly. The WUCs were further trained on management of improved water sources, e.g. collection and management of funds and preventive O&M. After HP installation they were given practical training together with the local HPM.

#### (1) Training Methodology

The main teaching methodology was a gender sensitive community participatory approach called PROWWESS. PROWWESS aim to actively involve all individuals in the group, but especially women, in decision-making and action for community development. PROWWESS is a gender oriented version of a teaching methodology, called SARAR. The five key components of SARAR is:

(a) Self esteem. The self esteem of the individuals and the group is acknowledged and enhanced. The participants recognise that they have capacity to be creative and analyse problems to find solutions.

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[2] PROWWESS stands for Promotion of the Role of Women in Water and Sanitation services. Here it is used to refer to a Community Participatory teaching methodology with focus on women.

(b) Associative strengths. The method recognises, that when people form groups, they become stronger and develop capacity together

(c) Resourcefulness. Each individual is a potential resource to the community. The method seeks to develop the resource fullness and creativity of the group and individuals seeking solutions to the problems.

(d) Action Planning. Planning for Action to solve problems, is the central method.

(e) Responsibility. The responsibility for follow through is taken by the group. Action that is planned must be carried out through responsible participation from all.

The SARAR method motivate adults to share ideas and learn new ones. The main training tool was simple paper cards with locally adapted pictures of WES related issues. The use of these cards assisted the participants, women as well as men, to gain confidence to discuss key issues and take decisions. Most training modules took place in groups followed by plenary sessions. The topics at focus were sanitation, hygiene, gender, community participation, work-planning, collection of basic information and O&M. The participants practiced the use of participatory tools in the community and learned "hands-on" O&M at the newly installed HP.

(2) **Brief Description of Training Modules.**

Below is a brief Description of the training modules in consecutive order as they took place during the training of TOTs. A more detailed description of the training modules used can be found in Appendix B-6.

**(a) Introduction**

All participants introduced them self. Participants wrote their particulars on pieces of paper and in pairs made the introductions.

**(b) Hopes and Fears**

Participants individually wrote down their hopes and fears about the workshop. Hopes and fear was discussed in a plenary session and compared with the objectives and the planned activities of the workshop. The list was used for evaluation at the end of the course.

(c) The Mapping Tool / Collection of Basic Information

Participants made a map showing the important features of their community through joint participation groups. The maps were discussed in plenary sessions. Good and bad features were identified, and proposals for improvement discussed.

(d) Faecal Routes and Barriers Tools

Through group discussions the participants arranged pictures to identify various faecal transmission routes. After identification of the faecal transmission routes pictures with barriers were fixed on each route. In plenary, participants discussed the faecal routes and barriers in a practical context within their localities.

(e) Sanitation Ladder

The participants would in groups arrange pictures of different types of different faecal disposal methods (locally available latrines) like a ladder in progression from the worst to the best. In plenary session, participants discussed the disadvantages/advantages and similarities and differences. They also located the stages where most members of the community were, and the reasons why it was difficult to climb the ladder. Participants were given a challenge to raise the sanitation coverage in their areas and on the quality of existing latrines.

(f) Safe Water Chain

The story with a gap tool, consist of two pictures of a water source. One where the water source is poorly maintained and non-functional and one where the same water source is well functioning and proper maintained. The participants are asked through group discussions to connect the two pictures, by pictures of action of steps taken to improve the poor water source. In plenary, participants discussed the reasons why the one BH was in bad state and the other in a good state. Connecting the two pictures participants came up with proposals and discussed how to keep a water source in good working condition, and how to improve a badly maintained and damaged water source. The ideas discussed were compared with the actual situation on the ground.

(g) Gender Role Analysis

Both groups get a large number of pictures showing a person doing common daily task from the area (e.g. collect fire wood, water, herd cattle, cook food, repair the HH). The one groups pictures show all tasks done by a women, the other all tasks done by a man. The groups are asked to identify the activities carried out by a man, a woman and or

jointly by both. Emphasis was laid to what participants practice in their plates. In plenary session, participants discussed similarities and differences between the group presentations. They further discussed why women have more activities than the man, and how such activities can be shared between the two to make the workloads more uniform.

**(h) Community Participation**

In groups the participants were asked to draw pictures of their understanding of community participation. The pictures were afterwards discussed in a plenary session. A summary of the concept of community participation, with emphasis on WES, was given by the facilitator.

**(i) Roles and Responsibilities**

In groups, participants listed the roles and responsibilities and in plenary discussed them and came up with a concrete list of the duties.

**(j) Working Planning**

A work plan format was introduced to participants. Who then in group produced and presented a suggestion for a simple work plan to achieve a task, e.g. improved water source.

### 2.2.3. Monitoring and Evaluation

A baseline survey was done in all five villages before intervention. The base line survey assessed the environmental health and the O&M of all water sources in the five communities. Twenty randomly selected HHs were included from each community. Data on socio-economi, environmental health and child health were collected from all 100 HHs. The questionnaires can be found in Appendix B-6.

Further a survey was done after intervention. The repeated survey measured the effect of the training on O&M at community level (e.g., the functional level of the WUCs and the caretakers, the condition of the newly installed water source)

### 2.2.4. Summary of Findings

**(1) Baseline Study**

The main findings from the baseline survey are summarised in Appendix B-5.

Age and gender were very similar in the to study samples. A larger percentage were Christians in the pilot villages, which also included more non-Ugandans. Generally the priority communities had more education and higher socio-economic status. The average number of persons per room was highest in the priority communities, which also spend more money last month on water and medicine. Nobody in the pilot communities had paid for water. The sanitation coverage, environmental and personal hygiene was lowest in the pilot communities. The differences in child health were not significant.

**(2) During Training**

The PROWWESS approach with use of locally adapted training materials was found to be a big success. It triggered off discussion among participants and brought about greater, participation of all members involved in the training, especially women. Despite that no allowances were paid , most community members showed up and continued to participate eagerly through out the course. All the issues pertaining to environmental Health and O&M were fully internalised. The participants identified the major problems in their community. They discussed the problems and prioritised the actions to be taken to improve the WES situation. They all became sensitised and aware of the importance of safe water, good hygiene and sanitation to maintain good health. They became motivated and enabled to ensure proper use and maintenance of the installed BH. District extension staff were involved in a varying degree.

**(3) During Implementation of the BH**

The drilling crew perceived the trained villages as taking a much more active part during the entire process of the BH installment.

**(4) After Training**

All trained villages have eagerly used the PROWWESS materials for training in their community. They have been interested in the installed BH and willingly participated in the training on how to operate and maintain it. They have developed detailed plans for improvement of environmental health in their community and setup three monthly targets. This is a direct result of the training, which facilitated the community decision making and planning by providing clear guidelines and encourage time related targets. They have established a WUC for the BH. The WUC has set up rules for it's function and developed guidelines for use of the BH. A fund has been established to cover future need for O&M.

The trained communities have fenced their water source, constructed a soak-away and made a floor of stones around the water source. A protective construction to prevent the "banging" of the HP during pumping has been constructed. The trained communities perceive the BH as theirs and are aware that they alone are responsible for the function and the life time span of their BH. They have established contact to the local HPM and ensured that the HPM on regular basis will service their BH.

The priority villages, have no plans for improvement of the environmental health in their area.. They have not selected a WUC committee, not set rules for use of the water source and not fenced or in any other way protected their new water source.

### 2.2.5. Conclusion

The present findings clearly show that the training has had an overwhelming effect on the communities, willingness and capacity to participate in the O&M of their BH and improve their personal and environmental hygiene.

Despite that the baseline study found the priority area to be significantly better of socio-economic than the pilot area. The pilot communities have after training with their limited resources achieved more than the non-trained communities have with their better access to resources and higher educational level.

Presently the trained communities are clearly more well organised and actively involved in their plans to improve the environmental health in their community and ensure that the installed BH will remain functional for a long time.

The small study sample and the present short monitoring time have not at present enabled the measurement of other possible differences in effect between intervention and no intervention.

# CHAPTER THREE : WATER SUPPLY AND O&M

## 3.1. Community Inventory and Target Communities

### 3.1.1. Inventory Survey

A village inventory survey was conducted for 300 target communities (villages and trading centres) in the Study Area, which were originally defined in the list attached to the Scope of Work(S/W) agreed by and between MNR and JICA.

The survey was conducted to identify the locations of the communities in the original list and to enquire the relevant information covering the following subjects to the chairpersons of the target communities and to the heads of the sampled households;

(1) Socio-economy
(2) Land use
(3) Health and Sanitation
(4) Present condition of water supply and utilisation
(5) On-going and programmed projects
(6) Village organisation
(7) WID related information, policy and institution

The enquiry was made through the questionnaire form designed previously as shown in Appendix B (Volume Three). The actual survey and analytical works were sub-contracted to a local consultant, Carl Bro Uganda Ltd.

The number of communities identified by the inventory survey was 282 in total instead of 300 in the original list. The major reasons for the difference are the following; Some communities were regrouped together in the recent consolidation of LC1's under the decentralisation policy. Also plural place names were sometimes given for a single community in the original list. Only one community name was adopted in the final list in such a case. The final list of communities in comparison with the original list is given in Appendix-1 at the end of this Volume.

### 3.1.2. Community Type and Target Communities

**(1) Community type by population size**

The community types are categorised by the population size and the existing water sources for the communities. The communities are grouped by four population sizes as below and summarised in Table 3.1.1.

(a) 200 or less
(b) 201 to 600
(c) 601 to 1,000 and
(d) 1,001 or above.

**TABLE 3.1.1. Number of Communities by Population Size**

| District | ≦200 | 201-600 | 601-1000 | 1001< | Total |
|---|---|---|---|---|---|
| Mpigi | 3 | 60 | 26 | 7 | 96 |
| Mubende | 4 | 60 | 29 | 3 | 96 |
| Kiboga | 10 | 65 | 10 | 5 | 90 |
| Total | 17 | 185 | 65 | 15 | 282 |
| % | 6.1 | 65.6 | 23.0 | 5.3 | 100.0 |

From this table it can be seen that about two-thirds of the rural communities have a population of 201 to 600 people.

**(2) Community by availability of safe water sources**

Communities are also categorised on the basis of availability of safe water sources. A safe water source is here considered to be the boreholes, the wells with handpumps, the protected springs or the gravity fed systems. Numbers of villages are counted according to the number of such safe water sources. The results are indicated in Table 3.1.2.

As to the availability of boreholes only 9.2% of the surveyed communities have working boreholes. The same for wells with handpumps, protected springs and gravity fed systems are 3.2, 10.3% respectively. Combining the above four sources of safe water, the overall availability of safe water for the three Districts are 23%, 27% and 30% for the study communities in Mpigi, Mubende and Kiboga Districts respectively. The average for all three districts is 26.6%.

TABLE 3.1.2. Number of Communities by Number of Safe Water Sources

| **Boreholes (working)** | | | | | | |
|---|---|---|---|---|---|---|
| No. of Boreholes | 1 | 2 | 3 | 4 or more | Total | % |
| Mpigi | 9 | 2 | 0 | 0 | 11 | 11 |
| Mubende | 8 | 1 | 0 | 0 | 9 | 9 |
| Kiboga | 5 | 1 | 0 | 0 | 6 | 6 |
| Total | 22 | 4 | 0 | 0 | 26 | 9.2 |
| **Well with Handpump (working)** | | | | | | |
| No. of Wells with Pumps | 1 | 2 | 3 | 4 or more | Total | % |
| Mpigi | 4 | 1 | 0 | 0 | 5 | 5 |
| Mubende | 2 | 1 | 0 | 0 | 3 | 3 |
| Kiboga | 1 | 0 | 0 | 0 | 1 | 1 |
| Total | 7 | 2 | 0 | 0 | 9 | 3.2 |
| **Protected Spring (working)** | | | | | | |
| No. of Protected Springs | 1 | 2 | 3 | 4 or more | Total | % |
| Mpigi | 5 | 0 | 0 | 1 | 6 | 6 |
| Mubende | 10 | 2 | 0 | 0 | 12 | 12 |
| Kiboga | 8 | 2 | 1 | 0 | 11 | 11 |
| Total | 23 | 4 | 1 | 1 | 29 | 10.3 |
| **Gravity Fed System (working)** | | | | | | |
| No. of Gravity Sys. | 1 | 2 | 3 | 4 or more | Total | % |
| Mpigi | 0 | 0 | 0 | 0 | 0 | 0 |
| Mubende | 2 | 0 | 0 | 0 | 2 | 2 |
| Kiboga | 4 | 3 | 1 | 1 | 9 | 10 |
| Total | 6 | 3 | 1 | 1 | 11 | 3.9 |
| **Total Safe Water Sources (working) (Boreholes, Wells with Handpumps, and Protected Springs and Gravity Fed Systems)** | | | | | | |
| No. of Water Sources | 1 | 2 | 3 | 4 or more | Total | % |
| Mpigi | 18 | 3 | 0 | 1 | 22 | 23 |
| Mubende | 22 | 4 | 0 | 0 | 26 | 27 |
| Kiboga | 18 | 6 | 2 | 1 | 27 | 30 |
| Total | 58 | 13 | 2 | 2 | 75 | 26.6 |

(3) **Trading Centres**

2 trading centres from each district i.e., a total of 6 in the Study area were pointed out as being particularly populous and thus meriting special attention. As a result of the inventory survey the following data were found as to the population of each trading centre.

**Table 3.1.3. Trading Centres and Population**

| Community | | District | (1) | (2) | (3) |
|---|---|---|---|---|---|
| No. | Name | | orig.pop | inv.pop | 2005-pop |
| 1216 | Kasangati | Mpigi | 2000 | 600 | 780 |
| 1419 | Wakiso | // | 2000 | 3000 | 3897 |
| | | | | | |
| 2119 | Kasambya | Mubende | 1500 | 800 | 1087 |
| 2201 | Kassanda | // | 1800 | 1700 | 2309 |
| | | | | | |
| 3109 | Bukomero | Kiboga | 3000 | 806 | 1072 |
| 3117 | Ntwetwe | // | 2000 | 524 | 697 |

Note: (1) orig.pop: No of population given in the original list.
(2) inv.pop: No. of population found by Inventory Survey.
(3) 2005-pop: No. of population projected in 2005.

The population of these trading centres with the exception of Wakiso and Kassanda is more or less the average size. Although Wakiso and Kassanda have a rather high population, further analysis showed that these could also be treated in the same manner as other communities. (Refer to Chapter Four)

(4) **AfDB Programmed Communities**

Mpigi and Mityana Towns fall under the Small Towns Project of DWD and are awaiting funds from the African Development Bank. Thus these towns are excluded from the present Study.

**Table 3.1.4. AfDB Projected Towns**

| Community | | District | (1) | (2) | (3) |
|---|---|---|---|---|---|
| No. | Name | | orig.pop | inv.pop | 2005-pop |
| 1502 | Mpigi | Mpigi | 500 | 8191 | 10640 |
| 2308/9 | Mityana | Mubende | - | 950 | 1291 |

Note: (1) orig.pop: No of population given in the original list.
(2) inv.pop: No. of population found by Inventory Survey.
(3) 2005-pop: No. of population projected in 2005.

### (5) Communities with Test Boreholes

During the present Study period 5 communities received test boreholes which were turned into services boreholes with handpumps. The following Table 3.1.5. indicates the names and population of these communities

**Table 3.1.5. Communities with Test Boreholes**

| Community | | District | (1) | (2) | (3) |
|---|---|---|---|---|---|
| No. | Name | | orlg pop | inv.pop | 2005-pop |
| 1217 | Seeta | Mpigi | - | 300 | 390 |
| 1218 | Magere | Mpigi | - | 400 | 520 |
| 2409 | Bekina | Mubende | - | 800 | 1087 |
| 3145 | Ssinde | Kiboga | 226 | 280 | 372 |
| 3146 | Kawaawa | Kiboga | 312 | 320 | 425 |

Note: (1) orig.pop: No of population given in the original list.
(2) inv.pop: No. of population found by Inventory Survey.
(3) 2005-pop: No. of population projected in 2005.

By constructing these boreholes water need for 4 communities was satisfied. But Bekina (No. 2409) with its population of 1087 forecast for 2005 could not be satisfied with only one borehole, which covers only 430 people. The remaining population of 657 (=1087-430) are still to be counted for supply of new facilities.

### (6) Target Communities

In due consideration of the above paragraphs the communities and their population to be excluded from the planning are summarised in Table 3.1.6.

**Table 3.1.6. Communities and Population by District Excluded from Planning**

| Community | | District | Population 2005 |
|---|---|---|---|
| No. | Name | | |
| 1217 | Seeta | Mpigi | 390 |
| 1218 | Magere | // | 520 |
| 1502 | Mpigi | // | 10640 |
| **Mpigi subtotal** | | 3 comm. | 11550 |
| 2409 | Bekina* | Mubende | 430* |
| 2308/9 | Mityana | // | 1291 |
| **Mubende subtotal** | | 1 comm.* | 1721 |
| 3145 | Ssinde | Kiboga | 372 |
| 3146 | Kawaawa | // | 425 |
| **Kiboga Subtotal** | | 2 comm. | 797 |
| **(Grand Total)** | | 6 comm. | 14068 |

Note*: One test borehole was constructed in Bekina (No.2409) which supplies water to 430 people. Out of total population of 1087 (year 2005) still 657(=1087-430) are to be given water sources. Therefore, Bekina is not excluded as a community but only the number of population is reduced by 430.

The target communities and population are thus calculated by subtracting the communities and population given in Table 3.1.6.

The result is shown in Table 3.1.7.

**Table 3.1.7. No. of Target Communities and Population by District**

| | No. of Communities | Population in 2005 |
|---|---|---|
| Total MPIGI DISTRICT | 96 | 87650 |
| Mpigi excluded | 3 | 11550 |
| Mpigi balance(Target) | 93 | 76100 |
| Total MUBENDE DISTRICT | 96 | 72723 |
| Mubende excluded | 1 | 1721 |
| Mubende balance (Target) | 95 | 71002 |
| Total KIBOGA DISTRICT | 90 | 58488 |
| Kiboga excluded | 2 | 797 |
| Kiboga balance (Target) | 88 | 57691 |
| Grand Total (3 Districts) | 282 | 218861 |
| Grand Total excluded | 6 | 14068 |
| Grand Total balance (Target) | 276 | 204793 |

## 3.2. Facilities and Equipment

### 3.2.1. Planning Criteria

The Scope of Work and the related Minutes of Meeting agreed by and between the Preparatory Study Team, JICA and the Ministry of Natural Resources, GOU specified that:

1) Target Year of plan : 2005

The designed population sizes of target communities are to be projected for the year 2005 based on those estimated in 1995. The annual population growth rates adopted for the projection in the three project districts are 2.65%, 3.11% and 2.89% for Mpigi, Mubende and Kiboga Districts, respectively

2) Basic Water Supply Rate : 20 lcd

The basic water supply rate per capita per day is to be 20 litres for each of the service population in the target communities.

3) Maximum Distance of Facility Coverage : 1.5 km

The maximum distance of coverage by any water supply facility is to be 1.5 km.

Besides the above, other criteria are necessary to formulate the project plan as below:

4) Basic Capacity of Handpump : 900 l/hr

An average pump capacity taking an average water-head (30m) and lesser strength of some operators (women or children) into account, the basic handpump (U3 pump) capacity is to be 900 l/hr.

5) Operating Efficiency of Handpump : 0.8

The operating efficiency of handpump is to be 80% of basic capacity taking the idle time during changing of pump operator into account.

6) Designed Capacity of Handpump : 720 l/hr

Based on (4) and (5) above, the designed capacity of handpump becomes

: 720 l/hr (900 l/hr x 0.8).

7) Pump Operating Hour per Day : (a standard case) 10 hr/day

: (an extreme case) 12 hr/day

In an ideal case, the pump operating hour per day is 8 hr (4 hr in the morning and another 4 hr in the evening). In view of the "some for all, and not more for some" principle, 10 hr/day in a standard case and 12 hr/day in an extreme case are to be taken in the Study.

8) Water Supply Capacity per Handpump : (a standard case) 7,200 l/day

: (an extreme case) 8,640 l/day

From (6) and (7) above, the water supply capacity per handpump per day becomes 7,200 l/day (720 l/hr x 10 hr/day) in a standard case and 8,640 l/day (720 l/hr x 12 hr/day) in an extreme case.

9) Service Population per Handpump : (a standard case) 360 to

: ( an extreme case) 432

Based on (2) and (8) above, the service population per handpump (borehole since a handpump is to be equipped with a borehole) becomes :

360 (7,200 l/day/20 lcd) in a standard case and

432 (8,640 l/day/20 lcd) in an extreme case.

10) Selection of Casing and Handpump Material

The results of water laboratory test sampled from boreholes reveal that more than 80 % of samples are over DWD permissible limit in the value of colour and total iron. The reason of high value is derived from the concentrations of pH, total alkalinity, calcium, sulphate, chlorride and bicarbonate which are the parameters relevant for corrosion on galvanized iron. The limit of values of the parameters are not decided, however, the results of the laboratory test indicate that materials of handpump and casing are corroded in more than 80 % of the boreholes. PVC for casing, stainless steel and brass materials for handpumps are to be used.

11) Successful Yield of Borehole : (a standard case) 720 l/hr

: (an extreme case) 360 l/hr

From the item (6) above, any borehole which yields 720 l/hr of safe water is deemed to be successful in a standard case. It is not reasonable in a financial view to give up any drilled borehole which yields less than 720 l/hr. Therefore any borehole which yields 360 l/hr or more is deemed to be a half (0.5) borehole to cover a service population up to 216.

12) Successful Rate of Borehole

A successful rate (or a dry hole rate) of borehole is necessary to estimate the project cost. The rate is evaluated to be 80 % in Mpigi, 70 % in Kiboga and 60 % in Mubende through the review of past drilling records and the test borehole construction (refer paragraph 4.3.2 Potential of Aquifer).

13) Mininum Community Size for Borehole Facility: 150

In view from the cost per performance and O&M cost of a borehole facility, the minimum community (population) size shall be 150 in the target year of 2005. Those community which is less than this size shall be allocated another type of water supply facility.

14) Allocation of Number of Borehole by Community Size:

The number of borehole to be allocated by community size is as per Table below:

Allocation of Number of Borehole by Community Size

| No. of Borehole | Community (Population) Size | | |
|---|---|---|---|
| 1 | 150 | to | 430 |
| 2 | 431 | to | 860 |
| 3 | 861 | to | 1,290 |
| 4 | 1,291 | to | 1,720 |
| 5 | 1,721 | to | 2,150 |
| 6 | 2,151 | to | 2,580 |
| 7 | 2,581 | to | 3,010 |
| 8 | 3,011 | to | 3,440 |

The actual numbers of BH facility are to be finally decided taking the service population by the exisitng safe water source(s), if any, into account.

15) Application of Stand-Pipe System

The stand-pipe system is to be examined in those communities which are densely populated and available groundwater sources are scattered. The system is to be adopted only in case that the initial cost is in a reasonable extent and O&M cost is affordable to the users.

The power sources for the system, such as commercial power, diesel generation, solar power, wind power, and so forth will be carefully examined in order to minimise the O&M cost.

### 3.2.2. Facilities

The available water sources were taken into consideration for planning new facilities for the Study area. Water taken from boreholes, wells with pumps, protected springs and gravity fed schemes are considered to be acceptable water. For improvement of water supply condition, the unprotected springs are proposed to be rehabilitated, upgraded and made proper facilities. If there still exist water shortage, then the dugwells without pumps shall be rehabilitated and upgraded by redigging, bailing or renewal and then equipping them with handpumps. If water is still insufficient for the community, new boreholes are proposed to supply water to the remaining villagers. If boreholes are not possible due to lack of groundwater or for other reasons, other alternatives are proposed such as valley, dams, piped water system, rain harvest, etc., depending on the geophysical, geographical and demographic conditions. The above process is tabulated in Appendix C-2 and the summary is as follows;

No. of Proposed Water Supply Facilities and No. of Communities

( ): No. of communities

| | Mpigi | Mubende | Kiboga | Total |
|---|---|---|---|---|
| No. of BH | 162 (70) | 164 (77) | 120 (65) | 446 (212) |
| Rehabilitation of Unprotected Spring | 57 (31) | 65 (33) | 65 (31) | 187 (95) |
| Rehabil. of Handdug Well | 37 (19) | 20 (11) | 4 (1) | 61 (31) |
| Valley Tank | 5 (5) | 8 (8) | 0 (0) | 13 (13) |
| Stand Pipe System | 0 (0) | 0 (0) | 1 (1) | 1 (1) |
| Total No. of Facilities | 261 (94) | 257 (95) | 190 (87) | 708 (276) |

## 3.3. Operation and Maintenance (O&M)

### 3.3.1. Strategy for "Intervention"

**(1) National Level**

The project will follow the national guidelines for the WES sector provided by DWD.

At national level the project will coordinate with the GOU and liaise with UNICEF and other relevant NGOs or donors working in the sector.

**(2) District Level**

The District Administration will be responsible for implementation of the national policies and guidelines set forward by the DWD.

At district level the project will liaise with the CAO, the RDA, the DMO and other Donors or NGOs active in WES or CBHC activities within the project area.

The project will work in coordination with the WES staff at district level (DHI, DCOD, DWO and BHMS).

**(3) SC, Parish and Community Level**

SC, parish and communities are to be well informed and committed to the project.

The SC are to be responsible for selection of HPM and smaller sparepart dealers based on project guidelines.

The SC and Parishes are to assist in training and coordination of communities in planning, development and monitoring of water schemes.

Contractors will be responsible for construction of water schemes

A consultant is to be responsible for the design and supervision of the water points, siting, training of trainers and facilitators. Monitoring and evaluation.

### 3.3.2. Outline of Project Strategy

The main project strategy will be:

1) Project implementation based on a demand driven approach
2) Priority to be given to areas most in need and willing to participate
3) Communities should be enabled to plan, develop and manage their own WES resources
4) The training strategy will aim at strengthen the community's (especially women's) management capacity of development and WES resources.
5) Preventive O&M
6) Improvement of the existing sanitation situation through health education and the use of local available resources

### 3.3.3. Time Schedule for Implementation of Activities

The broad outline for the activities will be as follows:

1) Training of Facilitators
2) Training of Trainers at SC and Parish level by Facilitators
3) Training of Communities by the SC and Parish trainers
4) Baseline monitoring at Community level by SC and Parish trainers
5) Community dialogue for selection of water point site
6) Formation of WUC
7) Implementation and construction of water points

8) Training of WUC, Caretakers and the HPM by facilitators
9) Commissioning of water supply facility
10) Continuous planning, monitoring and evaluation by the communities

### 3.3.4. Community Management Training

All training should focus on empowering and enabling the project communities to manage the WES development activities in their community.

The training methodology will be PROWESS, a gender sensitive Community participatory approach

The training should be done in consecutive small segments.
The first segment should take place before implementation of any improved water source. It should focus on mobilisation and empowerment of the communities.
The communities should be encouraged to be self reliant and get fully involved in the planning and managing of all WES activities in their area.

The communities understanding of the importance of improved water hygiene and sanitation for better health, should be strengthened.

The communities should be encouraged to take an active role in the development of better environmental health in their community and raise a "demand".

It is essential that the community demand is expressed in a way, which indicate a willingness and ability to maintain the improved water source. Some basic indicators are that the community commit themselves to form a WUC and select caretakers. That the selected WUC obtain the requirements for one year's operation and maintenance and make agreement with a HPM on preventive O&M. The Community should also make plans to increase the coverage of hygienic latrines and improve on their household hygiene.

The second segment of training should take place after the improved water source has been installed. The focus should be on the functionality and duties of the WUC, caretaker, the HPM and the O&M of the improved water source.

It will be necessary that the HP is fully installed before second training segment take place, as part of the training will be practical demonstrations on O&M of the BH. The focus should be on preventive O&M.

Follow-up support and monitoring of WES activities in the communities are essential for success. The district extension workers and trained local council or other important district personnel should use any opportunity to follow-up and provide advice to local communities.

### 3.3.5. Manpower

The project focus will be human resource development of SC, Parish and community staff, as well as the private sector.

SC and Parish level leaders will be trained as trainers of the communities.

### 3.3.6. Gender

Women should be encouraged to play influential roles in the management of WES activities in their community

Women should be encouraged to take the position as chair persons in the WUC or become HPM

### 3.3.7. O&M

The O&M of the improved water source should be the responsibility of the users, the focus should be on preventive O&M

The WUC shall be elected by the local Community after siting of the water point. The WUC should have minimum six members. It is recommended that 50 percent be women, and preferable the chairperson should be a women.

Already trained and active HPM should as far as possible be used, in areas with no HPMs, HPMs should be selected by the SC or Parish WES committee and be send for training. Training of HPMs should take place at a selected technical school. The project will be subsidize the training of female HPM with 50 percent.

Spareparts should not receive any subsidies.

The distribution should be privatised. Interested larger hardware dealers within the district should be trained in sparepart needs for O&M and be encourage to start a wholesale. HPM, WUC and smaller hardware dealers within the district should receive similar training and be encouraged to purchase spareparts from the district based wholesale.

### 3.3.8. Sanitation

Support to the sanitation sub-sector should be through health education promoting the construction of improved latrine facilities and general environmental sanitation. This will prevent pollution of the installed water sources.

Improvement of Household sanitation facilities should be manageable at village level. Initially the aim will be to mobilise the communities to construct traditional latrines and improve the existing ones (smeared, hygienic, with lid and a good superstructure). This is achievable and manageable for even the poorest village, through use of simple local materials. Once the need for improved latrines are created, there might be a marked for privatisation of sanplat or slabs.

### 3.3.9. Monitoring and Evaluation

The monitoring and evaluation system should be community based. The community should only collect data that is easy to obtain and useful for their own management of local WES resources, e.g. total number of HH with none, traditional or improved latrine, Total number of clean HH, the O&M of the Water supply facility.

## 3.4. Institutional Strengthening

### 3.4.1. Governmental Levels

#### (1) National Level

The project will follow the national guidelines for the WES sector provided by DWD. At national level the project will coordinate with the GOU and liaise with UNICEF and other relevant NGOs or donors working in the sector.

(2) District Level

The District Administration will be responsible for implementation of the national policies and guidelines set forward by the DWD. At district level the project will coordinate with the WES staff (DHI, DCOD, DWO and BHMS). The project will liaise with the CAO, the RDA, the DMO and Donors or NGOs active in WES and CBHC activities within the project area.

(3) SC, Parish and Community Level

SC, parish and communities are to be well informed and committed to the project. The SC are to be responsible for selection of HPM and smaller sparepart dealers based on project guidelines. The SC and Parishes are to assist the communities.

Community leaders are to assist, train and coordinate the communities planning, development and monitoring of water schemes and improved environmental hygiene.

### 3.4.2. Private Sector

Contractors will be responsible for construction of water schemes.

A consultant is to be responsible for the design, siting and construction supervision of the water supply facilities. The Consultant is also to be responsible for training of community level trainers, monitoring and evaluation.

### 3.4.3. Project Strategy

The project use a gender sensitive community participatory approach to train available human resources at Community level. The focus of the training is to enable the communities to plan, develop and manage their own WES resources. Special attention and additional training is given in the area of O&M of BH with HPs, to motivate the Community for preventive O&M. Health Education is considered crucial. Health Education enhance the community's understand for the link between water, sanitation and health. This motivate the community to take better care of their BH and improve their environment, through use of locally available resources. The combined effect is better environmental health

### 3.4.4. Project Activities

The sequential order for the activities to take place, are outlined below:

1) Training District Facilitators.
   Responsible: The Training Facilitators in coordination with the District.
2) Information and mobilisation of District, SC, Parish and Communities.
   Responsible: The Consultant and the Local Council from LC5 to LC1.
3) Selection of Hand-Pump Mechanics in SCs without.
   Responsible: The SC.
4) Community dialogue for selection of water point sites.
   Responsible: LC3, LC2, the Community and the drilling contractor.
5) Training of HPMs
   Responsible: The Training Facilitators and a Private Training Institution
6) Implementation of water points
   Responsible: The Drilling Contractor
7) Training of Trainers at Community level
   Responsible: The Training Facilitators

8a) Training of the Community
8b) Baseline monitoring at Community level
8c) Formation of the WUC
   Responsible (8a-c): The Community Trainers

9a) Construction of Water Facilities
9b) Continuos training of HPMs.
   Responsible (9a-b): The Drilling Contractor

10) Training of the WUC
   Responsible: The Community Based Trainers
11) Training of the Caretakers.
   Responsible: The Training Facilitators.
12) Commissioning of water supply facility
   Responsible: The Community
13) Continuous planning, monitoring and evaluation
   Responsible: The Community
14) Selection of Spare Part Dealers
   Responsible: The SC
15) Training of the Sparepart Dealers

Responsible: The Training Facilitators.

### 3.4.5. Human Resource Development and Institutional Strengthening

Presently the project focus on human resource development at community level. Community leaders will be trained as trainers of the community and the WUC. Local people will be trained as HPMs to do preventive O&M. Local hardware dealers will be trained as Sparepart dealers.

Like in most other WES projects, the essential coordination between the drilling-works and the training of the communities is problematic. Community training is slow, whereas the implementation of BHs is comparably faster. The training facilitators will, therefore, be required to invest full time on training activities to keep up with the drilling works. This exclude the use of the district based extension staff, as day to day facilitators. Especially due to their present limited numbers and their already heavy workload. The project will therefore use external project facilitators. These project facilitators will work in close cooperation with the District Extension Staff. The support of district staff to the project communities is, however, considered essential for success. It is, therefore, the plan to involve the existing district extension staff, as much as their present workload allow them. District extension staff will be trained as facilitators and encouraged to use any opportunity to follow-up and provide advice to the local communities. If possible the BHMS and the DWO should get actively involved in the training for O&M. This will enhance a sustainable support to the project communities at the end of the project.

## 3.5. Project Cost Estimate

The Project Cost consists of the following;

### (1) Facilities Construction

The unit construction costs and the numbers of the water supply facilities are as follows (Unit Cost and amount are as of 1995):

| Facility | Unit Cost | No. | Amount (US$) |
|---|---|---|---|
| i) Borehole with handpump (successful) | $14,500 | 446 | $6,467,000 |
| ii) Borehole (dry) | $9,240 | 134 | $1,238,160 |
| iii) Shallow well with handpump: | $3,770 | 61 | $229,970 |

| | | | |
|---|---|---|---|
| iv) Protected spring: | $2,300 | 187 | $430,100 |
| v) Valley dam: | $75,860 | 13 | $986,180 |
| vi) Level II system: | $298,760 | 1 | $298,760 |
| Sub-Total | | | $9,650,170 |

**(2) Procurement of Equipment**

The number and costs for the equipment necessary for maintenance of the facilities

| | | | |
|---|---|---|---|
| i) Station wagon : | $20,000 | 5 | $100,000 |
| ii) workshop equipment for BMU: | $20,000 | 1 | $20,000 |
| iii)Servicing rig for BMU incl. winch, compressor, tools : | $30,000 | 1 | $30,000 |
| iv) Water analysis kit for District water labs : | $7,000 | 3 | $21,000 |
| Sub-Total | | | $171,000 |

**(3) Assistance for Training Intervention**

i) TOT (Training of Trainers) and Training of WUC (Water User Committee) incl. remuneration, allowances and transport of trainers as well as training materials L.S. $420,000

ii) Training of Handpump Mechanics incl. one week class room, 4 weeks on-the-job training, plus supply of tools and bicycles. L.S. $26,000

Sub-Total $446,000

**(4) Total of (1), (2) and (3)** = $10,267,170

**(5) Engineering Fee**
(10% of Total (4) ) = $1,026,717

**(6) Administration Fee**
(5% of Total (4) ) = $513,359

**(7) Total (4+5+6)** = $11,807,246

**(8) Contingency**
(10% of Total (7) ) = $1,180,725

**(9) Grand Total**
(Total ( (7) + (8))

Grand Total = $12,987,971

say $13,000,000

## 3.6. Project Implementation Plan

### 3.6.1. Organisation

Implementation of the project shall be carried out by contracting a consultant and a contractor. The executing agency for implementation shall be the DWD of the Ministry of Natural Resources.

The consultant shall be responsible to conduct the detailed designs, prepare tender documents, assist the DWD in carrying out the bidding and in contract process with the contractor, to conduct the training interventions, siting for the water facilities and construction supervision.

The contractor is responsible to provide all necessary equipment, materials and labour force and to construct facilities.

### 3.6.2. Project Components

The project consists of the following components covering three districts;

(a) Governmental training intervention,

(b) Engineering works;
- Detailed design and preparation of tender documents,
- Siting of borehole and other water facilities,
- Assistance for tendering for construction contract,
- Construction supervision,

(c) Construction works of facilities inclusive of equipment procurement;
- Equipment procurement,
- Mobilisation,
- Borehole construction,
- Spring protection,
- Rehabilitation of shallow wells,
- Valley dam construction,
- Construction of Level-II system.

The numbers of facilities allocated to each district are as below:

**Table 3.6.1. Number of Facilities and Communities by District**

| | Mpigi | | Mubende | | Kiboga | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Facility | Comm'y | Facility | Comm'y | Facility | Comm'y | Facility | Comm'y |
| BH | 162 | 70 | 164 | 77 | 120 | 65 | 446 | 212 |
| BH dry | 32 | 70 | 66 | 77 | 36 | 65 | 134 | 212 |
| Well | 37 | 19 | 20 | 11 | 4 | 1 | 61 | 31 |
| Spring | 57 | 31 | 65 | 33 | 65 | 31 | 187 | 95 |
| Level-II | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| Val.Dam | 5 | 5 | 8 | 8 | 0 | 0 | 13 | 13 |
| Total | 261 | 93 | 257 | 95 | 190 | 88 | 708 | 276 |

Notes: (a) Number of communities is counted plurally.

(b) Successful rates of borehole by District are; 0.80 in Mpigi, 0.60 in Mubende and 0.70 in Kiboga.

(c) Total of facilities excludes dry BH's.

### 3.6.3. Packaging

From the viewpoint of smooth construction sequence, the factors to be considered are constructional mobilisation, proximity among the construction sites, access to the sites, distance to materials depots, etc. Hence it is desirable to proceed with the works by certain size of area whereby the site locations are conveniently and geographically grouped together. Besides, the present project is closely connected to the district and the lower levels of the local government. From this consideration the best results can be expected if the construction sequence follows the administrative units of each district.

### 3.6.4. Prioritisation

The required total number of facilities by district is in the order of Mpigi (261), Mubende (257) and Kiboga (190). While, the destitution in the existing water supply coverage by district is in order of Kiboga (17%), Mpigi (22%) and Mubende (24%). The successful rates of borehole by district are in order of Mpigi (0.80), Kiboga (0.70) and Mubende (0.60).

From the socioeconomical point of view the followings observation has been made. Mpigi district stretches encircling the capital, Kampala, and economical interdependence with the capital is the largest among the three districts. Also the population growth is being accelerated for this reason. The development of the infrastructure is on the other hand lagging behind compared to the above-mentioned changes. Shortage of water supply facilities especially is becoming one of the most serious and impending problems. Considering the above factors Mpigi district is to be given the first priority.

An international highway is running through MUBENDE District connecting the Ugandan capital and Kabalore. Two big towns are thriving on this route, namely, Mubende and Mityana Towns. Other communities of this district is influenced one way or another by the economical and communal development prompted by the existence of the highway and the activities of the two big towns. In this sense the establishment of clean safe water facilities is important as one of the infrastructures.

In spite of all above factors, Mubende district is planned to be tackled at the end of the project after Kiboga district. The reason is that the geological conditions of Mubende district is somewhat different and proved to be very difficult in terms of finding groundwater, as found out by the test boring during the present Study period. It is, therefore, recommendable to gather sufficient experience and information on the behaviour of groundwater in this region by proceeding with drilling works in the other two districts before embarking on the drilling of Mubende district.

### 3.6.5. Project Implementation Schedule

#### (1) General

For determination of the implementation schedule the size of the project plays a key role. In the present Project construction of both boreholes and protected springs would require longer times. With 4 work teams allocated for each of these works, the construction periods for boreholes and the protected springs become 40 and 33 months respectively. The critical path would be, therefore, the borehole construction.

In addition to the above, the period necessary for the detailed design, preparation of tender documents and tendering and contracting is required which is foreseen to be some six (6) months. Besides, two months period of mobilisation would be required for the contractor to prepare for the actual start of construction works.

(2) **Annual Working Days**

In view of natural and customary conditions in Uganda, the annual working days is estimated to be 250 days (365 - 52-Sundays - 12-holidays - 50-shutdown by rainy season).

(3) **Critical Path of Working Day by Facility**

The required working days and critical pass of facility construction are set forth as below:

- Borehole (successful); 6 days (drilling only)
- Borehole (dry); 4 days
- Spring protection; 15 days
- Shallow well; 18 days
- Valley dam; 90 days
- Level-II system; 100 days

(4) **Project Implementation Schedule**

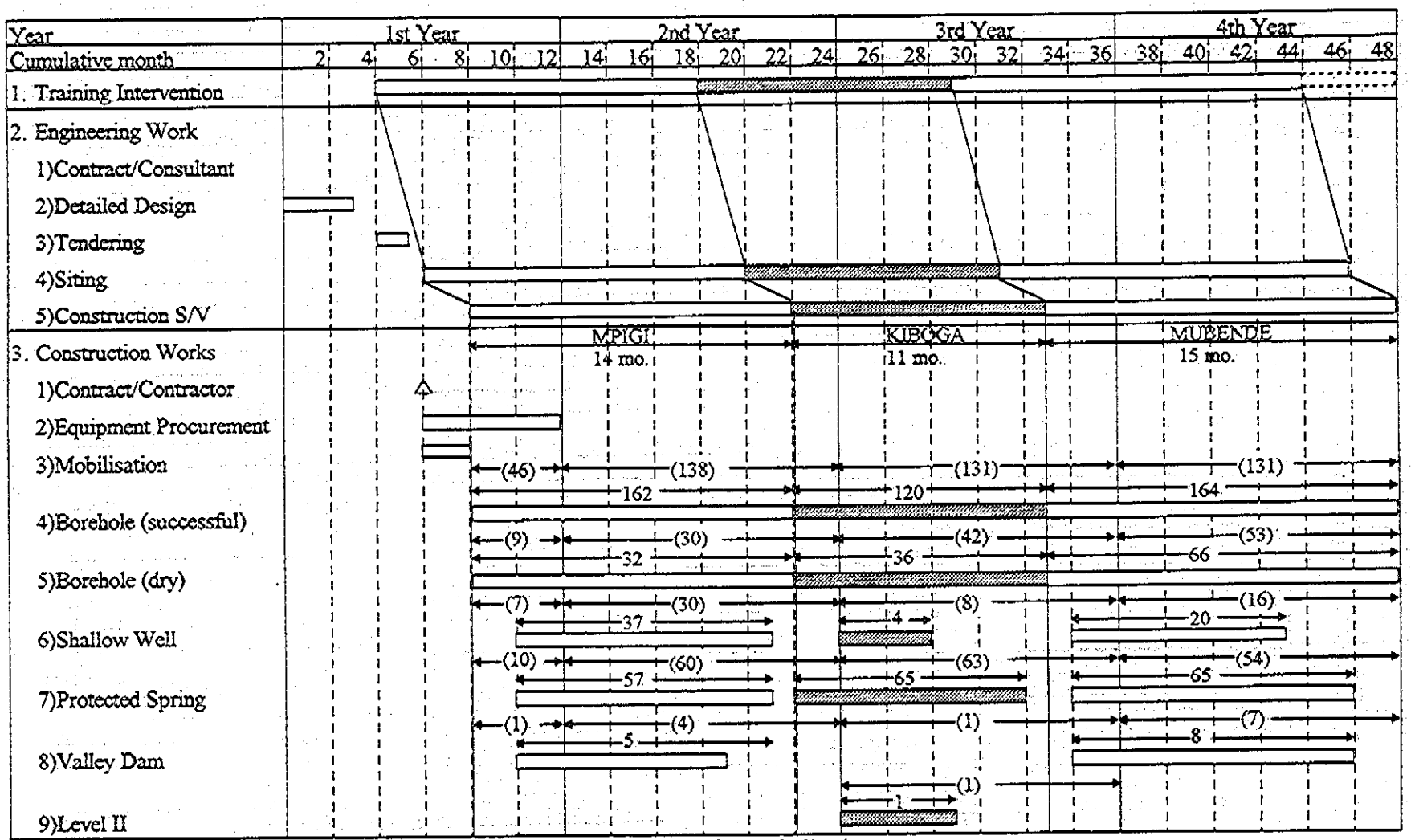
The type and number of facilities to be constructed by district and the required working days by facility are estimated as shown in Table 3.6.2.

Based on all above factors an implementation schedule of the whole project works inclusive of the interventions, the engineering and construction works is illustrated in Figure 3.6.1.

## Table 3.6.2. Required Working Period by Facility and by District

| DIST. | Facility | Borehole | | | Shallow Well | Protect Spring | Valley Dam | Standpipe System | TOTAL No.Fac. |
|---|---|---|---|---|---|---|---|---|---|
| | | successful | dry | Total | | | | | |
| | Workdays/fac | 6 | 4 | | 18 | 15 | 90 | 100 | |
| MPIGI | Quantity | 162 | 32 | 194 | 37 | 57 | 5 | | 261 |
| | Workdays | 972 | 128 | 1,100 | 666 | 855 | 450 | | |
| | Workparty | 4 | 4 | 4 | 3 | 4 | 2 | | |
| | Period(mo) | 11.7 | 1.5 | 13.2 | 10.7 | 10.3 | 10.8 | | |
| MUBENDE | Quantity | 164 | 66 | 230 | 20 | 65 | 8 | | 257 |
| | Workdays | 984 | 264 | 1,248 | 360 | 975 | 720 | | |
| | Workparty | 4 | 4 | 4 | 2 | 4 | 3 | | |
| | Period(mo) | 11.8 | 3.2 | 15.0 | 8.6 | 11.7 | 11.5 | | |
| KIBOGA | Quantity | 120 | 36 | 156 | 4 | 65 | | 1 | 190 |
| | Workdays | 720 | 144 | 864 | 72 | 975 | | 100 | |
| | Workparty | 4 | 4 | 4 | 1 | 5 | | 1 | |
| | Period(mo) | 8.6 | 1.7 | 10.4 | 3.5 | 9.4 | | 4.8 | |
| TOTAL | Quantity | 446 | 134 | 580 | 61 | 187 | 13 | 1 | 708 |
| | Workdays | 2,676 | 536 | 3,212 | 1,098 | 2,805 | 1,170 | 100 | |
| | Workparty | 4 | 4 | 4 | 2 | 4 | 1 | 1 | |
| | Period(mo) | 32.1 | 6.4 | 38.5 | 26.4 | 33.7 | 56.2 | 4.8 | |

**Figure 3.6.1. Implementation Schedule**




Notes: Figures above the graph bars indicate the number of facilities for each district.
Figures in parentheses indicate number of facilities to be constructed within each year.

# CHAPTER FOUR : SOCIOECONOMY, FINANCE AND PROJECT EVALUATION

## 4.1. The Nation

### 4.1.1. Geographical Features

Uganda is a landlocked country located in the heart of the African high plateau. It lies entirely between the two arms of the Great Rift Valley in East Africa lying astride the equator between latitudes 4° 12" N and 1° 29" S. To the west, Uganda borders Zaire. This border coincides with the western rift valley occupied from north to south by lakes Albert, Edward, George and Kivu. On this border with Zaire exist also, the Rwenzori mountain ranges the highest point of which (Mt. Marghreita) is 5,119 meters high. Further south-west between Lake Edward and Lake Kivu, there is the volcanic Muhabura range protruding, from the rift valley between 3,500 meters to 4,000 meters high. The country has a total area of 239,000 $km^2$ of which 197,000 $km^2$ is land.

### 4.1.2. Administrative Situations

The establishment of the Republic of Uganda is the Resistance Council system at present for achieving democratic decentralization. This policy of democratic decentralization was conceived in the first half of 1980's when the National Resistance Movement (NRM) was in the bush.

Under the decentralization policy, the Uganda sets two government systems, namely the Central Government and the Local Government. The development of this Decentralization Policy is reported as shown in APPENDIX D-1 in "Volume III Appendices".

The present system of democratic decentralization started in 1986 with establishment of the now familiar Resistance Councils and Resistance Committees. Since then the Government has taken actions to develop institutions and procedures which allow for autonomous decision making by local councils. Accordingly, the Local Government (Resistance Councils) Statute, 1993 is a refinement of the policy of decentralization since 1986 and a result of the desire to make local governments effective centres of local decision making, planning and development.

The nation of Uganda is divided into 39 Districts under the 4 regions. In rural areas, each District consists of several Counties, and each County is composed of Sub-Counties. Under a Sub-County, there furthermore are a kind of local communities domestically called as "Parish". Villages, the smallest administration units, are under the Parish as shown in APPENDIX D-2.

In urban areas, there are several Cities which are equivalent to Districts. Kampala is a City of them, and it is the Capital City of Uganda. A City consists of Municipalities. And, a Municipality is equivalent to a County in rural areas. Under a Municipality, there are Towns also equivalent to Sub-Counties. But, Kampala City only consists of Divisions without any Municipality. The Divisions are equivalent to Towns and Sub-Counties. A Town (a Division in Kampala City too) consists of several Wards that are equivalent to Parish in rural area. As same in rural area, Villages are under the Wards.

## 4.2. Socioeconomy of Uganda

### 4.2.1. The Whole of Uganda

#### (1) Population and Household

In these 26 years, population censuses of Uganda were conducted in 1969, 1980 and 1991. The 1980 population amounted 12,636 thousand on the increase by 3,101 thousand against 1969 population with an average annual growth rate of 2.59 %, and the 1991 population amounted 16,672 thousand on the increase by 4,036 thousand against the 1980 population with the average annual growth rate of also 2.55 %. The average annual growth rate during the period 1969 - 1991 showed 2.57 %.

On the other hand, a statistical data(1 reported a population projection. According to this data, the population as of 1995 was projected as 19,263 thousand.

The dependency ratio is high, as nearly half (about 9.6 million) as of 1995, the population is below 15 years of age. The life expectancy is 50.5 years for female and 45.7 years for male.

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(1 : Background to the Budget 1995 - 1996 -Economic Performance 1994 - 1995 and Medium
Term Strategy 1995/96 - 1997/98-, Ministry of Finance and Economic Planning.

According to the population censuses mentioned above, the average family size per household (HH) in Uganda was 4.85 persons/HH in 1991. This figure seems to be rather high comparing with a result of inventory survey for 3 Districts related to the Project made by JICA Study Team this time.

Details of population and household are shown in APPENDIX D-3 by region together with those of 3 Districts related to the Project.

(2) Ethnic Group

Uganda has over thirty ethnic communities, which can be divided into 5 broad linguistic categories, namely the Bantu, the Atekerin, the Luo, the Highland Nilotics and others called as the Madi-Moru group.

The Bantu, which contributes to 50 % or more of the population occupies the eastern, southern and western parts of the country. They are the earliest group to come to Uganda, and they comprise: the Baganda, the Banyoro, the Basoga, the Bagisu, the Banyankore, the Bakiga, the Bafumbira which is ethnically same as the Banyarwanda of Rwanda and closely related to the Batusi, the Batooro, the Bakonjo, the Bamba which they called as the Bambuti too, the Batwa which is also closely related to the Batusi in Rwanda, the Banyole, the Basamia, the Bagwe and the Bagwere.

The second group is the Atekerin, referred as the Para-Nilotics, the Lango or the Nilo-Hamites, which through migrations from Ethiopia, came to settle in the northern, the eastern and the north-eastern parts of Uganda. The group constitutes the Karimojong, the Iteso, the Kakwa and the Kumam.

The third group is the Luo, which originates from southern Sudan. They are found in the West Nile area and the northern and the eastern parts of Uganda. They constitute the Acholi, the Langi, the Alur, the Jonam and the Jopadhola.

The fourth group is the Highland Nilotics. This group of people is mainly concentrated in Kenya with the Kalenjin as the largest group. It extends to central Tanzania to include the Dadog and Otiek. In Uganda, only the Sebei belongs to this group, which inhabit the present Kapchorwa District.

The last group is the Sudanic speakers of West Nile called as the Madi-Moru group. This group constitutes: the Madi, the Lugbara, the Okebu and the Metu which is a sub-group of the Madi.

Presently it is difficult to demarcate the ethnic groups in Uganda. Colonialism, monetization, education, easy transport and urbanization have loosened the cultural ties and led to especially intermixtures, but to less extent to intermarriages. People still prefer to identify themselves by their different ethnic backgrounds. This has been the corner stone of the tribalism in post colonial Uganda.

The ethnic group by tribe, their homeland of origin, the places where they are mainly occupying in are shown in APPENDIX D-4.

**(3) Gross Domestic Product**

In 1994, Gross Domestic Product (GDP) of Uganda grew to UShs. 4,776 billion at current market price at an average annual growth rate of 55.73 % for the period 1987 - 1994, while the real annual growth rate was 5.98 % on average during the same period as shown in APPENDIX D-5.

A great difference between the 2 average annual growth rates at current market price and at 1991 constant price shown in the above mentioned table of APPENDIX D-5 seems that it means caused by high increasing ratio of price as studied in the other sub-clause hereunder.

Per capita GDP at current market price amounted to UShs. 255,657 in 1994 at the average annual growth rate of 51.35 % since 1987, and the real growth rate was 3.00 % for the period from 1987 to 1994 as shown in APPENDIX D-5. As seen in the above figure, the growth rate of per capita GDP is showing a low rate compared with that of the total GDP. This was due mainly to a high growth in population.

**(4) Import and Export**

Non-oil private imports increased by 57.4 % from US$450.2 million in 1993/94 to US$708.9 million in 1994/95. While the increment in non-oil private import has been attributed to the coffee boom which has been much stronger during fiscal year 1994/95 as compared to 1993/94, the 57.4 % increment in private imports, in absolute terms, was less than for 1993/94, when the same imports increased by nearly 60.0 %. As a percentage of

GDP, non-oil private imports increased from 11.9 % in 1993/94 to 13.4 % in 1994/95. The oil import bill increased by 22.3 % in 1994/95 as compared to a decline of 4.6 % in 1993/94.

The table of APPENDIX D-6 shows a situation of imports and export during these 14 years since 1981 excluding non-factor services. In these 2 years of 1993 and 1994, exports of merchandise goods increased by a large percentage comparing to those during the period 1987 - 1992. The amount of exports' value grew to US$402 million in 1994/95 from US$172 million. This good performance of export sector is mainly due to the dramatic improvement in terms of trade of coffee in the last 2 years. Initially, the coffee price increased by 42 % (from US$0.80 per kg to US$1.14 per kg) between 1992/93 and 1993/94, and nearly tripled to US$3.20 per kg in mid-1994 due to the frost which hit the Brazilian coffee crop. This significantly reduced the supply of coffee on the international market.

Among the imported goods during these 14 years since 1981, the commodity group of machinery and transport equipment had the highest share rate. Especially, electrical machinery was constantly increased with 18.4 % of average annual growth rate, while the import amount of transport equipment was nearly flat with some fluctuation in some years.

Among the exported goods during the same period, the commodity group of food and live animals which were led by coffee export was the highest one through the period.

(5) Industry

As shown in APPENDIX D-5 (B) mentioned in previous sub-clause, the agricultural industry contributes to the GDP about 25 % in monetary sector (when included the non-monetary sector, it contributes from 55 % to 60 % to the total GDP in Uganda) in every year since 1987. It means that the agricultural sector is the largest industry in Uganda.

There are several manufacturing commodity groups in industrial sector in Uganda as food processing, tobacco and beverages, textiles and clothing, leather and footwear, timber, paper and printing, chemical, paint and soap, bricks and cement, steel and steel products, and vehicle accessories, plastic products, electrical products and so on as miscellaneous commodity group as shown in table (A) of APPENDIX D-7.

The industrial sector, as measured by the index of industrial production, rose by 14.6 % annually from the base year of 1987 (=100.0) to 260.3 in 1994. The items which have shown strong growths include drinks and tobacco, chemicals, paint, soup, and steel products.

Production volumes of some commodities are shown in table (B) of APPENDIX D-7. Almost all commodities except jerrycans were far from their installed capacity to produce. But, plastic jerrycans have a small room for more production considering their 41 % of the average annual growth rate. The jerrycans have a lot of way to use for carrying liquid, especially for potable water in Uganda.

## (6) Consumer Price

### (a) Consumer Price

The consumer price indexes in whole Uganda and in its several cities are shown in APPENDIX D-8 with average increasing ratio. According to this Table, almost of whole country has an increasing ratio of price as about 22 % for the period from 1990 to 1994.

The highest increasing rates are that for sectors of food, beverage and tobacco, rent, fuel and utilities, transport and communication, and other goods and services. These high increasing rates of prices should press people's livelihood.

### (b) Exchange Rate

Fluctuation range of Uganda's Shilling (UShs) currency was not so much wide during these 3 years against US Dollar currency. As shown in APPENDIX D-9, against US Dollar, UShs currency has appreciated gradually since the end of 1992 to March 1995 with a rate of around 1.0 %.

However, between December 1993 and December 1994, the UShs currency (weighted bureau average) appreciated by 21.4 % and this was on top of an appreciation that had occurred when the interbank market was established on November 1993. The interbank mid-rate appreciated by 18.9 % in the same period. This correspondingly reduced the competitiveness of the export sector and made imports much cheaper at the expense of locally manufactured products.

(7) **Education**

Women in Uganda are impoverished and there are a large gender gap in education. The adult literacy rate is 48 % in males, but only 35 % in females. The total primary school enrollment was 56 % in 1980 but 47 % of these was girls (IDA, 1987). Today, it is about 70 %, 63 % of girls. The primary school attendance has increased, but drop out rate is high, especially for girls. Only 48 % of girls, but 72 % of boys enrolled in the primary school, graduate from P7 grade (MEFP, 1989).

About 12 % of children enrolled in the primary school enter into the secondary school. Only about 20 % of students graduating from the secondary school are female and only about 16 % of people with higher education are females.

(8) **Morbidity and Mortality**

Leading causes of morbidity[2] are malaria, ARI, intestinal worms, diarrhoeal disease and trauma. The leading causes of mortality[3] are malaria, diarrhoeal diseases, HIV/AIDS, ARI and nutritional deficiencies. Most of this morbidity and mortality are preventable.

The HIV/AIDS pandemic has been spreading rapidly during the years of political instability. The HIV/AIDS epidemic is likely to have a major impact on the socioeconomy of Uganda, as a large segment of the population becomes infected in the early "productive age" (15 to 45 years of age), to suffer from severe and costly morbidity before dying young. The exact impact of the HIV pandemic on demography and socioeconomy in Uganda is, however, hard to estimate, due to the poor reliability[4] of data-collection on morbidity and mortality from HIV/AIDS. The sero-prevalence of HIV in Uganda is estimated to be high especially in urban areas (25 % in Kampala) and among young women (15 to 20 years) of child bearing age. Almost six times as many females as males have HIV in the age group from 15 to 19 years, compared to only two times as many females as males in the age group from 20 to 24 years of age.

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[2] : Out-patient data from health facility statistics (1988), Ministry of Health, 1992.
[3] : In-patient data from health facility statistics (1988), Ministry of Health, 1992.
[4] : Poor reliability mainly due to poor surveillance with use of health facility statistics, suffering from under-reporting, diagnostic bias and others.

### 4.2.2. Districts Related to the Project

**(1) Population and Household**

As shown in APPENDIX D-3 in the previous sub-clause, a total population in Kiboga, Mpigi and Mubende Districts amounted 1,557 thousand in total as of 1991 with the average annual growth rate of 2.82 % since 1969 according to the 1991 Population and Housing Census. This population growth rate is slightly high comparing with that (2.57 %) of whole Uganda.

These three Districts are called Buganda in the former time indicating that most people are the Baganda, the largest single ethnic group in Uganda.

According to the said population census, the average family size per household in these three Districts is reported as 4.39 persons that is rather small scale comparing with that (4.85 persons) of Uganda.

**(2) Socioeconomic Perspective of the Districts Related to the Project**

The study area consists of three districts, namely Kiboga District, Mpigi District and Mubende District. As mentioned above, these areas form a Baganda society. This Society has classes, but no fixed social divisions and any person with talent can rise to a position of their social importance.

Socioeconomic perspectives are given below.

**(a) Kiboga District**

Kiboga District borders with the districts of Mubende in the South, Masindi and Hoima in the North, Kibale in the West and Luwero in the East with area of 4,004 km$^2$. It was formerly a part of Mubende District. The district has moderate rainfall and temperatures well enough for the growth of a number of crops.

Kiboga Town is its headquarters, and the District has 2 counties as Kiboga East County and Kiboga West County with a total of 10 sub-counties.

Main economic activity is agriculture with an emphasis on:

i) Food crops : maize, beans, groundnuts, bananas, finger millet, soya beans, sim-sim, sweet potatoes, and Irish potatoes.
ii) Cash crops : coffee, cotton, tea.
iii) Fruits and vegetables : pineapples, tomatoes, onions, passion fruits, and cabbages.
iv) Ranching with cattle : about 35,000 heads, goats : 8,500, sheeps : 2,000 and pigs : 8,300 in total as of 1992.

**(b) Mpigi District**

The District borders with districts of Mubende, Kiboga and Luwero in the North, Kampala District in the East, Masaka District in the South and Lake Victoria in extreme south with area of 6,222 km$^2$. They have about 36,000 ha of forest. Mpigi District lies at approximate altitudinal range of 1,982 m - 1,341 m above sea level receiving heavy and reliable rainfall together with relatively high temperatures. The Municipality Entebbe gets 1,513 mm of rain per annum.

The headquarters is Mpigi Town, and the District has Entebbe Municipality where it has an international airport, Buwama Town and Matuga Town with a total of 30 sub-counties.

Main economic activities are agriculture with a bias in:

i) Food crops : sweet potatoes, beans, cassava, maize, bananas, groundnuts, sorghum, soya beans, and Irish potatoes.
ii) Cash crops : coffee and cotton.
iii) Fruits and vegetables : Tomatoes, onions and cabbages.
iv) Dairy farming with about 125,000 head of cattle, 32,300 heads of goats and 11,500 heads of sheeps.
v) Fishing.

Major industries in Mpigi District are those of manufacturing of jaggery, foot wears, furniture, printing, brick making, stone quarrying, and processing of coffee, tea, and bakeries. Maganjo Maize Millers is the highest single employer with 117 employees as of 1992.

**(c) Mubende District**

The District borders with the districts of Kiboga and Luwero in the North, Mpigi in the South, Kibale in the North, Kabarole in the West and Masaka in the South with its area of

6,536 km$^2$. It lies at altitude of 1,372 m - 1,448 above sea level with high temperature and remarkably low rainfall.

Mubende Town is the headquarters, and there is a Mityana Town too as one more town level. Counties of Busujju, Buwekula, Kassanda and Mityana belong to this District with 22 sub-counties under those counties.

Main economic activities are agriculture with an emphasis on:

i) Food crops : maize, beans, sweet potatoes, Irish potatoes, groundnuts, bananas, finger millet, sim-sim, soya beans and yams.
ii) Cash crops : coffee, cotton and tea.
iii) Fruits and vegetables : Tomatoes, pineapples, passion fruits, onions and cabbages.
iv) Cattle ranching and dairy farming with cattle : 283,800 heads, goats : 5,700 heads, sheep : 26,800 heads as of 1992.

Major industries in the District are processing of coffee and tea, bread making, maize milling, brick making, printing and manufacturing of jaggery. Wamala Growers Union is the highest single employer with 120 employees as of 1992.

### 4.2.3. The Target Community

#### (1) Categories in Population Size

As a result of Inventory Survey this time, the target communities may be categorized as (1) the population size of 200 and below with share rate of 6.2 %, (2) between 201 to 600 with 64.9 %, (3) between 602 to 1,000 with 23.3 % and (4) over 1,000 with 5.6 % in the whole Project area as shown in Table below with those of each District, average family size and number of households headed by male and female and its rates:

**Table 4.2.1. Categories in Population Size in the Target Communities**

(As of 1995)

| Item | District | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total/average | | Mpigi | | Mubende | | Kiboga | |
| | In figure | (%) | In figure | (%) | In figure | (%) | In figure | (%) |
| Total population | 165,004 | 100.00 | 67,478 | 40.89 | 53,538 | 32.45 | 43,988 | 26.66 |
| Family size | 4.69 | - | 4.68 | - | 4.82 | - | 4.54 | - |
| Number of communities categorized | | | | | | | | |
| 200 & under | 18 | 6.25 | 4 | 4.12 | 4 | 4.12 | 10 | 10.64 |
| 201 - 600 | 187 | 64.93 | 59 | 60.82 | 61 | 62.89 | 67 | 71.28 |
| 601 - 1,000 | 67 | 23.26 | 26 | 26.80 | 28 | 28.87 | 13 | 13.83 |
| Over 1,000 | 16 | 5.56 | 8 | 8.25 | 4 | 4.12 | 4 | 4.26 |
| Total | 288 | 100.00 | 97 | 100.00 | 97 | 100.00 | 94 | 100.00 |
| Number of HHs headed by : | | | | | | | | |
| Male | 26,400 | 77.86 | 10,056 | 75.14 | 8,976 | 80.89 | 7,368 | 78.17 |
| Female | 7,506 | 22.14 | 3,327 | 24.86 | 2,121 | 19.11 | 2,058 | 21.83 |
| Total | 33,906 | 100.00 | 13,383 | 100.00 | 11,097 | 100.00 | 9,426 | 100.00 |

Source : Result of Inventory Survey for Communities made by JICA, 1995.

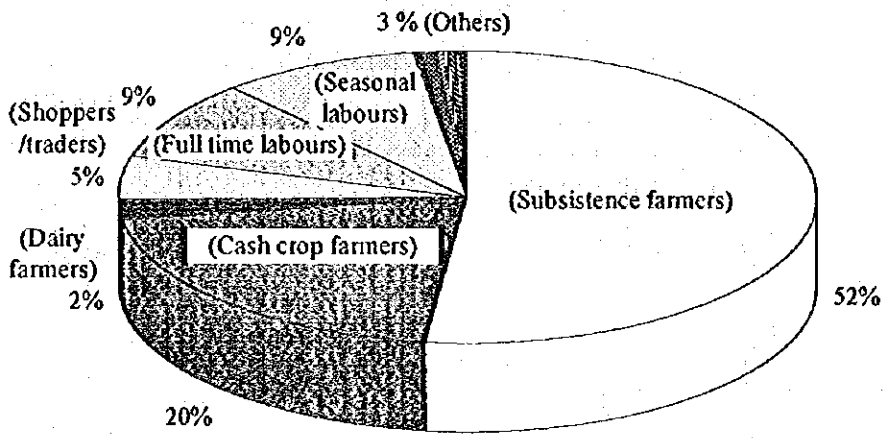
As shown in the above Table, around 21 % of households are headed by female, and the average family size is 4.69 persons consisting of 4.68 persons per HH in Mpigi District, 4.82 in Mubende District and 4.54 in Kiboga District. These family sizes are rather small comparing with other similar countries in Africa. The total population is around 166,000 in the whole Project area as of 1995.

Detail of the above is shown in APPENDIX D-10.

**(2) Major Industry**

Fig. 4.2.1 below shows a situation of occupation in the Project area based on the result of the said Inventory Survey as shown in APPENDIX D-11. According to this figure, almost 74 % of people in the Project area are engaged in agriculture including subsistence farmers, cash crop farmers and dairy farmers.

**Fig. 4.2.1 Occupation in the Project Area**




As shown in APPENDIX D-11 in detail, and its summarized Table of APPENDIX D-12, pastoralism related to the dairy farming is a high occupation rate in Mpigi comparing with the other 2 Districts as 2.1 % with 530 persons in number to the total occupation. Concerning this, Mubende has only 2 persons of pastoralists and Kiboga has only 30 persons of nomads with no any pastoralist. And only Mpigi has herdsmen related to pastoralism. Mpigi and Mubende have hunters of 50 persons and 30 persons respectively, this occupation relates to the dairy farming too.

Most animal husbandry is cattle in the Project area. In this viewpoint, a population of cattle in Kiboga is slightly higher as 38 % to the population of cattle than in Mpigi with 35 % and Mubende is the third with 28 % as mentioned in next clause on existing situation of communities.

In relating to construction industry, Mpigi and Kiboga have brick makers of 93 persons and 50 persons respectively but Mubende has none. On the other hand, Mpigi and Mubende have carpenters of 68 persons and 66 persons respectively, but Kiboga has none.

There are charcoal makers relating to the agricultural products and mechanics relating to manufacturing industry in Mpigi and Mubende, but Kiboga has no such occupation. Only

Mpigi has bark cloth makers and bee keepers, and only Mubende has black smith and cobblers.

According to a UNDP report as the Report on the Census of Business Establishments in Uganda 1989, number of establishments in whole Mpigi was 130 firms with 12,000 persons of employees but that in whole Mubende including whole Kiboga was only 70 firms with 2,000 persons of employees.

The above mentioned situation in the Project area resulted from the Inventory Survey seems to indicate the same pattern reported by UNDP.

**(3) Population, Households and Family Size**

As mentioned above, the total population in the Project area is 165,004 breaking down into Districts of Mpigi, Mubende and Kiboga as 67,478, 53,538 and 43,988 respectively as of 1995, and the total household (HH) is 37,598.

The family size may therefore be calculated as 4.02 persons per HH, 4.87 and 4.48 in Mpigi, Mubende and Kiboga respectively. The average family size in the whole Project area is then resulted as 4.39 persons per HH.

**(4) House Type**

House types in the communities are shown in APPENDIX D-13, and summarized below.

**Table 4.2.2. Number of Households by Type of House in the Target Communities**

(As of 1995)

| Item | District | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | | Average | Mpigi | | Mubende | | Kiboga | |
| | HH | (%) | (%) | HH | (%) | HH | (%) | HH | (%) |
| Number of HHs by type of house | | | | | | | | | |
| Permanent houses | 14,945 | 42.19 | 100.00 | 6,919 | 100.00 | 4,554 | 100.00 | 3,472 | 100.00 |
| With tin roof | 11,019 | | 73.73 | 5,243 | 75.78 | 3,537 | 77.67 | 2,239 | 64.49 |
| Without tin roof | 3,926 | | 26.27 | 1,676 | 24.22 | 1,017 | 22.33 | 1,233 | 35.51 |
| Semi-permanent with mud | 10,869 | 30.69 | | 4,086 | | 3,043 | | 3,740 | |
| Thatched houses | 9,607 | 27.12 | | 3,852 | | 3,386 | | 2,369 | |
| Total | 35,421 | 100.00 | | 14,857 | | 10,983 | | 9,581 | |
| Number of HHs with latrine | | | | | | | | | |
| With sanplat or slab | 1,964 | | 8.78 | 1,201 | 11.90 | 502 | 7.80 | 261 | 4.48 |
| With improved traditional | 20,394 | | 91.22 | 8,894 | 88.10 | 5,938 | 92.20 | 5,562 | 95.52 |
| Total | 22,358 | | 100.00 | 10,095 | 100.00 | 6,440 | 100.00 | 5,823 | 100.00 |
| Latrine facilitated rate (%) | 63.12 | | | 67.95 | | 58.64 | | 60.78 | |
| No of sampled communities | 285 | | | 95 | | 97 | | 93 | |
| Electric condition of community | | | | | | | | | |
| Communities with e'city | 41 | 14.39 | 100.00 | 18 | 100.00 | 14 | 100.00 | 9 | 100.00 |
| With down time | 38 | | 92.68 | 18 | 100.00 | 13 | 92.86 | 7 | 77.78 |
| No. of down time/w | 3 | | | 4 | | 4 | | 2 | |
| Average down time(h) | 4.55 | | | 4.28 | | 5.69 | | 3.14 | |
| Without down time | 3 | | 7.32 | 0 | 0.00 | 1 | 7.14 | 2 | 2.22 |
| Communities without e'city | 244 | 85.61 | | 77 | | 83 | | 84 | |

Source : Result of Inventory Survey for Communities made by JICA, 1995.

As indicated in the above Table, permanent houses in the whole Project area are 42.2 % to the total houses consisting of 74 % with tin roof and 26 % without tin roof to the total permanent houses. Remaining 57.8 % of houses are semi-permanent houses with mud and grass thatched houses. According to raw data of answer sheets of questionnaire for the Inventory Survey, most of these remaining houses are combined houses with mud and grass thatched.

Houses facilitated with latrine are 63 %, but those with modern sanplat or slab are only 9 % to the total houses with latrine. Remaining 91 % of houses have traditional ones with no modern sanplat or slab, but improved traditional ones. The other houses of 38 % have no latrine even if the traditional one.

Electrification rate of the communities in the whole Project area is only 14 %, and remaining 86 % have no electricity. Even the houses facilitated with electricity, the electricity is down 3 times a week in average, and the average down time is 4.6 hours per one time electricity down.

### (5) Live Stock

People living in the target communities have several kinds of live stocks as follows:

**Table 4.2.3. Population of Livestock in the Target Communities**

(As of 1995)

| Live stocks | Population of live stocks by District | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | | Mpigi | | Mubende | | Kiboga | |
| | (Heads) | (%) | (Heads) | (%) | (Heads) | (%) | (Heads) | (%) |
| Cattle | 166,550 | 100.00 | 57,501 | 34.52 | 46,469 | 27.90 | 62,580 | 37.57 |
| Sheep | 6,854 | 100.00 | 2,900 | 42.31 | 2,150 | 31.37 | 1,804 | 26.32 |
| Goats | 30,548 | 100.00 | 9,464 | 30.98 | 5,421 | 17.75 | 15,663 | 51.27 |
| Poultry | 208,433 | 100.00 | 115,870 | 55.59 | 50,102 | 24.04 | 42,461 | 20.37 |
| Others | | | | | | | | |
| Pigs | 10,157 | 100.00 | 530 | 5.22 | 5,820 | 57.30 | 3,807 | 37.48 |
| Rabbits | 210 | 100.00 | 0 | 0.00 | 200 | 95.24 | 10 | 4.76 |

Source : Result of Inventory Survey for Communities made by JICA, 1995.

Population of cattle in the Project area is almost the same level among 3 Districts, but slightly higher in Kiboga. This reflects a situation of animal husbandry in the Project area.

Poultry population in Mpigi is remarkable comparing with other 2 Districts. This poultry includes turkeys and/or ducks too, but most of the poultry is chicken according to original answer sheets of questionnaire for the Inventory Survey. The original answer sheets are summarized as shown in APPENDIX D-14.

### (6) Occupation

As mentioned in previous sub-clause, most occupation in the Project area is subsistence farmers with share of 52 %, and the second one is cash crop farmers with share rate of 20 %. The third one is full time labours and seasonal labours with the same share rates of 9 %. Shopper/traders share a rate of 5 % as the fourth one and dairy farmers are the fifth one with share rate of 2 %.

There are other occupation groups in the Project area too such as hunters, brick makers, Pastoralist, local brewers, mechanics, bark cloth makers, bee keepers, herdsmen, carpenters, teachers, charcoal makers, medical doctors, tailors, butchers, civil servants, cobblers, security guards, black smiths, nomads, and hospital staff including nurses.

Among those occupations, there is not any carpenters in the Project area of Kiboga. Most pastoralists are in Mpigi as number of 530 persons, and those in Mubende are very few. Kiboga has no pastoralists in the Project area according to the result of the Inventory

Survey. Hospital staffs are only in Kiboga because it has modern Kiboga Hospital. Nomads are also in Kiboga only.

### (7) Cultivated Land and Agricultural Products

An average accessible land in the Project area is 5.52 acre (around 2.2 ha) per household, but actual cultivated land is only 2.58 acre (around 1.0 ha) with cultivated rate of 47 % as shown in the Table (A) of APPENDIX D-15.

Agricultural products may be classified into 2 categories as (1) food crops and (2) cash crops.

Food crops include all agricultural crops for people's daily use, usually representative one is paddy. However, in the Project area, they do not produce paddy, but cassava, yams, sweet potatoes, Irish potatoes, maize, sorghum, beans, finger millets, soya beans, matoke bananas (plantains), sweet bananas, cabbages, onions, tomatoes, pineapples, ground nuts, fruits, and so on.

Following Table shows a situation of major food crops to produce, of self-use, and to sell their products to markets in the whole Project area based on a Table (B) of APPENDIX D-15.

**Table 4.2.4. Situation of Major Food Crops to Produce, of Self-Use, and to Sell in the Project Area**

(As of 1995, unit : %)

| Item | Percentage (%) to total sampled communities by major food crops | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cas-sava | Yams | Sweet pota-toes | Irish pota-toes | Maize | Sorg-hum | Beans | Fin-ger millet | Soya beans | Mato-ke ba-nanas | Sweet ba-nanas | Cab-bages | Onion | Toma-toes | Pine-apple | Ground nuts |
| To produce | 83.26 | 50.88 | 95.09 | 61.75 | 95.44 | 64.56 | 96.49 | 42.46 | 40.70 | 92.98 | 79.65 | 48.77 | 46.67 | 70.18 | 38.60 | 89.12 |
| Self-use | 85.26 | 49.12 | 93.68 | 58.95 | 91.23 | 26.32 | 94.74 | 37.54 | 32.98 | 90.18 | 70.88 | 48.07 | 51.93 | 69.82 | 39.30 | 86.32 |
| To sell | 45.61 | 16.84 | 50.88 | 31.23 | 70.88 | 55.79 | 77.54 | 27.02 | 25.96 | 55.44 | 48.77 | 34.74 | 28.07 | 60.35 | 19.30 | 57.89 |

Source : Result of Inventory Survey for Communities made by JICA, 1995.

As indicated in the above Table, sweet potatoes, maize, beans and matoke bananas (plantains) are produced by most communities with around 95 % to the total communities as the first crop group. The second crop group includes cassava and ground nuts with around 86 % share rate of communities. Share rates of self-use of some crops are higher than that to produce as shown in the Table like cassava and onions. According to information from an analyst of data resulted from the Inventory Survey, who ordered out

by JICA Study Team to compile the raw data, people are buying these short crops from markets.

Even food crops, people are selling their products to markets in the Project area. For example, almost 71 % of communities sell their produced maize, 60 % : tomatoes, 78 % : beans, 51 % : sweet potatoes, 55 % : matoke bananas (plantains), 58 % : ground nuts, and so on. Almost 65 % of people living in communities of the Project area produce their crops for double purposes as self-use and to sell. This is a way of getting their income in communities in the Project area.

Cash crops include cotton, coffee, tea, tobacco, and other crops which can be treated as trading crops for taking economic income of farmers. A representative cash crop in the Project area is coffee. They produce cotton and tea too, but very little. Tobacco is negligible small.

Following Table shows a summarized situation of cash crops together with a summary of food crops.

**Table 4.2.5. Situation of Major Cash Crops in the Project Area**

(As of 1995, unit of share rate : %)

| Crops | Number of communities to produce crops | To use crops for themselves | | To sell crops to markets | |
|---|---|---|---|---|---|
| | | Number of communities | Share rate to all communities | Number of communities | Share rate to all communities |
| Food crops | 3,235 | 3,027 | 93.57 | 2,093 | 64.70 |
| Cash crops | 274 | 148 | 54.01 | 277 | 101.09 |
| Cotton | 5 | 7 | - | 20 | - |
| Coffee | 256 | 113 | - | 240 | - |
| Tea | 13 | 28 | - | 17 | - |
| Total/average | 3,509 | 3,175 | 90.48 | 2,370 | 67.54 |

Source : Result of Inventory Survey for Communities made by JICA, 1995.

Total number of communities sampled is 285 communities in the Inventory Survey, and 256 communities produce coffee as shown in the above Table. It means that almost 90 % of communities are producing coffee in the Project area. Among these coffee production communities, 113 communities are self-users which are only 44 % to total coffee producers, but 240 communities are producing coffee for selling which are 94 % to total coffee producers. So there seems to be a lot of coffee producers who are producing it for double purpose to use and sell.

Cotton and tea cultivation are not so much active in the Project area as indicated in the above Table, tobacco cultivation is negligible small as mentioned in the previous sub-clause.

## 4.3. Development Plans

Three nationwide development plans are now on-going in Uganda, namely (1) the Rehabilitation and Development Plan, (2) the Water Action Plan and (3) the National Planning Strategy - Rural Water Supply Programme. The former 2 plans present targets and/or policies for socio economic development and water resources management respectively, and the last one presents a guideline for making clear volume of works and necessary fund in case of implementation of water supply projects in district level. Hereinafter, subjects of the plans are given briefly.

### 4.3.1. Rehabilitation and Development Plan[5]

#### (1) Introduction

In the Rehabilitation and Development Plan (RDP) (1993/94 - 1995/96), the Government set forth an overview of the outcome in the previous Economic Recovery Programme (ERP) (1987/88 - 1992/93), a comprehensive statement of the Medium Term Structural Adjustment Programme for 1993/94 - 1995/96 and a review of main features of the public expenditure programme for the plan period as summarized below:

#### (2) Economic Survey Programme (ERP)

The Government set forth ERP (1987/88 - 1992/93) aiming to rehabilitate the economy and play the foundations for sustained economic growth. The immediate objectives of the programme were to rehabilitate the productive sectors, in particular critical infrastructure, to reduce inflation primarily by tackling imbalances in the budget and to address the balance of payments' crisis. During the plan period, the main elements of the strategy to address these problems were; (a) export promotion, (b) reform of agriculture policy, (c) foreign investment promotion, (d) reform of the Government budget and (e) reduce the level of inflationary pressure. The performance of the economy in this period was impressive. An average real GDP growth exceeded 6 %/annum, inflation was reduced

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[5] : Source : MFEP, 1993.

from a level of 207 % in July 1987 to 0.5 % for a twelve month period to June 1993, and significant progress was made to reduce imbalances in the fiscal and external accounts.

(3) **Medium Term Structural Adjustment Programme**

The economic programme of the Government for 1993/94 - 1995/96 will built on the progress made under the previous ERP to achieve accelerated economic growth and a sustained improvement in social welfare of the Ugandan population. The programme aims to increase the tempo of economic growth whilst continuing to reduce macroeconomic imbalance in the economy and eliminate distortions in relative prices in the market for inputs, outputs and financial resources. The Government has set a number of macroeconomic targets to quantify progress toward these objectives; (a) an annual growth rate of at least 5 %/annum, (b) a reduction rate of inflation of 7.5 % by the end of 1993/94, (c) an improvement in the economy's external credit worthiness and (d) a substantial improvement in the economic and social prioritisation of public expenditure. The strategy to achieve these objective focuses on; (a) the development and diversification of the economy's export base, (b) the mobilization of domestic saving, (c) investment promotion, (d) implementing a debt reduction strategy, (e) reform of the Government budget and (f) providing incentives for the use in agricultural production.

The strategy will be supported by the specific policies in (a) external sector, (b) fiscal sector, (c) financial sector and (d) specific sector.

The specific sector policies have been set out in "The Way Forward II" within the medium term sectoral strategy and in the sectoral priorities in the building of a "independent, integrated and self sustaining economy" in the long term objectives for the economy. The movement towards these objectives implies increased emphasis on; promotion of inter-sectoral linkages, efficient import substitution, efficient and sustained investment in export oriented industries and expansion of external markets, development of a viable and resilient banking sector, development of indigenous technology and a programme to induce inflows of research and technology; and rehabilitation, expansion and maintenance of economic infrastructure.

In the agriculture sector, broad sectoral objectives will remain to increase food and production for self-sufficiency and food security, and to diversify agricultural exports by creating competitive systems for the processing and marketing on agricultural produce to ensure that produces receive adequately remunerative prices for their outputs.

In the industrial sector, constitution will be taken to improve the policy and regulatory environment to promote private sector participation in the production of competitive exports and import substitutes.

The transport policy emphasizes to recurrent costs of maintaining the road network, a substantial commitment which is unlikely to attract donor finance.

In the energy sector, priority objectives include acceleration of the programme for urban and rural electrification, and the raising of electricity tariffs to the level of long run marginal cost to generate resources for the investment in the sector.

In the mining sector, encouragement will be taken to private sector development by helping to establish the country's mineral resources.

In the tourism promotion, a special attention will be paid to attract tourism in the stabilization of exchange rate and to promote a more balanced use of natural resources of the nation.

In the social sector, the Government will intensify its efforts to address the needs of the most vulnerable groups with a view to alleviating poverty in general and mitigating the social costs of adjustment in particular. Sustainable poverty reduction requires greater efforts to achieve accelerated and broad based economic growth while at the same time improving human resources through better health and education, and, in the short term, targeted intervention to alleviate poverty particularly amongst the vulnerable groups.

The children of Uganda, whose number more than 50 % of the total population, will benefit from the implementation of the Uganda national Programme of Action for Children (UNPAC). Resources will be concentrated on the provision of basic education, health services and safe drinking water.

**(4) Public Expenditure Programme**

The number of recommended projects in the new RDP Priority List in 327 projects.

Total RDP expenditure in the plan period is estimated at UShs.1,980 billion or US$ 1.98 billion in 1993 constant price. The total annual expenditure is projected to increase from

the 1993/94 budget total of UShs.606 billion or US$ 606 million to UShs.713 billion or US$ 713 million in 1994/95 and UShs 616 billion or US$ 616 million in 1995/96.

In the sectoral distribution, the social infrastructure sector accounts for the largest proportion of planned expenditure within the RDP with 30.7 %.

The external assistance of the order of US$ 1.6 billion is required to sustain Uganda's economy recovery during the period 1993/94 - 1995/96. The assistance is particularly for debt relief some of burden of Uganda's US$ 2.6 billion external debts.

### 4.3.2. Water Action Plan[6]

A project entitled as The Water Action Plan for Water Resources Development and Management (WAP) was agreed between the Government of Uganda and the Government of Denmark on January 1993 and on October 1993, and then the project was started from March 1993 and ends on June 1994. A team of Danish consultants has been engaged by Danish International Development Assistance (DANIDA) to work within the Directorate of Water Development (DWD) belonging to the Ministry of Natural Resources in the execution of the Project. The consultant team has been composed of the VKI Water Quality Institute (leading partner), COWIconsult, Nordic Consulting Group and the Danish Hydraulic Institute.

The WAP has been formulated in the light of following 7 certain principles about water resources management that were derived in the meetings that led up to the United Nations Conference on Environment and Development, convened in Rio de Janeiro 1992:

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
- Land and water resources should be managed at the lowest appropriate level.
- The Government has an essential role as an enabler in a participatory, demand-driven approach to development.
- Water should be considered as a social and economic good, with a value reflecting its most valuable potential use.
- Water and land use management should be integrated.

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[6] : Source : Uganda Water Action Plan, July 1994.

- Women play a central part in the provision, management and safeguarding of water.
- The private sector has an important role in water management.

The WAP recommends (1) institutional and management structure, (2) management functions and its levels, (3) functions, potentials and constraints for water resources management, (4) short term management functions, (5) rapid water resources assessment, (6) comments on international aspects, (7) key issues from the districts studies, (8) management procedures, (9) action programme and (10) timing of implementation as summarized below.

**(1) Institutional and Management Structure**

The institutional and management structures for managing the water resources are divided into 3 levels as (1) national level, (2) district level and (3) local level.

In the national level, the Ministry of Natural Resources is the key organization, and a Water Policy Committee (WPC) follows the Ministry. A joint organization of WPC secretariat and DWD under the WPC is the substantial management body in the national level.

In this case, the WPC gets comments and/or information from the National Environmental Management Authority and the WPC member Ministries and Organizations.

In the district level, the District Resistance Council is the key management body who follows the joint organization of WPC secretariat and DWD, and gets comments and/or information from NGOs and private sector.

District Resistance Council sets (1) a Technical Planning Committee of District Development Committee and (2) a District Environment and Natural Resources Committee (DENRC).

The Technical Planning Committee of District Development Committee has a responsibility to related departments with extension services, and the DENEC has a responsibility to the Department of Environment and Natural Resources (ENRD).

In the local level, each Resistance Council of RC1 to RC3 is the management bodies who implement their work with getting comments and/or information from the said related

departments with extension services and the ENRD in the district level. Under the Resistance Councils of RC1 to RC3, there are water user groups, village water and sanitation committee, and individuals.

**(2) Management Functions and Its levels**

Each organization should have functions for water resources management. As the water management functions, the WAP sets the followings;

- formulation of international policies,
- policy making, planning, and coordination,
- water extraction regulation,
- waste water discharge and pollution regulation,
- monitoring,
- enforcement,
- mediation, and
- training and information dissemination.

The management bodies in each level mentioned above has responsibilities depending on subjects of functions and their levels.

**(3) Functions, Potentials and Constrains**

To establish the said functions is quite important for implementing the water resources management, but there should be several improvements or strengthening of the organizations to make them function smoothly. The WAP lists up several points of these improvements and strengthening named as potentials for each function.

For establishing the functions, there should be several constraints. The WAP lists up these constraints, too.

**(4) Short Term Management Functions**

The WAP sets up targets for achieving a level of the said points to be improved and strengthened for the first 5 years considering the constraints and potentials for water resources management.

(5) **Rapid Water Resources Assessment**

The rapid assessment has been provided, an approximate picture of the available water resources in the country - as a support to overall planning and as an indicator of priority areas within which more detailed investigation should be carried out.

Three major water resources planning units were considered: (1) the Upper Nile System which involves the equatorial lakes and Nile R. representing a huge water resource as a potential for numerous development activities, (2) the Ugandan Catchments as surface water sources throughout the country, and (3) the Ground Water Sources .

(6) **International Aspects**

If there were to be a marked reduction in the flow of Nile R, then the international consequences would be inevitably significant. There would be immediate impacts on the lower riparians, Egypt and Sudan - both of who have strong interests in continuing to receive the same volume of water as would be provided without any major abstractions by the upper riparian counties. Similarly, pollution of the lakes and rivers of the Nile basin can have an impact of significant to 5 countries like Egypt, Kenya, Sudan, Tanzania and Uganda.

The WAP examines the present legal obligations and the current forums for cooperation with a view to possibilities of ensuring equitable sharing arrangements.

(7) **Districts Studies**

Eight districts level studies have been made during the works for formation of WAP with different emphasis as given below:

- District level studies in Arua, Mbale, Mbarara, Moroto, and Mukono Districts focusing on identifying appropriate local water resources management levels and giving a background for outlining management procedures.
- District level study in Hoima District focusing on issues regarding detailed institutional capacities for water resources management.
- District level study in Kabale District focusing on the interaction between land management and water resources management.
- District level study in Tororo District focusing wetland irrigation management.

(8) **Management Procedures**

Among the many matters on which control can properly be exercised, there are 2 main activities for which regulatory mechanisms are urgently needed: extraction of both surface and ground water discharge. The WAP presents the case for permit system, proposes outline regulations and identifies the required administrative procedures.

As a proposed administration in this presentation, the WAP proposes to establish a small unit within the DWD for processing applications and issuing permits for water extraction and waste water discharge.

As a regulation of water resources management, the WAP recommends a water charge system. The recommended charges in connection with water extraction permits comprise 2 elements:

- a flat rate, one-time charge, to cover the costs of the administration associated with handling the permits, and
- an annual charge for water extraction.

The annual charge could be designed to reflect any scarcity in particular area. The revenue should be an income for administering the permit system; it would be used to cover, among other things, the costs of monitoring compliance with the given permits and impacts on water resources. The WAP recommends that DWD would design the structure of charges and WPC decide the size of the charges. But, people's capability to pay is not mentioned in the WAP.

The WAP also presents a data management system.

(9) **Action Programme**

The WAP sets an action programme to promote the plan with brief illustration. It seems that the structures, functions, procedures and action that are proposed in the WAP will need some external assistance - some materials and expertise in support of capacity building - but the WAP says that the action programme is achievable and sustainable because it is moulded within the existing institutional structures and it recognizes the general resource constraints.

**(10) Implementation**

The WAP sets an implementation schedule as the action programme with 3 stage strategy in which 39 actions will be undertaken. Stage One is expected to be completed after 2 years, Stage Two after 4 years, and Stage Three after 6 years. The criteria used in determining the schedule has been a balancing of considerations such as clustering actions that are best dealt with together, and following the logic of the overall Water Action Plan: firstly creating the enabling environment, then building the institutional structures, and, finally, producing and sing the needed management procedures and tools.

According to this implementation schedule, the WAP is now on going to enable the management environment as the Stage One.

### 4.3.3. National Planning Strategy - Rural Water Supply Programme[7]

The National Planning Strategy - Rural Water Supply Programme - (RWP) was studied and formulated by DANIDA in cooperating with the Water Development Department (WDD, now DWD) in the Ministry of Natural Resources in 1991.

The RWP presents;

(1) outlines of the demand for water in the rural area of Uganda,
(2) description of the water supply potential of the country,
(3) review of the technical options available for the provision of water from improved sources for the rural areas,
(4) determinations of the order of magnitude of the investment required to provide respectively 50 %, 75 % and 100 % of the rural population with safe water by the year 2000,
(5) estimation of a realistic level of investments in the rural water supply sector for the next 5 years (it means upto 1995) taking into account the absorptive capacity of both local communities and Government structures, and
(6) a model for the preparation of district-based plans which will make the local communities full-fledged partners in the planning process.

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[7] : National Planning Strategy - Rural Water Supply Programme - (Final Report), July 1991.

The RWP thus provides the general framework within which planning and implementation of the rural water supply and sanitation activities will take place.

## 4.4. Institution and Finance

### 4.4.1. Institution of the Government

Based on the said Decentralization Policy, the Government of Uganda sets resistance councils in the Central Government and in each administration unit for making policies and decision making, namely the National Resistance Council (NRC) which is the highest legislative and administrative organization of Uganda as already shown in APPENDIX D-2, District Resistance Council or City Council (5th level Resistance Committee formerly called as RC5, now called as LC5, Local Council Level 5), County Resistance Council or Municipal Council (formerly called as RC4, now called as LC4), Sub-County Resistance Council or Town Council (formerly called as RC3, now called as LC3), Parish Resistance Council or Ward Council (formerly called as RC2, now called as LC2), Village Resistance Council (formerly called as RC1, now called as LC1) as shown in APPENDIX D-16. All members from LC5 to LC1 form the Local Government.

Under the President, there are a Vice-President, and a Prime Minister in order. For the Prime Minister, there are three deputies, namely the First Deputy Prime Minister, the Second Deputy Prime Minister and the Third Deputy Prime Minister. Under this Prime Ministers group, 19 Ministries are set including the Ministry of Local Government. And all of them form the Cabinet of the Republic of Uganda. Details are shown in APPENDIX D-17.

The APPENDIX D-17 illustrates the main organization of the Ministry of Natural Resources, too. The Directorate of Water Development, the counterpart team of the JICA Study Team this time, belongs to this Ministry of Natural Resources. Detail structure of the Directorate of Water Development is shown in APPENDIX D-18.

The Resistance Councils mentioned above set their Resistance Committees as administrative body which are responsibility for the implementation of the policies and decisions made by the Resistance Councils, and without prejudice to the generality of the forgoing shall;

(a) assist the police and chiefs in the maintenance of law and order;

(b) maintain security in the area;

(c) encourage, support and participate in self-help projects and mobilize people, material and technical assistance in relation thereto;

(d) at Village and Parish levels, vet and recommend persons in the area who should be recruited into the Armed Force, Police Force, and Prisons Services;

(e) serve as the communication channel between the Government and people in the area;

(f) where necessary, elect ad-hoc and other sub-committees to assist the Resistance Committee in its functions;

(g) at Sub-County level, elect members of the Tax Assessment Committee; and

(h) generally monitor the administration in its area and report to the appropriate authority any incidents of mal-administration, corruption and misuse of Government property.

From LC1 to the upper level of Resistance Councils, a Village Resistance Council consist of all persons of or above the age of 18 years old, residing in a Village; a Parish or Ward Resistance Council consist of all the members of the Village Resistance Committees in the Parish or Ward; a Division Resistance Council in a City consist of all the members of the Ward Resistance Committees residing in the Division; a Sub-County or Town Council consist of all the members of the Parish or Ward Resistance Committees in the Sub-County or Town, as the case may be; a County or Municipal Resistance Council consists of all the members of the Sub-County or Division Resistance Committees in the County or Municipality, as the case may be; a City Resistance Council consists of all the members of the Division Resistance Committees in the City; a District Resistance Council consists of one representative elected from each Sub-County and Town Resistance Councils, and one representative for women elected from each County and Municipal Resistance Councils in the District and all members of the National Resistance Council from that district who shall be ex-officio members.

Every head of a Government Department at Parish, Sub-County, County or District level, as the case may be, shall be an ex-officio member of the respective Resistance Council with right to participate in the deliberations thereof, but shall not be entitled to vote.

### 4.4.2. Budgeting System of Local Government

Fiscal year in Uganda starts from the beginning of July, and ends in the last day of June in the next year. While the finance year of the Local Government (the Resistance Councils) is from the 1st of October of a year to the 30th of September in the next year.

Budget of the Local Government is decided through 6 stages of action for 6 months starting from April, the last quarter of the fiscal year, and ending in September, the first quarter of the next fiscal year.

The stages are the Budget Conference for the 1st stage in April, the Identification of Sectoral Priorities for the 2nd stage in May, the Review of Costed Priorities for the 3rd stage in June, the Debate on Committees Proposals for the 4th stage in July, the Preparation of Final Draft Budget for the 5th stage in August, and the Preparation of Budget for Councils Approval in September.

After that, the decided budget is implemented by the Local Government monitoring by several authorities. APPENDIX D-19 shows the detail budgeting process and cycle for the Local Government.

### 4.4.3. Public Finance

The central government budgetary operation gives a summary of Government's revenues, expenditures and the financing of the budget deficit. A Table (A) of APPENDIX D-20 gives a summary of the provisional outturn of the central government budgetary operations for the fiscal year 1994/95 as compared to the previous year.

The provisional outturn indicates that revenue and grants were UShs. 752.5 billion, higher than the budget estimated by about UShs. 62 billion. In nominal terms, this was about 11 % higher than in 1993/94. This higher outturn on the resources side for 1994/95 budget was attributed to revenues being higher than programmed one by UShs. 27 billion, and grants also being higher than that programmed by about UShs. 35 billion. Total

expenditure and net lending were UShs. 866.6 billion. Since expenditures were more than the revenues and grants, there was a deficit of UShs. 114.1 billion, which was largely financed by external borrowing.

The Ministry of Finance and Economic Planning made a macro-framework of the annual public finance for the next three years as shown in the other Table (B) of APPENDIX D-20, and the expected components of the resource (revenues) with an annual growth rate of about 9 % have been agreed by the Cabinet in the Budget Framework Paper in February 1995.

## 4.5. Financial Management Plan

### 4.5.1. Required Cost for Operation and Maintenance

O&M cost consists of two major items i.e., the running cost and the maintenance cost. Among the proposed water supply facilities the following facilities require positive attention involving maintenance of mechanical parts. The running cost concerns only the generator used for level-2 installation. The running cost per year for the generator (25 kW) is estimated as follows:

**Table 4.5.1. Running cost of Generator per Year**

(Unit:US$)

| | Personnel cost | Material cost | Machinery cost | Total |
|---|---|---|---|---|
| Local currency | 5000 | 180 | 0 | 5180 |
| Foreign currency | 0 | 1620 | 0 | 1620 |
| Total | 5000 | 1800 | 0 | 6800 |

The maintenance costs are incurred by handpumps installed to boreholes and shallow dug wells, pumps, both submersible and booster and a generator for the level 2 (stand pipe) system.

Table 4.5.2. Maintenance Cost for Water Facilities

1) Maintenance Cost for Handpump per Year

(Unit:US$)

| | Personnel cost | Material cost | Machinery cost | Total |
|---|---|---|---|---|
| Local currency | 50 | 9.5 | 0 | 59.5 |
| Foreign currency | 0 | 85.5 | 2.5 | 88.0 |
| Total | 50 | 95.0 | 2.5 | 147.5 |

2) Maintenance Cost for Submersible and Booster Pumps per Year

(Unit:US$)

| | Personnel cost | Material cost | Machinery cost | Total |
|---|---|---|---|---|
| Local currency | 250 | 46.3 | 0 | 296.3 |
| Foreign currency | 0 | 416.2 | 25 | 441.2 |
| Total | 250 | 462.5 | 25 | 737.5 |

3) Maintenance cost for Generator per Year

(Unit:US$)

| | Personnel cost | Material cost | Machinery cost | Total |
|---|---|---|---|---|
| Local currency | 600 | 245 | 0 | 845 |
| Foreign currency | 0 | 2,205 | 20 | 2,225 |
| Total | 600 | 2,450 | 20 | 3,070 |

### 4.5.2. Financial Background

The Table (B) of APPENDIX D-23 shows an estimation of people's capability to pay for water. At the present time, among the 458 samples, 384 samples (about 84 %) have never paid for taking water. In spite of this situation, a weighted average amount of payment for water from existing water source has been calculated as UShs. 10 per 20 litre jerrycan in Kiboga District. In Mpigi District, among the 569 samples, 379 samples (about 72 %) have never paid for taking water, but the weighted average amount of payment for water from existing water source UShs. 31 per 20 litre jerrycan. Also in Mubende District, among the 645 samples, 564 samples (about 87 %) have never paid for taking water, but the weighted average amount of payment for water from existing water source UShs. 11 per 20 litre jerrycan. A weighted average the water charge in the whole three Districts, would come UShs. 19 per 20 litre-jerrycan.