REPUBLIC OF KENYA



MINISTRY OF WATER DEVELOPMENT

MERU

DISTRICT WATER DEVELOPMENT STUDY

1993 - 2013

PART 1

WATER DEMAND AND WATER RESOURCES

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WATER RESOURCES
ASSESSMENT SECTION
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WATER RESOURCES
ASSESSMENT & PLANNING

TNO – INSTITUTE
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DELFT, THE NETHERLANDS

PREFACE

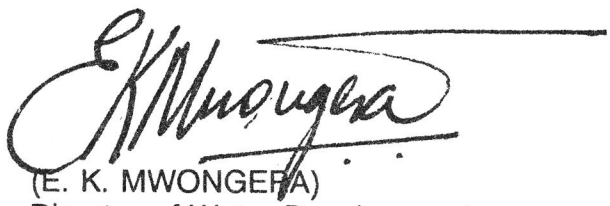
It gives me great pleasure to introduce the District Water Development Study for Meru District.

The Ministry of Water Development has the task of planning for water resources development, both at national and district levels. Districts have been assigned a major role in the development of the country as illustrated by the District Focus Strategy for Rural Development Policy. Consistent with this policy the Ministry of Water Development has put great emphasis on the studies for District Water Development Planning.

Water resources development can only be successfully undertaken if the long-term planning reflects the balance between availability and exploitation of water. Extensive investigations and monitoring are needed to determine the potential of the water resources and the effects of development on long-term basis. Presently, the Districts do not have the research capacity to carry out the necessary studies independently. To overcome this situation, the Ministry of Water Development has established a Water Resources Assessment Section that supports the Districts in carrying out these studies. The Section is being strengthened by the Water Resources Assessment and Planning Project.

The present study provides extensive information on the availability of water resources, the existing supply, the future water demand and the investments involved in developing the water resources in Meru District. Equipped with this information the District will be in a better position to plan its supply facilities. It is only after the District succeeds in explaining to the people the limitations of the natural system and the vulnerability of the environment involving them as much as possible in the planning and construction of their water supplies, that the difficult task of providing water to the people will see a good end.

I express the wish that this important study will be optimally used to achieve this common goal.



(E. K. MWONGERA)
Director of Water Development

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ABBREVIATIONS

ASAL	=	Arid and Semi-Arid Lands Development Program
CBWDP	=	Central Baringo Water Development Plan
CC	=	County Council
DANIDA	=	Danish International Development Agency
DDC	=	District Development Committee
DDP	=	Meru District Development Plan 1989-1993
DvDC	=	Divisional Development Committee
DWDP	=	District Water Development Plan
DWDS	=	District Water Development Study
EEC	=	European Economic Commission
EMI-ASAL	=	Embu - Meru - Isiolo Arid and Semi - Arid Lands Programm
FINNIDA	=	Finnish International Development Agency
GOK	=	Government of Kenya
GSK	=	Groundwater Survey Kenya
GTZ	=	Deutsche Gesellschaft fur Technische Zusammenarbeit
KFRWSDP	=	Kenya Finland Rural Water Supply Development Project in Western Province
KIDP	=	Kitui Development Program
Ksh	=	Kenya shilling
KWAHO	=	Kenya Water for Health Organization
KWDP	=	Kwale District Community Water Supply and Sanitation Project
L.U.	=	Livestock Unit
LBDA	=	Lake Basin Development Authority
lpcd	=	litres per capita per day
MoA	=	Ministry of Agriculture
MOH	=	Ministry of Health
MoLD	=	Ministry of Livestock Development
MoWD	=	Ministry of Water Development
MPND	=	Ministry of Planning and National Development
msl	=	Meters above mean sea level
NGO	=	Non-Government Organization
NORAD	=	Norwegian Agency for Development
ODA	=	Overseas Development Agency
Shs	=	Kenya shilling
SIDA	=	Swedish International Development Agency
UNDP	=	United Nations Development Program
UNICEF	=	United Nations International Children Emergency Fund
USAID	=	United States Agency for International Development
WECO	=	Western College of Arts
WRAP	=	Water Resources Assessment and Planning Project

SUMMARY

The present report on Water Demand and Water Resources is Part 1 of three reports, composing the Meru District Water Development Study. Part 1 contains the assessment of the district water demand and the results of the water resources study and the analysis of the compatibility of both. The objective of Part 1 is to enable an opinion on the feasibility of water supply development, in the context of the desired economic development and the available water resources in Meru District.

Meru District contains contrasting geographical features, from the height of the Mount Kenya massif and the Nyambeni range to the lowlands in the east and north. The tremendous range of altitude gives the District a diverse climate as well as a wide range of agro-ecological zones. The major part of the District is used for agriculture or livestock rangeland. The other parts are covered by forest reserves and the Meru and Mount Kenya National Parks.

Land use reflects the varying conditions. Agriculture and livestock are the main occupation in the high potential areas. Crops grown include tea, coffee, potatoes and maize. In the medium potential zones cotton, tobacco, sunflower, sorghum and millet are grown. In the dry parts of the District livestock is the main occupation.

The population of Meru District is estimated at 1,199,150 (1988). The main town is Meru (27,862 population). Other important urban centres are Nkubu (5,025), Chuka (2,721), Chogoria (1,711) and Maua (3,608). The majority of the population lives dispersed over the land on the farms or in small trading centres. The population density of the residential areas is 182 people/km^2.

The water demand is calculated using the unit water consumption rates as specified by the MoWD. Efforts have been made to obtain the best possible estimate of the 1988 water demand, which forms the basis for the projection of the water demand during the 20-year plan period. The initial year of the DWDP, when supplies are expected to be taken into operation, is determined at 1993.

As much as possible data and growth rates are used in accordance with the Meru District Development Plan 1989-1993. However projections are not available beyond 1993. Therefore it was decided to develop two scenarios as the basis for making the projections.

The growth rates to be applied in each of the two scenarios are determined such, that scenario 1 has growth rates reflecting a realistic assessment of the limited development potential of the District and that scenario 2 conforms as much as possible to the adopted growth rates at the national or district level.

As a first approach planning has to be undertaken on the basis of the growth rates for scenario 1, representing a base level of investment. This planning may also be seen as the first phase of development.

The next phase of development corresponding with scenario 2, takes into account the possibility of having to extent systems to cater for demand which is realised through appropriate social, cultural and institutional changes as envisaged by the District. It is this scenario for which most of the analyses in this study have been done.

The applied population growth rates for the period 1993 - 2013 are 3.1 % for scenario 1 and 4.1 % for scenario 2. The resulting population projection for 2013 is 3,159,600 people for scenario 2.

The processing of data and the calculation of the water demand was done using a Database Management System developed by WRAP in dBase IV on a micro-computer. The demand is divided in domestic and non-domestic demand. The domestic demand comprises all demand from population, schools, health - facilities and others. The non-domestic demand comprises livestock and industrial demand.

The total demand is calculated for each sub-location. The domestic demand in most sub-locations is in the range of 100-400 m^3/day. The urban water demand increases more than the rural demand because of the assumed higher growth rates. Under scenario 1 for instance, the demand in the main urban areas increases by about 8 times from 1988 to 2013. In the rural areas population growth rates are lower, but the demand for water increases mainly because of increased demand from institutions and commercial activities.

The information on the water resources in the district is based on the reports of the Water Resources Assessment Study in Meru District, made by WRAP.

Surfacewater is available in large quantities. Many smaller and larger streams descend from the hills and mountains, with reasonable dry season baseflows. Springs are found in abundance in the mountain ranges. Rainfall is high (1250-1500 mm/year) on the eastern slopes of the Nyambeni Range and Mount Kenya and low on the leeward side of the mountains and in the plains (400-1000 mm/year).

Geology consists of two types of rocks: Basement and volcanic rocks. Borehole yields are generally less than 10 m^3/hr in Basement, but may go up to 100 m^3/hr in volcanic rocks. Groundwater quality is generally good in the volcanic areas, but suffers from high fluoride and salinity levels at some places in the Basement.

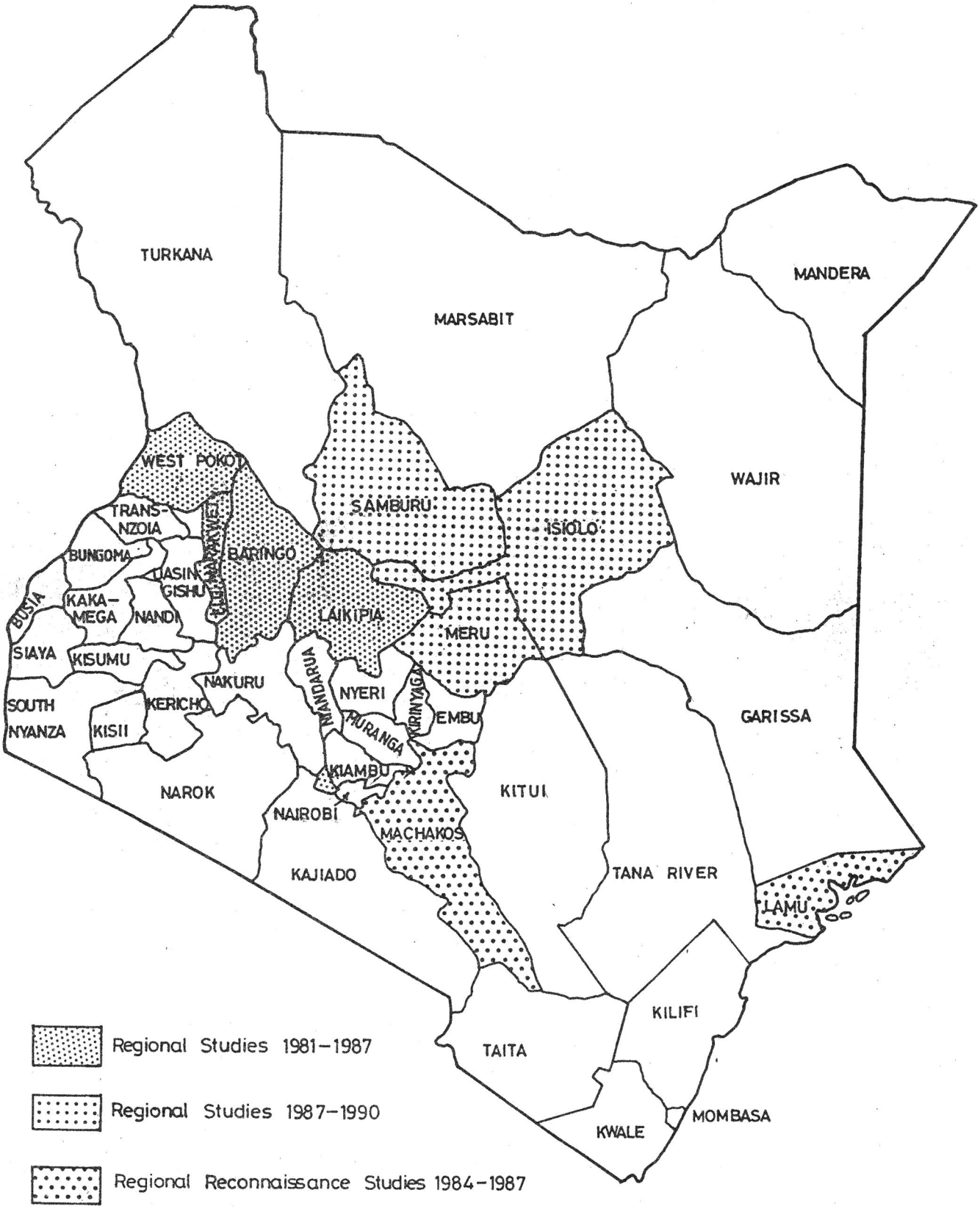
The analysis of the water demand versus the water resources is carried out per Location. Meru District numbers 48 Locations with an average area of 180 km^2.

The exact quantity of available water cannot be estimated, because there is not enough data. However there is sufficient information on the water resources to determine in each Location whether the existing or future water demand can be covered. This has been analysed in detail for the water demand of scenario 2.

The approach followed here first checks for a Location whether the domestic demand can be supplied. Then the quantity is determined of water available for other uses, like irrigation and industrial use. If shortages exist then water may be diverted from other neighbouring Locations. Water is also reserved for environmental purposes, such as catchment protection or maintenance of baseflow.

The development of surface water and springs is preferred to the development of groundwater for reasons of water availability and cost efficiency. Only in Locations with shortage of surface water is the increase until 2003 of the domestic demand expected to be covered by groundwater resources. The non-domestic demand is also supplied from surfacewater. The analysis indicates that water is available for irrigation or industrial use in good quantities in all Divisions.

WATER RESOURCES ASSESSMENT & PLANNING PROJECT



Regional Assessment Studies under the WRAP Programme 1981-1990

1. INTRODUCTION

1.1 Purpose and Scope of the Study

The District Water Development Study (DWDS) of Meru District is aimed at providing the basis for the District Water Development Plan (DWDP), which in turn will be the sector input to the District Development Plan (DDP).

The study was undertaken by the Ministry of Water Development in its role of supporting the districts in their task to develop the available water resources in a safe and sustainable way. Two conditions will have to be fulfilled to achieve this goal.

- The development of water resources must be in balance both with the capacity of these resources and with the conditions set by the environment.

- Supply of water to the community must be sustainable, meaning that the proposed schemes be designed in agreement with the technical and financial support capability of the people for whom they will be constructed.

These conditions require a thorough assessment of the situation in the districts and a planning that is in tune with the socio-economic institutional and technical developments.

The DWDS can be considered the first stage in the process of formulating a DWDP. The study, based on extensive assessments, describes the water resources development potential in comparison to the projected water demand, discusses the viability of different water supply options in terms of sustainability and safety, and provides estimates of the investment levels involved.

The DWDP based on the study will be more specific in that it also comprises the decisions of the district authorities regarding selection and prioritization of the water development schemes. The plan is to cover a period of 20 years, according to MoWD guidelines, starting from 1993 when operation of the first new schemes will supposedly begin. The DWDP will be an important component of the DDP which includes the entire socio-economical planning of the district in perspective to all the available resources. From the above it may be clear that both plans are closely linked and can only be successfully developed in good co-ordination.

The methodology for planning of water resources development, adopted by the Ministry facilitates full participation of the district authorities, community groups and individuals concerned in all stages of the planning process, which is in line with the District Focus Policy. An outline of the general approach is given in chapter 2 of this report. A summary of the main aspects of the District Focus Policy related to water development planning is presented in Appendix 1.

In order to provide optimal conditions for district involvement, the DWDS is carried out in three phases. District engineers and institutions concerned with water use and water supply are extensively consulted during the periods of data collection and analysis. The final report includes three volumes, corresponding with the three phases of the study. Each of these volumes is presented and discussed at a DEC-meeting.

The present report is Part 1 of the DWDS carried out for Meru District within the framework of WRAP. The report contains the basic data used to calculate the water demand for 1988 as well as the projected demands for the years 1993 and 2013, for different growth scenarios. It includes the analysis of these demands and the comparison with the available resources of groundwater and surface water and it presents the summaries of the calculations for each of the Locations of the District.

1.2 International Co-operation

The District Water Development Study was undertaken under Co-operative Agreement between the Governments of Kenya and The Netherlands.

The studies are carried out by the Water Resources Assessment Section of the Ministry of Water Development, Nairobi, Kenya in co-operation with the TNO Institute of Applied Geoscience, Delft, The Netherlands, within the framework of the **Water Resources Assessment and Planning (WRAP)** project.

Consultancy services were provided by the Netherlands Economic Institute, Rotterdam, The Netherlands and the International Institute for Hydraulic and Environmental Engineering, Delft, The Netherlands.

2. GENERAL APPROACH

The District Water Development Study (DWDS) is a base study for preparation of the District Water Development Plan (DWDP). All components that constitute the DWDP are also covered by the DWDS.

The model introduced by the WRAP project for preparation of a DWDP is shown in figure 2.1. The DWDS follows this model in analysing the various components that finally will lead to the formulation of the DWDP. The study includes three phases focusing on different aspects of the planning, namely:

- the compatibility of available water resources with water demand in the present situation and for projected demand scenarios
- the viability of the technical options for water supply development based on environmental and sustainability criteria
- the investments involved in the district water development and the technical, institutional, social and financial factors determining the sustainability of selected solutions

The results obtained in the subsequent phases of the DWDS are presented in Part 1, Part 2 and Part 3 of the DWDS report. An outline of the Study is given below.

Water Demand Study (Part 1)

The water demand study comprises of analyses and projections of the water consumption by all water users in the district. The baseline data available from various sources are often incomplete and/or inaccurate. Therefore, thorough scrutiny of the data is needed to ensure sufficient reliability of further analysis. The data is processed using a Database Management System that handles both the calculation of the water demand and the projection of the baseline data.

The water demand is calculated using the procedure laid down in the Design Manual of the Ministry of Water Development. The procedure compels to projecting the water demand in 5, 15 and 25 years time. This, in turn, requires analysis of the growth trends of population, livestock, agriculture, industries, tourism, etc.

The method adopted provides for projections following three different scenarios: a high growth scenario based on optimal conditions in economical development, a medium growth scenario corresponding with national and district development expectations and a low growth scenario taking into account the less favourable conditions set by the environment.

It may be clear that the DWDS depends on the input from other sectors, such as livestock and agriculture, to complete the projections in the most realistic way.

Water Resources Assessment Study (Part 1)

Water resources assessment studies are an essential component of the DWDS. The assessment studies undertaken within the framework of the WRAP project comprise the following:

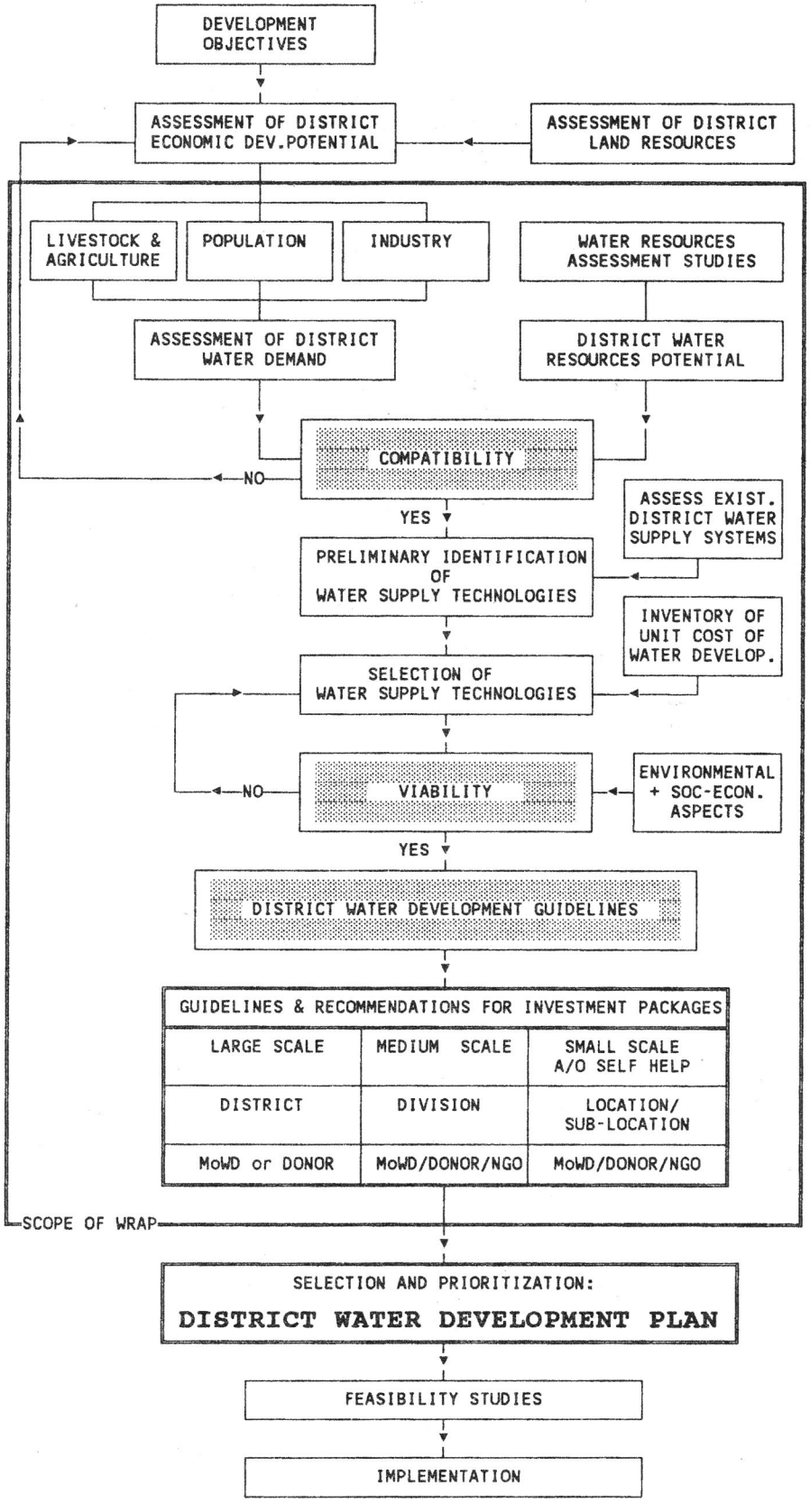


Figure 2.1 **Model for Preparation of District Water Development Plan**

- An inventory of available data and studies on the water resources in the District

- A field survey including collection of data on surface water and groundwater, rehabilitation of part of the existing measuring stations and installation of temporary measuring stations. Measurements are made of the quantity and quality of water in rivers, springs, wells and boreholes.

- A geophysical reconnaissance survey using vertical electrical or electromagnetic soundings and profiling, aimed at providing more insight into the hydrogeological conditions. The results of the survey are checked and calibrated by drilling of exploratory boreholes and test pumping.

- An analysis of the geological, geophysical, hydrological and hydrogeological maps and data, both from the inventory and from field investigations.

From all this information and after careful and systematic analysis, water availability maps are prepared which show the water development potential of the area. The water resources assessment investigations are described in a separate report and a summary of the main conclusions on the water development potential is given in Part 1 of the DWDS report.

Comparison of Water Demand and Available Resources (Part 1)

Having estimated the water demand over the next 25 years and the water resources available in the district, a close analysis is made of the water development potential to decide whether the projected water demand can be met. This analysis of water demand versus water resources availability is carried out for each Location.

When comparing the demand with the resources, priorities need to be set whether a district can best support human, livestock, agricultural or industrial development. In this respect both quantity and quality of the water must be considered.

What emerges from this process of comparing the anticipated demand with the resources, is a description of the development potential of the District, based on water availability.

Study of Water Supply Development Options (Part 2)

From the actual and projected water demand and the capacity of existing water supply schemes, the need for further development of the water supplies can be determined.

Limited water resources, contrasting interest or expected negative environmental impact may hamper further development. However, in situations with sufficient water available, often more than one supply option can be considered. A selection of the best alternative must then be based on considerations of financial, technical and environmental viability.

Phase 2 of the DWDS includes:

- Assessment of existing district water supply systems
- Assessment of technical options for water supply improvement
- Inventory of unit costs for water development based on existing supplies
- Preliminary identification of water supply options and cost

- Study of cost-effectiveness of water supply options

The results and conclusions are presented in Part 2 of the DWDS report. Together with Part 1 this forms the basis for the 'District Water Development Guidelines'.

Formulation of Guidelines and Recommendations for Investment Packages (Part 3)

The guidelines and recommendations for the development of the district water resources result in proposals for improvement of the existing water supply situation in the District. The proposed improvements may range from very small local supplies to comprehensive water supply schemes. The investments required to improve the water supply situation have been termed investment packages.

The purpose of the investment packages is to present to the Government of Kenya and interested donors a preliminary estimate of the funds and other inputs needed for water supply development. Each investment package or a combination of them can thus form the core of a water supply project.

Phase 3 of the DWDS includes the following issues:

- Land use, environmental, social, institutional and economic/financial factors to be considered
- Guidelines for assessment of water sector investment proposals
- Examples of investment packages
- Recommendations on required institutional strengthening for implementation of the DWDP
- A framework for a proposal based on the investment packages

The analyses, results, conclusions and recommendations arrived at are presented in Part 3 of the DWDS report. Part 1, Part 2 and Part 3 of the DWDS should provide the district authorities with sufficient base information for initiating further development of the water resources in the District.

3. MERU DISTRICT

3.1 Description of the District

3.1.1 General

Meru District lies in the Eastern Province. It covers an area of 9,922 km^2 and it is bounded by the parallels 0° 30'S and 0° 45'N and the longitudes 37°E and 38° 30'E.

The District contains contrasting geographical features, from the height of the Mount Kenya massif and the Nyambeni range to the lowlands in the east and north. The tremendous range of altitude gives the District a diverse climate as well as a wide range of agro-ecological zones.

Administratively, the District is divided into 9 Divisions (Figure 3.1). The Divisions are further divided into 48 locations and 145 sub-locations. Sub-divisions of the administrative units are effected every year therefore current numbers may already be different. Also it is already known that proposals exist to sub-divide some of the Divisions (Tigania, Nithi, Tharaka). Therefore the administrative boundaries used in this study are for planning purposes only and the study does not aim to present the most up-to-date situation. In case sub-divisions take place in future, then the here presented water supply development planning is valid for the combined units.

The District has four major local authorities: Meru County Council, Meru Municipal Council, Chuka Town Council, and Maua Town Council.

Urban and rural centres are relatively small in Meru District. The largest centre is Meru Town, the District headquarters. Other urban centres are Chuka, Chogoria, Nkubu and Maua. In general the size of the rural centres is small, which may be due to the poor infrastructure.

Most of the roads converge on Meru Town. However only three roads are tarmac: Embu - Meru, Nanyuki - Isiolo - Meru and Meru - Maua. The upgrading of roads currently receives much attention from the District authorities and this may have a stimulating effect in future on the growth of the centres.

Electricity is supplied to the main urban centres, to the high potential areas and some rural centres, such as Mitunguu, Tunyai, Lare, Mutuati, etc. Currently electricity lines are being extended into Ntonyiri and plans exist to supply Mikinduri and Igembe Division south of Maua. Of all Divisions only Tharaka Division is largely without electricity.

3.1.2 Physiography and Hydrogeography

Four main physiographic units can be distinguished:

1. Mount Kenya
2. The Nyambeni Range
3. The volcanic Lowlands
4. The Basement System Area

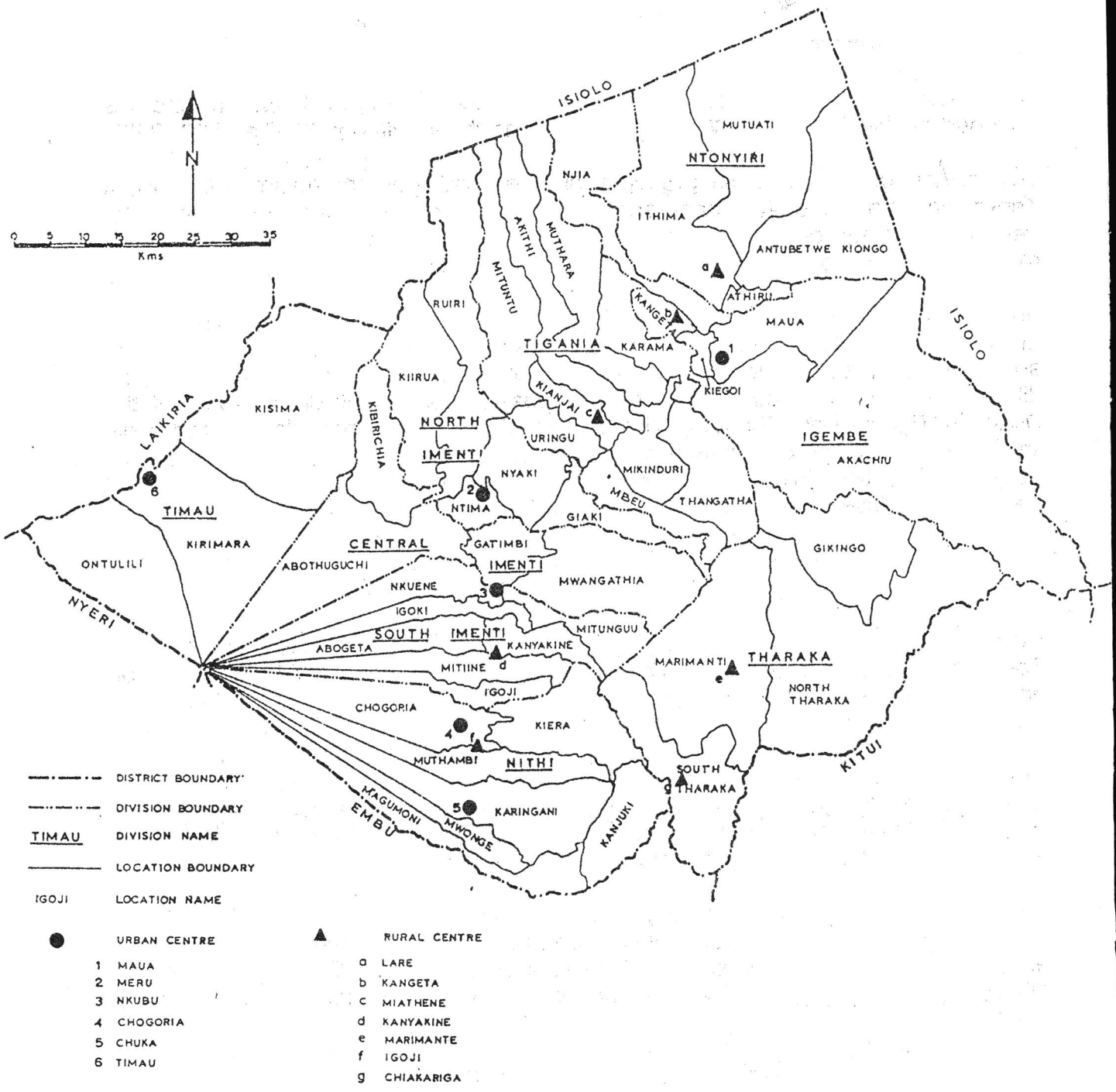


Fig. 3.1 Meru District Administrative Boundaries

From: Meru District Development Plan, 1989-1993

Mount Kenya can be further subdivided into

(i) the Upper,
(ii) the Middle and
(iii) the Lower Volcanic Slopes.

The Upper Volcanic Slopes of Mount Kenya (5,199 m) are situated above approximately 3,000 m. This zone coincides rather well with the former glaciation. At present it comprises a glacial-naval subzone, an afro-alpine subzone and a moorland subzone. Several glaciers drain to the Ewaso Ngiro and Tana catchment, but contrary to popular belief, total discharge from this area is small. The area is mainly a recharge area with a deep groundwater table, though locally shallow groundwater and moorlands occur which are associated with perched aquifers.

The Middle Volcanic Slopes extend from around 2,400 m to 3,000 m. They are covered with forest which tend to thin out to the north-eastern leeward side of the mountain where little true forest is left. These areas enjoy the highest rainfall and supply a substantial part of the perennial runoff. The terrain is often rugged and the rivers are deeply incised. It is a groundwater recharge and transmission area but at lower elevations many springs occur.

The Lower Volcanic Slopes of Mount Kenya are used for rainfed agriculture. They are among the best lands in the country. The terrain is hilly to rolling although steep sloping, rugged parts also exist. Stream incision generally decreases in a downstream direction as does rainfall. The landscape has a humid appearance in the upper part of the zone and a semi-arid character in the lower parts. The groundwater table is predominantly shallow at the transition zone between the Upper and Middle Volcanic Slopes, but falls gradually to greater depth in downstream directions. Few springs occur on the leeward side of the mountain, but many in the transition zone on the eastern side of the mountain where rainfall is higher. This area is mainly a groundwater transfer zone although some recharge might occur in the upper, humid parts.

The volcanic Nyambeni Range (2,514 m) is elongated in a north-east to south-west direction rising from the foothills of Mount Kenya and shows superficially a lot of similarity with the Lower Volcanic Slopes of Mount Kenya. The soils are among the best in the country and are used for rainfed agriculture. The terrain is generally steep although flat or hilly parts also occur, notably near the summit. The landscape has a humid appearance in the upper and middle parts and a semi-arid in the lower parts. The groundwater table is predominantly shallow but can be deep at the top of the range. Many springs are found on the windward side of the range and less so on the leeward side. The springs in the Nyambeni Range are less in number but carry much more discharge than those at Mount Kenya. Recharge takes place in the rainy upper parts of the range while most discharge occurs through many large springs on the contact between different lava flows and the underlying Basement.

The Volcanic Lowlands lie roughly between 600 and 1,500 metres contour lines. The climate is semi-arid. They are formed by lavas which have been extruded from the Nyambeni Range, and to a lesser extent from Mount Kenya. The topography is mostly flat to gently undulating with rivers flowing through narrow valleys.

The Basement System Area is considered as a separate unit. The appearance of the rocks and the terrain is very different from that of the volcanic areas as are the groundwater, surface water and climatic conditions. The Basement Area can be characterised as a dusty arid flat, dotted with inselbergs and bare rugged mountains.

The present landsurface in the Basement country has been lowered well below the sub-Miocene peneplain which is a sub-volcanic floor, only preserved intact below protective lava layers or as degraded remnants of resistant metamorphic rocks. This surface occurs between 1,200 and 1,350 metres at the eastern and south-eastern margins of Mount Kenya.

The second peneplain, the end-Tertiary or mid-Pliocene peneplain is much more important. It occurs at elevations usually between 1,000 and 1,200 metres. According to Baker (1967) volcanicity of Mount Kenya began just before the maturation of this peneplain. The mature peneplain is the floor on which the Nyambeni volcanic pile was built up.

3.1.3 Drainage System and Rainfall

The drainage system is determined chiefly by three factors:

- the direction of the slope of Mount Kenya and the Nyambeni Range
- the slope of the end - Tertiary Peneplain
- the Basement System structure

Radial and near - radial drainage patterns predominate on the slopes of Mount Kenya and the Nyambeni Range, until the mountain streams debouch from the gorges in the lavas onto the Basement System floor. The rivers on the western and northern slopes, i.e. the Timau, Sirimon and Isiolo are tributaries of the Ewaso Ngiro as are the ephemeral streams on the northern slopes of the Nyambeni Range. All other rivers, i.e. the Thuchi, Mutonga, Thangatha, Kathita and Ura are tributaries of the Tana River.

Most of the tributaries rising on the Upper and Middle Volcanic Slopes are perennial while the majority of the streams rising on the Lower Slopes, the Volcanic Lowlands and the Basement System are ephemeral. Also the streams on the north-western flanks of the Nyambeni Range are intermittent.

The south-eastern slopes of Mount Kenya and the Nyambeni Range receive 1,250 to 1,500 mm of rainfall annually. This is in strong contrast with the rainfall on the leeward sides of the mountains and the lowlands of the District: 400 to 1000 mm annually. The rainfall pattern is bi-modal with the long rains from mid-March to May and the short rains frorn October to December.

3.1.4 Soils

The soil distribution in the study area is mainly determined by the parent rock and climate.

Soils on the volcanic rocks are shallow to moderately deep, dark reddish to dark brown, well drained with clayey loam to clayey sub-soils. They are medium to highly fertile and their infiltration capacity is moderate to low. Soils on the upper parts of

Mount Kenya are shallow to very shallow with rock outcrops and ice in the highest parts. Soils on the semi-arid Volcanic Lowlands in the northern part of the district are of the same type, but more calcareous and more stony.

In the Basement System areas in the south-east of the study area rocks mainly consists of banded gneisses. Soils in this area are generally well drained, moderately deep, dark red to yellowish red. Subsoil is usually sandy clay to clay with a top-soil of loamy sand.

3.1.5 Land Use and Land Holding

According to the District Development Plan, Meru District has 651,000 ha of agricultural land broken down as shown in Table 3.1.

High potential areas grow mainly tea, coffee, potatoes and maize while cotton, tobacco, sunflower, sorghum and millet are for medium and marginal zones.

Apart from the agricultural land, the remaining part of the district consists of forest reserves and the parks. Forest reserves cover an area of 1397 km^2. This excludes ungazetted hills in Tigania, Igembe, Nithi and Tharaka Divisions owned by the Meru County Council, clans or individuals. Tree planting and soil conservation projects are encouraged in these areas. Meru National Park (870 km^2) and Mount Kenya National Park (380 km^2) represent together 12.6% of the district's total area.

Table 3.1 Land Classification of Meru District

Category	Area (ha)
High Potential	241,000
Medium Potential	95,000
Low Potential	315,000
Forests	139,700
National Parks	125,000
Other	76,500
Total	992,200

Source: Meru District Development Plan 1989/93

Figure 3.2 depicts the relationship between moisture availability zones and agro-zones as shown in the Meru District Development Plan.

Land Holding *(text from DDP 1989/93)*

Land in Meru is held under three headings: clan land; individual small-scale land holdings; and large-scale farms.

Clan Land: There are a number of areas in Meru that have not been gazetted as adjudication areas. These areas are mainly in Igembe, Ntonyiri, Tigania and Tharaka Divisions. Work on adjudication is continuing despite a lot of objections to the process. In many of these areas, the ownership of the land is vested in the clan (Mwiriga) and the clan distributes the land to its individual male members. Most of this un-allocated

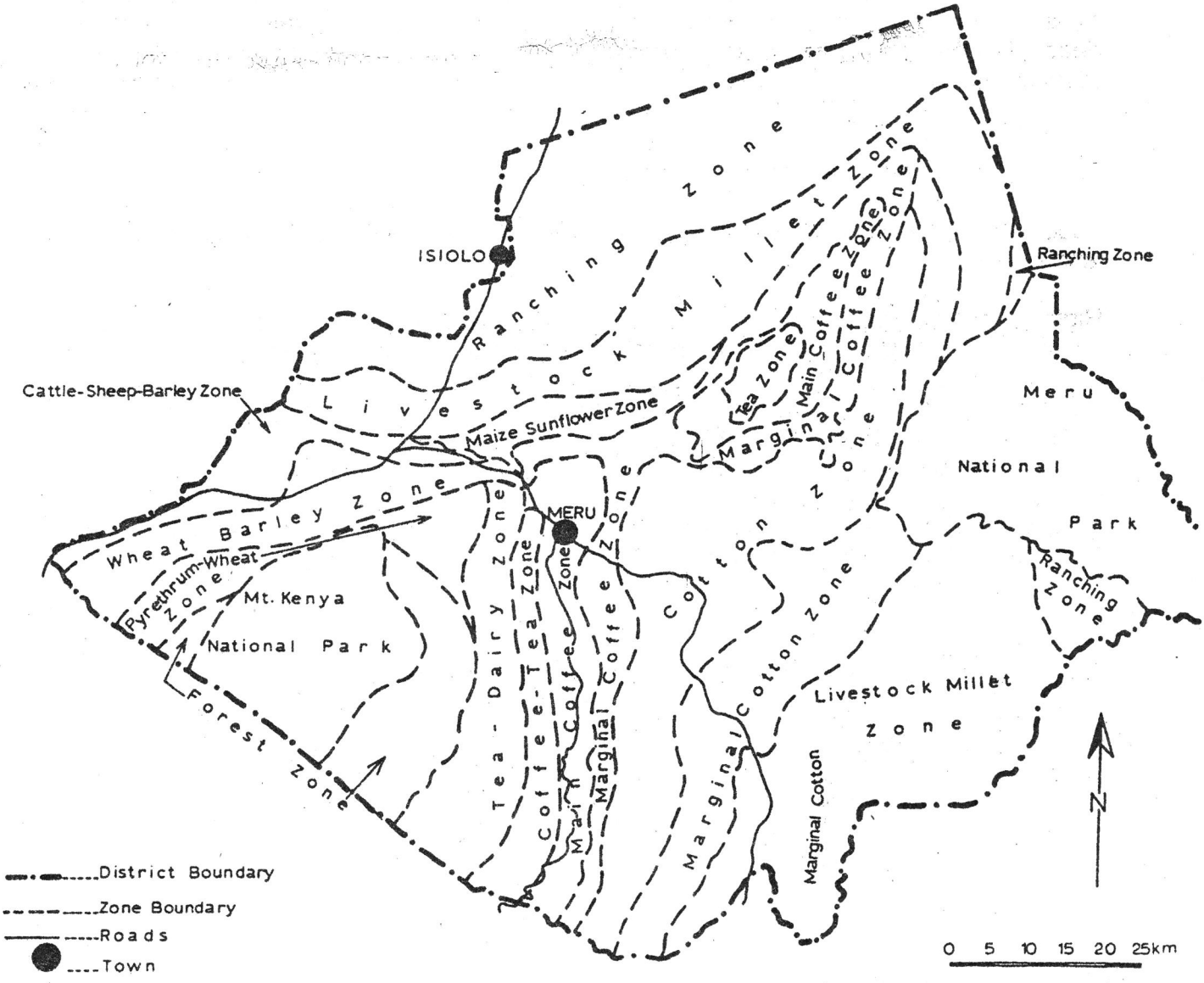


Figure 3.2 Meru District Simplified Agro-Ecological Zones

From: Meru District Development Plan, 1989-1993

communal land is now being converted into public land especially where public utilities need to be constructed, e.g. dispensaries, hospitals, cattle dips and schools. There is not likely to be a lot of land communally owned by the end of this development plan period.

Large Farms: A large-scale farm is defined as that which used to be included in the former scheduled areas (white highlands); these were mainly in Timau Division of Meru District. The average size was about 700 ha. although very few large farms still exist due to migration into the Division and purchase of these farms by groups of people for sub-division to the members. This fragmentation of the huge farms has meant that wheat and barley can no longer be grown in the District on as large a scale as was hitherto possible. This type of farm has therefore ceased to play a major role in determining the potential of the District.

Small Farms: Most of the land in Meru is now owned by small scale farmers who work on the farms as household property. It is cultivated by the farmer and his family for both subsistence and cash crop farming. The average size of these holdings range from 0.2 ha to 12 ha. The family supplies the major part of the labour input. The majority of the small-scale farmers are commercially oriented although there are still a few who do only subsistence farming oblivious of the economic prospects and potential of their farms. This is where the work of the agricultural extension worker is of crucial importance in promoting sustained economic growth and sufficient food production, and economic development in general.

3.1.6 Agriculture and Irrigation

In Meru District crop production is wholly by smallholder farmers except for wheat and barley where there are some large-scale farmers growing the two crops in Timau Division. These large scale farmers account for about 50% and 90% of the production of wheat and barley respectively, the rest being grown by small holders. There is also one coffee estate and two tea estates which may account for less than 1% of the total production of the two cash crops.

Crop production estimates for 1987 indicating hectarage, overall production and also yields per hectare for the major crops grown in the district are shown in the Table 3.2 below.

Coffee is the major cash crop in the District, but there is no expansion of the area due to low prices. Tea is the second most important cash crop and the hectarage of this crop has increased in recent years. Cotton is the major cash crop in the lower areas, but the area is declining.

Table 3.2 Crop Production: 1987

Crop	Ha	Prod. (Tons)	Yields (Tons/Ha)	Crop	Ha	Prod. (Tons)	Yields (Tons/Ha)
Cash Crops:				**Food Crops:**			
Coffee (Cherry)	34,502	73,823	2.28	Maize	72,296	60,801	0.84
Tea (green Leaf)	7,021	32,235	4.59	Wheat	6,500	10,395	1.6
Cotton	8,278	5,700	0.69	Sorghum/Millet	13,225	11,691	0.88
Pyrethrum	292	67	0.23	Beans	32,700	10,193	0.31
Tobacco	1,214	1,321	1.09	Cow Peas	4,948	4,927	1.0
Sunflower	10,500	6,510	0.62	Njahi	2,412	2,689	1.1
Barley	1,500	3,790	2.52	Green Grams	4,080	3,771	0.92
				Pigeon Peas	2,825	2,754	0.97
				Irish Potatoes	10,120	65,140	6.44
				Bananas	15,242	132,710	8.71
				Citrus	3,100	18,250	5.89
				Cabbages/Kales	1,212	5,720	4.72
				Cassava	1,052	4,635	4.40

Source: District Development Plan 1989 - 1993

Maize is the major food crop in the District. The area under this crop is more or less constant, yields are low due to poor husbandry. Sorghum and millet are the major cereals in the lower areas. Potatoes are grown mainly in the Kibirichia area. Bananas and citrus are the major fruit crops.

Several soil and water conservation programmes are going on to improve the agricultural production. Through these programmes terraces are constructed and grass strips are planted, agro-forestry is encouraged and farmers and local leaders are trained in general awareness of conservation of soil and water. However the response from farmers has been low and more commitment will be needed to make these programmes a success.

The potential irrigation area in the District according to the DDP is estimated at over 10,000 ha. Currently only about 1,100 ha is under irrigation, mainly by group - based small holder schemes.

Most of the schemes are furrow systems and need some sort of rehabilitation. Maintenance of furrow systems is simple and therefore easy to organise. But many schemes are experiencing problems of water shortage and change to sprinkler systems seems the only possible solution in the long run.

The viability of irrigation schemes in the District depends mainly on the marketing of the produce. Some problems have been encountered in marketing at the Mitunguu Irrigation Scheme, therefore improvements in the marketing infrastructure still seem to be needed.

3.1.7 Livestock

Although there has not been a recent livestock census, estimates of livestock numbers by the Ministry of Livestock Development are available based on their dipping and vaccination statistics. The latest data on livestock production date back to 1986-1987.

WRAP carried out a livestock census in collaboration with the local administration and Divisional livestock offices to obtain livestock numbers for all sub-locations in the District. The data are presented in Appendix 2 and summarized in table 3.4.

Table 3.3 Irrigation Schemes in Meru District

Name of Scheme	Division	Area (ha)	Crops	Description
Kanjoo	Igembe	100	Vegetables	Furrow, Plan International is introducing sprinklers
Katheri	C. Imenti	?	Vegetables	Initiated by farmers (1 acre/farmer)
Kiorimba	Tigania	200	Fod/veg/Tob.	Furrow, initiated by farmers, poor design
Kiguru	Timau	60	Fodder/veg	Pipe + canal, pressure problems
Materi	Tharaka	20	Fodder/veg	
Mitunguu	S. Imenti	400	Vegetables	Overhead sprinkler, operational 1985
Mutunyi	Timau	100	Fodder/veg	Furrow, scheme started by settlers
Ng'urwe Gakirwe	Tharaka	150	Fodder/veg	Phase I and II completed, Diocese supporting
Ngare Ndare	Timau	60	Vegetables	Furrow, needs rehabilitation
Tharaka Secondary	Tharaka	20	Vegetables	Diesel pump, started 1972
Proposed Schemes				
Nkondi	Tharaka	100-500	-	Area will depend on water availability
Kamuu	Nithi	-	-	Furrow, mainly domestic, minor irrigation
Muthuani	Nithi	150	-	Overhead sprinkler, gravity system
Kunati	Tigania	20-50	-	Furrow
Ruungu	Tigania	50-100	-	-
Kibuga	Tharaka	-	-	-
Gikui Mweru	S. Imenti	-	-	Furrow, sprinklers, domestic & minor irrigation
Akothima	Tigania	20-50	-	-
Gatunga	Tharaka	20-50	-	-
Kindani	Igembe	20-50	-	-
Kithinu	Tharaka	20-50	-	-
Thiiti	Tigania	20-50	-	-
Thanantu	Tigania	20-50	-	-
Ura West	Tharaka	20-50	-	-

Source: 1. Atlas of Irrigation and Drainage in Kenya, MoA, 1990
2. Information from MoA, Meru

Table 3.4 Livestock in Meru District

TYPE	1982	1984	1986	1988
Grade Cattle	94,917	46,589	66,982	214,709
Beef Cattle	261,018	200,984	224,590	151,987
Sheep	312,525	}	}	}
Goats	322,854	}525,000	}555,552	} 482,613
Pigs	5,066	} -	} -	} -
Poultry	932,883	73,000	842,041	-
Donkeys	19,653	-	-	4,621
Bee Hives	76,527	-	-	-

Source: Meru District Development Plan 1984/88 and 1989/93

Grade cows do well in high to medium potential areas while marginal and range areas tend to support only native cattle.

3.1.8 Population

In 1969, Meru District had a population of 596,506 and in 1979 a population of 830,179. The intercensal population growth rate from 1969 to 1979 was 3.4%. The Central Bureau of Statistics estimates the Meru District's annual population growth rate from 1980 to 1988 at 3.9%. Using this estimate, the projected population on divisional level in Meru District is given in Table 3.5.

Table 3.5 Population Projections 1979 - 1988

DIVISION	1979	1988	Residential Area (Km^2)	Population Density 1988
North Imenti	107,396	153,198	460	333
Timau	23,389	33,783	790	43
South Imenti	103,543	149,569	392	382
Nithi	142,288	205,528	640	321
Tigania	140,651	203,155	652	312
Tharaka	50,277	72,618	1,496	49
Igembe	90,807	130,592	535	244
Ntonyiri	80,790	116,692	1,167	100
Central Imenti	91,038	134,015	458	293
District Total	830,179	1,199,150	6,590	182

Sources: 1. Central Bureau of Statistics, Kenya Population Census 1979, Volume 1, June 1981 and updated by WRAP to include the new administrative boundaries since then.
2. Central Bureau of Statistics, Population Projections 1980-2000, March 1983
3. Meru District Development Plan 1989-1993

The average population density for 1979 was 84 persons per km^2 given an area of 9,922 km^2. However, excluding non-residential areas like forest and parks, the remaining residential area is 6,590 km^2. This implies a population density of 126 in 1979, 147 in 1983 and 182 in 1988.

It appears that Nithi has the largest population and Timau the smallest. The highest population density is found in South Imenti, the lowest in Timau Division. Timau has the lowest population density of the district because it was a scheduled area and settlement is still taking place. South Imenti has the highest density because most of the area is fertile and well settled.

3.1.9 Water Supply

There are 11 public (MoWD) water supplies in Meru District, and more than 1000 small and large self-help/community owned water projects.
The MoWD owned schemes supply four urban areas and seven rural areas. They supply about 140,000 people or 12% of the population. All schemes use surface water and except Nkubu supply the water by gravity. In principal there are no restrictions in the water availability, however the water quantities are insufficient in most of the supplies due to operational and maintenance problems. Also some supplies are too old and need major rehabilitation to serve the increased population adequately.

It will be noticed that the majority of the private/self-help projects are to be found on the eastern slopes of Mount Kenya. This is mainly due to the availability of abundant surface water on the east side of Mount Kenya. Other areas with many self-help schemes are Tigania and Igembe Divisions. The condition of the self-help schemes is variable, but generally only NGO supported schemes are sufficiently reliable. A crucial factor is the revenue collection, because operation and maintenance of supplies is only reliable when sufficient funds exist for repairs, improvement etc.

Treatment of water is not executed in the self-help schemes and the quality of the distributed water is therefore unreliable where intakes are located downstream human settlements or factories. Especially coffee factories cause extensive pollution hazards, at the times of the coffee picking season.

Table 3.6 Existing MoWD Water Supplies

Scheme	Division	Working Condition	Distribution Capacity (m^3/day)	Storage (m^3)	Treatment	Connections	Kiosks
Kanyakine	S. Imenti	Poor	270	260	Full	437	0
Mitunguu	S. Imenti/ Tharaka	Good	624	250	Full	394	12
Nkabune	N. Imenti	Good	293	100	Full	304	20
Tigania	Tigania	Good	2,004	324	Chlorin.	464	42
Mwimbi	Nithi	Fair	4,290	325	Chlorin.	1,516	0
Karingani	Nithi	Fair/ Inadequate	5,900	-	Chlorin.	2,972	0
Timau	Timau	Fair	130	500	None	315	0
Maua	Igembe	Very Poor	169	45	Full	242	0
Nkubu	S. Imenti	Fair	314	125	Full	215	0
Meru	N. Imenti	Good	7,000	1,600	Fil., Chl.	2,955	0
Chuka	Nithi	Good	415	700	Chlorin.	350	0

Source: 1. Central Bureau of Statistics, Kenya Population Census 1979, Volume 1, June 1981 and updated by WRAP to include the new administrative boundaries since then.
2. Central Bureau of Statistics, Population Projections 1980-2000, March 1983
3. Meru District Development Plan 1989-1993

Table 3.7 Some Major Private/Self-Help Water Schemes

Scheme	Division	Distribution Capacity (m^3/day)	Storage (m^3)	Connec-tions	Kiosks	Working Condition	Assisting Agency
Ntumburi	C. Imenti	743	225	0	50	Good	-
Ng'uru Gakirwe	Tharaka	6,000	25	260	0	Good	Diocese
Tuuru	Ntonyiri/ Igembe	1,700	4,000	490	86	Good	Diocese
Murugi Mugumango	Nithi	1,690	-	1,187	0	Good	CHF
Kithinu - Mari	S. Imenti	430	318	536	0	Fair	-
Taita/Muguru	S. Imenti	90	0	160	0	Fair	-
Mwirangara	S. Imenti	-	96	500	-	Fair	-
Mitunguu Irrigation	S. Imenti	34,560	64	310	0	Good	GTZ
Kaweru	Igembe	1,470	415	400	28	Good	Plan Int.

3.1.10 Health, Education and Social Services

Health

Meru district has a total of 104 health facilities including 7 hospitals and 8 health centres. The rest are dispensaries, and 2 nursing homes.

Education

Meru had an estimated population of 1.2 million in 1988. A large number of schools (secondary and primary) take care of the school age population numbering 399,970 in 1988. The district has a total of 822 primary and 131 secondary schools. The following table shows the distribution and enrolment of the schools.

Table 3.8 Distribution of Health Facilities

Division	Hospital	Health Centre	Dispensary	Nursing Home	Total
Nithi	2	1	29	-	32
South Imenti	2	-	18	-	20
Tharaka	-	2	8	-	10
Central Imenti	-	1	5	-	6
North Imenti	1	1	12	2	16
Timau	-	1	2	-	3
Ntonyiri	-	1	2	-	3
Igembe	1	-	5	-	6
Tigania	1	1	6	-	8
Total	7	8	87	2	104

Table 3.9 Primary Schools and Secondary Schools

	Primary Schools					Secondary Schools		
	Schools	Teachers		Enrolment		Schools	Enrolment	
		Trained	Untrained	Male	Female		Males	Females
Nithi	166	1,454	315	26,421	26,419	36	4,407	3,312
South Imenti	95	1,089	211	18,171	18,169	22	2,732	1,765
Tharaka	120	465	295	8,662	8,661	6	520	422
Central Imenti	70	733	244	13,718	13,716	9	1,014	1,402
North Imenti	102	1,133	292	20,741	20,738	24	1,821	1,748
Timau	20	1,169	61	3,496	3,496	1	200	124
Ntonyiri	63	332	188	11,190	11,191	6	265	181
Igembe	65	446	205	11,195	11,193	8	503	556
Tigania	121	870	472	26,068	26,068	19	985	1,173
Total	822	6,691	2,283	139,664	139,651	131	12,447	10,683

Culture and Social Services

The Ministry of Culture and Social Services is charged with the responsibility of mobilizing and motivating people through the formation of self-help development groups which encourage self-reliance through both individual and collective action. This is done by creating awareness among the people of the conditions around them and making them realise they are responsible for bringing about positive changes to improve those conditions. Existing social structures such as schools, age groups, churches, chiefs meetings etc. are used to reach the people. There are Social Development Assistants in every location who work closely with the community to understand the social organisation of each society and their leadership. It is on the basis of this that people are encouraged to start development projects and groups according to their felt needs.

Social Services include *(text from DDP 1989-1993):*

(a) **Social welfare:** includes incorporation of individuals who are disadvantaged or handicapped by productively accommodating them in the society.

(b) **Vocational Rehabilitation:** relates to training individual cases in income generating trades and crafts.

(c) **Family Life Training:** Teaching families both aspects of nutrition and balanced dietary techniques and family planning.

(d) **Youth:** Imparting vocational skills to the youth hence enabling them to be self-employed, self-reliant and contribute to rural development. This is achieved through a total of thirteen government assisted and eleven self-help village polytechnics in the district.

(e) **Sports:** This is mainly for entertainment and promotion of excellence. Most of the sporting stadia in the district needs improvement. These include Nkubu, Ntonyiri, Uru, Maua, and Ndagania Stadia, with Kinoru in need of expansion and electrification and more chairs.

(f) **Women Programmes:** Idea is to make women more self-reliant by engaging in various income generating programmes. The response has been very good with 1415 groups registering during the 1984-1988 plan period. Major activities of women groups are weaving and spinning, dye and dye, posho mills, plot development, water storage tanks, soil conservation, dairy farming, sheep and goat keeping, handicrafts, baking and confectioneries, poultry keeping, knitting and embroidery, tree nurseries, water projects and family planning in general.

(g) **Community Development Programme:** The programme aims at uplifting economic and social standards of the people throughout the district through the self-help or harambee movement. Tremendous achievements have been realised through the programme throughout the whole district. Self-help groups made substantial contributions - inclusive of labour, material and cash amounting to Ksh. 66,182,484.05 while the central government and foreign aid, Local Authority and other donor agencies, gave material and financial assistance to the tune of Ksh. 9,371,748.30 to supplement the efforts of the wananchi towards implementation of various self-help programmes in the district.

3.2 District Development Plans

The district development plans are prepared by the District Departmental Heads of Ministries under the co-ordination of the District Commissioner assisted by the District Development Officer and his assistant. Each department prepares a draft of proposals which then are presented to the District Executive Committee and the District Development Committee for discussion. The District Development Committee gives the approval for the final draft of the plan for printing. The Rural Planning Department of the Ministry of Planning and National Development provides overall guidance through seminars, formulation of guidelines and has the responsibility of editing and publication of the plan. The survey of Kenya provides the cartographic services.

The plan is divided into three chapters.

1. Background information on Districts resources base and the state of development.

2. The district strategy, the potential for development, constraints to the exploitation of the potential and the DDC decision on proposed solutions and actions.

3. Spelling out district policy orientations for the major development sectors. Listing in order of priority for each sector major projects and programmes which the DDC wishes to see implemented over the plan period (five years).

The selection and prioritization of projects and programmes rests on the DDC. The drafting of the plan is guided by the sessional paper No. 1 of 1986 and other relevant national and sectoral policy documents. In the prioritization of projects emphasis is put on: underutilized/overutilized existing facilities, uncompleted ongoing projects, food production for self-sufficiency and for export promoting Rural-Urban balance, employment generation, cost effectiveness in project implementation, preventive and promotive health care, undeserved areas requiring new or additional facilities.

3.2.1 Major Development Potential and Needs

The major economic activities in Meru District are the production of Tea and coffee, and production of marketed milk in high potential areas around Mount Kenya and Nyambene Ranges (Nithi Division, South, Central and North Imenti, Tigania, Igembe and Ntonyiri Divisions). Increased production through intensified use of available land and surplus rural labour must be encouraged through extension programmes, improved crop varieties and animal breeds, and zero grazing for the animals. The lower areas of the Divisions named above are of lower potential and hence would have to be exploited for grain crops and cotton production coupled with good marketing services both for inputs and outputs. So self-sufficiency in food production is a primary priority in the district as is indeed the national policy.

The DDC's second high priority is to increase the quality of the educational system in the District to improve the quality of passes at primary and secondary school levels to be able to compete effectively with other Districts in the Republic. The facilities started under the 8-4-4 system will have to be completed for maximum utilization. The youth polytechnics will be improved through more grants, better teachers and facilities. This will enable them to offer much needed locally-relevant skills to increase agricultural production through offering back-up services of tools and equipment, and the sources of skilled labour to run the agro-based industries which spring up with improved agricultural production.

Urban and service centres have to be accessible to the agricultural areas. These centres will themselves require co-ordinated planning and provision of basic infrastructure, ie access roads, power to run agro-based industries, improved water supply systems and telecommunications.

Grading in most of the roads currently in a state of disrepair will be more often than at the present coupled with gravelling of more important roads to facilitate economical marketing of farm produce. The bitumen standard planned road from Meru Town through Githongo will go a long way in opening the agricultural/horticultural potential of the higher zones of North, Central and South Imenti and Nithi.

There is a definite need for population control. The current District population growth rate of 3.7% must be reduced substantially if the development and other resources in the district are to match population growth. Family Planning practices must be encouraged with a view to reducing the birth rate. Soil conservation measures should be enhanced.

3.2.2 Problems Constraining Development

Cash Crop Production: Shortage of additional suitable land is a major limitation to cash crop extension in the District. Encouraging intensive methods of cultivation may well waive this handicap. There has been a trade off between the production of cash crops, farm animals and food crops all competing for the same limited land, the District having a mixed economy. Intensified production, better varieties and breeds, better extension services and technique eases this problem. Poor marketing services for both inputs and outputs is a real constraint. These include road systems, supply of packing bags, prompt payment to farmers etc.

Education System - Formal and Technical: High influx of untrained teachers especially the drier areas of Tigania, Tharaka, Igembe, Ntonyiri and Timau, affect the quality of education especially at Primary School level. There are far too few secondary Schools in comparison with the large population. There is an imbalance between the number of girls and boys in schools. Emphasis should be placed on giving equal opportunities for both girls and boys. There are far too few youth polytechnics which are fully functional and able to supply high calibre graduates.

Human Resources: Inadequate employment opportunities forms a major constraint on development of human resources. This has caused a high rate of unemployment in Meru District. Another constraint is the rural - urban migration mainly due to lack of employment facilities and other social amenities in the rural areas. Poor incentives in the agricultural sector e.g delayed pays, lack of loans etc kills the moral of the people and adversely affects production.

3.2.3 DDC Decision on Development Priorities

Agricultural Production Increase: Production per hectare must be intensified, coupled with extension techniques, improved crop varieties and improved breeds.
Secondly, an improved marketing system is crucial for increased production. This calls for construction of more milk collection centres, more tea and coffee collection centres, increased capacity to cope with improved production (Meru Central Farmers Co-operative dairy plant expansion programme) or construction of new facilities (KCC plant at Laare), and at most of the coffee, tea and cotton factories in Meru. Thirdly, farmers must be advised to produce high quality produce to attract good income.

Fourthly, it is important that the Government, encourages increase of service centres to service the farmers needs, e.g., for repairs, basic informal sector activities or Jua Kali production programme. This can only succeed where the Government helps to provide basic infrastructure in these service centres such as electrification. Laare, Chogoria, Timau, Uru, Mikinduri, Maua, and other centres lack adequate water services, roads, telephones and adequate school facilities. A service charge should be levied where possible so that the people living in these service centres/towns contribute towards the expansion and development of the centres.

Education Improvement and Support: A good educational background is essential for development. The educated are able to interpret the Government's goals and strategies and therefore aid in the welfare development of the people. It is therefore important that the Government gives the necessary incentives to increase the back-up support to agricultural development.

Through organized loan schemes to the graduates of polytechnics and businessmen we are likely to improve the income levels of the wananchi through improved production. This will improve the general welfare of the wananchi in Meru District and beyond. Graduates would no longer be attracted to the larger townships where they would not be guaranteed employment but would stick to the service centres where they obtain regular incomes.

Emphasis should be placed on appropriate education and training through social workers, adult literacy classes, training on the job, polytechnics and technical institutes, and farmers training centres giving appropriate training, thereby increasing the employment opportunities within the District.

Lastly, it is the responsibility of the DDC to stress to wananchi that there are no soft options; we must face the fact that there are no more white-collar jobs and that most of the jobs are available in agriculture - through the soiling of our hands. That is the only choice left.

Planning and Provision of Infrastructure in Service Centre: Many service centres in Meru lack basic infrastructure and have un-co-ordinated expansion. This needs to be streamlined so that the centres can grow in accordance with the laid down development programme. These towns need physical planning, electricity, telephones, water, markets, and good road systems. The towns and centres indicated for development are Chuka, Chogoria, Nkubu, Chiokariga, Timau, Gatimbi, Githongo, Kianjai, Uru, Mikinduri, Maua, Kanuni, Laare and Mutuati. The improvement of these centres will no doubt attract potential investors who would ordinarily have preferred to situate their industry or factory at Meru township where services are easily available.

(From: Meru District Development Plan, 1989-1993, Ministry of Planning and National Development)

4. GROWTH SCENARIOS AND DATA PROJECTIONS

4.1 General

The activities necessary for the preparation of Part 1 were coordinated through the District Water Engineer and the District Development Officer. They included the following:

- meeting with the District Executive Committee (DEC) to explain the objectives and intentions of the project;
- meeting with all government departments present in the district to obtain information about their short term development priorities and the influence on water needs;
- follow-up visits to the same government departments to obtain data necessary for water demand calculation;
- visits to government departments in Nairobi;
- field visits by the Planning Unit of WRAP to collect data directly;
- analysis of relevant publications.

The data presented in this report was partly collected by WRAP and partly obtained from other sources. An important source of information is the District Development Plan (DDP), which contains basic data provided by each governmental district office.

WRAP has tried to achieve the best possible accuracy of data, but this could not always be fulfilled satisfactorily, because of insufficient quality or incompleteness of the source data. WRAP considers the presented data as the best possible estimate at this stage of the study.

The quality of the DWDP depends on the data on which the Plan is based. Accurate and realistic planning is only possible if reliable baseline data is available. In this respect the assistance from other ministries, local authorities, projects etc. is very valuable, but also necessary, because the DWDP cannot be prepared without it. WRAP therefore recommends that much attention is given by all government ministries to the collection and dissemination of up-to-date baseline data.

4.2 Water Demand Study

The objective of the water demand study is twofold:

- to enable a comparison of the available water resources with the existing and future water demand
- to provide the basis for the planning of the required development of water sources.

The execution of the water demand study can be summarized in 4 phases:

- determine water consumption rates
- determine present water demand
- determine methods for projection of future water demand

- determine future water demand

The adopted model for the implementation of the water demand study is presented in figure 4.1.

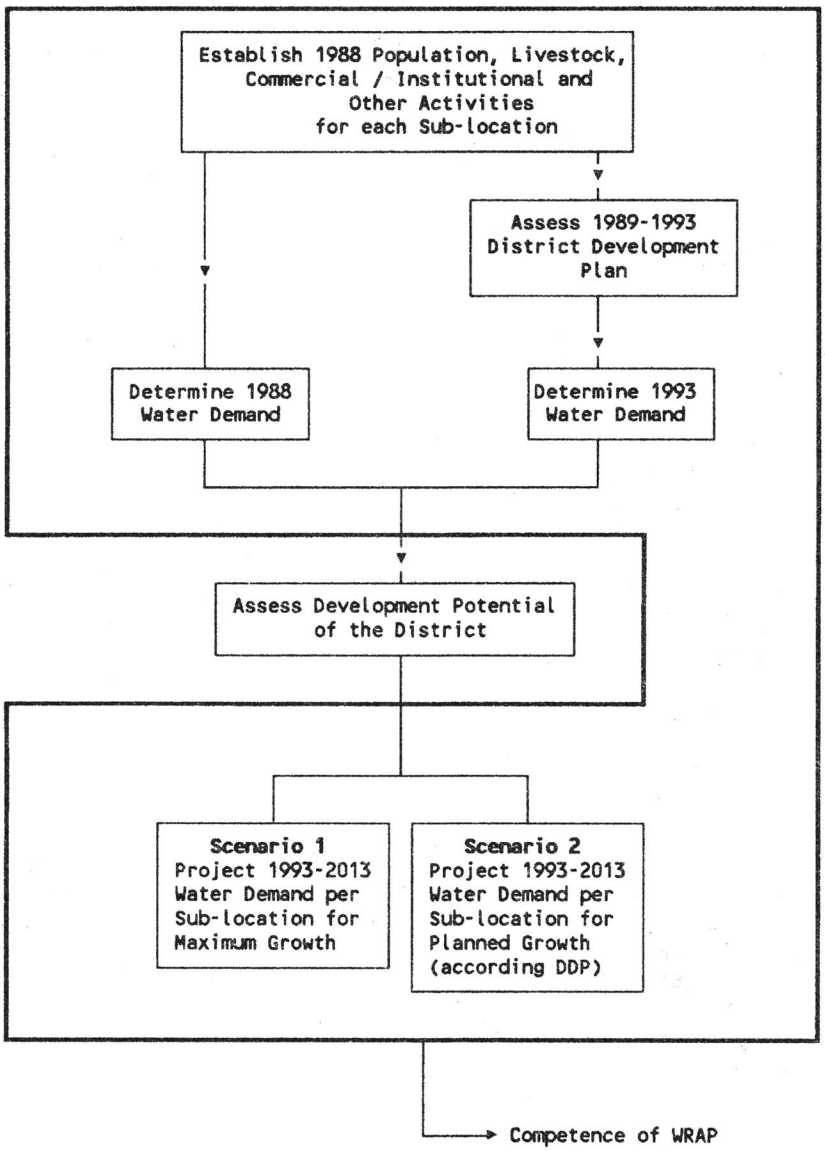


Figure 4.1 Model for Implementation of the Water Demand Study

The model indicates that the water demand needs to be determined per sub-location for the years 1988, 1993 and 1993-2013:

- The analysis of demand versus resources is carried out per geographical sub-area. It was decided for Meru District to establish water demand as per the smallest administrative unit, the sub-location. The boundaries and names of the sub-locations used here represent the situation in September 1988 and were obtained from the Central Bureau of Statistics (unpublished data), which at the time had a team in the district preparing for the 1989 census.

The district numbers 146 sub-locations (Plate 1) with an average area of 68 km^2.

- According to the Design Manual the water demand study should yield quantities of water required in the 'initial', in the 'future' and in the 'ultimate' year at the end of the design period. The initial year is defined as the year when the supply is expected to be taken into operation, the future year is 10 years later and the ultimate year is to be taken as 20 years from the initial year. Considering an earliest commissioning in 1993 of projects initiated by the presently prepared DWDP, then water demands are to be established for 1993, 2003 and 2013.

4.3 Water Consumption Rates

The calculation of water demand for the DWDP is made using the unit rates and related guidelines as specified by the 'Design Manual for Water Supply in Kenya', a publication by the MoWD (Appendix 2). The consumption rates include the water demand for population, livestock and commercial/institutional facilities. Unit rates for other users (e.g. wildlife or agriculture) are not specified, therefore these are dealt with separately in this study (see paragraph 5.2.4).

The rates:

- include about 20 % allowance for water losses through leakage and wastage
- represent consumption for which systems have to be designed, without applying peak factors
- are proposed as a guide and may be adjusted if different rates are found appropriate
- represent the consumption of the average consumer category; within a category there may be considerable variations.

The consumption rates are general rates for the whole country. To study their applicability in Meru District WRAP organized a household survey, which was carried out by the University of Nottingham (Williams and M'Barine, 1990). In the survey households were visited for interviews in the rural areas of three locations (Nkuene, Mitunguu and Marimanti). The urban areas were not included in the household survey, therefore the survey provides only a check of the water consumption in the rural areas. Part of the survey report is reproduced in Appendix 6.

The conclusion from the household survey is that the water consumption rates are broadly correct for the conditions of Meru District. Differences exist between the wet parts and dry parts of the district, because people tend to use more water if more water is available. But the use of different rates covers this for areas with different land potential.

The household survey indicates that 4% of the consumption is used for irrigation of kitchen gardens or livestock. However this seems to be an underestimate, as many respondents were not able to give an estimate of the water used for this purpose. The used consumption rates thus only include a small allowance for irrigation. In the present circumstances this is considered acceptable, because of the limited availability of clean water for domestic purposes and therefore the existing need to restrict the use of drinking water for irrigation or livestock watering.

The water consumption rate for livestock is specified in the Design Manual at 50 l/LU/day. A LU (Livestock Unit) is equal to 3 indigenous cows or 15 sheep or goats, and corresponds to 450 kg animal body weight. The MoLD uses a different unit (TLU = Tropical Livestock Unit) which corresponds to 250 kg animal body weight; (see table 5.3). The water consumption rate for the 250 kg TLU should be about 30 l/TLU/day, because the water requirement is lower for this smaller Livestock Unit.

The above rates are nominal figures, which do not take into account seasonal variations or local conditions. The water intake by animals during dry, hot periods, for instance, will be higher than during the wet, cool periods. Also influencing the water intake by animals is the forage water content. The water intake in the lowlands eg. Tharaka will be higher than in the cooler higher lands eg the upper Nithi and Upper Imentis. A different water consumption rate, therefore, must, ideally, be applied for the different seasons for each sub-location or even part of the sub-location. This, however, has not been done for simplicity reasons.

The rate 50 l/LU/day covers the water demand during dry and warm conditions. The calculated livestock demand in the cooler areas is therefore an over estimate. This must be taken into account when analizing the water demand in the "cooler" sub-locations (e.g. those on the slopes of Mount Kenya and the Nyambene Hills).

4.4 Baseline Data

The main baseline data needed for the calculation of the water demand is on population, land potential (high/medium/low) of the rural areas, percentage distribution of high/medium/low class housing for the urban areas (including trading centres), type and number of livestock units, and commercial/institutional facilities.

The main source of up-to-date information is the DDP 1989-1993. Other reports dealing with planning in the District e.g from departments or projects, may also provide suitable information. One such report was found for Meru Town only: Meru Structure Plan 1985-2015.

Publications providing specific data were:

- for population: Census 1979, CBS
- for land potential: Farm Management Handbook, MoA.
- others: Annual Reports of District Offices MoH, MoE, etc.
  : Infrastructural Inventory, MPND

Much information was collected by WRAP itself in Meru District. A census was carried out with the help of the local administration (mainly chiefs and their assistants) to obtain numbers of livestock. Information on education and health facilities was collected from the relevant departments in the District. The local administration further assisted in the provision of information on businesses, industries and administrative offices. All this information was collected for each sub-location in the District.

WRAP has tried to verify all the available data both in the field and in the offices of the various departments. This has been a major task, because rarely complete summaries are available, which cover the entire District. The main data are summarized in Appendix 2.

4.5 Scenarios for Projection of Baseline Data

The projection of the future water demand has to be based on growth rates, which have to be applied in conjunction with the baseline data. For the short term such growth rates can be found in the DDP, which specifies the economic development until 1993. For the long term growth rates are not determined at district level, but these may be obtained from publications by the Ministry of Planning and National Development. However the information in these publications is not always directly applicable to the Meru situation.

The projection of the baseline data suffers from the poor availability and low accuracy of data and of growth rates:

- 1988 baseline data are in itself projections (e.g population estimate is based on 1979 census) or are of uncertain accuracy (e.g livestock numbers, which depend on the estimates provided by the livestock owners).

- growth rates have to be based on too few and often unreliable data available from the district and cannot be directly derived from rates used in other areas in the country, due to specific characteristics of Meru District.

Due to the shortage of accurate information it was decided to develop two scenarios as the basis for making the projections. Although this in itself does not address the problem of the low accuracy and uncertainty of data and growth rates, the creation of scenarios, and the resulting range of possible water demands, will provide a basis for a flexible approach to development planning.

The growth rates to be applied in each of the two scenarios were determined such:

- that scenario 1 represents the minimum growth which may occur in the District. It takes into consideration current assessment of possible limitations set by the physical environment.

- that scenario 2 has growth rates higher than those of scenario 1 based on the adopted growth rates at the national or district level.

As a first approach planning has to be undertaken on the basis of the growth rates for scenario 1, representing a base level of investment. This planning may also be seen as the first phase of development.

The next phase of development corresponds with scenario 2. With appropriate social, cultural and institutional changes, such growth rates as envisaged by the District in the DDP are achievable. Thus, investment planning should take into account the possibility of having to extend systems to cater for this level of demand in a 'second phase'.

The applied annual growth rates are summarised in table 4.1. The growth rates are discussed in the remainder of this paragraph.

Table 4.1 Annual Growth Rates 1988-2013

	Scenario 1	Scenario 2
Applied Population Growth Rates		
Major Urban Areas: Meru	4.2 %	5 %
Minor Urban Areas: Chuka, Nkubu Chogoria, Maua	7.2 %	8 %
Rural Areas : High Potential	4.0 %	4.5 %
: Medium Potential	3.5 %	4.0 %
: Low Potential	2.5 %	3.0 %
Resulting District Population Growth Rates		
1988 - 1993	3.1 %	4.1 %
1993 - 2013	3.1 %	4.1 %
Applied Livestock Growth Rates: High pot.	2 %	4 %
Medium pot.	2 %	5 %
Low pot.	2 %	6 %
Applied School Growth Rates	8 %	10 %
Applied Health (No. of Beds) Growth Rates	4 %	6 %
Applied Commercial/Administr. Growth Rates	7 %	8 %

The DDP 1989/1993 uses a district population growth rate of 3.7% in 1988, which declines to 3.5% in 1993. The expected growth rate beyond this period is not specified, and efforts to obtain an estimate from CBS were also not successful. For planning purposes, and in the absence of any reliable information on the said growth rates after year 1993, it was assumed that growth rates remain constant for the subsequent years.

The above rate is the overall district growth rate. This rate needs to be distributed between the urban and rural population.

The Meru Structure Plan estimates the growth rate for Meru town as between 4.2% and 5% hence it was found appropriate to assume 5.0% as growth rate for scenario 2 and 4.2% for scenario 1 for Meru town. The District Development Plan 1988-1993 assumes the growth rates of other Urban Centres viz Nkubu, Chuka, Maua and Chogoria to be between 7.2% and 8.0%. This report therefore assumed 8% for the highest growth (scenario 2) and 7.2% for the lower growth (scenario 1).

The growth rate of the rural population needs to be determined in harmony with the urban growth rates in order to arrive at the same overall district growth rate as used in the DDP.

In determining the livestock growth rates in Meru district, discussions were held with the District Livestock development officer. It was assumed that the higher potential areas would have a lower livestock growth rate due to adoption of high technological methods of livestock development e.g zero grazing where the tendency is to reduce the livestock numbers and rear a fewer number of high yielding exotic breeds. In the lower potential areas, however, indigenous beef cattle are reared due to the fact that it is the only breed of cattle which can endure the poor conditions in the semi-arid regions.

According to the DLDO's Office Meru, with the current improved milk marketing conditions, livestock growth rates in the high potential areas are likely to be higher than the national livestock growth rate of 5%, say 6% for about 2-3 years until the pressure on land increases to such an extent that growth rate is forced to lower, to say 4-3%. In the low potential areas e.g. Tharaka Division, the land adjudication process implies

improved farming conditions which leads to stable growth rate assumed to be the same as the national growth rate of 5%.

The number of livestock in the dry part of the district is limited, due to the land carrying capacity of the area. Nevertheless the MoLD in Meru estimates that a growth rate of 5% is possible in this part. On the basis of the above considerations it was assumed that growth rates for the high, medium and low potential areas are respectively 2% for scenario 1 and 4%, 5% and 6% for scenario 2.

The growth rate of schools was assumed to be high at 8 and 10% respectively, to reflect the strong increase in educational facilities necessary for the children of school-going age. To prevent a too high rise of pupils in schools, a maximum of 36% of the sub-location population was used, above which the number of pupils cannot rise.

The growth of health facilities was assumed to be similar to the growth of the urban population at respectively 4% and 6% for scenario 1 and 2.

The growth rate for commercial/administrative offices was taken to be in harmony with the growth rates of the minor urban areas and hence was taken to be 8% for scenario 2 and 7% for scenario 1.

It is noteworthy to mention at this juncture that these applied growth rates described above were mainly assumptions based either on discussions with the relevant district authorities or classified documents/reports on the district which also happen to be assumptions by other parties.

4.6 Constraints of Scenarios

The assumptions made in the implementation of scenarios 1 and 2 simplify the actual conditions. Therefore when using the results of demand calculations, the following constraints must be acknowledged:

1. The applied growth rates cannot be related to past population growth, due to the in-exactness of the census of 1969 and 1979.

2. Growth rates for rural areas have been applied uniformly, despite the fact that land potential in each Division is different.

3. Growth rates for minor urban areas viz Nkubu, Chuka, Chogoria and Maua, has been applied uniformly without taking into account that these depend on potential of the served area, quality of the infrastructure etc.

4. Growth rates have been assumed constant between 1988 and 2013, although economic development of the district will not be constant during this period.

5. The effects of natural calamities e.g. droughts and epidemics has not been considered in the assumption of growth rates.

6. The projection of population is calculated from the 1988 estimate which was assumed from the DDP 1988-1993. The household count by CBS in 1988 although deemed inaccurate, indicated a great difference when compared by

the DDP estimates (assuming a standard 5 persons/household). In fact the DDP estimate was portrayed as an over estimate which then implies that the corresponding demand calculation was an over estimate.

7. It should be noted that the livestock numbers in the dry parts of the District, which are projected over the plan period (1988-2013) are for demand calculations only. Actual livestock numbers can be different, depending on the natural conditions prevailing during the period.

Meru District has a share of semi-arid region in Tharaka. The DWDP for such areas must not only consider the potential of such an area for livestock development but must also consider the liability of the same to overgrazing. Especially in periods of droughts, a continued unavailability of water may bring about range lands damage, which may take long periods to recover. The opinion of rangelands experts from the MoLD should therefore have a large influence on the contents of the DWDP in such areas.

4.7 Calculation of Water Demand

The Design Manual for Water Supply in Kenya' specifies the unit rates (Appendix 2). The rates are applied whenever a water supply is designed by the MoWD. The same rates are used to calculate the water demand for the District Water Development Plan (Paragraph 4.3).

The data required for the calculation of the Water Demand is described in chapter 5. The processing of data was done jointly by the Documentation Unit and the Planning Unit of the WRAP at Nairobi. The data was processed using a Database Management System programmed in DBase IV on a micro-computer.

The system works with clear menus on the computer screen and data can be viewed on the screen or printed. The processing yields Districts Water Demand summaries for the start year (1988) and for the initial (1993), future (2003) and the ultimate (2013) year. The summaries show per sub-location the water demand for each category of water user.

The Database Management System was specially developed by WRAP. The features of the Database programme for development planning are:

1. Separate database for each district in Kenya
2. Data entry, with an automatic check on corrections of some of the data
3. Data editing, to change any data in the database
4. Screen display, to view the data entry and demand calculations on the screen
5. Dataprint, with lay-out suitable for reports
6. Upto three scenarios for water development planning can be calculated
7. Calculation of water demand using unit rates.

8. Summary of sub-location water demand in tables

9. Entry of growth rates (percentages) for each category of water user for projection during plan period.

10. Projection of water demand to respectively 5, 15 and 25 years from the start year

11. Free choice of start year when utilising a new district data base

12. Password to protect database from unauthorised users.

13. Possibility to add new sub-locations, locations or divisions to a district.

14. Possibility to add provinces/Districts.

For more information on Database Management system, reference is made to the user's guide (in preparation).

The Meru District data is stored in separate databases for each Development Plan period (1988, 1993, 2003 and 2013). The updating of the data is easy and recalculation of the water demand can be carried out at any time. This makes it possible to update the water demand estimates whenever new data is received.

Population Demand

The domestic water demand is determined by taking into account:

1. The number of individual connections versus communal connections, which depends on;

2. for urban areas: the class of housing

3. for rural areas: the land potential

According to the Design Manual, the distribution between individual connections and communal should be assumed to be as shown in table 4.2.

No data are yet available on the class of housing in Meru District. Therefore assumptions had to be made for the five urban centres in the district:

Meru Municipality:	20% High, 40% Medium, 40% low
Chuka township:	0% High, 40% Medium, 60% low
Maua:	No classification was used
Nkubu:	No classification was used
Chogoria:	No classification was used

All other areas in Meru are considered rural.

The distribution of the population according to land potential is not known. As a first approach, it has therefore been assumed that the population is distributed evenly over the areas with different land potential. Thus the same percentages apply for population in the rural areas.

The conditions of housing classes and land potential which currently prevail are assumed to remain constant in the near future. They are also assumed to be similar for both the two scenarios. This must be considered as a simplified first approach. If more detailed information becomes available, then more accurate interpretation of these conditions may be expected.

Table 4.2 Service Type (Percentage Connections)

Class of Housing	% Individual Conn.			% Non-individual Conn.		
	Initial	Future	Ultimate	Initial	Future	Ultimate
Urban Areas:						
High and Medium	100	100	100	0	0	0
Low Class	10	30	50	90	70	50
Rural Areas:						
High Potential	20	40	80	80	60	20
Medium Potential	10	20	40	90	80	60
Low Potential	5	10	20	95	90	80

5. WATER DEMAND

5.1 Introduction

The District Water Development Plan will be based on the water demand as presented in this report and covers the planning period 1993-2013. The water demand during this period is determined by projecting the estimate of the present (1988) water demand, according two different scenarios.

The water demand is calculated according the procedures as described in the 'Design Manual for Water Supply in Kenya' of the MoWD. The unit water consumption rates applied are presented in Appendix 2.

The demand of all potential water users in each sub-location of the district was calculated and is summarized in Appendix 3 together with the basic data used. A summary of the calculated demand is presented in paragraph 5.3.

The available baseline data on population, livestock, institutional and commercial facilities etc., are described in paragraph 5.2. Also included in this paragraph are the population projections according the two scenarios and the percentages applied for the projection of the other baseline data. The methodology of estimating and projecting the baseline data was already described in chapter 4.

5.2 Baseline Data

5.2.1 Population

The available population data of Meru District are from the census of 1979.

According to the 1979 population census, the population of Meru District was 830,179 persons. The District Development Plan 1989-1993 estimates the 1988 population at 1,199,511, which is obtained by projecting the 1979 census population with an estimated growth rate of 4.17% per annum. The DDP suggests for the period 1988-1993 a declining growth rate from 3.7% in 1987 to 3.5% in 1992.

Table 5.1 Population Data Meru District

DIVISION	CENSUS 1979	DDP PROJECTION 1988
Nithi	142,288	205,590
South Imenti	103,543	149,608
Tharaka	50,277	72,644
Central Imenti	91,038	131,539
North Imenti	107,396	155,174
Timau	23,389	33,795
Ntonyiri	80,790	116,732
Igembe	90,807	131,205
Tigania	140,651	203,224
Total	830,179	1,199,511

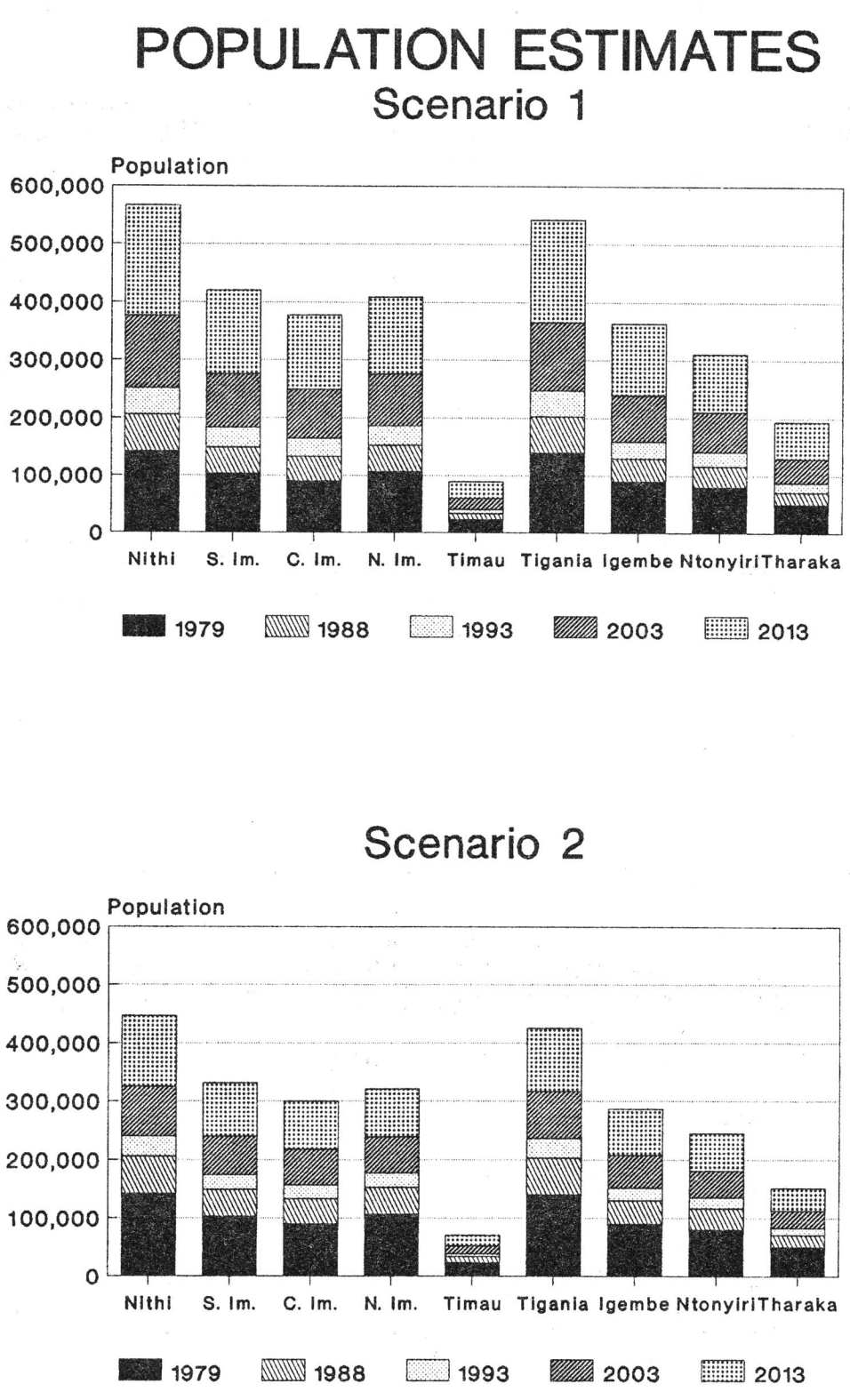


Fig. 5.1 Population Estimates and Projections - Meru District

The 1989 census results will not come in time to be incorporated in the present DWDP and therefore the population of 1988 has to be estimated by projecting the 1979 census data. WRAP has adopted for the present DWDP, the same population estimate as used in the DDP 1989/1993, mainly to stay in line with the planning by the District.

For the water demand calculation estimates have to be obtained on the 1988 rural and urban population in each sub-location.

The information available to WRAP was:

- Meru Town: Projection of urban population 1985-2015

- Four urban centres (Chuka, Chogoria, Nkubu and Maua):

  - projection 1988 - 1993 in DDP
  - estimate of 1990 population by the National Population Council.

Estimates of the population in the rural areas or of the small centres in the rural areas were not available. Therefore WRAP has prepared estimates of the 1988 rural population in all sub-locations on the basis of the total District population projected from the 1979-census, taking into account the available estimates of population in urban centres. The population of the rural centres was not estimated separately and is therefore included in the rural population estimate.

The 1988 population estimates of all sub-locations are presented in Appendix 2.

The projection of the rural and urban population over the period 1993 - 2013 was carried out with the growth rates as presented in paragraph 4.5. A summary of these population projections is presented in table 5.2.

The population of the sub-locations was determined by subdividing the divisional population according to ratios obtained from the 1979 census. Because the number of sub-locations has increased since 1979 new estimates had to be made for those sub-locations which had changed or which were established new. This was carried out by using the population distribution as obtained from the household count carried out in 1988 by the CBS.

5.2.2 Livestock

Estimates of the livestock population in the district are available from a census carried out by the WRAP Planning team in Meru. The census was carried out in close collaboration with the district local administration down to the village level (chiefs, assistant chiefs and the village elders). The results of this census represent the actual sub-location livestock figures in 1988 (see Appendix 2). The methodology used in the projection of livestock numbers to subsequent years is explained in paragraph 4.5.

Table 5.2 Population Estimates and Projections

	POPULATION 1979 CENSUS	%	ESTIMATE 1988	%	SCENARIO 1 PROJECTION 1993	%	2003	%	2013	%	SCENARIO 2 PROJECTION 1993	%	2003	%	2013	%
Nithi Division	142,288	17.1	205,528	17.1	248,456	17.4	364,129	17.8	536,159	18.2	254,583	17.4	391,892	17.7	606,436	18.1
South Imenti Division	103,543	12.5	149,569	12.5	181,516	12.7	268,411	13.1	399,378	13.5	186,026	12.7	289,154	13.1	452,844	13.5
Central Imenti Division	91,038	11.0	134,015	11.2	161,519	11.3	234,872	11.5	341,950	11.6	165,450	11.3	252,426	11.4	385,578	11.5
North Imenti Division	107,396	12.9	153,198	12.8	181,941	12.7	265,052	12.9	386,943	13.1	186,874	12.7	287,286	13.0	442,800	13.2
Tharaka Division	50,277	6.1	72,618	6.1	83,605	5.8	110,994	5.4	147,683	5.0	85,659	5.8	119,370	5.4	166,715	5.0
Timau Division	23,389	2.8	33,783	2.8	39,963	2.8	56,067	2.7	78,957	2.7	40,938	2.8	60,271	2.7	89,067	2.7
Igembe Division	90,807	10.9	130,592	10.9	157,317	11.0	229,136	11.2	335,773	11.4	161,216	11.0	246,683	11.2	379,952	11.4
Ntonyiri Division	80,790	9.7	116,692	9.7	136,016	9.5	185,235	9.0	253,338	8.6	139,348	9.5	199,173	9.0	285,892	8.5
Tigania Division	140,651	16.9	203,155	16.9	240,216	16.8	336,786	16.4	473,825	16.0	246,081	16.8	362,044	16.4	534,503	16.0
MERU DISTRICT TOTAL	830,179	100.0	1,199,150	100.0	1,430,549	100.0	2,050,682	100.0	2,954,006	100.0	1,466,175	100.0	2,208,299	100.0	3,343,787	100.0
Annual Growth Rate (%)			7.6		3.6		3.7		3.7		4.1		4.2		4.2	
URBAN AREAS																
Meru Municipality	20,622	2.5	27,862	2.3	34,226	2.4	51,645	2.5	77,931	2.6	35,560	2.4	57,924	2.6	94,351	2.8
Nkubu	2,514	0.3	5,025	0.4	7,114	0.5	14,258	0.7	28,576	1.0	7,383	0.5	15,940	0.7	34,414	1.0
Chuka	1,361	0.2	2,721	0.2	3,852	0.3	7,721	0.4	15,474	0.5	3,998	0.3	8,631	0.4	18,635	0.6
Chogoria	856	0.1	1,711	0.1	2,422	0.2	4,855	0.2	9,730	0.3	2,514	0.2	5,428	0.2	11,718	0.4
Maua	1,805	0.2	3,608	0.3	5,108	0.4	10,237	0.5	20,518	0.7	5,301	0.4	11,445	0.5	24,709	0.7
URBAN TOTAL	27,158	3.3	40,927	3.4	52,722	3.7	88,716	4.3	152,229	5.2	54,757	3.7	99,368	4.5	183,827	5.5
RURAL AREAS																
Nithi Division	140,071	16.9	201,096	16.8	242,182	16.9	351,554	17.1	510,955	17.3	248,071	16.9	377,833	17.1	576,084	17.2
South Imenti Division	101,029	12.2	144,544	12.1	174,402	12.2	254,153	12.4	370,802	12.6	178,643	12.2	273,214	12.4	418,430	12.5
Central Imenti Division	70,416	8.5	106,153	8.9	127,293	8.9	183,227	8.9	264,019	8.9	129,890	8.9	194,502	8.8	291,227	8.7
North Imenti Division	107,396	12.9	153,198	12.8	181,941	12.7	265,052	12.9	386,943	13.1	186,874	12.7	287,286	13.0	442,800	13.2
Tharaka Division	50,277	6.1	72,618	6.1	83,605	5.8	110,994	5.4	147,683	5.0	85,659	5.8	119,370	5.4	166,715	5.0
Timau Division	23,389	2.8	33,783	2.8	39,963	2.8	56,067	2.7	78,957	2.7	40,938	2.8	60,271	2.7	89,067	2.7
Igembe Division	89,002	10.7	126,984	10.6	152,209	10.6	218,899	10.7	315,255	10.7	155,915	10.6	235,238	10.7	355,243	10.6
Ntonyiri Division	80,790	9.7	116,692	9.7	136,016	9.5	185,235	9.0	253,338	8.6	139,348	9.5	199,173	9.0	285,892	8.5
Tigania Division	140,651	16.9	203,155	16.9	240,216	16.8	336,786	16.4	473,825	16.0	246,081	16.8	362,044	16.4	534,503	16.0
RURAL TOTAL	803,021	96.7	1,158,223	96.6	1,377,827	96.3	1,961,966	95.7	2,801,777	94.8	1,411,418	96.3	2,108,931	95.5	3,159,960	94.5

Notes:
1. Meru Municipality consists of Igoki East (part), Igoki West, Mulathankari North, Ntakira West (part), Town
2. Projection Meru Municipality population: 1979-1988 3.4%
   Source: Meru Structure Plan 1985-2015, Physical Planning Department, 1987
3. 1988 Population estimate four urban areas from District Development Plan
4. Igembe Division includes 400 people from Meru National Park (Census 1979)
5. Population N. Imenti includes 2325 in Northern Grazing Area, which number was not included in the Database because the actual location is unclear.
6. Projection percentages:

	Scenario 1	Scenario 2
Meru Municipality	4.2 %	5.0 %
Other urban centres	7.2 %	8.0 %
Rural area - High Potential	4.0 %	4.5 %
Rural area - Medium Potential	3.5 %	4.0 %
Rural area - Low Potential	2.5 %	3.0 %

7. The estimated 1988 population differs slightly from the estimate given in the DDP, because the estimate for this study was done per sub-location.

Table 5.3 Livestock Numbers in Meru District, 1988

Division	Cattle		Goats & Sheep	Camels	Donkeys	Total L.U
	Grade	Indigenous				
Central Imenti	27,580	6,128	24,647	-	140	31,319
Igembe	4,698	18,469	31,840	-	357	13,115
Nithi Division	78,941	8,964	161,067	-	19	92,662
North Imenti	33,606	1,567	31,405	-	961	36,598
Ntonyiri	12,861	51,071	69,078	-	844	34,824
South Imenti	37,607	-	29,895	-	15	39,596
Tharaka	-	40,402	110,382	-	1,209	21,303
Tigania	22,774	91,092	96,997	63	2,460	60,610
Timau	14,459	-	44,137	-	195	17,477
District Total	232,525	217,693	599,448	63	6,200	347,505

Notes: 1 L.U = 3 indigenous cows = 15 goats/sheep
= 1 grade cow = 450 kg animal weight

Table 5.4 Projection of Livestock Numbers

Livestock Numbers (L.U)	1988	Scenario 1			Scenario 2		
		1993	2003	2013	1993	2003	2013
Central Imenti	31,319	34,579	42,153	51,386	38,545	58,461	88,822
Igembe	13,115	14,479	17,654	21,521	16,737	27,268	44,417
Nithi Division	92,662	102,311	124,712	152,028	116,357	183,778	276,403
North Imenti	36,598	40,407	49,258	60,045	45,540	70,765	110,535
Ntonyiri	34,825	38,449	46,871	57,135	46,605	83,462	149,471
South Imenti	39,596	43,721	53,297	64,969	48,301	71,899	107,071
Tharaka	21,303	23,522	28,675	34,955	28,511	51,064	91,454
Tigania	60,610	66,917	81,579	99,446	77,358	126,005	205,259
Timau	17,477	19,297	23,522	28,675	23,057	40,189	70,173
District Total	347,505	383,672	467,721	570,160	441,011	712,891	1,143,605

5.2.3 Institutional and Commercial Facilities

The information on institutional facilities (schools, hospitals, health centres, dispensaries, administrative offices) and commercial facilities (hotels, shops, bars) is mainly obtained from the relevant governmental departments. In case of, Meru District, much of the information was obtained directly from the district through visits to the departments in the district.

The projection of the number of the institutional/commercial facilities is made assuming a constant relation with population numbers or by applying a uniform growth rate. It is described per facility in this paragraph.

The 1988 data on the institutional/commercial facilities is summarised in appendix 2.

Schools

In 1988 there were 822 primary schools (279, 315 students) and 131 secondary schools (23,130 students) in the district, of these 127 are boarding schools and 826 day schools. All day schools were assumed to be without WC whereas all boarding schools were assumed to be with WC.

It will be noted that of the 131 secondary schools in the district, about 25% are girls schools and 75% are boys or mixed schools. This means there is not yet a fair distribution of educational opportunities between the boys and the girls. Again these schools are not uniformly distributed among the Divisions of the District. For example, Nithi has 166 primary and 36 secondary schools respectively compared to Timau (lowest) 20 primary and 1 secondary school. School distribution in the district corresponds to the regional population distribution and the corresponding land potential. Enrolment of children of school-going age is highest on the eastern slopes of Mount Kenya whereas the drier areas have poorer turn up. In the region of Ntonyiri/Igembe Division miraa trade is responsible for enormous numbers of school drop outs before completion of primary education despite the general affluence of the people around there.

The DDP does not provide an estimate of the future number of pupils/schools. The growth rate of the number of pupils, therefore, had to be estimated. Percentages of 8% and 10% were assumed for scenario 1 and 2 respectively. These percentages being higher than the population growth rates, it was found necessary to introduce a limit. This was determined at 36% of the population in each sub-location, which percentage was derived from the population age structure (the percentage of population of school-going age (5-17 years) for the years 1988-1993 is about 36%). With respect to day schools and boarding schools, equal growth rate was assumed for both.

For some newly started or proposed schools whose enrolment was not known, it was assumed that day school would have 100 students and the boarding schools would have 240 students.

Health

According to the DDP (1988-1993) the district has total of 104 health facilities including 7 hospitals (Meru, Chogoria, Nkubu, Chuka, Kanyakine, Maua and Mikinduri) and 8 health centres located in Nithi (1), Tharaka (2), Central Imenti (1), North Imenti (1), Timau (1), Ntonyiri (1), and Tigania (1). The rest are dispensaries and 2 nursing homes (see paragraph 3.2.9). The increase in the number of beds and outpatients is not specified by the DDP. It was then assumed for the water demand calculation that both will grow for each of the two scenarios at a growth rate somewhere between the growth rate of the major urban population (Meru town) and that of the minor urban population (Maua, Nkubu, Chogoria and Chuka), that is 4% and 6% for scenario 1 and 2 respectively.

Other Facilities

Information on the number of shops, bars and hotels was obtained from the offices of the County Councils (Chuka and Meru Town) and Municipality Council Meru. The projection of these numbers into the future was done by using the same growth rates as applied for the urban population.

Industries

According to information obtained directly from the local administration at the sub-locational level, there are a total of 492 ha under industrial activity in the district, with some Divisions registering none (Central Imenti, Igembe and Tharaka) and the majority being indicated in North Imenti the seat of Meru Municipality. Future industrial

projections are not specified in the DDP. Therefore in the absence of any industrial growth trends, it was quite difficult to project the future industrial demand. In view of the fact that majority of these indicated industries were actually "Jua Kali" sheds, it was assumed that part of the industrial water demand may temporarily be covered by the domestic demand. The projection of the industrial water demand presented in Appendix 4 must therefore be used with caution and will need more study, before using it for water supply planning.

5.2.4 Agriculture and Wildlife

The water demand for wildlife and agriculture is normally not included in the rates as used by the MoWD. Nevertheless the use of water for both purposes needs to be included in the DWDP.

The provision of water for wildlife must be planned for in cooperation with the Ministry of Tourism and Wildlife, to ensure optimal coverage of the wildlife water demand. The provision of water for wildlife was not included in this study, but it is strongly advised to incorporate wildlife demand for water in the final DWDP. Separate feasibility studies may have to be carried out to investigate the options for water supply to wildlife. There are two National Parks in the District, namely Meru and Mount Kenya National Parks, which are actually much endowed with water sources.

Agricultural demand for water is normally dealt with in separate agricultural studies. The water demand for irrigation will not be calculated in this DWDS. However, the DWDS will indicate the potential for irrigation, if water resources in a Location are sufficient. It is note worthy that the irrigation potential in the District is large, estimated at 10,000 ha. Some of this potential has been exploited in the form of Mitunguu Irrigation Scheme (overhead system), Kanjoo irrigation scheme (need rehabilitation) in Igembe Division, Ngare Ndare Irrigation scheme (need rehabilitation) in Timau Division, Mutonyi and Katheri/Githongu irrigation scheme in Central Imenti (need for rehabilitation). Other proposed irrigation projects where preliminary feasibility studies have been carried out are Nkondi, Ruungu, Mbeu and Nguuru Gakirwe (see table 3.3).

5.3 Water Demand Figures

5.3.1 Total Water Demand

The results of the water demand calculations are presented in detail in the appendices:

- Appendix 3 contains some examples of the data entry sheets and the 1988 demand sheets per sub-location in the District.

- Appendix 4 contains summaries per Division of the calculated water demand of all sub-locations for the year 1988 and for scenario 1 and 2 of the years 1993, 2003 and 2013.

The demand figures are summarized in table 5.5 and figure 5.2, which present the total water demand per Division, both for domestic and non-domestic use.

Table 5.5 Projected Water Demand (m^3/day) in Meru District

Year: 1988

Division	Total Water Demand	Total Domestic	Total Non-Domestic
Central Imenti	5,481	3,915	1,566
Igembe	4,212	3,557	656
Nithi	11,612	6,458	5,153
North Imenti	17,075	6,145	10,930
Ntonyiri	4,111	2,349	1,762
South Imenti	7,013	4,913	2,100
Tharaka	2,335	1,270	1,065
Tigania	7,827	4,757	3,071
Timau	1,693	779	914
District Total	61,359	34,143	27,217

Year: 1993

Division	Scenario 1			Scenario 2		
	Total Water Demand	Total Domestic	Total Non-Domestic	Total Water Demand	Total Domestic	Total Non-Domestic
Central Imenti	6,507	4,778	1,729	6,853	4,923	1,931
Igembe	5,111	4,387	724	5,361	4,518	843
Nithi	13,587	7,933	5,654	14,532	8,226	6,306
North Imenti	22,281	7,541	14,740	23,411	7,814	15,597
Ntonyiri	4,734	2,792	1,943	5,207	2,876	2,331
South Imenti	8,419	6,093	2,326	8,883	6,310	2,573
Tharaka	2,662	1,486	1,176	2,937	1,532	1,405
Tigania	9,177	5,771	3,406	9,952	5,940	4,011
Timau	1,940	935	1,005	2,141	962	1,179
District Total	74,418	41,716	32,702	79,277	43,101	36,176

Year: 2003

Division	Scenario 1			Scenario 2		
	Total Water Demand	Total Domestic	Total Non-Domestic	Total Water Demand	Total Domestic	Total Non-Domestic
Central Imenti	10,896	8,788	2,108	12,486	9,546	2,940
Igembe	8,980	8,097	883	10,215	8,813	1,402
Nithi	21,765	14,509	7,256	25,915	15,898	10,017
North Imenti	40,747	13,264	27,483	46,945	14,667	32,278
Ntonyiri	7,124	4,740	2,384	9,230	5,113	4,117
South Imenti	14,282	11,337	2,945	16,345	12,383	3,962
Tharaka	3,779	2,345	1,434	5,020	2,573	2,446
Tigania	14,417	10,218	4,199	17,962	11,095	6,866
Timau	2,916	1,660	1,256	3,835	1,810	2,025
District Total	124,906	74,959	49,947	147,952	81,899	66,053

Year: 2013

Division	Scenario 1			Scenario 2		
	Total Water Demand	Total Domestic	Total Non-Domestic	Total Water Demand	Total Domestic	Total Non-Domestic
Central Imenti	20,351	17,782	2,569	24,871	20,382	4,490
Igembe	17,423	16,347	1,076	21,073	18,730	2,343
Nithi	38,617	28,969	9,648	49,113	33,670	15,443
North Imenti	76,985	24,763	52,222	96,555	29,008	67,547
Ntonyiri	11,432	8,495	2,937	16,864	9,585	7,279
South Imenti	26,856	23,048	3,808	32,867	26,701	6,166
Tharaka	5,673	3,926	1,748	8,713	4,570	4,143
Tigania	24,967	19,755	5,212	33,999	22,450	11,548
Timau	4,849	3,255	1,594	7,249	3,748	3,501
District Total	227,154	146,340	80,814	291,303	168,845	122,458

5.3.2 Domestic Water Demand

The total domestic water demand per Division is shown in figure 5.2. The figure indicates that the differences in demand are small between the two scenarios, especially until year 2003.

The distribution of domestic water demand per sub-location type is represented in table 5.6 of the 145 sub-locations in the district. Only 9 have an urban element; the rest are predominantly rural.

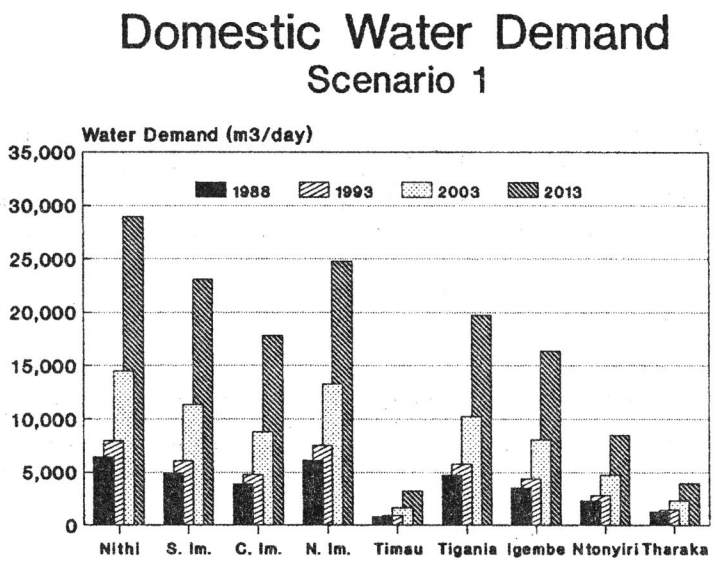
The total domestic demand in many rural sub-locations is an average about 100-400 m^3/day.

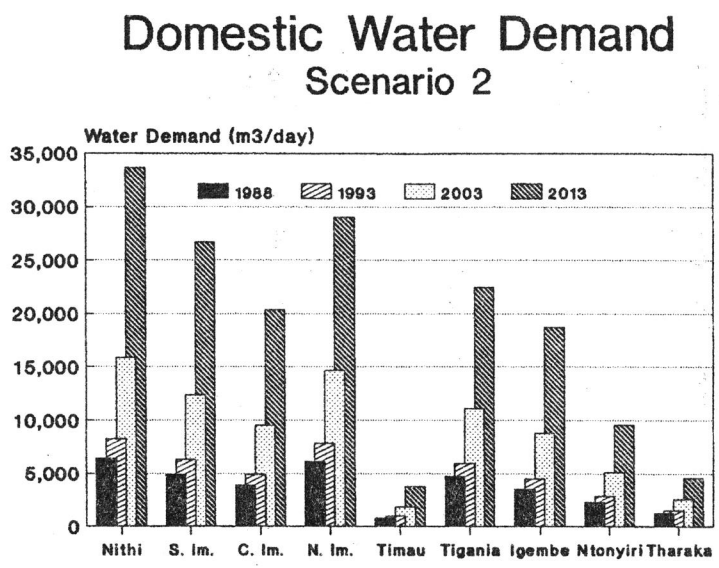
The urban water demand increases more than the rural demand because of the assumed higher growth rates. Under scenario 1 for instance, the demand in the main urban areas increases by about 8 times from 1988 to 2013. In the rural areas population growth rates are lower, but the demand for water increases mainly because of increased demand from institutions and commercial activities.

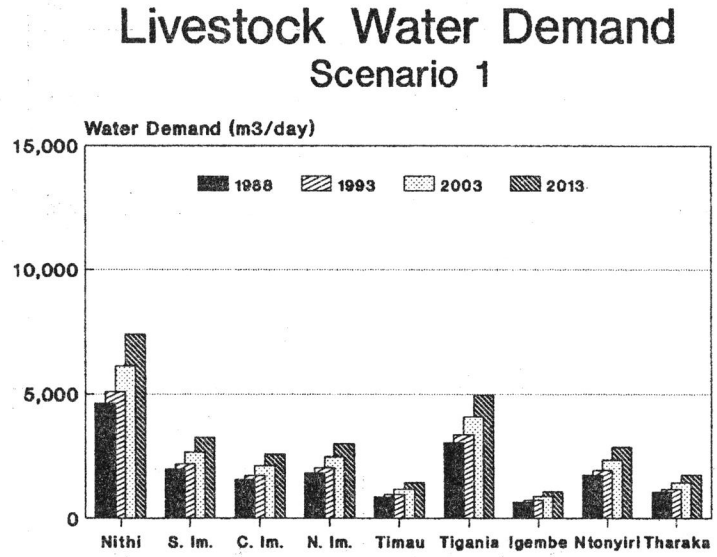
Table 5.6 Projected Domestic Water Demand per Sub-Location Type

Scenario 1 ("Lower Growth")

Division	Area (Km²)	1988		1993		2003		2013	
		No. of Sub-Loc.	Water Demand (m^3/day)	No. of Sub-Loc.	Water Demand (m^3/day)	No. of Sub-loc.	Water Demand (m^3/day)	No. of Sub-Loc.	Water Demand (m^3/day)
C. Imenti	458	16	3,915	16	4,778	16	8,788	16	17,782
Type 1		16	3,915	16	4,778	16	8,788	16	17,782
Type 2		0	0	0	0	0	0	0	0
Type 3		0	0	0	0	0	0	0	0
Type 4		0	0	0	0	0	0	0	0
Igembe	535	12	3,557	12	4,387	12	8,097	12	16,347
Type 1		11	2,753	11	3,343	11	6,105	11	12,196
Type 2		0	0	0	0	0	0	0	0
Type 3		1	804	0	0	0	0	0	0
Type 4		0	0	1	1,044	1	1,992	1	4,152
Nithi	640	32	6,458	32	7,933	32	14,509	32	28,969
Type 1		30	5,532	30	6,710	30	12,142	30	24,192
Type 2		1	581	0	0	0	-	0	0
Type 3		1	346	2	1,223	0	-	0	0
Type 4		0	0	0	-	2	2,367	2	4,777
N. Imenti	460	18	6,145	18	7,541	18	13,264	18	24,763
Type 1		13	2,713	13	3,294	13	6,010	13	12,167
Type 2		0	0	0	0	0	0	0	0
Type 3		3	1,535	2	942	1	1,144	0	0
Type 4		2	1,898	3	3,306	4	6,110	5	12,595
Ntonyiri	1,167	8	2,349	8	2,792	8	4,740	8	8,495
Type 1		8	2,349	8	2,792	8	4,740	8	8,495
Type 2		0	0	0	0	0	0	0	0
Type 3		0	0	0	0	0	0	0	0
Type 4		0	0	0	0	0	0	0	0







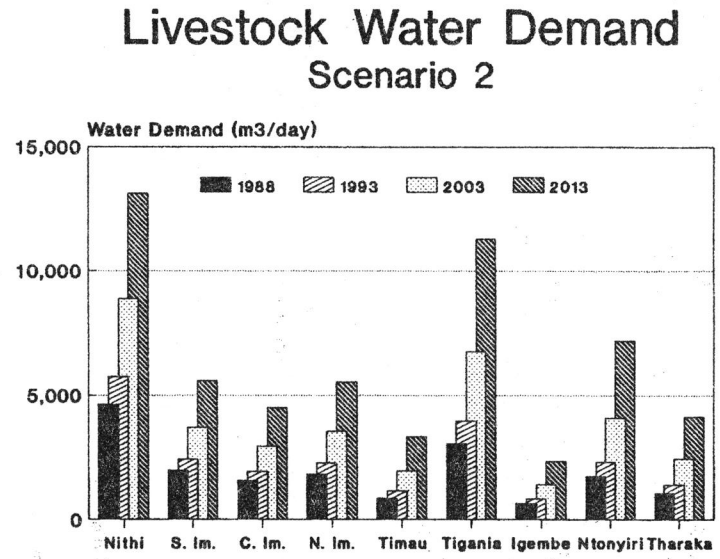


Fig. 5.2 Projected Domestic and Non-Domestic Water Demand in Meru District

Table 5.6 (Cont.) Projected Domestic Water Demand per Sub-Location Type

Scenario 1 ("Lower Growth")

Division	Area (km²)	1988		1993		2003		2013	
		No. of Sub-Loc.	Water Demand (m³/day)	No. of Sub-Loc.	Water Demand (m³/day)	No. of Sub-loc.	Water Demand (m³/day)	No. of Sub-Loc.	Water Demand (m³/day)
S. Imenti	292	18	4,913	18	6,093	18	11,337	18	23,048
Type 1		17	4,129	17	5,055	17	9,200	17	18,556
Type 2		0	0	0	0	0	0	0	0
Type 3		0	0	0	0	0	0	0	0
Type 4		1	784	1	1,038	1	2,137	1	4,492
Tharaka	1,496	12	1,270	12	1,486	12	2,345	12	3,926
Type 1		12	1,270	12	1,486	12	2,345	12	3,926
Type 2		0	0	0	0	0	0	0	0
Type 3		0	0	0	0	0	0	0	0
Type 4		0	0	0	0	0	0	0	0
Tigania	652	23	4,757	23	5,771	23	10,218	23	19,755
Type 1		23	4,757	23	5,771	23	10,218	23	19,755
Type 2		0	0	0	0	0	0	0	0
Type 3		0	0	0	0	0	0	0	0
Type 4		0	0	0	0	0	0	0	0
Timau	790	6	779	6	935	6	1,660	6	3,255
Type 1		6	779	6	935	6	1,660	6	3,255
Type 2		0	0	0	0	0	0	0	0
Type 3		0	0	0	0	0	0	0	0
Type 4		0	0	0	0	0	0	0	0

Note: Type 1 = Rural Sub-location
Type 2 = Sub-location with market or local centre <2,000 population
Type 3 = Sub-location with rural centre >2,000 population
Type 4 = Sub-location with urban centre >5,000 population

5.3.3 Non-Domestic Demand

The non-domestic demand comprises demand from livestock and industries. However, table 5.7 indicates that the industrial demand is not significant in the present calculation, except for North Imenti Division where Meru Town is located.

Table 5.7 Industrial Water Demand

Division	1988 Water Demand (m³/day)	Scenario 2		
		1993 Water Demand (m³/day)	2003 Water Demand (m³/day)	2013 Water Demand (m³/day)
Central Imenti	-	-	-	-
Igembe	-	-	-	-
Nithi	520	560	1,140	2,320
North Imenti	9,100	13,320	28,740	62,020
Ntonyiri	20	20	40	80
South Imenti	120	140	280	580
Tharaka	-	-	-	-
Tigania	40	60	120	260
Timau	40	40	80	160
District	9,840	14,140	30,400	65,420

The growth rates applied to industries are higher than for livestock, especially for scenario 1, therefore the share of the industrial demand becomes larger in the future.

The total 1988 livestock demand is lower than the domestic demand in all Divisions except Timau. This Division was a designated settlement area and large scale livestock and wheat farms still dominate. The livestock demand is presented in table 5.8 and in figure 5.2.

Table 5.8 Livestock Water Demand

Division	No. of Sub-locations	1988 Livestock Water Demand (m^3/day)	Average Livestock Demand/ Sub-loc. (m^3/day)	Scenario 2 2013 Livestock Water Demand (m^3/day)	Average Livestock Demand/ Sub-loc. (m^3/day)
Central Imenti	16	1,566	98	4,490	281
Igembe	12	656	55	2,342	195
Nithi	32	4,633	145	13,123	410
North Imenti	18	1,830	102	5,527	307
Ntonyiri	8	1,741	218	7,199	900
South Imenti	18	1,980	110	5,586	310
Tigania	23	3,031	132	11,288	491
Timau	6	874	146	3,341	557
Tharaka	12	1,065	89	4,143	345
District	145	17,375	120	57,038	393

Notes: 1. Demand shown includes that from all livestock considered in the data entry sheets (Appendix 2)

The water demand from livestock is biggest in Nithi followed by Tigania, with the lowest in Igembe. It will be noticed that the average livestock demand/sub-location changes at different rates from 1988 to 2013 mainly due to the fact that the applied growth rates for each sub-location depend on the potential. E.g Central Imenti has a change of 183 m^3/day in the demand/sub-location representing a 187% change between 1988 and 2013, compared to Ntonyiri which registers a change of almost 700 m^3/day in the demand/sub-location representing a 313% change between the same years. This is mainly due to the higher assumed growth rate for lower potential areas than that for the higher potential areas (Central Imenti is a higher potential Division than Ntonyiri on average).

The projected water demand for industries and livestock is presented for each sub-location in Appendix 4.

6. WATER RESOURCES

6.1 Groundwater Resources

The geology of Meru consists of two major units: the Basement System and the Tertiary Volcanics. Groundwater is found in both units and in the shallow alluvial sediments on top of these units. The Basement System is characterized by the presence of local aquifers: this means that there are many small, isolated groundwater bearing rocks in this unit. In contrary, the Tertiary Volcanics form a predominantly regional aquifer, which means that there is a continuous aquifer in most of this unit. Borehole siting is therefore much more critical in the Basement Rocks than in the Volcanics.

Groundwater availability can be subdivided into five zones with respectively: (i) Very High, (ii) High, (iii) Medium, (iv) Low and (v) Uncertain Groundwater Availability. The characteristics of the zones regarding groundwater availability are:

(i) Very High Groundwater Availability

- aquifers are continuous
- borehole yields are very high
- the most productive aquifers are found in pyroclastics (cinders, coarse ashes, etc).

Lowermost Volcanic Slopes of the Nyambeni

- recharge potential is very good; most recharge comes from the higher parts of the Nyambeni, and to a lesser extent Mt Kenya
- there are 75 boreholes of which 69 were successful
- borehole yields go up to 100 m3/h. Average yield of existing boreholes is 10.5 m3/h. The standard deviation is 14.7 m3/h. If boreholes were better constructed average borehole yields would certainly be much higher, possibly around 50 m3/h.
- groundwater struck levels are rather shallow: 5-115 m, average: 40±25 m.
- groundwater rest levels vary between 0 to 100 m, average: 30±23 m.
- borehole depths vary between 11 and 213 m. Average is 66±40 m.
- groundwater quality in these volcanic rocks is fresh. The mean EC amounts to 422±400 $\mu S/cm^2$
- there are 56 springs in this area. The average discharge is very high: 52±91 l/sec.

(ii) High Groundwater Availability

- there are many springs with good quality water. These sources should be preferred instead of boreholes for reasons of economy and reliability.
- borehole yields are rather high
- borehole siting is not critical
- the aquifers are perched; the most productive aquifers are found in cinderlayers
- recharge potential is very good
- aquifers are continuous and hydraulically interconnected by fissures

Windward Mount Kenya Slopes (Meru-Chuka Area)

- there are 11 boreholes, the success rate is 100%
- borehole yields go up to 70 m3/h. Average yield is 9.6 m3/h. The standard deviation is 18.
- groundwater struck levels are less than 170 m, average: 53±47 m.
- groundwater rest levels vary between 10 to 150 m, average: 53±39 m.
- borehole depths vary between 20 and 200 m.
- there are 360 permanent springs in this area. The average discharge is high: 39±154 l/sec. The highest flow was 1520 l/sec.
- water quality is excellent: the mean and standard deviation of the electrical conductivity amounts to: 60±65 $\mu S/cm^2$.

Nyambeni Uplands

- there are 13 boreholes. Water rest levels are recorded of 10 boreholes.
- borehole yields go up to 10 m3/h. Average yield is 5.1±3.7 m3/h.
- groundwater struck levels are less than 120 m, average: 55±27 m.
- groundwater rest levels vary between 2 to 69 m, average: 28±19 m.
- borehole depths vary between 18 and 120 m.
- groundwater quality in these volcanic rocks is mildly saline.
- there are 117 springs in this area. The average discharge is high: 16±26 l/sec. The highest is 150 l/sec.
- the EC amounts to 131±117 $\mu S/cm^2$ with a maximum of 780 $\mu S/cm^2$.

(iii) Medium Groundwater Availability

Leeward Mount Kenya Slopes (Nanyuki-Timau Area)

- there are springs with good quality water but the spring density is much less than in the rainier windward side. The use of springs instead of boreholes should be preferred.
- borehole yields are rather high
- borehole siting is not critical
- the most productive aquifers are found in cinderlayers
- recharge potential is good
- aquifers are continuous and hydraulically interconnected by fissures
- there are 11 boreholes, 8 boreholes were successful.
- borehole yields go up to 14 m3/h. Average yield is 4.6±4.9 m3/h.
- groundwater struck levels are less than 160 m, average: 76±35 m.
- groundwater rest levels vary between 16 to 161 m, average: 60±38 m
- borehole depths vary between 50 and 157 m.
- there are 37 springs in this area. The average discharge is high: 69±149 l/sec with a maximum of 149 l/sec
- the EC amounts to 113±63 $\mu S/cm^2$ with a maximum of 300 $\mu S/cm^2$.

(iv) Low Groundwater Availability

Compact Tuff Area

- groundwater occurs mainly in fine volcanic tuffs, lahars and lava flows
- there are no permanent springs
- borehole yields are very small, only sufficient for handpumps
- borehole siting is not critical
- groundwater struck and rest levels are near the ground surface
- water quality is expected to be generally good enough for domestic use

Basement Area

- groundwater occurs mainly in fractures, faults and in weathered zones forming small, isolated water bearing cells of low permeability
- groundwater quantities are usually small
- borehole siting therefore is critical. Proper application and interpretation of geophysics could improve the success rate of boreholes.
- boreholes should be near rivers or laggas so as to facilitate recharge
- borehole yields are less than 10 m3/h, average and standard deviation are 3.1±3.0 m3/h.
- depth at which groundwater is struck is less than 40 m. The average is 14±9 m3/h.
- depth to water rest level varies between 0 and 24 m. The average is 6.1±4.5 m3/h.
- the mean and standard deviation of the depths of the boreholes is 29±11 m.
- groundwater quality is usually mildly saline to very saline, and hard to very hard. Fluoride levels often exceed the standard of 2.5 mg/l.
- the success rate of boreholes is about 30% taking into account sufficient discharge for an handpump and the permissable chemical concentrations
- there are no permanent springs

(v) Uncertain Groundwater Availability (very deep aquifers)

Kibirichia Area
Lare Area

- groundwater probably occurs in large amounts at greater depth (>200 m), but how deep is not known
- perched aquifers with sufficient yield for handpumps do occur sometimes at shallower depth: in the Lare area, only two out of a total of 13 boreholes have a discharge which is sufficient for handpumps
- there are very few permanent springs
- borehole siting is not critical; striking a perched aquifer seems to be a matter of luck
- water quality is expected to be generally good enough for domestic use but there are no data.

6.2 Surface Water Resources

Rivers

The drainage system is mainly determined by three factors:

- the direction of the slopes of Mount Kenya and the Nyambeni Range
- the slope of the end-Tertiary peneplain
- the Basement System structure.

Radial and near radial drainage patterns predominate on the slopes of Mt Kenya and the Nyambeni Range, until the mountain streams debouch from the gorges in the lavas onto the Basement System floor. The rivers on the western and northern slopes, i. a. the Timau, Sirimon and Isiolo Rivers are tributaries of the Ewaso Ngiro as are the ephemeral streams on the northern slopes of the Nyambeni Range. These are part of drainage area 5. All other rivers i.a. the Thuchi, Mutonga, Thangatha, Kathita and Ura are tributaries of the Tana River. These rivers are situated in drainage area 4.

The mean, 80% and 96% flows of 26 stations situated in Meru District, and of one station situated in Isiolo (Archers Post) are listed in Table 6.1. Note that the 80% flow is the design flow for irrigation schemes while the 96% flow is the design flow for domestic supplies. These data, together with other streamflow data from Baringo and Laikipia were used to derive the following regression equations relating streamflow to drainage area and precipitation.

Table 6.1 Streamflow Related to Drainage Area and Precipitation

Qmean	=	$12.59*10^{-3}$	*	$Area^{0.85}$	*	$Rain^{2.7}$
Q80%	=	$3.27*10^{-3}$	*	$Area^{0.85}$	*	$Rain^{2.7}$
Q96%	=	$1.72*10^{-3}$	*	$Area^{0.85}$	*	$Rain^{2.7}$

Note: Rain = mean annual rainfall in metres
Area = catchment area in square km

These equations imply that the 80% and 96% flows can be estimated from the mean flow using the following proportionality:

Qmean : Q80% : Q96% = 1 : 0.259 : 0.136

These equations have been derived using all available data from perennial streams in Baringo, Laikipia, Meru and Isiolo District. In all catchments, the subsoil is predominantly volcanic and the rains are concentrated into two distinct rainy seasons. Mean annual rainfall varies between 550 and 1900 mm and the drainage areas between 26 and 15,300 km^2. These equations are probably valid throughout Kenya and their use should be preferred where measured data look suspicious.

These equations are used to estimate the surface water inflow on divisional and locational level. These data were used to estimate

- the flow to the Tana River, and
- the total surface flow from Mt Kenya in Meru District along the Chuka-Meru-Nanyuki road.

The results are given in Table 6.2

Table 6.2 Summary of Streamflow in Meru District

			mean	80%	96%	
Streamflow into the Tana River			70	17	8.2	cumec
Streamflow along the	Mt Kenya, windward side	4E	29	7.6	4.9	cumec
	Mt Kenya, leeward side	5BE	3.6	1.1	0.54	cumec
Chuka-Nanyuki Rd	Mt Kenya, Timau-Isiolo side	5D	3	0.8	0.3	cumec
Total streamflow passing the road			36	10	5.7	cumec

Note: There are no reliable measurements available for the estimate for the Timau-Isiolo side

Laggas

Laggas occur in large numbers in the Basement area. They flow intermittently during the year, usually for very short periods, rather hours than days. Their flows can be very high when rainfall intensities are high as storage capacity is small.

In most of the area laggas do not play a significant role in the water supply because of the nearness of permanent rivers. But distances to permanent rivers can be rather large in Chiokariga and East of Gatunga. So, there are well developed laggas and lagga deposits in these areas.

Neither flow nor chemical data are available but chemical water quality is expected to be generally acceptable.

Rainfall

The humid windward south-eastern slopes of Mt Kenya and the Nyambeni Range receive 1,250 to 1,500 mm of rainfall annually. Locally, rain will exceed even the 2,000 mm mark. This is in strong contrast with the semi-arid leeward side of the mountains and the lowlands of the District where 400 to 1,000 mm of rainfall is measured (Figure 6.1). The rainfall pattern is bi-modal with the long rains from mid-March to May and the short rains from October to December.

6.3 Water Resources Development Potential

6.3.1 Surface Water Development Potential

There is ample potential left in Meru District for development of surface water, for domestic use and even for development of low flows for irrigation. Valid surface water permits are issued for around 1,700 different abstraction points along rivers endorsing a total dry season abstraction of 8.4 cumec before the rivers leave the District or join the Tana River.

The available low flow with a probability level of 80% (design flow for irrigation projects) of 20 cumec (equals around 630 million m^3/year) is sufficient to irrigate an area of about 200 km2 given an irrigation requirement of about 10 mm/day. This acreage could be substantially increased with construction of additional streamflow intakes and proper storage facilities (dams) along the main rivers.

In some of the semi-arid areas of Tharaka where the distance to the nearest perennial stream is too large, sub-surface dams and sand-filled dams in the beds of seasonal rivers may provide reliable water points, particularly for cattle watering. Roof catchments can be an important supplementary source of drinking water provided that the storage tank is properly constructed.

However, the chemical and biological quality of the streams is in danger as more than 100 coffee factories dispose their effluent without proper treatment into the rivers. Unfortunately, peak coffee production coincides with the onset of low flows when dilution is not as strong as during the rainy season. So, the poisonous coffee effluent is discharged into the streams in a time when about 70% of the population depends on river flow for their drinking water. Only strict law enforcement by curbing illegal waste water disposal could alleviate this situation.

6.3.2 Groundwater Development Potential

Surface water in the parts of Meru District draining towards the Tana River is usually contaminated with coffee waste water. Groundwater (including spring water) is then a safe alternative. So, even where abundant surface supplies are available, groundwater from springs, boreholes and shallow wells should be considered, particularly for domestic supplies: though development of groundwater other than from springs is not cheap, the benefits in the form of reduced incidence of illnesses certainly outweigh the high initial costs, or high cost of treatment.

Very High Groundwater Development Potential

Lowermost Volcanic Slopes of the Nyambeni: This vast area has only a few permanent springs. The Northern Grazing Area being part of this zone has no springs and no permanent rivers. Fortunately, the area possesses very productive aquifers. High yielding boreholes can be constructed almost everywhere. Locally, yields may be so high that groundwater irrigation is feasible.

High Groundwater Development Potential

Windward Mount Kenya Slopes (Meru-Chuka Area) and Nyambeni Uplands: These

areas are dotted with many springs. Springs are almost everywhere and should be preferred. There are only a few isolated patches without springs. Only in such areas construction of boreholes can be considered.

Medium Groundwater Development Potential

Leeward Mount Kenya Slopes (Nanyuki-Timau Area): Groundwater development in this area should be mainly by boreholes as springs are too far apart.

Low Groundwater Development Potential

Compact Tuff Area: Borehole yields in this area might be just sufficient for handpumps, to be used only a couple of hours per day.

Basement Area: The aquifers in the Basement Area can be characterized as isolated, irregularly shaped water bearing cells. So, it is very important to find the right sites. Recharge often comes from laggas, or sometimes rainfall. Sida acknowledges that only 30% of the boreholes can be considered successful: sufficient discharge for a handpump, and proper chemical quality.

Groundwater development for irrigation can be ruled out because of the low yields.

Uncertain Groundwater Development Potential

Kibirichia Area and Lare Area: The WRAP rig drilled several boreholes in these areas but none was successful. Rotary drilling was extremely difficult because of the coarse cinderlayers. One borehole was continued up to 240 m depth but there was still no water (except for a small perched aquifer on top of a lava layer). Nevertheless, it is still the feeling that there must be productive aquifers at greater depth, possibly as productive as those underlaying the Northern Grazing Area.

7. WATER RESOURCES VERSUS WATER DEMAND

The objective of the comparison between water resources and water demand is two fold:

1. to determine whether the resources are sufficient to supply the future demand for domestic and non-domestic use

2. to determine the quantity of water available for irrigation or other uses

The comparison was carried out for each Location in the District, because it was considered that this is the smallest area for which a realistic estimate is possible of the water resources. The estimate of the water resources was based on the results of the Resources Assessment Study (summarized in Chapter 6). The approach followed first checks for a Location whether the domestic demand can be supplied. Then the quantity is determined of water available for other uses, like irrigation and industrial use. If shortages exist then water may be diverted from other neighbouring Locations.

The allocation of the resources for different uses needs to be done according their priority. These priorities of use need to be determined by the District, therefore this choice of the priorities is open to discussion and should not be seen as definite:

1. domestic water supplies (including livestock at the homestead)

2. surface water baseflow to be reserved for environmental purposes and to retain a minimum inflow into the Tana and Ewaso Nyiro rivers

3. livestock water supply in ASAL (low potential) areas

4. irrigation water supply in ASAL (low potential) areas

5. industrial water supply (mainly coffee factories and agro-industries)

6. other uses, e.g irrigation in high potential areas, non agro-industries, etc.

The priorities are also discussed in paragraph 4.2.3 in Part 3.

The comparison between water resources and water demand is carried out for all 48 Locations in the nine Divisions. The methodology and procedure for calculation is described below:

1. Water resources to be considered are:

    - surface water flow in rivers
        - the design flow for irrigation and some industries is the 80% flow, which is the flow exceeded in 80% of the time
        - the design flow for domestic water supply is the 96% flow which represents the riverflow which is exceeded in 96% of the time
    - springs
    - groundwater.

2. Water demand to be compared with the resources is the ultimate demand for the year 2013, calculated according scenario 2 (this is the maximum possible demand during the planning period). The demand to be considered is the domestic demand combined with the livestock demand because livestock is kept in many areas of Meru District at the homestead.

   The demand from other uses (industries) as calculated in Chapter 5 was not considered. But instead, the water availability for other uses (industries, but also irrigation) was determined by distributing equally between the Locations the resources not used for domestic and livestock supply. This distribution was done according the area of each Location.

3. The quantity of water available from the resources are estimated:

   - *surfacewater*: by an empirical relationship between rainfall and runoff, where the mean, 80% and 96% flow were calculated from the size of the catchment area.

   - *springs*: from the flows measured during the spring inventory in Meru District which covered over 550 springs.

   - *groundwater*: as a first step groundwater has been considered for the area indicated as very high availability (paragraph 6.3) only; the quantity available was based on a groundwater recharge of 10 mm/year/km²; this quantity is considered to be a reliable estimate for planning of groundwater use and represents the introduction of a safety margin with respect to the potential groundwater availability described in chapter 6.

4. The procedure for the comparison of the available water resources with the water demand per Location was as follows:

   a. - Determine total *surfacewater* inflow into the Location for 96% flow and 80% flow. Flow in rivers forming the boundary between two Locations is divided on a 50 - 50% basis.
      - Determine total flow from all *springs* in the Location.
      - Determine area with very high *groundwater* availability in the Location and calculate groundwater quantity.

   b. Compare total *domestic and livestock demand* in the location with the total 96% flow, the spring flow and groundwater availability. In case demand exceeds this than a contribution from other Locations is required.

   c. Determine *surfacewater baseflow* which should not be used, but instead reserved for environmental purposes, such as catchment protection or to avoid dry river beds. This baseflow was preliminary estimated at 20% of the 80% surfacewater flow.

   d. Determine the surfacewater quantity which in addition to the baseflow should be reserved for use in Locations situated *downstream*.

   e. Calculate quantity of water available for other uses, such as *irrigation or industrial use* by subtracting the three types of water use described above (b. domestic and livestock use + c. baseflow + d. downstream flow) from

the total water resources available in the Location. This quantity of water is totalled for each Division and subsequently distributed as water used for irrigation, industries and other uses according the area of each Location.

f. Determine for each Location the quantity of water which *is not used* for supply. This quantity is minimized to achieve full use of the available resources. In case of a shortage in resources than demand from industries, irrigation and other uses is decreased.

g. Determine the total *outflow* from the Location to the next downstream Location consisting of:
   - recharge to surfacewater flow from rainfall
   - baseflow
   - downstream flow (allocated quantity for downstream use)
   - return flow from other uses especially irrigation, which is water returning to the surfacewater sources after use (estimated at 20%).

   In some Locations surfacewater recharge is considerable and part of this water may already be used in the same Locations to augment the surfacewater inflow. This quantity is indicated as Additional Use.

The approach followed here is mainly intended to determine and allocate the water available for irrigation and other uses in each Division. The procedure is based on the 80% flows which means that actually in less than 80% of the time more water is available, but also that in 20% of the time less water is available. In case a higher reliability of supply is required (e.g for certain industries) then water use should be compared with the 96% flows.

The results of the calculations are presented in table 7.1 and Appendix 5. Table 7.1 summarizes per Location the estimates of water availability and of water used. Appendix 5 shows for each Location in detail the comparison of water resources and water demand, including the water used, the outflow from the Location and the quantities diverted to neighbouring Locations. The latter quantities are also summarized seperately on the last page of Appendix 5.

The outflow of surface water from the District, which results from the analysis is about 500,000 m^3/day to Tana River and about 130,000 m^3/day to Isiolo District.

In table 7.1 the column "Total Water Use" indicates the water quantities available for combined domestic and livestock use, available in total for irrigation and industries, and available for baseflow. In the context of the present study no attempt was made to determine how much water may be used separately for irrigation, industries or other uses. This is a decision which should be made according the priorities as set out in the District Water Development Plan.

The presented analysis indicates that water is available for irrigation or industries in all Divisions. The area which may be irrigated with this quantity is estimated in Part 3 of this study. In most areas irrigation will be from surfacewater, but in some areas with a possibility of high yielding boreholes, e.g. the Northern Grazing Area, irrigation from groundwater is also a feasibility and therefore was included.

The required water development per Location for domestic supply is also presented in Part 3 of this study, where the existing supply capacity is analysed in relation to the

required supply capacity. As result of this analysis estimates are presented of the required new capacity, of the existing capacity which may be rehabilitated and of existing capacity which is still good enough to be used.

Table 7.1 Water Resources Availability (m^3/day)

Location/ Division	Water Resources Available				Total Water Use 1)			
	Surface Water	Springs	Ground Water	Total	Domestic Livestock	Irrigation Industries	Baseflow	Total
ABOTHUGUCHI	23,609	35,884	-	59,493	8,149	37,621	13,622	59,392
GATIMBI	22,233	6,335	390	28,958	6,154	18,450	4,347	28,951
MWANGANTHIA	59,556	9,286	4,315	73,157	6,678	61,447	5,111	73,237
KIBIRICHIA	30,679	748	-	31,427	3,889	26,232	1,336	31,456
C. IMENTI	136,076	52,253	4,705	193,035	24,870	143,750	24,415	193,035
KANGETA	0	3,456	2,148	5,604	2,452	3,076	0	5,528
KIEGOI	0	3,288	-	3,288	1,708	1,627	0	3,335
AKACHIU	17,113	29,744	2,671	49,528	5,487	37,289	6,703	49,479
MAUA	6,720	28,182	3,173	38,075	6,385	29,502	2,164	38,051
NJIA	5,300	14	1,890	7,204	5,041	2,206	0	7,247
IGEMBE	29,133	64,684	9,882	103,699	21,073	73,700	8,867	103,640
KIIRUA	7,627	248	625	8,500	4,295	3,636	525	8,456
RUIRI	0	3,807	2,838	6,645	2,281	4,378	0	6,659
NTIMA	22,019	10,469		32,488	16,539	16,106	0	32,645
NYAKI	21,721	977	1,466	24,164	8,590	14,364	1,144	24,098
GIAKI	49,143	0	1,233	50,375	2,829	38,568	8,508	49,905
N. IMENTI	100,510	15,501	6,162	122,173	34,534	77,050	10,178	121,762
MAGUMONI	69,995	2,086	-	72,081	4,397	50,846	16,899	72,142
MWONGE	16,852	462	-	17,314	2,950	10,176	4,170	17,296
KARINGANI	81,204	5,338	-	86,542	16,515	66,961	3,041	86,517
MUTHAMBI	69,970	2,171	-	72,141	6,890	53,155	11,994	72,039
CHOGORIA	37,474	18,794	-	56,268	7,583	37,963	10,695	56,241
KIERA	94,192	12,020	-	106,212	6,882	87,594	11,638	106,114
KANJUKI	127,316	-	-	127,316	1,577	100,006	25,463	127,046
NITHI	497,003	40,871	0	537,874	46,794	406,700	83,901	537,395
ITHIMA	11,000	86	9,589	20,675	8,908	6,000	0	14,908
MUTUATI	3,800	-	10,307	14,107	3,327	8,800	0	12,127
ANTUBETWE-K.	3,200	-	1,707	4,907	2,264	950	0	3,214
ATHIRU-RUUJINE	2,500	-	2,090	4,590	2,283	1,000	0	3,283
NTONYIRI	20,500	86	23,693	44,279	16,782	16,750	0	33,532
IGOJI	29,429	4,399	-	33,828	3,854	22,657	7,286	33,797
MITINE	58,709	5,566	-	64,275	3,662	52,662	7,902	64,226
ABOGETA	13,086	25,793	-	38,879	3,489	33,305	2,097	38,891
IGOKI	26,401	1,981	-	28,382	3,632	23,269	1,500	28,401
NKUENE	10,957	39,766	-	50,723	11,082	35,316	4,331	50,729
MITUNGUU	54,000	51	1,014	55,065	2,430	45,314	7,340	55,084
KANYAKINE	51,491	3,617	-	55,108	4,137	39,478	11,518	55,133
S. IMENTI	244,074	81,173	1,014	326,261	32,286	252,000	41,975	326,261
GIKINGO	57,900	-	1,003	42,403	857	41,530	0	42,387
MARIMANTI	98,640	-	1,003	87,543	4,502	83,061	0	87,563
N. THARAKA	110,506	-	-	139,106	1,817	137,300	0	139,117
S. THARAKA	70,887	-	-	70,887	1,538	69,309	0	70,847
THARAKA	337,933	0	2,005	339,938	8,714	331,200	0	339,914

Table 7.1 (Cont.) Water Resources Availability (m^3/day)

Location/ Division	Water Resources Available				Total Water Use 1)			
	Surface Water	Springs	Ground Water	Total	Domestic Livestock	Irrigation Industries	Baseflow	Total
MITUNTU	7,725	3,806	1,781	13,312	816	11,764	745	13,325
URINGU	4,400	1,756	1,863	8,019	3,068	4,973	0	8,041
MBEU	18,876	3,015	1,425	23,316	2,165	17,291	3,775	23,231
KIANJAI	14,161	3,195	507	17,863	4,765	10,745	2,352	17,863
AKITHII	14,766	14,200	778	29,744	4,375	20,482	4,833	29,690
MUTHARA	10,107	22,940	723	33,770	7,900	23,900	2,021	33,821
KARAMA	9,170	493	-	9,663	2,181	5,691	1,834	9,706
MIKINDURI	4,391	27,591	1,247	33,229	4,966	25,109	3,078	33,153
THANGATHA	49,743	1,839	1,611	53,193	3,503	42,445	7,149	53,097
TIGANIA	133,341	78,835	9,934	222,110	33,739	162,400	25,788	221,927
ONTULILI	25,143	211	-	25,354	2,107	18,959	4,299	25,365
KIRIMARA	16,800	4,450	-	21,250	1,315	15,845	4,090	21,250
KISIMA	23,126	6,742	2,088	31,956	3,668	24,896	3,425	31,989
TIMAU	65,069	11,403	2,088	78,560	7,090	59,700	11,814	78,604
MERU DISTR.	1,563,639	344,806	59,484	1,967,928	225,882	1,523,250	206,937	1,956,069

Note: 1) Total water use based on water demand calculated for the year 2013 under scenario 2.

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APPENDIX 1

DISTRICT FOCUS POLICY

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DISTRICT FOCUS POLICY

Main Aspects Related to Preparation of

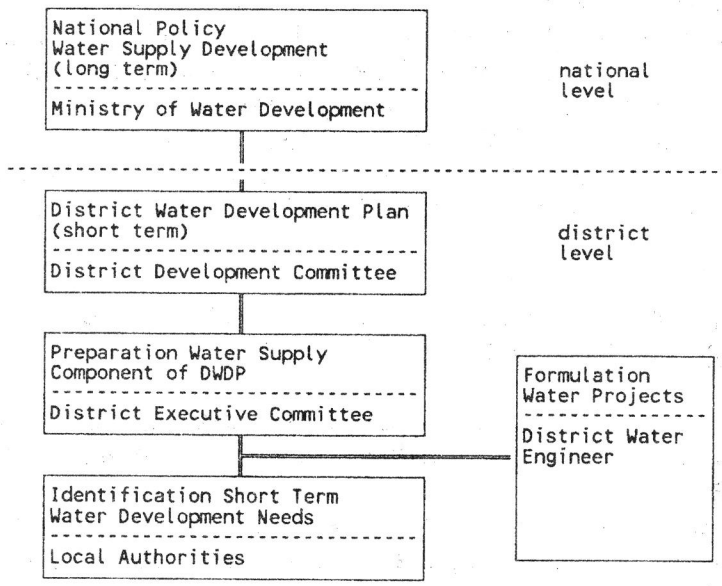
a District Water Development Plan

APPENDIX 1 DISTRICT FOCUS POLICY

The Water Resources Assessment and Planning Project (WRAP) complies with the policy on District Focus for Rural Development. The water resources assessment presents the District authorities with an overall view of the water availability within their District. The study of the water development potential and options enables the District to select it's priorities and to plan for the development of the district water resources.

The district focus policy forms the background for the preparation of the District Water Development Plan and therefore the main aspects are summarized here (District Focus for Rural Development, Office of the President, 1987). The summary also contains information on the institutional set-up for planning in the District, which will be referred to in Part 3.

A schematic reproduction of the District Focus structure for the Water Sector is given below.



The responsibility for planning and implementing rural developments has been shifted from the headquarters of ministries to the districts. This strategy, known as the 'District Focus for Rural Development', is based on the principle of a complementary relationship between the ministries with their sectoral approach to development and the districts with their integrated approach to addressing local needs. Responsibility for the operational aspects of district-specific rural development projects has been delegated to the districts. Responsibility for general policy and the planning of multi-district and national programmes remains with the ministries.

The ministries and districts are co-operating on rural development through local projects and through multi-district and national programmes. Projects (or local components of larger programmes) that are primarily intended to serve one district or part of a district are referred to as 'district-specific' and are to be identified, selected, planned, and implemented at the district level.

Ministries also guide the districts in the implementation of the Budget Rationalization Programme. Districts must recognize that due to limited resources it is not possible for ministries to incorporate into their budgets and to implement all the projects being proposed at the same time. There is need, therefore, to concentrate the available resources on fewer projects so as to complete them sooner and bring them into productive service faster.

Operational consequences are, e.g.:

- limitation of proposals for GoK funding to two per sector per division;
- no drastic changes in the annual GoK budget for the District (10% plus or minus);
- identification of private resources to be put to use in support of an organised development programme.

District planning and co-ordination are carried out through a process which includes regular meetings of the development committees at each level of the district administrative structure and through the preparation of two basic planning documents: the 5 year District Development Plan and the annual Annex to that Plan. As has been mentioned before, the district responsibility for planning and co-ordination covers district-specific projects sponsored by the Government (ministries will provide policy guidelines), including those supported by foreign donors and those supported through the local authorities and through Harambee efforts. The district also reviews and endorses projects in the district sponsored by parastatal organizations, and by non-governmental organizations (NGOs), including local self-help organizations. Large national projects, which might have a great impact on the district's economic development, are meant to be included in the DDP, although they are planned on national level.

The District Development Committee is the foundation of the decentralised rural development strategy. The functions of the DDC are to:

1. review ongoing progress to ensure that current projects are rapidly implemented and that completed projects and existing infrastructure are effectively operated and maintained;
2. consider new proposals submitted by the Divisional Development Committees;
3. establish priorities for future projects in the five year District Development Plan;
4. endorse the district's annual submission of project proposals to the ministries in the annual Annex to the District Development Plan; and
5. review and endorse all project proposals of local authorities, parastatals, regional development authorities, and NGOs operating in the district.

In undertaking its planning responsibilities the DDC must take a broad perspective on ensuring the full and productive utilization of the resources available within the district, including manpower, natural resources and financial resources. In this respect the DDC should view the district as an economic unit, identifying economic potentials and the infrastructure and other conditions required for realizing these potentials. This will require also that the DDC develop and maintain a comprehensive Infrastructure Inventory of the existing and newly completed facilities in each sector of the economy (roads, schools, water systems, health facilities, etc.). A major planning function of the DDC will be to ensure that adequate resources are available for operation and maintenance of the existing infrastructure and facilities.

The District Executive Committee provides technical support for the DDC activities, including preparation of plans and management and implementation of projects. The DEC also serves to promote the inter-ministerial coordination of development activities in the district.

The principal functions of the DEC are to:

1. make operational decisions within the guiding directives of the DDC,
2. co-ordinate and monitor implementation of all projects and activities in the district,
3. prepare the draft District Development Plans and the annual Annexes for submission to the DDC, and
4. prepare briefing notes on all proposals and reports to be submitted to the DDC.

The office of the District Development Officer, who is the secretary of the DDC and the DEC, is being strengthened by the establishment of a District Planning Unit. The unit's objectives are to serve as a secretariat to the District Executive Committee for day-to-day coordination of planning and implementation work. However the DPU's are currently not yet fully operational.

The identification of projects is a continuous process. The initial idea for a project usually comes from the area that will benefit from its implementation (the location or sub-location). After being discussed and agreed upon locally, the project suggestion is forwarded to the Divisional Development Committee. Divisional Development Committees expand these suggestions into project proposals which are properly formulated and ranked according to the priorities of the division. These proposals are then submitted to the DDC.

Project proposals submitted by the DvDC to the DDC are first screened by the District Executive Committee on technical grounds and then prioritised by the DDC for inclusion in the five year District Development Plan and subsequently into the annual Annexes to that Plan.

The District Officer, District Development Officer and divisional technical officers in the DvDCs are charged with the responsibility of preparing the required documentation to support the DvDC project proposals. Local involvement in project identification and formulation is an essential element in the planning process, since it is this process which ensures that the feelings and wishes of the beneficiaries are included in the design and selection of all development projects and programmes.

The Locational Development Committees (LDCs) and Sub-locational Development Committees (SLDCs) represent the grass-roots level community and are responsible for discussion of community needs and the initial identification of projects and activities to address those needs. They are to forward initial project ideas to the Divisional Development Committee for review and appraisal and play an important role in the co-ordination and monitoring of project implementation.

These community level development committees are an essential element in promoting increased local level participation in the development process. However, while DvDCs have been active in all districts, LDCs and SLDCs have not been sufficiently active in all districts. Locational and sub-locational personnel have also not been equipped with basic skills in project planning and monitoring. It is necessary that these personnel be given training in handling these functions and in preparing detailed minutes of meetings

in order to ensure effective communication with the DvDCs and DDCs. All DDCs must take steps to ensure that these committees meet regularly to carry out the above functions and that they receive the training required to improve their capabilities for carrying out these functions.

The planning and siting of all projects should be fully discussed and approved by the local development committees so that the projects are seen as community projects. All communications with the communities and the local development committees on technical issues should also be phrased in a language that can be fully understood by them. This will promote full community participation in project implementation.

(From: District Focus for Rural Development, Office of the President, March 1987).

APPENDIX 2

UNIT WATER CONSUMPTION RATES

APPENDIX 2

UNIT WATER CONSUMPTION RATES

Basic Data for Water Demand Calculations

- Population
- Areas

Input Data to Database Management System

- Population
- Livestock
- Land Potential
- Education
- Health
- Commercial Facilities

UNIT WATER CONSUMPTION RATES

CONSUMER	UNIT	RURAL AREAS			URBAN AREAS		
		HIGH POTENTIAL	MEDIUM POTENTIAL	LOW POTENTIAL	HIGH CLASS HOUSING	MEDIUM CLASS HOUSING	LOW CLASS HOUSING
People with Individual Connections	l/head/day	60	50	40	250	150	75
People without Individual Connections	l/head/day	20	15	10	-		20
Livestock Unit	l/head/day	50			-		
Boarding Schools	l/head/day	50					
Day Schools: with WC without WC	l/head/day	25 5					
Hospitals: Regional District Other	l/bed/day	400} 200} +20 l per outpatient per day 100} (total minimum 5000 l/day)					
Dispensary and Health Centre	l/day	5000					
Hotels: High Class Medium Class Low Class	l/bed/day	600 300 50					
Administrative Offices	l/head/day	25					
Bars	l/day	500					
Shops	l/day	100					
Unspecified Industry	l/ha/day			20,000			
Coffee Pulping Factories	l/kg coffee	25 (when recirculation of water is used)					

(Source: Design Manual for Water Supply in Kenya, MoWD, 1986)

Remark: Many health centres have beds, therefore it is better to estimate the demand similar as for hospitals at 100 l/bed/day.

MERU DISTRICT -POPULATION DATA PER SUB-LOCATION

		1979 CENSUS AREA (km2)	1988 DDP AREA (km2)	1979 CENSUS POPULATION	1988 ESTIMATE POPULATION	DISTR. DEV. PLAN 1988 ESTIMATE
SUMMARY	NITHI DIVISION	626	640	142,288	205,528	205,590
	SOUTH IMENTI DIVISION	387	392	103,543	149,569	149,608
	CENTRAL IMENTI DIVISION	452	458	91,038	134,015	131,539
	NORTH IMENTI DIVISION	447	460	107,396	153,198	155,174
	THARAKA DIVISION	1490	1496	50,277	72,618	72,644
	TIMAU DIVISION	790	790	23,389	33,783	33,795
	IGEMBE DIVISION	535	535	90,407	130,592	131,205
	NTONYIRI DIVISION	1157	1167	80,790	116,692	116,732
	TIGANIA DIVISION	645	652	140,651	203,155	203,224
	Meru National Park	870	870	400		
	MERU DISTRICT TOTAL	7399	7460	830,179	1,199,150	1,199,511

REMARKS:

1. The area is according the 1979 Census. The areas of subdivided Divisions, Locations and Sub-locations were estimated from the boundaries on the map.
   However the areas measured on the map with a planimeter do not agree with the areas indicated in the 1979 Census.
2. Meru National Park is located in Igembe Division.
3. The District Development Plan (DDP) indicates that all non-residential land is excluded.
   The total land area of Meru District is 9922 km2. The non-residential lands (eg. forests) are 3332 km2 (including Meru National Park)
4. The estimated 1988 population differs slightly from the DDP 1988 projection.
   This is due to the projection per sub-location. The following annual growth rates were used:

Urban Areas:	Meru Municipality	3.4 %
	Chuka, Chogoria, Nkubu, Maua	8 %
Rural areas:	NITHI DIVISION	4.1 %
	SOUTH IMENTI DIVISION	4.06 %
	CENTRAL IMENTI DIVISION	4.39 %
	NORTH IMENTI DIVISION	4.17 %
	THARAKA DIVISION	4.17 %
	TIMAU DIVISION	4.17 %
	IGEMBE DIVISION	4.08 %
	NTONYIRI DIVISION	4.17 %
	TIGANIA DIVISION	4.17 %

The differences in percentages of the rural areas are to obtain a similar estimate for each Division as in the DDP.

MERU DISTRICT -POPULATION DATA PER SUB-LOCATION

DIVISION	LOCATION	SUB-LOCATION	AREA (km2)	1979 CENSUS SUB-LOC.	1979 CENSUS LOC.	Revised 1979 CENSUS SUB-LOC.	Revised 1979 CENSUS LOC.	1988 ESTIMATE SUB-LOC.	1988 ESTIMATE LOC.
Nithi	Magumoni	Kamwimbi	63	3965	17034	3019	17034	4334	24455
		Mukuuni	22	5703		5703		8188	
		Thuita	17	7366		7366		10575	
		Itugururu				946		1358	
	Mwonge	Mwonge	5	3651	11172	3651	11172	5242	16039
		Kabuboni	8	4096		4096		5881	
		Rubate	9	3425		3425		4917	
	Karingani	Mugirirwa	14	6318	33983	6318	33983	9071	49555
		Muiru	10	5034		5034		7227	
		Gitareni	21	6136		6136		8809	
		Kithangani	37	2318		2318		3328	
		Mariani	4	3655		3655		5247	
		Ndagani	21	7121		4278		6142	
		Kiangondu				2843		4082	
		Chuka	5	2040		2040		2929	
		Chuka Town	1	1361		1361		2721	
	Muthambi	Karimba	18	4984	22376	4984	22376	7155	32125
		Gatua	15	5339		5339		7665	
		Igamurathi	6	2580		2580		3704	
		Kandungu	22	2735		2735		3927	
		Iriga	10	2785		2785		3998	
		Chamunga	8	3953		3953		5675	
	Kiera	Magumango	33	12637	27155	8372	27155	12019	38986
		Magutuni	94	12529		11436		16418	
		Thigaa	6	1989		1989		2856	
		Iruma				4265		6123	
		Kirumi				1093		1569	
	Kanjuki	Kanjuki	59	3960	9118	3960	9118	5685	13090
		Kamaindi	28	1679		1679		2411	
		Mutino	37	3479		3479		4995	
	Chogoria	Chogoria	21	7399	21450	7399	21450	10623	31277
		Chogoria TC	1	856		856		1711	
		Murugi	27	10492		10492		15063	
		Kiraro	4	2703		2703		3881	
		NITHI TOTAL	626	142288	142288	142288	142288	205528	205528

MERU DISTRICT -POPULATION DATA PER SUB-LOCATION

DIVISION	LOCATION	SUB-LOCATION	AREA (km2)	1979 CENSUS SUB-LOC.	1979 CENSUS LOC.	Revised 1979 CENSUS SUB-LOC.	Revised 1979 CENSUS LOC.	1988 ESTIMATE SUB-LOC.	1988 ESTIMATE LOC.
South Imenti	Nkuene	Kigane			27263	5114	27263	7316	40434
		Mikumbune	17	10324		5210		7454	
		Kathera	20	6637		6637		9496	
		Nkubu Centre	1	2514		2514		5025	
		Uruku	15	7788		7788		11142	
	Abogeta	Upper Kithangari	20	4613	11236	4613	11236	6600	16076
		Upper Kiungone	28	6623		6623		9476	
	Igoki	Upper Chure	29	5757	5757	3986	8710	5703	12461
		Mwichure				1771		2534	
		Kothine				2953		4224	
	Mitine	Kianjogu	19	5969	17256	5969	17256	8540	24688
		Kinoro	31	5422		5422		7757	
		Mweru	33	5865		5865		8391	
	Igoji	Karia	21	6460	13592	6460	13592	9242	19446
		Gikui	14	7132		7132		10204	
	Mitunguu	Kirendene	52	4232	13533	4232	10580	6055	15137
		Ng'onyi	27	9301		6348		9082	
	Kanyakine	Kanyakine	18	8988	14906	8988	14906	12859	21326
		Kiringa	42	5918		5918		8467	
		SOUTH IMENTI TOTAL	387	103543	103543	103543	103543	149569	149569
Tharaka	North Tharaka	Gatunga	106	4594	9473	4594	9473	6636	13683
		Gatue	215	2796		2796		4039	
		Kathangachini	284	2083		2083		3009	
	Gikingo	Irunduni			7618	1435	7618	2073	11003
		Kanjoro	177	7618		6183		8931	
	South Tharaka	Chiokariga	88	4859	12895	4859	12895	7018	18625
		Tunyai	75	4452		4452		6430	
		Kamanyaki	137	3584		3584		5177	
	Marimanti	Turima			20291	2844	20290	4108	29307
		Marimanti	173	5703		5703		8237	
		Kanyuru	141	7499		4654		6722	
		Nkondi	94	7089		7089		10239	
		THARAKA TOTAL	1490	50277	50277	50276	50276	72618	72618

MERU DISTRICT -POPULATION DATA PER SUB-LOCATION

DIVISION	LOCATION	SUB-LOCATION	AREA (km2)	1979 CENSUS SUB-LOC.	1979 CENSUS LOC.	Revised 1979 CENSUS SUB-LOC.	Revised 1979 CENSUS LOC.	1988 ESTIMATE SUB-LOC.	1988 ESTIMATE LOC.
Central Imenti	Abothuguchi	Katheri	28	11508	24655	11508	24655	16941	36294
		Githongo	14	5827		5827		8578	
		Kithirune	19	7320		7320		10776	
	Mwangathia	Gitie	21	4885	27617	4885	27617	7191	40654
		Gaitu	33	5878		5878		8653	
		Makandune	34	2540		2540		3739	
		Kaongo	35	5197		5197		7650	
		Igane	21	4885		4885		7191	
		Kiamuri	62	4232		4232		6230	
	Kibirichia	Mboroga	17	2121	16733	2121	16733	3122	24632
		Kimbo	57	6132		6132		9027	
		Ntumburi	38	3249		3249		4783	
		Kiamiogo	19	5231		5231		7700	
	Gatimbi	Ruiga	26	7212	22033	7212	22033	10617	32434
		Kariene	19	9898		9898		14571	
		Mariene	9	4923		4923		7247	
	CENTRAL IMENTI TOTAL		452	91038	91038	91038	91038	134015	134015
North Imenti	Ntima	Upper Igoki (Urb.)	11	8800	43413	8800	43413	11890	60978
		Ntakira (Urb.)		3094		3094		4180	
		Ntakira	10	9849		9849		14226	
		Lower Igoki (Urb.)		1874		1874		2532	
		Lower Igoki	5	7025		7025		10147	
		Nthimbiri	7	6411		6411		9260	
		Township (Urb.)	0	4750		4750		6418	
		N. Grazing Area	-	1610		1610		2325	
		Mpuri							
		Ngonyi							
	Nyaki	Mulathankari (Urb.	3	2104	28636	2104	28636	2843	41165
		Thuura	32	6506		6506		9397	
		Chugu	5	8164		8164		11792	
		Munithu	33	6150		6150		8883	
		Nkabune	15	5712		5712		8250	
	Giaki	Giaki	99	5478	10536	5478	10536	7912	15218
		Kiburine		5058		5058		7306	
	Kiirua	Kiirua	69	5600	15280	5600	15280	8089	22070
		Naari	27	8926		8926		12893	
		Thege	5	754		754		1089	
	Ruiri	Ruiri	126	9531	9531	9531	9531	13766	13766
	NORTH IMENTI TOTAL		447	107396	107396	107396	107396	153198	153198

MERU DISTRICT -POPULATION DATA PER SUB-LOCATION

DIVISION	LOCATION	SUB-LOCATION	AREA (km2)	1979 CENSUS SUB-LOC.	1979 CENSUS LOC.	Revised 1979 CENSUS SUB-LOC.	Revised 1979 CENSUS LOC.	1988 ESTIMATE SUB-LOC.	1988 ESTIMATE LOC.
Timau	Kisima	Buuri			8045	2984	8045	4310	11620
		Ngare Ndare	429	8045		2687		3881	
		Mutunyi				2374		3429	
	Ontulili	Ontulili	185	8114	8114	8114	8114	11720	11720
	Kirimara	Ngushishi	176	7230	7230	5190	7230	7497	10443
		Kithithina				2040		2946	
		TIMAU TOTAL	790	23389	23389	23389	23389	33783	33783
Igembe	Maua	Amwathi	17	14576	22804	14576	22804	20890	33704
		Maua TC	3	1805		1805		3608	
		Antubetwe-Njoune	24	5304		5304		7602	
		Kanjoo	160	1119		1119		1604	
	Kiegoi	Kiegoi	20	7114	7114	7114	7114	10196	10196
	Kangeta	Liliaba	43	4432	11414	4432	11414	6352	16358
		Kangeta	43	6982		6982		10007	
	Akachiu	Kirindine	56	8899	30238	8899	30238	12754	43337
		Amung'enti	62	9212		9212		13203	
		Auki	9	4760		4760		6822	
		Athiru-Gaiti	32	7367		7367		10558	
	Njia	Njia-Cia-Mwendwa	48	8366	18837	8366	18837	11990	26997
		Buurieruri	18	10471		10471		15007	
		IGEMBE TOTAL	535	90407	90407	90407	90407	130592	130592
Ntonyiri	Ithima	Akirangondu	118	12467	30908	12467	30908	18007	44643
		Antuambui	218	11791		11791		17031	
		Ntunene	17	6650		6650		9605	
	Mutuati	Naathu	121	10678	27102	10678	27102	15423	39146
		Amwathi 1	257	10135		10135		14639	
		Amwathi 2	245	6289		6289		9084	
	Antubetwe-Kiongo	Antubetwe-Kiongo	89	10146	10146	10146	10146	14655	14655
	Athiru-Ruujine	Athiru-Ruujine	92	12634	12634	12634	12634	18248	18248
		NTONYIRI TOTAL	1157	80790	80790	80790	80790	116692	116692
	Meru National Park		870	400	400				

MERU DISTRICT -POPULATION DATA PER SUB-LOCATION

DIVISION	LOCATION	SUB-LOCATION	AREA (km2)	1979 CENSUS SUB-LOC.	1979 CENSUS LOC.	Revised 1979 CENSUS SUB-LOC.	Revised 1979 CENSUS LOC.	1988 ESTIMATE SUB-LOC.	1988 ESTIMATE LOC.
Tigania	Uringu	Uringu	21	5505	11327	5505	11327	7951	16361
		Nkomo	39	5822		5822		8409	
	Kianjai	Kianjai	23	8237	16101	8237	16101	11897	23256
		Miathene	13	7864		7864		11359	
	Mbeu	Mbeu	46	9771	9771	2933	9771	4236	14113
		Kiorimba				6838		9877	
	Muthara	Athinga	17	4575	17982	4575	17982	6608	25973
		Athanja	38	6722		6722		9709	
		Kitharene	33	6685		6685		9656	
	Karama	Karama	41	10891	10891	10891	10891	15731	15731
	Mikinduri	Kigucwa	15	8642	25509	8642	25509	12482	36845
		Athwana	4	3346		3346		4833	
		Akaiga	52	5557		5557		8026	
		Antuamburi	26	7964		7964		11503	
	Thangatha	Ankamia	26	8518	18106	8518	18106	12303	26152
		Kunati	57	4386		4386		6335	
		Igarie	38	1993		1993		2879	
		Giithu	23	3209		3209		4635	
	Akithii	Kitheo	19	7315	25015	7315	25015	10566	36131
		Athwana	20	5010		5010		7236	
		Ncooro	29	12690		7590		10963	
		Thinyaine				5100		7366	
	Mituntu	Mituntu	65	5949	5949	5949	5949	8593	8593
		TIGANIA TOTAL	645	140651	140651	140651	140651	203155	203155

9 = Divisions
47 = Locations
145 = Sub-locations

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

Printed: 24/01/91

INPUT DATA ANALYSES – Part 1 (1988)

DIVISION: CENTRAL IMENTI **DISTRICT: MERU**

Location	Sub-Location	Population 1979	Population 1988	Type	Rural Area Land Potential High	Rural Area Land Potential Med	Rural Area Land Potential Low	Urban Area Class Housing High	Urban Area Class Housing Med	Urban Area Class Housing Low
Abothuguchi	Githongo	5827	8578	1	100%	0%	0%	0%	0%	0%
	Katheri	11508	16941	1	100%	0%	0%	0%	0%	0%
	Kithirune	7320	10776	1	100%	0%	0%	0%	0%	0%
Gatimbi	Kariene	9898	14571	1	100%	0%	0%	0%	0%	0%
	Mariene	4923	7247	1	100%	0%	0%	0%	0%	0%
	Ruiga	7212	10617	1	100%	0%	0%	0%	0%	0%
Kibirichia	Kiamiogo	5231	7700	1	70%	30%	0%	0%	0%	0%
	Kimbo	6132	9027	1	60%	40%	0%	0%	0%	0%
	Mboroga	2121	3122	1	40%	60%	0%	0%	0%	0%
	Ntumburi	3249	4783	1	0%	30%	70%	0%	0%	0%
Mwangathia	Gaitu	5878	8653	1	30%	70%	0%	0%	0%	0%
	Gitie	4885	7191	1	50%	40%	10%	0%	0%	0%
	Igane	4885	7191	1	70%	30%	0%	0%	0%	0%
	Kaongo	5197	7650	1	60%	40%	0%	0%	0%	0%
	Kiamuri	4232	6230	1	0%	50%	50%	0%	0%	0%
	Makandune	2540	3739	1	0%	80%	20%	0%	0%	0%
	Divisional Total (%)				72%	22%	6%	0%	0%	0%
	Divisional Total	91038	134016		96601	29485	7930			

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

Printed: 24/01/91

INPUT DATA ANALYSES – Part 1 (1988)

DIVISION: IGEMBE **DISTRICT: MERU**

Location	Sub-Location	Population 1979	Population 1988	Type	Rural Area Land Potential High	Rural Area Land Potential Med	Rural Area Land Potential Low	Urban Area Class Housing High	Urban Area Class Housing Med	Urban Area Class Housing Low
Akachiu	Amungenti	9212	13203	1	20%	80%	0%	0%	0%	0%
	Athiru Gaiti	7367	10558	1	10%	90%	0%	0%	0%	0%
	Auki	4760	6822	1	100%	0%	0%	0%	0%	0%
	Kirindine	8899	12754	1	30%	70%	0%	0%	0%	0%
Kangeta	Kangeta	6982	10007	1	30%	20%	50%	0%	0%	0%
	Liliaba	4432	6352	1	20%	20%	60%	0%	0%	0%
Kiegoi	Kiegoi	7114	10196	1	100%	0%	0%	0%	0%	0%
Maua	Amwathi	16381	24498	3	34%	51%	0%	0%	6%	9%
	Antubetwe Njoune	5304	7602	1	30%	70%	0%	0%	0%	0%
	Kanjoo	1119	1604	1	0%	40%	60%	0%	0%	0%
Njia	Buri Eruri	10471	15007	1	100%	0%	0%	0%	0%	0%
	Njia Cia Mwendwa	8366	11990	1	100%	0%	0%	0%	0%	0%
	Divisional Total (%)				51%	39%	7%	0%	1%	2%
	Divisional Total	90407	130593		66420	50720	9777		1470	2205

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

Printed: 24/01/91

INPUT DATA ANALYSES – Part 1 (1988)

DIVISION: NITHI **DISTRICT: MERU**

Location	Sub-Location	Population 1979	Population 1988	Type	Rural Area Land Potential High	Rural Area Land Potential Med	Rural Area Land Potential Low	Urban Area Class Housing High	Urban Area Class Housing Med	Urban Area Class Housing Low
Chogoria	Chogoria	8255	12334	2	86%	0%	0%	0%	6%	8%
	Kiraro	2703	3881	1	100%	0%	0%	0%	0%	0%
	Murugi	10492	15063	1	100%	0%	0%	0%	0%	0%
Kanjuki	Kamaindi	1679	2411	1	0%	30%	70%	0%	0%	0%
	Kanjuki	3960	5685	1	0%	60%	40%	0%	0%	0%
	Mutino	3479	4995	1	0%	40%	60%	0%	0%	0%
Karingani	Chuka Township	3401	5650	3	52%	0%	0%	0%	19%	29%
	Gitareni	6136	8809	1	40%	60%	0%	0%	0%	0%
	Kiangondu	2843	4082	1	100%	0%	0%	0%	0%	0%
	Kithangani	2318	3328	1	0%	100%	0%	0%	0%	0%
	Mariani	3655	5247	1	0%	100%	0%	0%	0%	0%
	Mugirirua	6318	9071	1	100%	0%	0%	0%	0%	0%
	Muiru	5034	7227	1	100%	0%	0%	0%	0%	0%
	Ndagani	4278	6142	1	70%	30%	0%	0%	0%	0%
Kiera	Iruma	4265	6123	1	100%	0%	0%	0%	0%	0%
	Kirumi	1093	1569	1	50%	50%	0%	0%	0%	0%
	Magutuni	11436	16418	1	10%	90%	0%	0%	0%	0%
	Mugumango	8372	12019	1	70%	30%	0%	0%	0%	0%
	Thigaa	1989	2856	1	80%	20%	0%	0%	0%	0%
Magumoni	Itugururu	946	1358	1	0%	100%	0%	0%	0%	0%
	Kamwibi	3019	4334	1	0%	60%	40%	0%	0%	0%
	Mukuuni	5703	8188	1	60%	40%	0%	0%	0%	0%
	Thuita	7366	10575	1	100%	0%	0%	0%	0%	0%
Muthambi	Chamunga	3953	5675	1	100%	0%	0%	0%	0%	0%
	Gatua	5339	7665	1	100%	0%	0%	0%	0%	0%
	Igamurathi	2580	3704	1	100%	0%	0%	0%	0%	0%
	Iriga	2785	3998	1	100%	0%	0%	0%	0%	0%
	Kadungu	2735	3927	1	10%	60%	30%	0%	0%	0%
	Karimba	4984	7155	1	50%	50%	0%	0%	0%	0%
Mwonge	Kabuboni	4096	5881	1	100%	0%	0%	0%	0%	0%
	Mwonge	3651	5242	1	100%	0%	0%	0%	0%	0%
	Rubate	3425	4917	1	60%	40%	0%	0%	0%	0%
	Divisional Total (%)				65%	28%	5%	0%	1%	1%
	Divisional Total	142288	205529		134514	56707	9871		1814	2626

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

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INPUT DATA ANALYSES – Part 1 (1988)

DIVISION: NORTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Population 1979	Population 1988	Type	Rural Area Land Potential High	Rural Area Land Potential Med	Rural Area Land Potential Low	Urban Area Class Housing High	Urban Area Class Housing Med	Urban Area Class Housing Low
Giaki	Giaki	5478	7912	1	70%	30%	0%	0%	0%	0%
	Kiburine	5058	7306	1	0%	10%	90%	0%	0%	0%
Kiirua	Kiirua	5600	8089	1	0%	40%	60%	0%	0%	0%
	Naari	8926	12893	1	100%	0%	0%	0%	0%	0%
	Thege	754	1089	1	100%	0%	0%	0%	0%	0%
Ntima	Lower Igoki	8899	12679	3	80%	0%	0%	2%	6%	12%
	Mpuri	0	0	1	100%	0%	0%	0%	0%	0%
	Ngonyi	0	0	1	100%	0%	0%	0%	0%	0%
	Ntakira	12943	18406	3	77%	0%	0%	2%	7%	14%
	Nthimbiri	6411	9260	1	100%	0%	0%	0%	0%	0%
	Town/Gakoromone	4750	6418	4	0%	0%	0%	10%	30%	60%
	Upper Igoki	8800	11890	4	0%	0%	0%	10%	30%	60%
Nyaki	Chugu	8164	11792	1	100%	0%	0%	0%	0%	0%
	Mulathankari	2104	2843	3	0%	0%	0%	10%	30%	60%
	Munithu	6150	8883	1	100%	0%	0%	0%	0%	0%
	Nkabune	5712	8250	1	100%	0%	0%	0%	0%	0%
	Thuura	6506	9397	1	100%	0%	0%	0%	0%	0%
Ruiri	Ruiri	9531	13766	1	0%	50%	50%	0%	0%	0%
	Divisional Total (%)				61%	9%	12%	2%	6%	11%
	Divisional Total	105786	150873		91418	13224	18311	2737	8394	16789

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

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INPUT DATA ANALYSES – Part 1 (1988)

DIVISION: NTONYIRI **DISTRICT: MERU**

Location	Sub-Location	Population 1979	Population 1988	Type	Rural Area Land Potential High	Rural Area Land Potential Med	Rural Area Land Potential Low	Urban Area Class Housing High	Urban Area Class Housing Med	Urban Area Class Housing Low
Antubetwe-Kiongo	Antubetwe-Kiongo	10146	14655	1	10%	60%	30%	0%	0%	0%
Athiru-Ruujine	Athiru Ruujine	12634	18248	1	20%	40%	40%	0%	0%	0%
Ithima	Akirangondu	12467	18007	1	30%	20%	50%	0%	0%	0%
	Antuambui	11791	17031	1	30%	20%	50%	0%	0%	0%
	Ntunene	6650	9605	1	30%	20%	50%	0%	0%	0%
Mutuati	Amwathi 1	10135	14639	1	20%	20%	60%	0%	0%	0%
	Amwathi 2	6289	9084	1	0%	30%	70%	0%	0%	0%
	Naathu	10678	15423	1	20%	20%	60%	0%	0%	0%
	Divisional Total (%)				21%	29%	50%	0%	0%	0%
	Divisional Total	80790	116692		24522	33758	58415			

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INPUT DATA ANALYSES – Part 1 (1988)

DIVISION: SOUTH IMENTI

DISTRICT: MERU

Location	Sub-Location	Population 1979	Population 1988	Type	Rural Area Land Potential High	Rural Area Land Potential Med	Rural Area Land Potential Low	Urban Area Class Housing High	Urban Area Class Housing Med	Urban Area Class Housing Low
Abogeta	Upper Githangari	4613	6600	1	100%	0%	0%	0%	0%	0%
	Upper Kiungone	6623	9476	1	100%	0%	0%	0%	0%	0%
Igoji	Gikui	7132	10204	1	70%	30%	0%	0%	0%	0%
	Karia	6460	9242	1	100%	0%	0%	0%	0%	0%
Igoki	Kothine	2953	4224	1	100%	0%	0%	0%	0%	0%
	Mwichure	1771	2534	1	100%	0%	0%	0%	0%	0%
	Upper Chure	3986	5703	1	100%	0%	0%	0%	0%	0%
Kanyakine	Kanyakine	8988	12859	1	100%	0%	0%	0%	0%	0%
	Kiringa	5918	8467	1	30%	70%	0%	0%	0%	0%
Mitine	Kianjogu	5969	8540	1	0%	0%	100%	0%	0%	0%
	Kinoro	5422	7757	1	100%	0%	0%	0%	0%	0%
	Mweru	5865	8391	1	50%	50%	0%	0%	0%	0%
Mitunguu	Kirendene	4232	6055	1	0%	70%	30%	0%	0%	0%
	Ngonyi	9301	9082	1	70%	30%	0%	0%	0%	0%
Nkuene	Kathera	9151	14521	4	65%	0%	0%	0%	14%	21%
	Kigane	5114	7316	1	100%	0%	0%	0%	0%	0%
	Mikumbune	5210	7454	1	100%	0%	0%	0%	0%	0%
	Uruku	7788	11142	1	100%	0%	0%	0%	0%	0%
	Divisional Total (%)				76%	13%	7%	0%	1%	2%
	Divisional Total	106496	149567		113982	20148	10357		2033	3049

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

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INPUT DATA ANALYSES – Part 1 (1988)

DIVISION: THARAKA **DISTRICT: MERU**

Location	Sub-Location	Population 1979	Population 1988	Type	Rural Area Land Potential High	Rural Area Land Potential Med	Rural Area Land Potential Low	Urban Area Class Housing High	Urban Area Class Housing Med	Urban Area Class Housing Low
Gikingo	Irunduni	1435	2073	1	0%	10%	90%	0%	0%	0%
	Kanjoro	6183	8931	1	0%	10%	90%	0%	0%	0%
Marimanti	Kanyuru	4654	6722	1	0%	40%	60%	0%	0%	0%
	Marimanti	5703	8237	1	0%	0%	100%	0%	0%	0%
	Nkondi	7089	10239	1	0%	70%	30%	0%	0%	0%
	Turima	2844	4108	1	0%	70%	30%	0%	0%	0%
North Tharaka	Gatue	2796	4039	1	0%	40%	60%	0%	0%	0%
	Gatunga	4594	6636	1	0%	20%	80%	0%	0%	0%
	Kathangachini	2083	3009	1	0%	20%	80%	0%	0%	0%
South Tharaka	Chiokariga	4859	7018	1	0%	30%	70%	0%	0%	0%
	Kamanyaki	3584	5177	1	0%	20%	80%	0%	0%	0%
	Tunyai	4452	6430	1	0%	80%	20%	0%	0%	0%
	Divisional Total (%)				0%	35%	65%	0%	0%	0%
	Divisional Total	50276	72619			25661	46958			

MINISTRY OF WATER DEVELOPMENT

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INPUT DATA ANALYSES – Part 1 (1988)

DIVISION: TIGANIA **DISTRICT: MERU**

Location	Sub-Location	Population 1979	Population 1988	Type	Rural Area Land Potential High	Rural Area Land Potential Med	Rural Area Land Potential Low	Urban Area Class Housing High	Urban Area Class Housing Med	Urban Area Class Housing Low
Akithii	Athwana	5010	7236	1	0%	20%	80%	0%	0%	0%
	Kitheo	7315	10566	1	0%	10%	90%	0%	0%	0%
	Nchooro	7590	10963	1	30%	30%	40%	0%	0%	0%
	Thinyaine	5100	7366	1	0%	20%	80%	0%	0%	0%
Karama	Karama	10891	15731	1	70%	20%	10%	0%	0%	0%
Kianjai	Kianjai	8237	11897	1	40%	60%	0%	0%	0%	0%
	Miathene	7864	11359	1	100%	0%	0%	0%	0%	0%
Mbeu	Kiorimba	6838	9877	1	20%	80%	0%	0%	0%	0%
	Mbeu	2933	4236	1	20%	80%	0%	0%	0%	0%
Mikinduri	Akaiga	5557	8026	1	50%	50%	0%	0%	0%	0%
	Antuamburi	7964	11503	1	0%	0%	100%	0%	0%	0%
	Athwana	3346	4833	1	30%	70%	0%	0%	0%	0%
	Kiguchua	8642	12482	1	100%	0%	0%	0%	0%	0%
Mituntu	Mituntu	5949	8593	1	5%	15%	80%	0%	0%	0%
Muthara	Athanja	6722	9709	1	40%	10%	50%	0%	0%	0%
	Athinga	4575	6608	1	30%	10%	60%	0%	0%	0%
	Kitharene	6685	9656	1	50%	10%	40%	0%	0%	0%
Thangatha	Ankamia	8518	12303	1	40%	60%	0%	0%	0%	0%
	Giithu	3209	4635	1	0%	100%	0%	0%	0%	0%
	Igarii	1993	2879	1	0%	0%	100%	0%	0%	0%
	Kunati	4386	6335	1	0%	100%	0%	0%	0%	0%
Uringu	Nkomo	5822	8409	1	80%	20%	0%	0%	0%	0%
	Uringu	5505	7951	1	100%	0%	0%	0%	0%	0%
	Divisional Total (%)				40%	30%	30%	0%	0%	0%
	Divisional Total	140651	203153		81909	60158	61087			

MINISTRY OF WATER DEVELOPMENT

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INPUT DATA ANALYSES – Part 1 (1988)

DIVISION: TIMAU **DISTRICT: MERU**

Location	Sub-Location	Population 1979	Population 1988	Type	Rural Area Land Potential High	Rural Area Land Potential Med	Rural Area Land Potential Low	Urban Area Class Housing High	Urban Area Class Housing Med	Urban Area Class Housing Low
Kirimara	Kithithina	2040	2946	1	10%	50%	40%	0%	0%	0%
	Ngushishi	5190	7497	1	10%	40%	50%	0%	0%	0%
Kisima	Buuri	2984	4310	1	100%	0%	0%	0%	0%	0%
	Mutunyi	2374	3429	1	0%	30%	70%	0%	0%	0%
	Ngare Ndare	2687	3881	1	0%	20%	80%	0%	0%	0%
Ontulili	Ontulili	8114	11720	1	80%	20%	0%	0%	0%	0%
	Divisional Total (%)				44%	26%	31%	0%	0%	0%
	Divisional Total	23389	33783		14731	8621	10432			

MINISTRY OF WATER DEVELOPMENT

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INPUT DATA ANALYSES – Part 2 (1988)

DIVISION: CENTRAL IMENTI **DISTRICT: MERU**

Location	Sub-Location	Cows		Shoats	Donkey	Camel	L.U.	Industry
		Grade	Indig.					
Abothuguchi	Githongo	1440	360	496	8	-	1596	-
	Katheri	5000	-	300	25	-	5030	-
	Kithirune	3500	-	550	12	-	3541	-
Gatimbi	Kariene	1107	277	421	-	-	1227	-
	Mariene	1614	404	450	-	-	1778	-
	Ruiga	660	165	832	-	-	770	-
Kibirichia	Kiamiogo	1522	380	2196	11	-	1799	-
	Kimbo	1411	353	1683	43	-	1658	-
	Mboroga	680	170	910	6	-	799	-
	Ntumburi	363	1448	3063	40	-	1065	-
Mwangathia	Gaitu	2013	503	3651	-	-	2424	-
	Gitie	2216	554	2309	-	-	2554	-
	Igane	1740	435	2201	-	-	2031	-
	Kaongo	1661	415	2295	2	-	1953	-
	Kiamuri	1627	407	1960	3	-	1894	-
	Makandune	1026	257	1330	-	-	1200	-
	Divisional Total	27580	6128	24647	150	-	31319	-

MINISTRY OF WATER DEVELOPMENT

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INPUT DATA ANALYSES – Part 2 (1988)

DIVISION: IGEMBE **DISTRICT: MERU**

Location	Sub-Location	Cows Grade	Cows Indig.	Shoats	Donkey	Camel	L.U.	Industry
Akachiu	Amungenti	211	845	1216	3	-	574	-
	Athiru Gaiti	185	410	1066	3	-	393	-
	Auki	117	468	123	-	-	281	-
	Kirindine	362	1448	6791	-	-	1297	-
Kangeta	Kangeta	490	1960	3237	115	-	1405	-
	Liliaba	1210	4842	2567	30	-	3007	-
Kiegoi	Kiegoi	169	677	1118	40	-	485	-
Maua	Amwathi	496	1986	3291	48	-	1396	-
	Antubetwe Njoune	220	880	3279	9	-	735	-
	Kanjoo	267	1068	4890	-	-	949	-
Njia	Buri Eruri	318	1273	1270	-	-	827	-
	Njia Cia Mwendwa	653	2612	2992	109	-	1766	-
	Divisional Total	4698	18469	31840	357	-	13115	-

MINISTRY OF WATER DEVELOPMENT

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INPUT DATA ANALYSES – Part 2 (1988)

DIVISION: NITHI **DISTRICT: MERU**

Location	Sub-Location	Cows Grade	Cows Indig.	Shoats	Donkey	Camel	L.U.	Industry
Chogoria	Chogoria	1260	-	802	-	-	1313	1 ha.
	Kiraro	652	-	734	-	-	700	1 ha.
	Murugi	3106	-	2037	-	-	3241	1 ha.
Kanjuki	Kamaindi	505	-	6700	7	-	954	-
	Kanjuki	2236	-	7624	2	-	2745	-
	Mutino	-	-	-	-	-	-	1 ha.
Karingani	Chuka Township	179	49	248	-	-	211	-
	Gitareni	2697	-	3950	-	-	2960	1 ha.
	Kiangondu	1333	-	1638	-	-	1442	-
	Kithangani	33812	8453	96368	-	-	43054	2 ha.
	Mariani	2466	-	3354	-	-	2689	-
	Mugirirua	1847	462	1115	-	-	2075	3 ha.
	Muiru	1720	-	3200	-	-	1933	1 ha.
	Ndagani	1526	-	1685	-	-	1638	1 ha.
Kiera	Iruma	2122	-	3614	-	-	2362	1 ha.
	Kirumi	1912	-	2238	-	-	2061	-
	Magutuni	3661	-	4976	2	-	3993	1 ha.
	Mugumango	871	-	441	-	-	900	1 ha.
	Thigaa	819	-	1129	-	-	894	-
Magumoni	Itugururu	990	-	867	3	-	1049	1 ha.
	Kamwibi	1995	-	5766	3	-	2380	1 ha.
	Mukuuni	1788	-	1643	2	-	1898	1 ha.
	Thuita	-	-	-	-	-	-	1 ha.
Muthambi	Chamunga	1062	-	1299	-	-	1148	1 ha.
	Gatua	1683	-	393	-	-	1709	1 ha.
	Igamurathi	1602	-	622	-	-	1643	1 ha.
	Iriga	2056	-	2554	-	-	2226	1 ha.
	Kadungu	1315	-	1848	-	-	1438	-
	Karimba	1667	-	2047	-	-	1803	1 ha.
Mwonge	Kabuboni	1342	-	1246	-	-	1425	1 ha.
	Mwonge	187	-	154	-	-	197	1 ha.
	Rubate	530	-	775	-	-	581	-
	Divisional Total	78941	8964	161067	19	-	92662	26 ha.

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES - Part 2 (1988)

DIVISION: NORTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Cows Grade	Cows Indig.	Shoats	Donkey	Camel	L.U.	Industry
Giaki	Giaki	4185	-	5635	-	-	4560	1 ha.
	Kiburine	3030	-	2792	-	-	3216	1 ha.
Kiirua	Kiirua	1051	-	4512	500	-	1551	1 ha.
	Naari	3454	-	1327	156	-	3604	-
	Thege	150	-	50	50	-	173	-
Ntima	Lower Igoki	850	-	945	1	-	913	-
	Mpuri	874	-	729	-	-	922	-
	Ngonyi	633	-	674	1	-	678	-
	Ntakira	1454	-	612	4	-	1496	-
	Nthimbiri	1554	-	763	-	-	1604	-
	Town/Gakoromone	1076	-	703	-	-	1122	450 ha.
	Upper Igoki	716	-	703	1	-	763	-
Nyaki	Chugu	333	83	420	-	-	388	-
	Mulathankari	614	153	330	-	-	687	-
	Munithu	3547	549	4566	-	-	4034	1 ha.
	Nkabune	932	233	1175	-	-	1088	-
	Thuura	2196	549	2770	-	-	2563	-
Ruiri	Ruiri	6957	-	2699	248	-	7236	1 ha.
	Divisional Total	33606	1567	31405	961	-	36598	455 ha.

MINISTRY OF WATER DEVELOPMENT

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INPUT DATA ANALYSES – Part 2 (1988)

DIVISION: NTONYIRI **DISTRICT: MERU**

Location	Sub-Location	Cows Grade	Cows Indig.	Shoats	Donkey	Camel	L.U.	Industry
Antubetwe-Kiongo	Antubetwe-Kiongo	2228	8911	12743	66	-	6074	-
Athiru-Ruujine	Athiru Ruujine	1154	4616	10318	315	-	3506	-
Ithima	Akirangondu	2822	10917	9325	103	-	7123	-
	Antuambui	3420	13680	7954	200	-	8590	-
	Ntunene	2640	10560	9020	100	-	6801	1 ha.
Mutuati	Amwathi 1	243	972	12090	41	-	1389	-
	Amwathi 2	239	956	1925	-	-	686	-
	Naathu	115	459	5703	19	-	655	-
	Divisional Total	12861	51071	69078	844	-	34824	1 ha.

MINISTRY OF WATER DEVELOPMENT

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INPUT DATA ANALYSES – Part 2 (1988)

DIVISION: SOUTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Cows Grade	Cows Indig.	Shoats	Donkey	Camel	L.U.	Industry
Abogeta	Upper Githangari	2118	-	861	4	-	2177	1 ha.
	Upper Kiungone	2824	-	1148	5	-	2902	-
Igoji	Gikui	1611	-	1888	-	-	1736	1 ha.
	Karia	1906	-	1738	-	-	2021	-
Igoki	Kothine	3067	-	1795	-	-	3186	-
	Mwichure	3683	-	3053	-	-	3886	-
	Upper Chure	3554	-	3308	-	-	3774	-
Kanyakine	Kanyakine	1913	-	1968	-	-	2044	1 ha.
	Kiringa	2258	-	2859	-	-	2448	-
Mitine	Kianjogu	1677	-	1414	-	-	1771	-
	Kinoro	707	-	441	-	-	736	-
	Mweru	1236	-	1697	2	-	1349	-
Mitunguu	Kirendene	1918	-	2337	-	-	2073	1 ha.
	Ngonyi	1836	-	1625	-	-	1944	-
Nkuene	Kathera	2113	-	1184	-	-	2191	2 ha.
	Kigane	1026	-	537	-	-	1061	-
	Mikumbune	1941	-	1140	-	-	2017	-
	Uruku	2219	-	902	4	-	2280	-
	Divisional Total	37607	-	29895	15	-	39596	6 ha.

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES - Part 2 (1988)

DIVISION: THARAKA **DISTRICT: MERU**

Location	Sub-Location	Cows Grade	Cows Indig.	Shoats	Donkey	Camel	L.U.	Industry
Gikingo	Irunduni	-	889	20	-	-	297	-
	Kanjoro	-	3831	84	-	-	1282	-
Marimanti	Kanyuru	-	5421	17885	124	-	3048	-
	Marimanti	-	6642	21916	152	-	3735	-
	Nkondi	-	8258	27243	189	-	4644	-
	Turima	-	3313	10930	76	-	1863	-
North Tharaka	Gatue	-	5420	32063	281	-	4056	-
	Gatunga	-	1007	51	56	-	361	-
	Kathangachini	-	2847	145	168	-	1025	-
South Tharaka	Chiokariga	-	1171	19	69	-	419	-
	Kamanyaki	-	1003	16	59	-	359	-
	Tunyai	-	600	10	35	-	214	-
	Divisional Total	-	40402	110382	1209	-	21303	-

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 2 (1988)

DIVISION: TIGANIA **DISTRICT: MERU**

Location	Sub-Location	Cows Grade	Cows Indig.	Shoats	Donkey	Camel	L.U.	Industry
Akithii	Athwana	1534	6133	7387	551	-	4291	-
	Kitheo	440	1760	1527	4	-	1130	-
	Nchooro	665	2659	2759	44	-	1752	-
	Thinyaine	830	3320	9971	299	-	2721	-
Karama	Karama	21	85	814	84	-	137	-
Kianjai	Kianjai	620	2480	2762	18	-	1638	-
	Miathene	1978	7912	13258	298	-	5618	-
Mbeu	Kiorimba	322	1286	1738	1	-	866	-
	Mbeu	1093	4374	3363	41	-	2791	-
Mikinduri	Akaiga	428	1712	2836	-	-	1187	-
	Antuamburi	444	1775	5285	40	-	1404	2 ha.
	Athwana	264	1055	1214	2	-	697	-
	Kiguchua	361	1445	774	6	-	896	-
Mituntu	Mituntu	599	2398	1669	76	-	1540	-
Muthara	Athanja	6847	27387	14136	507	-	17121	-
	Athinga	3063	12252	6324	227	-	7659	-
	Kitharene	1001	4003	5935	112	-	2775	-
Thangatha	Ankamia	465	1859	2479	-	-	1249	-
	Giithu	156	623	2434	-	-	525	-
	Igarii	603	2414	3117	18	-	1622	-
	Kunati	233	934	4180	55	-	845	-
Uringu	Nkomo	438	1752	1690	50	63	1186	-
	Uringu	369	1474	1345	27	-	960	-
	Divisional Total	22774	91092	96997	2460	63	60610	2 ha.

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 2 (1988)

DIVISION: TIMAU **DISTRICT: MERU**

Location	Sub-Location	Cows Grade	Cows Indig.	Shoats	Donkey	Camel	L.U.	Industry
Kirimara	Kithithina	417	-	4170	16	-	701	-
	Ngushishi	1055	-	10553	40	-	1774	-
Kisima	Buuri	1200	-	12000	45	-	2018	-
	Mutunyi	7667	-	11472	70	-	8459	1 ha.
	Ngare Ndare	1567	-	4867	7	-	1894	-
Ontulili	Ontulili	2553	-	1075	17	-	2631	1 ha.
	Divisional Total	14459	-	44137	195	-	17477	2 ha.

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

Printed: 16/01/91

INPUT DATA ANALYSES – Part 3 (1988)

DIVISION: CENTRAL IMENTI **DISTRICT: MERU**

Location	Sub-Location	Day Schools with WC		Day Schools without WC		Boarding Schools		Administration Offices
		No.	Pupils	No.	Pupils	No.	Pupils	Staff
Abothuguchi	Githongo	-	-	4	1460	2	1247	5
	Katheri	-	-	5	3318	3	723	-
	Kithirune	-	-	5	2421	3	329	3
Gatimbi	Kariene	-	-	9	4341	1	411	44
	Mariene	-	-	3	2205	1	380	-
	Ruiga	-	-	9	3306	-	-	1
Kibirichia	Kiamiogo	-	-	3	1297	-	-	-
	Kimbo	-	-	2	1138	-	-	15
	Mboroga	-	-	2	496	-	-	-
	Ntumburi	-	-	6	2516	3	747	1
Mwangathia	Gaitu	-	-	6	2062	-	-	-
	Gitie	-	-	7	2161	1	339	-
	Igane	-	-	7	1984	-	-	10
	Kaongo	-	-	6	1609	-	-	-
	Kiamuri	-	-	5	1216	-	-	3
	Makandune	-	-	4	945	-	-	3
	Divisional Total	-	-	83	32475	14	4176	85

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 3 (1988)

DIVISION: IGEMBE **DISTRICT: MERU**

Location	Sub-Location	Day Schools with WC		Day Schools without WC		Boarding Schools		Administration Offices
		No.	Pupils	No.	Pupils	No.	Pupils	Staff
Akachiu	Amungenti	-	-	7	2082	1	396	-
	Athiru Gaiti	-	-	6	1573	-	-	-
	Auki	-	-	5	1411	1	21	-
	Kirindine	-	-	7	1872	-	-	-
Kangeta	Kangeta	-	-	5	2686	-	-	-
	Liliaba	-	-	5	1895	1	330	-
Kiegoi	Kiegoi	-	-	7	2624	-	-	-
Maua	Amwathi	-	-	15	5445	2	429	-
	Antubetwe Njoune	-	-	2	1001	-	-	-
	Kanjoo	-	-	4	784	-	-	-
Njia	Buri Eruri	-	-	4	2549	1	360	-
	Njia Cia Mwendwa	-	-	8	5009	1	224	-
	Divisional Total	-	-	75	28931	7	1760	-

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 3 (1988)

DIVISION: NITHI **DISTRICT: MERU**

Location	Sub-Location	Day Schools with WC No.	Day Schools with WC Pupils	Day Schools without WC No.	Day Schools without WC Pupils	Boarding Schools No.	Boarding Schools Pupils	Administration Offices Staff
Chogoria	Chogoria	-	-	5	2271	6	1825	-
	Kiraro	-	-	3	1056	2	158	-
	Murugi	-	-	8	3535	2	795	-
Kanjuki	Kamaindi	-	-	3	476	-	-	-
	Kanjuki	-	-	5	979	1	93	-
	Mutino	-	-	6	1340	-	-	-
Karingani	Chuka Township	-	-	-	-	-	-	-
	Gitareni	-	-	9	2160	2	250	-
	Kiangondu	-	-	5	1890	1	323	-
	Kithangani	-	-	7	907	1	11	-
	Mariani	-	-	7	1119	-	-	-
	Mugirirua	-	-	6	2101	1	277	-
	Muiru	-	-	6	1856	-	-	-
	Ndagani	-	-	6	2088	-	-	-
Kiera	Iruma	-	-	5	2468	-	-	-
	Kirumi	-	-	4	2229	-	-	-
	Magutuni	-	-	10	2286	-	-	-
	Mugumango	-	-	8	2818	1	286	-
	Thigaa	-	-	2	784	-	-	-
Magumoni	Itugururu	-	-	3	531	-	-	-
	Kamwibi	-	-	6	1257	-	-	-
	Mukuuni	-	-	6	2110	1	192	-
	Thuita	-	-	9	2611	3	173	-
Muthambi	Chamunga	-	-	2	1102	1	335	-
	Gatua	-	-	8	2148	1	322	-
	Igamurathi	-	-	3	2315	3	1072	-
	Iriga	-	-	3	1058	1	156	-
	Kadungu	-	-	3	876	2	437	-
	Karimba	-	-	6	2035	1	186	-
Mwonge	Kabuboni	-	-	7	1698	2	302	-
	Mwonge	-	-	4	1529	1	265	-
	Rubate	-	-	4	1092	1	88	-
	Divisional Total	-	-	169	52725	34	7546	-

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 3 (1988)

DIVISION: NORTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Day Schools with WC		Day Schools without WC		Boarding Schools		Administration Offices
		No.	Pupils	No.	Pupils	No.	Pupils	Staff
Giaki	Giaki	-	-	8	2329	-	-	5
	Kiburine	-	-	4	1621	-	-	6
Kiirua	Kiirua	-	-	7	1711	2	407	-
	Naari	-	-	10	2873	2	374	-
	Thege	-	-	1	150	-	-	-
Ntima	Lower Igoki	-	-	3	1335	1	217	-
	Mpuri	-	-	4	2123	1	143	-
	Ngonyi	-	-	3	1600	-	-	-
	Ntakira	-	-	5	2221	1	336	-
	Nthimbiri	-	-	3	1280	-	-	-
	Town/Gakoromone	-	-	1	655	-	-	1000
	Upper Igoki	-	-	9	3908	1	61	-
Nyaki	Chugu	-	-	5	2772	3	298	-
	Mulathankari	-	-	3	981	-	-	10
	Munithu	-	-	4	2650	-	-	3
	Nkabune	-	-	-	-	-	-	-
	Thuura	-	-	4	2446	-	-	5
Ruiri	Ruiri	-	-	16	4177	1	152	100
	Divisional Total	-	-	90	34832	12	1988	1129

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 3 (1988)

DIVISION: NTONYIRI **DISTRICT: MERU**

Location	Sub-Location	Day Schools with WC		Day Schools without WC		Boarding Schools		Administration Offices
		No.	Pupils	No.	Pupils	No.	Pupils	Staff
Antubetwe-Kiongo	Antubetwe-Kiongo	-	-	9	2366	-	-	3
Athiru-Ruujine	Athiru Ruujine	-	-	10	2629	-	-	17
Ithima	Akirangondu	-	-	8	3358	-	-	-
	Antuambui	-	-	8	3358	-	-	103
	Ntunene	-	-	4	1679	-	-	35
Mutuati	Amwathi 1	-	-	7	2445	-	-	-
	Amwathi 2	-	-	5	1746	-	-	1
	Naathu	-	-	8	2794	-	-	-
	Divisional Total	-	-	59	20375	-	-	159

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 3 (1988)

DIVISION: SOUTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Day Schools with WC		Day Schools without WC		Boarding Schools		Administration Offices
		No.	Pupils	No.	Pupils	No.	Pupils	Staff
Abogeta	Upper Githangari	-	-	3	1148	1	160	2
	Upper Kiungone	-	-	8	2758	1	314	-
Igoji	Gikui	-	-	4	1375	3	1538	5
	Karia	-	-	4	2411	1	92	-
Igoki	Kothine	-	-	1	367	1	132	-
	Mwichure	-	-	2	1598	-	-	-
	Upper Chure	-	-	7	2273	1	303	1
Kanyakine	Kanyakine	-	-	9	2854	3	757	5
	Kiringa	-	-	3	2060	2	421	-
Mitine	Kianjogu	-	-	7	2247	2	1672	-
	Kinoro	-	-	6	2048	1	148	2
	Mweru	-	-	9	2174	1	191	-
Mitunguu	Kirendene	-	-	4	1032	1	64	2
	Ngonyi	-	-	6	2918	-	-	-
Nkuene	Kathera	-	-	5	2580	3	1104	4
	Kigane	-	-	2	1383	-	-	-
	Mikumbune	-	-	3	2097	2	501	-
	Uruku	-	-	5	2708	3	751	-
	Divisional Total	-	-	88	36031	26	8148	21

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 3 (1988)

DIVISION: THARAKA **DISTRICT: MERU**

Location	Sub-Location	Day Schools with WC		Day Schools without WC		Boarding Schools		Administration Offices
		No.	Pupils	No.	Pupils	No.	Pupils	Staff
Gikingo	Irunduni	-	-	9	2089	-	-	-
	Kanjoro	-	-	13	1833	-	-	-
Marimanti	Kanyuru	-	-	6	692	1	20	-
	Marimanti	-	-	10	1602	1	555	-
	Nkondi	-	-	21	2867	-	-	-
	Turima	-	-	15	2276	-	-	-
North Tharaka	Gatue	-	-	7	890	-	-	-
	Gatunga	-	-	7	981	-	-	-
	Kathangachini	-	-	7	520	-	-	-
South Tharaka	Chiokariga	-	-	9	1281	1	362	-
	Kamanyaki	-	-	6	739	-	-	-
	Tunyai	-	-	11	2529	1	314	-
	Divisional Total	-	-	121	18299	4	1251	-

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 3 (1988)

DIVISION: TIGANIA **DISTRICT: MERU**

Location	Sub-Location	Day Schools with WC		Day Schools without WC		Boarding Schools		Administration Offices
		No.	Pupils	No.	Pupils	No.	Pupils	Staff
Akithii	Athwana	-	-	5	1879	-	-	6
	Kitheo	-	-	10	2758	-	-	50
	Nchooro	-	-	4	1606	-	-	61
	Thinyaine	-	-	10	2853	-	-	9
Karama	Karama	-	-	10	2466	-	-	17
Kianjai	Kianjai	-	-	10	3017	1	115	105
	Miathene	-	-	25	2567	27	794	102
Mbeu	Kiorimba	-	-	-	-	-	-	6
	Mbeu	-	-	5	1837	1	54	3
Mikinduri	Akaiga	-	-	3	1101	-	-	-
	Antuamburi	-	-	10	3720	1	16	-
	Athwana	-	-	10	2145	-	-	2
	Kiguchua	-	-	10	2729	-	-	-
Mituntu	Mituntu	-	-	10	2646	-	-	2
Muthara	Athanja	-	-	10	3644	-	-	-
	Athinga	-	-	6	1379	-	-	-
	Kitharene	-	-	2	612	-	-	-
Thangatha	Ankamia	-	-	10	3214	-	-	23
	Giithu	-	-	3	1454	-	-	26
	Igarii	-	-	1	252	-	-	27
	Kunati	-	-	5	1731	-	-	8
Uringu	Nkomo	-	-	10	2873	-	-	40
	Uringu	-	-	10	2006	-	-	15
	Divisional Total	-	-	179	48489	30	979	502

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 3 (1988)

DIVISION: TIMAU **DISTRICT: MERU**

Location	Sub-Location	Day Schools with WC		Day Schools without WC		Boarding Schools		Administration Offices
		No.	Pupils	No.	Pupils	No.	Pupils	Staff
Kirimara	Kithithina	-	-	3	1192	-	-	-
	Ngushishi	-	-	4	1493	-	-	-
Kisima	Buuri	-	-	1	282	-	-	4
	Mutunyi	-	-	4	983	-	-	3
	Ngare Ndare	-	-	1	281	-	-	6
Ontulili	Ontulili	-	-	6	2488	-	-	-
	Divisional Total	-	-	19	6719	-	-	13

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 4 (1988)

DIVISION: CENTRAL IMENTI **DISTRICT: MERU**

Location	Sub-Location	Health Centre / Disp.	Regional Hospitals No.	Regional Hospitals Beds	District Hospitals No.	District Hospitals Beds	Other Hospitals No.	Other Hospitals Beds	Outpatients per day
Abothuguchi	Githongo	2	-	-	-	-	-	-	270
	Katheri	-	-	-	-	-	-	-	-
	Kithirune	-	-	-	-	-	-	-	-
Gatimbi	Kariene	1	-	-	-	-	-	-	300
	Mariene	-	-	-	-	-	-	-	-
	Ruiga	-	-	-	-	-	-	-	-
Kibirichia	Kiamiogo	-	-	-	-	-	-	-	-
	Kimbo	-	-	-	-	-	-	-	-
	Mboroga	-	-	-	-	-	-	-	-
	Ntumburi	-	-	-	-	-	-	-	-
Mwangathia	Gaitu	3	-	-	-	-	-	-	77
	Gitie	-	-	-	-	-	-	-	-
	Igane	-	-	-	-	-	-	-	-
	Kaongo	2	-	-	-	-	-	-	280
	Kiamuri	-	-	-	-	-	-	-	-
	Makandune	1	-	-	-	-	-	-	20
	Divisional Total	9	-	-	-	-	-	-	947

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 4 (1988)

DIVISION: IGEMBE **DISTRICT: MERU**

Location	Sub-Location	Health Centre / Disp.	Regional Hospitals No.	Regional Hospitals Beds	District Hospitals No.	District Hospitals Beds	Other Hospitals No.	Other Hospitals Beds	Outpatients per day
Akachiu	Amungenti	1	-	-	-	-	-	-	150
	Athiru Gaiti	1	-	-	-	-	-	-	10
	Auki	-	-	-	-	-	-	-	-
	Kirindine	1	-	-	-	-	-	-	19
Kangeta	Kangeta	1	-	-	-	-	-	-	157
	Liliaba	-	-	-	-	-	-	-	-
Kiegoi	Kiegoi	-	-	-	-	-	-	-	-
Maua	Amwathi	-	-	-	-	-	1	110	35
	Antubetwe Njoune	-	-	-	-	-	-	-	-
	Kanjoo	1	-	-	-	-	-	-	33
Njia	Buri Eruri	-	-	-	-	-	-	-	-
	Njia Cia Mwendwa	-	-	-	-	-	-	-	-
	Divisional Total	5	-	-	-	-	1	110	404

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 4 (1988)

DIVISION: NITHI **DISTRICT: MERU**

Location	Sub-Location	Health Centre / Disp.	Regional Hospitals No.	Regional Hospitals Beds	District Hospitals No.	District Hospitals Beds	Other Hospitals No.	Other Hospitals Beds	Outpatients per day
Chogoria	Chogoria	-	-	-	-	-	1	300	250
	Kiraro	-	-	-	-	-	-	-	-
	Murugi	2	-	-	-	-	-	-	50
Kanjuki	Kamaindi	-	-	-	-	-	-	-	-
	Kanjuki	1	-	-	-	-	-	-	144
	Mutino	1	-	-	-	-	-	-	7
Karingani	Chuka Township	-	-	-	-	-	-	-	-
	Gitareni	1	-	-	-	-	-	-	26
	Kiangondu	-	-	-	-	-	-	-	-
	Kithangani	1	-	-	-	-	-	-	9
	Mariani	1	-	-	-	-	-	-	8
	Mugirirua	1	-	-	-	-	-	-	8
	Muiru	2	-	-	-	-	-	-	12
	Ndagani	-	-	-	1	31	1	4	240
Kiera	Iruma	2	-	-	-	-	-	-	20
	Kirumi	2	-	-	-	-	-	-	20
	Magutuni	4	-	-	-	-	-	-	30
	Mugumango	2	-	-	-	-	-	-	-
	Thigaa	2	-	-	-	-	-	-	5
Magumoni	Itugururu	-	-	-	-	-	-	-	-
	Kamwibi	-	-	-	-	-	-	-	-
	Mukuuni	1	-	-	-	-	-	-	20
	Thuita	2	-	-	-	-	-	-	163
Muthambi	Chamunga	1	-	-	-	-	-	-	516
	Gatua	2	-	-	-	-	-	-	291
	Igamurathi	-	-	-	-	-	-	-	-
	Iriga	1	-	-	-	-	-	-	160
	Kadungu	1	-	-	-	-	-	-	146
	Karimba	2	-	-	-	-	-	-	469
Mwonge	Kabuboni	2	-	-	-	-	-	-	138
	Mwonge	-	-	-	-	-	-	-	-
	Rubate	-	-	-	-	-	-	-	-
	Divisional Total	34	-	-	1	31	2	304	2732

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES - Part 4 (1988)

DIVISION: NORTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Health Centre / Disp.	Regional Hospitals No.	Regional Hospitals Beds	District Hospitals No.	District Hospitals Beds	Other Hospitals No.	Other Hospitals Beds	Outpatients per day
Giaki	Giaki	1	-	-	-	-	-	-	68
	Kiburine	-	-	-	-	-	-	-	-
Kiirua	Kiirua	1	-	-	-	-	1	41	185
	Naari	1	-	-	-	-	-	-	79
	Thege	-	-	-	-	-	-	-	-
Ntima	Lower Igoki	-	-	-	-	-	-	-	-
	Mpuri	-	-	-	-	-	-	-	-
	Ngonyi	-	-	-	-	-	-	-	-
	Ntakira	-	-	-	-	-	-	-	-
	Nthimbiri	-	-	-	-	-	-	-	-
	Town/Gakoromone	2	-	-	1	311	2	57	1254
	Upper Igoki	2	-	-	-	-	-	-	121
Nyaki	Chugu	-	-	-	-	-	-	-	-
	Mulathankari	-	-	-	-	-	-	-	-
	Munithu	1	-	-	-	-	-	-	170
	Nkabune	1	-	-	-	-	-	-	13
	Thuura	-	-	-	-	-	-	-	-
Ruiri	Ruiri	2	-	-	-	-	-	-	87
	Divisional Total	11	-	-	1	311	3	98	1977

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section Printed: 16/01/91

INPUT DATA ANALYSES – Part 4 (1988)

DIVISION: NTONYIRI **DISTRICT: MERU**

Location	Sub-Location	Health Centre / Disp.	Regional Hospitals No.	Regional Hospitals Beds	District Hospitals No.	District Hospitals Beds	Other Hospitals No.	Other Hospitals Beds	Outpatients per day
Antubetwe-Kiongo	Antubetwe-Kiongo	1	-	-	-	-	-	-	15
Athiru-Ruujine	Athiru Ruujine	-	-	-	-	-	-	-	-
Ithima	Akirangondu	-	-	-	-	-	-	-	-
	Antuambui	1	-	-	-	-	-	-	110
	Ntunene	1	-	-	-	-	-	-	250
Mutuati	Amwathi 1	-	-	-	-	-	-	-	-
	Amwathi 2	-	-	-	-	-	-	-	-
	Naathu	-	-	-	-	-	-	-	-
	Divisional Total	3	-	-	-	-	-	-	375

MINISTRY OF WATER DEVELOPMENT

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INPUT DATA ANALYSES – Part 4 (1988)

DIVISION: SOUTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Health Centre / Disp.	Regional Hospitals No.	Regional Hospitals Beds	District Hospitals No.	District Hospitals Beds	Other Hospitals No.	Other Hospitals Beds	Outpatients per day
Abogeta	Upper Githangari	-	-	-	-	-	-	-	-
	Upper Kiungone	-	-	-	-	-	-	-	-
Igoji	Gikui	-	-	-	-	-	1	37	69
	Karia	1	-	-	-	-	-	-	30
Igoki	Kothine	-	-	-	-	-	-	-	-
	Mwichure	1	-	-	-	-	-	-	75
	Upper Chure	1	-	-	-	-	-	-	30
Kanyakine	Kanyakine	1	-	-	-	-	-	-	192
	Kiringa	-	-	-	-	-	-	-	-
Mitine	Kianjogu	1	-	-	-	-	-	-	20
	Kinoro	1	-	-	-	-	-	-	100
	Mweru	-	-	-	-	-	-	-	-
Mitunguu	Kirendene	-	-	-	-	-	-	-	-
	Ngonyi	-	-	-	-	-	-	-	-
Nkuene	Kathera	-	-	-	-	-	1	320	500
	Kigane	-	-	-	-	-	-	-	-
	Mikumbune	1	-	-	-	-	-	-	79
	Uruku	2	-	-	-	-	-	-	210
	Divisional Total	9	-	-	-	-	2	357	1305

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

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INPUT DATA ANALYSES – Part 4 (1988)

DIVISION: THARAKA **DISTRICT: MERU**

Location	Sub-Location	Health Centre / Disp.	Regional Hospitals No.	Regional Hospitals Beds	District Hospitals No.	District Hospitals Beds	Other Hospitals No.	Other Hospitals Beds	Outpatients per day
Gikingo	Irunduni	-	-	-	-	-	-	-	-
	Kanjoro	-	-	-	-	-	-	-	-
Marimanti	Kanyuru	-	-	-	-	-	-	-	-
	Marimanti	1	-	-	-	-	-	-	43
	Nkondi	1	-	-	-	-	-	-	35
	Turima	-	-	-	-	-	-	-	-
North Tharaka	Gatue	-	-	-	-	-	-	-	-
	Gatunga	1	-	-	-	-	-	-	20
	Kathangachini	1	-	-	-	-	-	-	43
South Tharaka	Chiokariga	1	-	-	-	-	-	-	89
	Kamanyaki	1	-	-	-	-	-	-	20
	Tunyai	1	-	-	-	-	-	-	22
	Divisional Total	7	-	-	-	-	-	-	272

MINISTRY OF WATER DEVELOPMENT

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INPUT DATA ANALYSES – Part 4 (1988)

DIVISION: TIGANIA **DISTRICT: MERU**

Location	Sub-Location	Health Centre / Disp.	Regional Hospitals No.	Regional Hospitals Beds	District Hospitals No.	District Hospitals Beds	Other Hospitals No.	Other Hospitals Beds	Outpatients per day
Akithii	Athwana	-	-	-	-	-	-	-	-
	Kitheo	1	-	-	-	-	1	90	150
	Nchooro	-	-	-	-	-	-	-	-
	Thinyaine	-	-	-	-	-	-	-	-
Karama	Karama	-	-	-	-	-	-	-	-
Kianjai	Kianjai	-	-	-	-	-	-	-	-
	Miathene	-	-	-	-	-	2	80	656
Mbeu	Kiorimba	-	-	-	-	-	-	-	-
	Mbeu	-	-	-	-	-	-	-	-
Mikinduri	Akaiga	-	-	-	-	-	-	-	-
	Antuamburi	1	-	-	-	-	-	-	160
	Athwana	-	-	-	-	-	-	-	-
	Kiguchua	-	-	-	-	-	-	-	-
Mituntu	Mituntu	-	-	-	-	-	-	-	-
Muthara	Athanja	-	-	-	-	-	-	-	-
	Athinga	-	-	-	-	-	-	-	-
	Kitharene	-	-	-	-	-	-	-	-
Thangatha	Ankamia	-	-	-	-	-	-	-	-
	Giithu	-	-	-	-	-	-	-	-
	Igarii	-	-	-	-	-	-	-	-
	Kunati	-	-	-	-	-	-	-	-
Uringu	Nkomo	1	-	-	-	-	-	-	225
	Uringu	-	-	-	-	-	-	-	-
	Divisional Total	3	-	-	-	-	3	170	1191

MINISTRY OF WATER DEVELOPMENT

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INPUT DATA ANALYSES – Part 4 (1988)

DIVISION: TIMAU **DISTRICT: MERU**

Location	Sub-Location	Health Centre / Disp.	Regional Hospitals No.	Regional Hospitals Beds	District Hospitals No.	District Hospitals Beds	Other Hospitals No.	Other Hospitals Beds	Outpatients per day
Kirimara	Kithithina	1	-	-	-	-	-	-	21
	Ngushishi	1	-	-	-	-	-	-	593
Kisima	Buuri	-	-	-	-	-	-	-	-
	Mutunyi	-	-	-	-	-	-	-	-
	Ngare Ndare	-	-	-	-	-	-	-	-
Ontulili	Ontulili	1	-	-	-	-	-	-	25
	Divisional Total	3	-	-	-	-	-	-	639

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INPUT DATA ANALYSES – Part 5 (1988)

DIVISION: CENTRAL IMENTI **DISTRICT: MERU**

Location	Sub-Location	Hotels High Class No.	Hotels High Class Beds	Hotels Med. Class No.	Hotels Med. Class Beds	Hotels Low Class No.	Hotels Low Class Beds	Bars	Shops
Abothuguchi	Githongo	-	-	-	-	-	-	20	58
	Katheri	-	-	-	-	-	-	15	52
	Kithirune	-	-	-	-	-	-	9	68
Gatimbi	Kariene	-	-	-	-	-	-	17	90
	Mariene	-	-	-	-	-	-	10	13
	Ruiga	-	-	-	-	-	-	2	5
Kibirichia	Kiamiogo	-	-	-	-	-	-	16	130
	Kimbo	-	-	-	-	-	-	2	10
	Mboroga	-	-	-	-	-	-	4	13
	Ntumburi	-	-	-	-	-	-	5	-
Mwangathia	Gaitu	-	-	-	-	-	-	9	81
	Gitie	-	-	-	-	-	-	5	15
	Igane	-	-	-	-	-	-	9	21
	Kaongo	-	-	-	-	-	-	11	40
	Kiamuri	-	-	-	-	-	-	8	9
	Makandune	-	-	-	-	-	-	4	5
	Divisional Total	-	-	-	-	-	-	146	610

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INPUT DATA ANALYSES – Part 5 (1988)

DIVISION: IGEMBE **DISTRICT: MERU**

Location	Sub-Location	Hotels High Class No.	Hotels High Class Beds	Hotels Med. Class No.	Hotels Med. Class Beds	Hotels Low Class No.	Hotels Low Class Beds	Bars	Shops
Akachiu	Amungenti	-	-	-	-	-	-	5	10
	Athiru Gaiti	-	-	-	-	-	-	4	15
	Auki	-	-	-	-	-	-	2	8
	Kirindine	-	-	-	-	-	-	18	59
Kangeta	Kangeta	-	-	-	-	-	-	23	75
	Liliaba	-	-	-	-	-	-	8	8
Kiegoi	Kiegoi	-	-	-	-	-	-	-	-
Maua	Amwathi	-	-	-	-	-	-	-	-
	Antubetwe Njoune	-	-	-	-	-	-	18	40
	Kanjoo	-	-	-	-	-	-	-	-
Njia	Buri Eruri	-	-	-	-	-	-	32	63
	Njia Cia Mwendwa	-	-	-	-	-	-	10	15
	Divisional Total	-	-	-	-	-	-	120	293

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INPUT DATA ANALYSES – Part 5 (1988)

DIVISION: NITHI **DISTRICT: MERU**

Location	Sub-Location	Hotels High Class No.	Hotels High Class Beds	Hotels Med. Class No.	Hotels Med. Class Beds	Hotels Low Class No.	Hotels Low Class Beds	Bars	Shops
Chogoria	Chogoria	-	-	-	-	-	-	9	52
	Kiraro	-	-	-	-	-	-	2	18
	Murugi	-	-	-	-	-	-	8	39
Kanjuki	Kamaindi	-	-	-	-	-	-	-	-
	Kanjuki	-	-	-	-	-	-	9	11
	Mutino	-	-	-	-	-	-	5	32
Karingani	Chuka Township	-	-	-	-	-	-	23	500
	Gitareni	-	-	-	-	-	-	2	26
	Kiangondu	-	-	-	-	-	-	-	-
	Kithangani	-	-	-	-	-	-	5	26
	Mariani	-	-	-	-	-	-	-	-
	Mugirirua	-	-	-	-	-	-	14	58
	Muiru	-	-	-	-	-	-	25	109
	Ndagani	-	-	-	-	-	-	11	38
Kiera	Iruma	-	-	-	-	-	-	6	48
	Kirumi	-	-	-	-	-	-	13	67
	Magutuni	-	-	-	-	-	-	12	123
	Mugumango	-	-	-	-	-	-	7	33
	Thigaa	-	-	-	-	-	-	-	-
Magumoni	Itugururu	-	-	-	-	-	-	5	21
	Kamwibi	-	-	-	-	-	-	3	11
	Mukuuni	-	-	-	-	-	-	15	36
	Thuita	-	-	-	-	-	-	14	79
Muthambi	Chamunga	-	-	-	-	-	-	13	49
	Gatua	-	-	-	-	-	-	13	101
	Igamurathi	-	-	-	-	-	-	4	13
	Iriga	-	-	-	-	-	-	1	80
	Kadungu	-	-	-	-	-	-	-	-
	Karimba	-	-	-	-	-	-	13	66
Mwonge	Kabuboni	-	-	-	-	-	-	5	28
	Mwonge	-	-	-	-	-	-	5	20
	Rubate	-	-	-	-	-	-	-	-
	Divisional Total	-	-	-	-	-	-	242	1684

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INPUT DATA ANALYSES – Part 5 (1988)

DIVISION: NORTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Hotels High Class No.	Hotels High Class Beds	Hotels Med. Class No.	Hotels Med. Class Beds	Hotels Low Class No.	Hotels Low Class Beds	Bars	Shops
Giaki	Giaki	-	-	-	-	-	-	11	55
	Kiburine	-	-	-	-	-	-	5	19
Kiirua	Kiirua	-	-	-	-	-	-	20	115
	Naari	1	50	1	30	-	-	12	50
	Thege	-	-	-	-	-	-	2	1
Ntima	Lower Igoki	-	-	-	-	-	-	-	-
	Mpuri	-	-	-	-	-	-	-	-
	Ngonyi	-	-	-	-	-	-	-	-
	Ntakira	-	-	-	-	-	-	-	-
	Nthimbiri	-	-	-	-	-	-	-	-
	Town/Gakoromone	3	120	4	100	20	400	25	354
	Upper Igoki	-	-	-	-	-	-	-	-
Nyaki	Chugu	-	-	-	-	-	-	-	-
	Mulathankari	-	-	-	-	-	-	3	12
	Munithu	-	-	-	-	-	-	9	40
	Nkabune	-	-	-	-	-	-	-	-
	Thuura	-	-	-	-	-	-	10	49
Ruiri	Ruiri	-	-	-	-	-	-	14	110
	Divisional Total	4	170	5	130	20	400	111	805

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INPUT DATA ANALYSES - Part 5 (1988)

DIVISION: NTONYIRI **DISTRICT: MERU**

Location	Sub-Location	Hotels High Class No.	Hotels High Class Beds	Hotels Med. Class No.	Hotels Med. Class Beds	Hotels Low Class No.	Hotels Low Class Beds	Bars	Shops
Antubetwe-Kiongo	Antubetwe-Kiongo	-	-	-	-	-	-	51	81
Athiru-Ruujine	Athiru Ruujine	-	-	-	-	-	-	34	40
Ithima	Akirangondu	-	-	-	-	-	-	-	-
	Antuambui	-	-	-	-	-	-	99	525
	Ntunene	-	-	-	-	-	-	29	85
Mutuati	Amwathi 1	-	-	-	-	-	-	63	120
	Amwathi 2	-	-	-	-	-	-	9	8
	Naathu	-	-	-	-	-	-	-	-
	Divisional Total	-	-	-	-	-	-	285	859

MINISTRY OF WATER DEVELOPMENT

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INPUT DATA ANALYSES – Part 5 (1988)

DIVISION: SOUTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Hotels High Class No.	Hotels High Class Beds	Hotels Med. Class No.	Hotels Med. Class Beds	Hotels Low Class No.	Hotels Low Class Beds	Bars	Shops
Abogeta	Upper Githangari	-	-	-	-	-	-	9	38
	Upper Kiungone	-	-	-	-	-	-	11	12
Igoji	Gikui	-	-	-	-	-	-	17	32
	Karia	-	-	-	-	-	-	13	15
Igoki	Kothine	-	-	-	-	-	-	-	-
	Mwichure	-	-	-	-	-	-	-	-
	Upper Chure	-	-	-	-	-	-	5	28
Kanyakine	Kanyakine	-	-	-	-	-	-	16	58
	Kiringa	-	-	-	-	-	-	11	15
Mitine	Kianjogu	-	-	-	-	-	-	8	30
	Kinoro	-	-	-	-	-	-	14	40
	Mweru	-	-	-	-	-	-	7	22
Mitunguu	Kirendene	-	-	-	-	-	-	14	90
	Ngonyi	-	-	-	-	-	-	7	8
Nkuene	Kathera	-	-	-	-	-	-	27	142
	Kigane	-	-	-	-	-	-	1	16
	Mikumbune	-	-	-	-	-	-	9	48
	Uruku	-	-	-	-	-	-	9	48
	Divisional Total	-	-	-	-	-	-	178	642

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INPUT DATA ANALYSES – Part 5 (1988)

DIVISION: THARAKA **DISTRICT: MERU**

Location	Sub-Location	Hotels High Class No.	Hotels High Class Beds	Hotels Med. Class No.	Hotels Med. Class Beds	Hotels Low Class No.	Hotels Low Class Beds	Bars	Shops
Gikingo	Irunduni	-	-	-	-	-	-	-	-
	Kanjoro	-	-	-	-	-	-	4	61
Marimanti	Kanyuru	-	-	-	-	-	-	2	27
	Marimanti	-	-	-	-	-	-	5	56
	Nkondi	-	-	-	-	-	-	4	44
	Turima	-	-	-	-	-	-	2	39
North Tharaka	Gatue	-	-	-	-	-	-	-	-
	Gatunga	-	-	-	-	-	-	5	61
	Kathangachini	-	-	-	-	-	-	-	-
South Tharaka	Chiokariga	-	-	-	-	-	-	4	51
	Kamanyaki	-	-	-	-	1	0	-	30
	Tunyai	-	-	-	-	-	-	4	47
	Divisional Total	-	-	-	-	1	-	30	416

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INPUT DATA ANALYSES – Part 5 (1988)

DIVISION: TIGANIA **DISTRICT: MERU**

Location	Sub-Location	Hotels High Class No.	Hotels High Class Beds	Hotels Med. Class No.	Hotels Med. Class Beds	Hotels Low Class No.	Hotels Low Class Beds	Bars	Shops
Akithii	Athwana	-	-	-	-	-	-	-	8
	Kitheo	-	-	-	-	-	-	-	29
	Nchooro	-	-	-	-	-	-	8	15
	Thinyaine	-	-	-	-	-	-	1	6
Karama	Karama	-	-	-	-	-	-	29	54
Kianjai	Kianjai	-	-	-	-	-	-	16	159
	Miathene	-	-	-	-	-	-	9	36
Mbeu	Kiorimba	-	-	-	-	-	-	10	42
	Mbeu	-	-	-	-	-	-	11	171
Mikinduri	Akaiga	-	-	-	-	-	-	11	-
	Antuamburi	-	-	-	-	-	-	44	165
	Athwana	-	-	-	-	-	-	11	13
	Kiguchua	-	-	-	-	-	-	27	42
Mituntu	Mituntu	-	-	-	-	-	-	18	-
Muthara	Athanja	-	-	-	-	-	-	-	-
	Athinga	-	-	-	-	-	-	8	35
	Kitharene	-	-	-	-	-	-	7	53
Thangatha	Ankamia	-	-	-	-	-	-	31	41
	Giithu	-	-	-	-	-	-	19	27
	Igarii	-	-	-	-	-	-	10	37
	Kunati	-	-	1	0	-	-	20	67
Uringu	Nkomo	-	-	-	-	-	-	26	119
	Uringu	-	-	-	-	-	-	5	105
	Divisional Total	-	-	1	-	-	-	321	1224

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INPUT DATA ANALYSES – Part 5 (1988)

DIVISION: TIMAU **DISTRICT: MERU**

Location	Sub-Location	Hotels High Class No.	Hotels High Class Beds	Hotels Med. Class No.	Hotels Med. Class Beds	Hotels Low Class No.	Hotels Low Class Beds	Bars	Shops
Kirimara	Kithithina	-	-	-	-	-	-	-	-
	Ngushishi	-	-	-	-	-	-	-	-
Kisima	Buuri	-	-	-	-	-	-	9	109
	Mutunyi	-	-	-	-	-	-	1	5
	Ngare Ndare	-	-	-	-	-	-	4	12
Ontulili	Ontulili	-	-	-	-	-	-	6	19
	Divisional Total	-	-	-	-	-	-	20	145

APPENDIX 3

DATA ENTRY SHEETS

DEMAND SHEETS

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Githongo

LOCATION : Abothuguchi
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 0 mN Long. = 343000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	15 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100 %	population
		Medium Potential	= 0 %	population
		Low Potential	= 0 %	population
	Urban Area :	High Class Housing	= 0 %	population
		Medium Class Housing	= 0 %	population
		Low Class Housing	= 0 %	population
POPULATION	:	1979 (census)	= 5827	No.
		1988 (estimated)	= 8578	No.
LIVESTOCK	:	Grade cow	= 1440	No.
		Indigenous cow	= 360	No.
		Sheep/goats	= 496	No.
		Donkey	= 8	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	4	Day Schools no WC ->	1460	Pupils
	2	Boarding Schools ->	1247	Pupils
HEALTH CENTRES/DISPENSARIES			= 2	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	270	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	5	No.
BARS	:	=	20	No.
SHOPS	:	=	58	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Githongo DIVISION : Central Imenti
LOCATION : Abothuguchi DISTRICT : Meru

POPULATION : 8578 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1715	No.	60	102900
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	6862	No.	20	137240
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						240140
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1596	No.	50	79800
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1460	No.	5	7300
	Boarding Schools -> Pupils =			1247	No.	50	62350
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			270	No.	20	5400
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	5	No.	25	125
BARS			=	20	No.	500	10000
SHOPS			=	58	No.	100	5800
			TOTAL DEMAND (l/day)				420915

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Katheri

LOCATION : Abothuguchi
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 1000 mN Long. = 344500 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	29 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 11508	No.
		1988 (estimated)	= 16941	No.
LIVESTOCK	:	Grade cow	= 5000	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 300	No.
		Donkey	= 25	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	5	Day Schools no WC ->	3318	Pupils
	3	Boarding Schools ->	723	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	15	No.
SHOPS	:	=	52	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Katheri DIVISION : Central Imenti
LOCATION : Abothuguchi DISTRICT : Meru

POPULATION : 16941 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	3388	No.	60	203280
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	13552	No.	20	271040
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						474320
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	5030	No.	50	251500
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			3318	No.	5	16590
	Boarding Schools -> Pupils =			723	No.	50	36150
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	15	No.	500	7500
SHOPS			=	52	No.	100	5200
			TOTAL DEMAND (l/day)				791260

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kithirune

LOCATION : Abothuguchi
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9998000 mN Long. = 342500 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	18 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 7320	No.
		1988 (estimated)	= 10776	No.
LIVESTOCK	:	Grade cow	= 3500	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 550	No.
		Donkey	= 12	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	5	Day Schools no WC ->	2421	Pupils
	3	Boarding Schools ->	329	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	3	No.
BARS	:	=	9	No.
SHOPS	:	=	68	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kithirune DIVISION : Central Imenti
LOCATION : Abothuguchi DISTRICT : Meru

POPULATION : 10776 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	2155	No.	60	129300
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	8620	No.	20	172400
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						301700
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	3541	No.	50	177050
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2421	No.	5	12105
	Boarding Schools -> Pupils =			329	No.	50	16450
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	3	No.	25	75
BARS			=	9	No.	500	4500
SHOPS			=	68	No.	100	6800
			TOTAL DEMAND (l/day)				518680

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kariene

LOCATION : Gatimbi
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9996000 mN Long. = 358000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	20 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100 %	population
		Medium Potential	= 0 %	population
		Low Potential	= 0 %	population
	Urban Area :	High Class Housing	= 0 %	population
		Medium Class Housing	= 0 %	population
		Low Class Housing	= 0 %	population
POPULATION	:	1979 (census)	= 9898	No.
		1988 (estimated)	= 14571	No.
LIVESTOCK	:	Grade cow	= 1107	No.
		Indigenous cow	= 277	No.
		Sheep/goats	= 421	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	9	Day Schools no WC ->	4341	Pupils
	1	Boarding Schools ->	411	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	300	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	44	No.
BARS	:	=	17	No.
SHOPS	:	=	90	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kariene DIVISION : Central Imenti
LOCATION : Gatimbi DISTRICT : Meru

POPULATION : 14571 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	2914	No.	60	174840
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	11656	No.	20	233120
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						407960
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1227	No.	50	61350
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			4341	No.	5	21705
	Boarding Schools -> Pupils =			411	No.	50	20550
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			300	No.	20	6000
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	44	No.	25	1100
BARS			=	17	No.	500	8500
SHOPS			=	90	No.	100	9000
	TOTAL DEMAND (l/day)						541165

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mariene

LOCATION : Gatimbi
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9997500 mN Long. = 348000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	11 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100 %	population
		Medium Potential	= 0 %	population
		Low Potential	= 0 %	population
	Urban Area :	High Class Housing	= 0 %	population
		Medium Class Housing	= 0 %	population
		Low Class Housing	= 0 %	population
POPULATION	:	1979 (census)	= 4923	No.
		1988 (estimated)	= 7247	No.
LIVESTOCK	:	Grade cow	= 1614	No.
		Indigenous cow	= 404	No.
		Sheep/goats	= 450	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		3 Day Schools no WC ->	2205	Pupils
		1 Boarding Schools ->	380	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	10	No.
SHOPS	:	=	13	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mariene DIVISION : Central Imenti
LOCATION : Gatimbi DISTRICT : Meru

POPULATION : 7247 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1449	No.	60	86940
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	5797	No.	20	115940
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						202880
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1778	No.	50	88900
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2205	No.	5	11025
	Boarding Schools -> Pupils =			380	No.	50	19000
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	10	No.	500	5000
SHOPS			=	13	No.	100	1300
			TOTAL DEMAND (l/day)				328105

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Ruiga

LOCATION : Gatimbi
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9999000 mN Long. = 353000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 27 (km²)		
CLASSIFICATION	Rural Area : High Potential	=	100 % population
	Medium Potential	=	0 % population
	Low Potential	=	0 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	7212 No.
	1988 (estimated)	=	10617 No.
LIVESTOCK	: Grade cow	=	660 No.
	Indigenous cow	=	165 No.
	Sheep/goats	=	832 No.
	Donkey	=	0 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	9 Day Schools no WC ->		3306 Pupils
	0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		0 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff	=	1 No.
BARS	:	=	2 No.
SHOPS	:	=	5 No.
INDUSTRIES	No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Ruiga DIVISION : Central Imenti
LOCATION : Gatimbi DISTRICT : Meru

POPULATION : 10617 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC, High :	20 % =	2123	No.		60	127380
	Medium :	0 % =	0	No.		50	0
	Low :	0 % =	0	No.		40	0
	with NC, High :	80 % =	8493	No.		20	169860
	Medium :	0 % =	0	No.		15	0
	Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population						297240
URBAN POPULATION	with IC, High :	0 % =	0	No.		250	0
	Medium :	0 % =	0	No.		150	0
	Low :	0 % =	0	No.		75	0
	with NC, Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population						0
LIVESTOCK		(L.U.) =	770	No.		50	38500
SCHOOLS	Day Schools with WC -> Pupils =		0	No.		25	0
	Day Schools no WC -> Pupils =		3306	No.		5	16530
	Boarding Schools -> Pupils =		0	No.		50	0
HEALTH	Health Centres\Dispensaries =		0	No.		5000	0
	Regional Hospitals -> Beds =		0	No.		400	0
	District Hospitals -> Beds =		0	No.		200	0
	Other Hospitals -> Beds =		0	No.		100	0
	All Hospitals Outpatients =		0	No.		20	0
HOTELS	High Class Hotels -> Beds =		0	No.		600	0
	Medium Class Hotels -> Beds =		0	No.		300	0
	Low Class Hotels -> Beds =		0	No.		50	0
ADMINISTRATIVE OFFICES	Staff =		1	No.		25	25
BARS	=		2	No.		500	1000
SHOPS	=		5	No.		100	500
	TOTAL DEMAND (l/day)						353795

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kiamiogo

LOCATION : Kibirichia
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 11000 mN Long. = 333000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	20 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	70 % population
		Medium Potential	=	30 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	5231 No.
		1988 (estimated)	=	7700 No.
LIVESTOCK	:	Grade cow	=	1522 No.
		Indigenous cow	=	380 No.
		Sheep/goats	=	2196 No.
		Donkey	=	11 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	3	Day Schools no WC ->		1297 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:	=		16 No.
SHOPS	:	=		130 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kiamiogo DIVISION : Central Imenti
LOCATION : Kibirichia DISTRICT : Meru

POPULATION : 7700 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 70 % population
Medium Potential = 30 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 17 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	14 % =	1078	No.	60	64680
		Medium :	3 % =	231	No.	50	11550
		Low :	0 % =	0	No.	40	0
	with NC,	High :	56 % =	4312	No.	20	86240
		Medium :	27 % =	2079	No.	15	31185
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						193655
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1799	No.	50	89950
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1297	No.	5	6485
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	16	No.	500	8000
SHOPS			=	130	No.	100	13000
TOTAL DEMAND (l/day)							311090

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kimbo

LOCATION : Kibirichia
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 10000 mN Long. = 334000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	55 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	60 % population
		Medium Potential	=	40 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	6132 No.
		1988 (estimated)	=	9027 No.
LIVESTOCK	:	Grade cow	=	1411 No.
		Indigenous cow	=	353 No.
		Sheep/goats	=	1683 No.
		Donkey	=	43 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	2	Day Schools no WC ->		1138 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		15 No.
BARS	:		=	2 No.
SHOPS	:		=	10 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kimbo DIVISION : Central Imenti
LOCATION : Kibirichia DISTRICT : Meru

POPULATION : 9027 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 60 % population
Medium Potential = 40 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 16 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	12 % =	1083	No.	60	64980
		Medium :	4 % =	361	No.	50	18050
		Low :	0 % =	0	No.	40	0
	with NC,	High :	48 % =	4332	No.	20	86640
		Medium :	36 % =	3249	No.	15	48735
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						218405
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1658	No.	50	82900
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1138	No.	5	5690
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	15	No.	25	375
BARS			=	2	No.	500	1000
SHOPS			=	10	No.	100	1000
TOTAL DEMAND (l/day)							309370

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mboroga

LOCATION : Kibirichia
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES UTM-grid = 37N
(main Centre) Lat. = 14000 mN Long. = 337000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 18 (km²)			
CLASSIFICATION	Rural Area	: High Potential	= 40 %	population
		Medium Potential	= 60 %	population
		Low Potential	= 0 %	population
	Urban Area	: High Class Housing	= 0 %	population
		Medium Class Housing	= 0 %	population
		Low Class Housing	= 0 %	population
POPULATION		: 1979 (census)	= 2121	No.
		1988 (estimated)	= 3122	No.
LIVESTOCK		: Grade cow	= 680	No.
		Indigenous cow	= 170	No.
		Sheep/goats	= 910	No.
		Donkey	= 6	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		2 Day Schools no WC ->	496	Pupils
		0 Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES		: Staff =	0	No.
BARS		: =	4	No.
SHOPS		: =	13	No.
INDUSTRIES		No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mboroga DIVISION : Central Imenti
LOCATION : Kibirichia DISTRICT : Meru

POPULATION : 3122 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 40 % population
Medium Potential = 60 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 14 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	8 % =	249	No.		60	14940
		Medium :	6 % =	187	No.		50	9350
		Low :	0 % =	0	No.		40	0
	with NC,	High :	32 % =	999	No.		20	19980
		Medium :	54 % =	1685	No.		15	25275
		Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population							69545
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	799	No.		50	39950
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			496	No.		5	2480
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			0	No.		5000	0
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			0	No.		20	0
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.		25	0
BARS			=	4	No.		500	2000
SHOPS			=	13	No.		100	1300
			TOTAL DEMAND (l/day)					115275

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Ntumburi

LOCATION : Kibirichia
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 14300 mN Long. = 355700 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	39 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	30 % population
		Low Potential	=	70 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	3249 No.
		1988 (estimated)	=	4783 No.
LIVESTOCK	:	Grade cow	=	363 No.
		Indigenous cow	=	1448 No.
		Sheep/goats	=	3063 No.
		Donkey	=	40 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	6	Day Schools no WC ->		2516 Pupils
	3	Boarding Schools ->		747 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		1 No.
BARS	:		=	5 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Ntumburi DIVISION : Central Imenti
LOCATION : Kibirichia DISTRICT : Meru

POPULATION : 4783 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 30 % population
Low Potential = 70 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 7 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	3 % =	143	No.	50	7150
		Low :	4 % =	191	No.	40	7640
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	27 % =	1291	No.	15	19365
		Low :	66 % =	3156	No.	10	31560
	Total Demand for RURAL population						65715
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1065	No.	50	53250
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2516	No.	5	12580
	Boarding Schools -> Pupils =			747	No.	50	37350
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	1	No.	25	25
BARS			=	5	No.	500	2500
SHOPS			=	0	No.	100	0
			TOTAL DEMAND (l/day)				171420

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Gaitu

LOCATION : Mwangathia
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9999000 mN Long. = 363000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	37 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	30 % population
		Medium Potential	=	70 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	5878 No.
		1988 (estimated)	=	8653 No.
LIVESTOCK	:	Grade cow	=	2013 No.
		Indigenous cow	=	503 No.
		Sheep/goats	=	3651 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		6 Day Schools no WC ->		2062 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	3 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		77 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:		=	9 No.
SHOPS	:		=	81 No.
INDUSTRIES	No			

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Gaitu DIVISION : Central Imenti
LOCATION : Mwangathia DISTRICT : Meru

POPULATION : 8653 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 30 % population
Medium Potential = 70 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 13 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	6 % =	519	No.		60	31140
		Medium :	7 % =	605	No.		50	30250
		Low :	0 % =	0	No.		40	0
	with NC,	High :	24 % =	2076	No.		20	41520
		Medium :	63 % =	5451	No.		15	81765
		Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population							184675
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	2424	No.		50	121200
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			2062	No.		5	10310
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			3	No.		5000	15000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			77	No.		20	1540
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.		25	0
BARS			=	9	No.		500	4500
SHOPS			=	81	No.		100	8100
TOTAL DEMAND (l/day)								345325

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Gitie

LOCATION : Mwangathia
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9990000 mN Long. = 363000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	23 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	50 % population
		Medium Potential	=	40 % population
		Low Potential	=	10 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	4885 No.
		1988 (estimated)	=	7191 No.
LIVESTOCK	:	Grade cow	=	2216 No.
		Indigenous cow	=	554 No.
		Sheep/goats	=	2309 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		7 Day Schools no WC ->		2161 Pupils
		1 Boarding Schools ->		339 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:		=	5 No.
SHOPS	:		=	15 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Gitie DIVISION : Central Imenti
LOCATION : Mwangathia DISTRICT : Meru

POPULATION : 7191 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 50 % population
Medium Potential = 40 % population
Low Potential = 10 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 15 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	10 % =	719	No.	60	43140
		Medium :	4 % =	287	No.	50	14350
		Low :	1 % =	71	No.	40	2840
	with NC,	High :	40 % =	2876	No.	20	57520
		Medium :	36 % =	2588	No.	15	38820
		Low :	9 % =	647	No.	10	6470
	Total Demand for RURAL population						163140
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2554	No.	50	127700
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2161	No.	5	10805
	Boarding Schools -> Pupils =			339	No.	50	16950
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	5	No.	500	2500
SHOPS			=	15	No.	100	1500
TOTAL DEMAND (l/day)							322595

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Igane

LOCATION : Mwangathia
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9994000 mN Long. = 363000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	23 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	70 % population
		Medium Potential	=	30 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	4885 No.
		1988 (estimated)	=	7191 No.
LIVESTOCK	:	Grade cow	=	1740 No.
		Indigenous cow	=	435 No.
		Sheep/goats	=	2201 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		7 Day Schools no WC ->		1984 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		10 No.
BARS	:		=	9 No.
SHOPS	:		=	21 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Igane DIVISION : Central Imenti
LOCATION : Mwangathia DISTRICT : Meru

POPULATION : 7191 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 70 % population
Medium Potential = 30 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 17 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	14 % =	1006	No.		60	60360
		Medium :	3 % =	215	No.		50	10750
		Low :	0 % =	0	No.		40	0
	with NC,	High :	56 % =	4026	No.		20	80520
		Medium :	27 % =	1941	No.		15	29115
		Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population							180745
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	2031	No.		50	101550
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			1984	No.		5	9920
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			0	No.		5000	0
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			0	No.		20	0
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	10	No.		25	250
BARS			=	9	No.		500	4500
SHOPS			=	21	No.		100	2100
			TOTAL DEMAND (l/day)					299065

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kaongo

LOCATION : Mwangathia
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9996000 mN Long. = 367000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 39 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	60 % population
		Medium Potential	=	40 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	5197 No.
		1988 (estimated)	=	7650 No.
LIVESTOCK	:	Grade cow	=	1661 No.
		Indigenous cow	=	415 No.
		Sheep/goats	=	2295 No.
		Donkey	=	2 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		6 Day Schools no WC ->		1609 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	2 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		280 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:		=	11 No.
SHOPS	:		=	40 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kaongo DIVISION : Central Imenti
LOCATION : Mwangathia DISTRICT : Meru

POPULATION : 7650 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 60 % population
Medium Potential = 40 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 16 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	12 % =	918	No.	60	55080
		Medium :	4 % =	306	No.	50	15300
		Low :	0 % =	0	No.	40	0
	with NC,	High :	48 % =	3672	No.	20	73440
		Medium :	36 % =	2754	No.	15	41310
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						185130
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1953	No.	50	97650
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1609	No.	5	8045
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			280	No.	20	5600
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	11	No.	500	5500
SHOPS			=	40	No.	100	4000
TOTAL DEMAND (l/day)							315925

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kiamuri

LOCATION : Mwangathia
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9990000 mN Long. = 376000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	94 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	50 % population
		Low Potential	=	50 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	4232 No.
		1988 (estimated)	=	6230 No.
LIVESTOCK	:	Grade cow	=	1627 No.
		Indigenous cow	=	407 No.
		Sheep/goats	=	1960 No.
		Donkey	=	3 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		5 Day Schools no WC ->		1216 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		3 No.
BARS	:		=	8 No.
SHOPS	:		=	9 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kiamuri DIVISION : Central Imenti
LOCATION : Mwangathia DISTRICT : Meru

POPULATION : 6230 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 50 % population
Low Potential = 50 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 8 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	5 % =	311	No.	50	15550
		Low :	3 % =	186	No.	40	7440
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	45 % =	2803	No.	15	42045
		Low :	47 % =	2928	No.	10	29280
	Total Demand for RURAL population						94315
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1894	No.	50	94700
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1216	No.	5	6080
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	3	No.	25	75
BARS			=	8	No.	500	4000
SHOPS			=	9	No.	100	900
TOTAL DEMAND (l/day)							200070

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Makandune

LOCATION : Mwangathia
DIVISION : Central Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9990000 mN Long. = 370000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	30 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	80 % population
		Low Potential	=	20 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	2540 No.
		1988 (estimated)	=	3739 No.
LIVESTOCK	:	Grade cow	=	1026 No.
		Indigenous cow	=	257 No.
		Sheep/goats	=	1330 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	4	Day Schools no WC ->		945 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		20 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		3 No.
BARS	:		=	4 No.
SHOPS	:		=	5 No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Makandune DIVISION : Central Imenti
LOCATION : Mwangathia DISTRICT : Meru

POPULATION : 3739 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 80 % population
Low Potential = 20 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 9 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.		60	0
		Medium :	8 % =	299	No.		50	14950
		Low :	1 % =	37	No.		40	1480
	with NC,	High :	0 % =	0	No.		20	0
		Medium :	72 % =	2692	No.		15	40380
		Low :	19 % =	710	No.		10	7100
	Total Demand for RURAL population							63910
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	1200	No.		50	60000
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			945	No.		5	4725
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			1	No.		5000	5000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			20	No.		20	400
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	3	No.		25	75
BARS			=	4	No.		500	2000
SHOPS			=	5	No.		100	500
			TOTAL DEMAND (l/day)					136610

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Amungenti

LOCATION : Akachiu
DIVISION : Igembe

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 21500 mN Long. = 384000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 65 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	20 % population
		Medium Potential	=	80 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	9212 No.
		1988 (estimated)	=	13203 No.
LIVESTOCK	:	Grade cow	=	211 No.
		Indigenous cow	=	845 No.
		Sheep/goats	=	1216 No.
		Donkey	=	3 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		7 Day Schools no WC ->		2082 Pupils
		1 Boarding Schools ->		396 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		150 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:		=	5 No.
SHOPS	:		=	10 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Amungenti DIVISION : Igembe
LOCATION : Akachiu DISTRICT : Meru

POPULATION : 13203 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 20 % population
Medium Potential = 80 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 12 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	4 % =	528	No.	60	31680
		Medium :	8 % =	1056	No.	50	52800
		Low :	0 % =	0	No.	40	0
	with NC,	High :	16 % =	2112	No.	20	42240
		Medium :	72 % =	9506	No.	15	142590
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						269310
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	574	No.	50	28700
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2082	No.	5	10410
	Boarding Schools -> Pupils =			396	No.	50	19800
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			150	No.	20	3000
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	5	No.	500	2500
SHOPS			=	10	No.	100	1000
	TOTAL DEMAND (l/day)						339720

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Athiru Gaiti

LOCATION : Akachiu
DIVISION : Igembe

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 23500 mN Long. = 386000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	57 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	10 % population
		Medium Potential	=	90 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	7367 No.
		1988 (estimated)	=	10558 No.
LIVESTOCK	:	Grade cow	=	185 No.
		Indigenous cow	=	410 No.
		Sheep/goats	=	1066 No.
		Donkey	=	3 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		6 Day Schools no WC ->		1573 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		10 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:	=		4 No.
SHOPS	:	=		15 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Athiru Gaiti DIVISION : Igembe
LOCATION : Akachiu DISTRICT : Meru

POPULATION : 10558 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 10 % population
Medium Potential = 90 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 11 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	2 % =	211	No.	60	12660
		Medium :	9 % =	950	No.	50	47500
		Low :	0 % =	0	No.	40	0
	with NC,	High :	8 % =	844	No.	20	16880
		Medium :	81 % =	8551	No.	15	128265
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						205305
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	393	No.	50	19650
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1573	No.	5	7865
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			10	No.	20	200
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	4	No.	500	2000
SHOPS			=	15	No.	100	1500
TOTAL DEMAND (l/day)							241520

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Auki

LOCATION : Akachiu
DIVISION : Igembe

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 21000 mN Long. = 381000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	10 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 4760	No.
		1988 (estimated)	= 6822	No.
LIVESTOCK	:	Grade cow	= 117	No.
		Indigenous cow	= 468	No.
		Sheep/goats	= 123	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	5	Day Schools no WC ->	1411	Pupils
	1	Boarding Schools ->	21	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	2	No.
SHOPS	:	=	8	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Auki DIVISION : Igembe
LOCATION : Akachiu DISTRICT : Meru

POPULATION : 6822 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1364	No.	60	81840
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	5457	No.	20	109140
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						190980
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	281	No.	50	14050
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1411	No.	5	7055
	Boarding Schools -> Pupils =			21	No.	50	1050
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	2	No.	500	1000
SHOPS			=	8	No.	100	800
TOTAL DEMAND (l/day)							214935

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kirindine

LOCATION : Akachiu
DIVISION : Igembe

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 14000 mN Long. = 384000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 63 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	30 % population
		Medium Potential	=	70 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	8899 No.
		1988 (estimated)	=	12754 No.
LIVESTOCK	:	Grade cow	=	362 No.
		Indigenous cow	=	1448 No.
		Sheep/goats	=	6791 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		7 Day Schools no WC ->		1872 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day	=	19 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	18 No.
SHOPS	:		=	59 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kirindine DIVISION : Igembe
LOCATION : Akachiu DISTRICT : Meru

POPULATION : 12754 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 30 % population
Medium Potential = 70 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 13 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	6 % =	765	No.		60	45900
		Medium :	7 % =	892	No.		50	44600
		Low :	0 % =	0	No.		40	0
	with NC,	High :	24 % =	3060	No.		20	61200
		Medium :	63 % =	8035	No.		15	120525
		Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population							272225
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	1297	No.		50	64850
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			1872	No.		5	9360
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			1	No.		5000	5000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			19	No.		20	380
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.		25	0
BARS			=	18	No.		500	9000
SHOPS			=	59	No.		100	5900
TOTAL DEMAND (l/day)								366715

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kangeta

LOCATION : Kangeta
DIVISION : Igembe

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 30600 mN Long. = 376000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 55 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	30 % population
		Medium Potential	=	20 % population
		Low Potential	=	50 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	6982 No.
		1988 (estimated)	=	10007 No.
LIVESTOCK	:	Grade cow	=	490 No.
		Indigenous cow	=	1960 No.
		Sheep/goats	=	3237 No.
		Donkey	=	115 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	5	Day Schools no WC ->		2686 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		157 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:		=	23 No.
SHOPS	:		=	75 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kangeta DIVISION : Igembe
LOCATION : Kangeta DISTRICT : Meru

POPULATION : 10007 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 30 % population
Medium Potential = 20 % population
Low Potential = 50 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 11 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	6 % =	600	No.	60	36000
		Medium :	2 % =	200	No.	50	10000
		Low :	3 % =	300	No.	40	12000
	with NC,	High :	24 % =	2401	No.	20	48020
		Medium :	18 % =	1801	No.	15	27015
		Low :	47 % =	4703	No.	10	47030
	Total Demand for RURAL population						180065
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1405	No.	50	70250
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2686	No.	5	13430
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			157	No.	20	3140
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	23	No.	500	11500
SHOPS			=	75	No.	100	7500
TOTAL DEMAND (l/day)							290885

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Liliaba

LOCATION : Kangeta
DIVISION : Igembe

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 34000 mN Long. = 372000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 55 (km²)		
CLASSIFICATION	Rural Area : High Potential	=	20 % population
	Medium Potential	=	20 % population
	Low Potential	=	60 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	4432 No.
	1988 (estimated)	=	6352 No.
LIVESTOCK	: Grade cow	=	1210 No.
	Indigenous cow	=	4842 No.
	Sheep/goats	=	2567 No.
	Donkey	=	30 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	5 Day Schools no WC ->		1895 Pupils
	1 Boarding Schools ->		330 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		0 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff =		0 No.
BARS	:	=	8 No.
SHOPS	:	=	8 No.
INDUSTRIES	No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Liliaba DIVISION : Igembe
LOCATION : Kangeta DISTRICT : Meru

POPULATION : 6352 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 20 % population
Medium Potential = 20 % population
Low Potential = 60 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 9 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	4 % =	254	No.	60	15240
		Medium :	2 % =	127	No.	50	6350
		Low :	3 % =	190	No.	40	7600
	with NC,	High :	16 % =	1016	No.	20	20320
		Medium :	18 % =	1143	No.	15	17145
		Low :	57 % =	3620	No.	10	36200
	Total Demand for RURAL population						102855
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	3007	No.	50	150350
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1895	No.	5	9475
	Boarding Schools -> Pupils =			330	No.	50	16500
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	8	No.	500	4000
SHOPS			=	8	No.	100	800
	TOTAL DEMAND (l/day)						283980

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kiegoi

LOCATION : Kiegoi
DIVISION : Igembe

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 25000 mN Long. = 380000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	19 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 7114	No.
		1988 (estimated)	= 10196	No.
LIVESTOCK	:	Grade cow	= 169	No.
		Indigenous cow	= 677	No.
		Sheep/goats	= 1118	No.
		Donkey	= 40	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	7	Day Schools no WC ->	2624	Pupils
	0	Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	0	No.
SHOPS	:	=	0	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kiegoi DIVISION : Igembe
LOCATION : Kiegoi DISTRICT : Meru

POPULATION : 10196 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	2039	No.	60	122340
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	8156	No.	20	163120
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						285460
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	485	No.	50	24250
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2624	No.	5	13120
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
			TOTAL DEMAND (l/day)				322830

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Amwathi

LOCATION : Maua
DIVISION : Igembe

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 25800 mN Long. = 382000 mE

TYPE = 3
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	41 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	34 % population
		Medium Potential	=	51 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	6 % population
		Low Class Housing	=	9 % population
POPULATION	:	1979 (census)	=	16381 No.
		1988 (estimated)	=	24498 No.
LIVESTOCK	:	Grade cow	=	496 No.
		Indigenous cow	=	1986 No.
		Sheep/goats	=	3291 No.
		Donkey	=	48 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	15	Day Schools no WC ->		5445 Pupils
	2	Boarding Schools ->		429 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	1	Other Hospitals ->		110 Beds
		Outpatients/day =		35 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:		=	0 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Amwathi DIVISION : Igembe
LOCATION : Maua DISTRICT : Meru

POPULATION : 24498 Rural Pop. = 85 % Urban Pop. = 15 %

CLASSIFICATION :
- High Potential = 34 % population
- Medium Potential = 51 % population
- Low Potential = 0 % population
- High Class Housing = 0 % population
- Medium Class Housing = 6 % population
- Low Class Housing = 9 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 12 % Urban Area = 7 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	7 % =	1714	No.	60	102840
		Medium :	5 % =	1224	No.	50	61200
		Low :	0 % =	0	No.	40	0
	with NC,	High :	27 % =	6614	No.	20	132280
		Medium :	46 % =	11269	No.	15	169035
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						465355
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	6 % =	1469	No.	150	220350
		Low :	1 % =	244	No.	75	18300
	with NC,	Low :	8 % =	1959	No.	20	39180
	Total Demand for URBAN population						277830
LIVESTOCK			(L.U.) =	1396	No.	50	69800
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			5445	No.	5	27225
	Boarding Schools -> Pupils =			429	No.	50	21450
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			110	No.	100	11000
	All Hospitals Outpatients =			35	No.	20	700
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
TOTAL DEMAND (l/day)							873360

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Antubetwe Njoune

LOCATION : Maua
DIVISION : Igembe

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 27000 mN Long. = 385000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	27 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	30 % population
		Medium Potential	=	70 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	5304 No.
		1988 (estimated)	=	7602 No.
LIVESTOCK	:	Grade cow	=	220 No.
		Indigenous cow	=	880 No.
		Sheep/goats	=	3279 No.
		Donkey	=	9 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		2 Day Schools no WC ->		1001 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:		=	18 No.
SHOPS	:		=	40 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Antubetwe Njoune DIVISION : Igembe
LOCATION : Maua DISTRICT : Meru

POPULATION : 7602 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 30 % population
Medium Potential = 70 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 13 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	6 % =	456	No.	60	27360
		Medium :	7 % =	532	No.	50	26600
		Low :	0 % =	0	No.	40	0
	with NC,	High :	24 % =	1824	No.	20	36480
		Medium :	63 % =	4789	No.	15	71835
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						162275
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	735	No.	50	36750
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1001	No.	5	5005
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	18	No.	500	9000
SHOPS			=	40	No.	100	4000
TOTAL DEMAND (l/day)							217030

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kanjoo

LOCATION : Maua
DIVISION : Igembe

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 13200 mN Long. = 385000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 125 (km²)			
CLASSIFICATION	Rural Area :	High Potential =	0	% population
		Medium Potential =	40	% population
		Low Potential =	60	% population
	Urban Area :	High Class Housing =	0	% population
		Medium Class Housing =	0	% population
		Low Class Housing =	0	% population
POPULATION	: 1979 (census) =		1119	No.
	1988 (estimated) =		1604	No.
LIVESTOCK	: Grade cow =		267	No.
	Indigenous cow =		1068	No.
	Sheep/goats =		4890	No.
	Donkey =		0	No.
	Camel =		0	No.
SCHOOLS	0 Day Schools with WC ->		0	Pupils
	4 Day Schools no WC ->		784	Pupils
	0 Boarding Schools ->		0	Pupils
HEALTH CENTRES/DISPENSARIES	=		1	No.
HOSPITALS	0 Regional Hospitals ->		0	Beds
	0 District Hospitals ->		0	Beds
	0 Other Hospitals ->		0	Beds
	Outpatients/day =		33	No.
HOTELS	0 High Class Hotels ->		0	Beds
	0 Medium Class Hotels ->		0	Beds
	0 Low Class Hotels ->		0	Beds
ADMINISTRATION OFFICES	: Staff =		0	No.
BARS	: =		0	No.
SHOPS	: =		0	No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kanjoo DIVISION : Igembe
LOCATION : Maua DISTRICT : Meru

POPULATION : 1604 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 40 % population
Low Potential = 60 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 7 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.		60	0
		Medium :	4 % =	64	No.		50	3200
		Low :	3 % =	48	No.		40	1920
	with NC,	High :	0 % =	0	No.		20	0
		Medium :	36 % =	577	No.		15	8655
		Low :	57 % =	914	No.		10	9140
	Total Demand for RURAL population							22915
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	949	No.		50	47450
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			784	No.		5	3920
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			1	No.		5000	5000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			33	No.		20	660
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.		25	0
BARS			=	0	No.		500	0
SHOPS			=	0	No.		100	0
TOTAL DEMAND (l/day)								79945

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Buri Eruri

LOCATION : Njia
DIVISION : Igembe

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 32000 mN Long. = 381000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 19 (km²)		
CLASSIFICATION	Rural Area : High Potential	= 100 %	population
	Medium Potential	= 0 %	population
	Low Potential	= 0 %	population
	Urban Area : High Class Housing	= 0 %	population
	Medium Class Housing	= 0 %	population
	Low Class Housing	= 0 %	population
POPULATION	: 1979 (census)	= 10471	No.
	1988 (estimated)	= 15007	No.
LIVESTOCK	: Grade cow	= 318	No.
	Indigenous cow	= 1273	No.
	Sheep/goats	= 1270	No.
	Donkey	= 0	No.
	Camel	= 0	No.
SCHOOLS	0 Day Schools with WC ->	0	Pupils
	4 Day Schools no WC ->	2549	Pupils
	1 Boarding Schools ->	360	Pupils
HEALTH CENTRES/DISPENSARIES		= 0	No.
HOSPITALS	0 Regional Hospitals ->	0	Beds
	0 District Hospitals ->	0	Beds
	0 Other Hospitals ->	0	Beds
	Outpatients/day =	0	No.
HOTELS	0 High Class Hotels ->	0	Beds
	0 Medium Class Hotels ->	0	Beds
	0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	: Staff =	0	No.
BARS	: =	32	No.
SHOPS	: =	63	No.
INDUSTRIES	No		

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Buri Eruri DIVISION : Igembe
LOCATION : Njia DISTRICT : Meru

POPULATION : 15007 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC, High :	20 % =	3001	No.		60	180060
	Medium :	0 % =	0	No.		50	0
	Low :	0 % =	0	No.		40	0
	with NC, High :	80 % =	12005	No.		20	240100
	Medium :	0 % =	0	No.		15	0
	Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population						420160
URBAN POPULATION	with IC, High :	0 % =	0	No.		250	0
	Medium :	0 % =	0	No.		150	0
	Low :	0 % =	0	No.		75	0
	with NC, Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population						0
LIVESTOCK	(L.U.) =		827	No.		50	41350
SCHOOLS	Day Schools with WC -> Pupils =		0	No.		25	0
	Day Schools no WC -> Pupils =		2549	No.		5	12745
	Boarding Schools -> Pupils =		360	No.		50	18000
HEALTH	Health Centres\Dispensaries =		0	No.		5000	0
	Regional Hospitals -> Beds =		0	No.		400	0
	District Hospitals -> Beds =		0	No.		200	0
	Other Hospitals -> Beds =		0	No.		100	0
	All Hospitals Outpatients =		0	No.		20	0
HOTELS	High Class Hotels -> Beds =		0	No.		600	0
	Medium Class Hotels -> Beds =		0	No.		300	0
	Low Class Hotels -> Beds =		0	No.		50	0
ADMINISTRATIVE OFFICES	Staff =		0	No.		25	0
BARS	=		32	No.		500	16000
SHOPS	=		63	No.		100	6300
	TOTAL DEMAND (l/day)						514555

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Njia Cia Mwendwa

LOCATION : Njia
DIVISION : Igembe

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 34000 mN Long. = 376000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	96 (km²)	
CLASSIFICATION	Rural Area :	High Potential =	100 % population
		Medium Potential =	0 % population
		Low Potential =	0 % population
	Urban Area :	High Class Housing =	0 % population
		Medium Class Housing =	0 % population
		Low Class Housing =	0 % population
POPULATION	:	1979 (census) =	8366 No.
		1988 (estimated) =	11990 No.
LIVESTOCK	:	Grade cow =	653 No.
		Indigenous cow =	2612 No.
		Sheep/goats =	2992 No.
		Donkey =	109 No.
		Camel =	0 No.
SCHOOLS		0 Day Schools with WC ->	0 Pupils
		8 Day Schools no WC ->	5009 Pupils
		1 Boarding Schools ->	224 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS		0 Regional Hospitals ->	0 Beds
		0 District Hospitals ->	0 Beds
		0 Other Hospitals ->	0 Beds
		Outpatients/day =	0 No.
HOTELS		0 High Class Hotels ->	0 Beds
		0 Medium Class Hotels ->	0 Beds
		0 Low Class Hotels ->	0 Beds
ADMINISTRATION OFFICES	:	Staff =	0 No.
BARS	:	=	10 No.
SHOPS	:	=	15 No.
INDUSTRIES	No		

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Njia Cia Mwendwa DIVISION : Igembe
LOCATION : Njia DISTRICT : Meru

POPULATION : 11990 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	2398	No.	60	143880
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	9592	No.	20	191840
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						335720
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1766	No.	50	88300
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			5009	No.	5	25045
	Boarding Schools -> Pupils =			224	No.	50	11200
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	10	No.	500	5000
SHOPS			=	15	No.	100	1500
TOTAL DEMAND (l/day)							466765

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Chogoria

LOCATION : Chogoria
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9977000 mN Long. = 346000 mE

TYPE = 2
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	23 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	86 % population
		Medium Potential	=	0 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	6 % population
		Low Class Housing	=	8 % population
POPULATION	:	1979 (census)	=	8255 No.
		1988 (estimated)	=	12334 No.
LIVESTOCK	:	Grade cow	=	1260 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	802 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC	->	0 Pupils
		5 Day Schools no WC	->	2271 Pupils
		6 Boarding Schools	->	1825 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals	->	0 Beds
		0 District Hospitals	->	0 Beds
		1 Other Hospitals	->	300 Beds
		Outpatients/day	=	250 No.
HOTELS		0 High Class Hotels	->	0 Beds
		0 Medium Class Hotels	->	0 Beds
		0 Low Class Hotels	->	0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	9 No.
SHOPS	:		=	52 No.
INDUSTRIES			->	1 ha.

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Chogoria DIVISION : Nithi
LOCATION : Chogoria DISTRICT : Meru

POPULATION : 12334 Rural Pop. = 86 % Urban Pop. = 14 %

CLASSIFICATION :
High Potential = 86 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 6 % population
Low Class Housing = 8 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 17 % Urban Area = 7 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	17 % =	2096	No.	60	125760
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	69 % =	8510	No.	20	170200
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						295960
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	6 % =	740	No.	150	111000
		Low :	1 % =	123	No.	75	9225
	with NC,	Low :	7 % =	863	No.	20	17260
	Total Demand for URBAN population						137485
LIVESTOCK			(L.U.) =	1313	No.	50	65650
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2271	No.	5	11355
	Boarding Schools -> Pupils =			1825	No.	50	91250
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			300	No.	100	30000
	All Hospitals Outpatients =			250	No.	20	5000
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	9	No.	500	4500
SHOPS			=	52	No.	100	5200
INDUSTRIES			=	1	ha.	20000	20000
			TOTAL DEMAND (l/day)				666400

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kiraro

LOCATION : Chogoria
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9975000 mN Long. = 354000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	5 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100 %	population
		Medium Potential	= 0 %	population
		Low Potential	= 0 %	population
	Urban Area :	High Class Housing	= 0 %	population
		Medium Class Housing	= 0 %	population
		Low Class Housing	= 0 %	population
POPULATION	:	1979 (census)	= 2703	No.
		1988 (estimated)	= 3881	No.
LIVESTOCK	:	Grade cow	= 652	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 734	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		3 Day Schools no WC ->	1056	Pupils
		2 Boarding Schools ->	158	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	2	No.
SHOPS	:	=	18	No.
INDUSTRIES		->	1	ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kiraro DIVISION : Nithi
LOCATION : Chogoria DISTRICT : Meru

POPULATION : 3881 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	776	No.	60	46560
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	3104	No.	20	62080
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						108640
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	700	No.	50	35000
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1056	No.	5	5280
	Boarding Schools -> Pupils =			158	No.	50	7900
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	2	No.	500	1000
SHOPS			=	18	No.	100	1800
INDUSTRIES			=	1	ha.	20000	20000
			TOTAL DEMAND (l/day)				179620

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Murugi

LOCATION : Chogoria
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9973000 mN Long. = 349000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	30 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 10492	No.
		1988 (estimated)	= 15063	No.
LIVESTOCK	:	Grade cow	= 3106	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 2037	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		8 Day Schools no WC ->	3535	Pupils
		2 Boarding Schools ->	795	Pupils
HEALTH CENTRES/DISPENSARIES			= 2	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	50	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	8	No.
SHOPS	:	=	39	No.
INDUSTRIES		->	1	ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Murugi DIVISION : Nithi
LOCATION : Chogoria DISTRICT : Meru

POPULATION : 15063 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	3012	No.	60	180720
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	12050	No.	20	241000
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						421720
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	3241	No.	50	162050
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			3535	No.	5	17675
	Boarding Schools -> Pupils =			795	No.	50	39750
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			50	No.	20	1000
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	8	No.	500	4000
SHOPS			=	39	No.	100	3900
INDUSTRIES			=	1	ha.	20000	20000
		TOTAL DEMAND (l/day)					680095

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kamaindi

LOCATION : Kanjuki
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9957000 mN Long. = 369000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 29 (km²)			
CLASSIFICATION	Rural Area :	High Potential =	0	% population
		Medium Potential =	30	% population
		Low Potential =	70	% population
	Urban Area :	High Class Housing =	0	% population
		Medium Class Housing =	0	% population
		Low Class Housing =	0	% population
POPULATION	: 1979 (census) =		1679	No.
	1988 (estimated) =		2411	No.
LIVESTOCK	: Grade cow =		505	No.
	Indigenous cow =		0	No.
	Sheep/goats =		6700	No.
	Donkey =		7	No.
	Camel =		0	No.
SCHOOLS	0 Day Schools with WC ->		0	Pupils
	3 Day Schools no WC ->		476	Pupils
	0 Boarding Schools ->		0	Pupils
HEALTH CENTRES/DISPENSARIES	=		0	No.
HOSPITALS	0 Regional Hospitals ->		0	Beds
	0 District Hospitals ->		0	Beds
	0 Other Hospitals ->		0	Beds
	Outpatients/day =		0	No.
HOTELS	0 High Class Hotels ->		0	Beds
	0 Medium Class Hotels ->		0	Beds
	0 Low Class Hotels ->		0	Beds
ADMINISTRATION OFFICES	: Staff =		0	No.
BARS	: =		0	No.
SHOPS	: =		0	No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kamaindi DIVISION : Nithi
LOCATION : Kanjuki DISTRICT : Meru

POPULATION : 2411 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 30 % population
Low Potential = 70 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 7 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.		60	0
		Medium :	3 % =	72	No.		50	3600
		Low :	4 % =	96	No.		40	3840
	with NC,	High :	0 % =	0	No.		20	0
		Medium :	27 % =	650	No.		15	9750
		Low :	66 % =	1591	No.		10	15910
	Total Demand for RURAL population							33100
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	954	No.		50	47700
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			476	No.		5	2380
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			0	No.		5000	0
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			0	No.		20	0
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.		25	0
BARS			=	0	No.		500	0
SHOPS			=	0	No.		100	0
	TOTAL DEMAND (l/day)							83180

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kanjuki

LOCATION : Kanjuki
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9963000 mN Long. = 370000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 59 (km²)			
CLASSIFICATION	Rural Area :	High Potential =	0	% population
		Medium Potential =	60	% population
		Low Potential =	40	% population
	Urban Area :	High Class Housing =	0	% population
		Medium Class Housing =	0	% population
		Low Class Housing =	0	% population
POPULATION	: 1979 (census) =		3960	No.
	1988 (estimated) =		5685	No.
LIVESTOCK	: Grade cow =		2236	No.
	Indigenous cow =		0	No.
	Sheep/goats =		7624	No.
	Donkey =		2	No.
	Camel =		0	No.
SCHOOLS	0 Day Schools with WC ->		0	Pupils
	5 Day Schools no WC ->		979	Pupils
	1 Boarding Schools ->		93	Pupils
HEALTH CENTRES/DISPENSARIES	=		1	No.
HOSPITALS	0 Regional Hospitals ->		0	Beds
	0 District Hospitals ->		0	Beds
	0 Other Hospitals ->		0	Beds
	Outpatients/day =		144	No.
HOTELS	0 High Class Hotels ->		0	Beds
	0 Medium Class Hotels ->		0	Beds
	0 Low Class Hotels ->		0	Beds
ADMINISTRATION OFFICES	: Staff =		0	No.
BARS	: =		9	No.
SHOPS	: =		11	No.
INDUSTRIES	No			

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kanjuki DIVISION : Nithi
LOCATION : Kanjuki DISTRICT : Meru

POPULATION : 5685 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 60 % population
Low Potential = 40 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 8 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	6 % =	341	No.	50	17050
		Low :	2 % =	113	No.	40	4520
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	54 % =	3069	No.	15	46035
		Low :	38 % =	2160	No.	10	21600
	Total Demand for RURAL population						89205
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK	(L.U.) =			2745	No.	50	137250
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			979	No.	5	4895
	Boarding Schools -> Pupils =			93	No.	50	4650
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			144	No.	20	2880
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES	Staff =			0	No.	25	0
BARS	=			9	No.	500	4500
SHOPS	=			11	No.	100	1100
	TOTAL DEMAND (l/day)						249480

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mutino

LOCATION : Kanjuki
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9966000 mN Long. = 372000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	37 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	40 % population
		Low Potential	=	60 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	3479 No.
		1988 (estimated)	=	4995 No.
LIVESTOCK	:	Grade cow	=	0 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	0 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC	->	0 Pupils
		6 Day Schools no WC	->	1340 Pupils
		0 Boarding Schools	->	0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals	->	0 Beds
		0 District Hospitals	->	0 Beds
		0 Other Hospitals	->	0 Beds
		Outpatients/day	=	7 No.
HOTELS		0 High Class Hotels	->	0 Beds
		0 Medium Class Hotels	->	0 Beds
		0 Low Class Hotels	->	0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	5 No.
SHOPS	:		=	32 No.
INDUSTRIES			->	1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mutino DIVISION : Nithi
LOCATION : Kanjuki DISTRICT : Meru

POPULATION : 4995 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 40 % population
Low Potential = 60 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 7 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	4 % =	199	No.	50	9950
		Low :	3 % =	149	No.	40	5960
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	36 % =	1798	No.	15	26970
		Low :	57 % =	2847	No.	10	28470
	Total Demand for RURAL population						71350
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	0	No.	50	0
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1340	No.	5	6700
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			7	No.	20	140
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	5	No.	500	2500
SHOPS			=	32	No.	100	3200
INDUSTRIES			=	1	ha.	20000	20000
	TOTAL DEMAND (l/day)						108890

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Chuka Township

LOCATION : Karingani
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9964000 mN Long. = 350000 mE

TYPE = 3
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	5 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	52 % population
		Medium Potential	=	0 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	19 % population
		Low Class Housing	=	29 % population
POPULATION	:	1979 (census)	=	3401 No.
		1988 (estimated)	=	5650 No.
LIVESTOCK	:	Grade cow	=	179 No.
		Indigenous cow	=	49 No.
		Sheep/goats	=	248 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		0 Day Schools no WC ->		0 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day	=	0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	23 No.
SHOPS	:		=	500 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Chuka Township DIVISION : Nithi
LOCATION : Karingani DISTRICT : Meru

POPULATION : 5650 Rural Pop. = 52 % Urban Pop. = 48 %

CLASSIFICATION :
High Potential = 52 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 19 % population
Low Class Housing = 29 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 10 % Urban Area = 22 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	10 % =	565	No.	60	33900
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	42 % =	2373	No.	20	47460
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						81360
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	19 % =	1073	No.	150	160950
		Low :	3 % =	169	No.	75	12675
	with NC,	Low :	26 % =	1469	No.	20	29380
	Total Demand for URBAN population						203005
LIVESTOCK			(L.U.) =	211	No.	50	10550
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			0	No.	5	0
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	23	No.	500	11500
SHOPS			=	500	No.	100	50000
TOTAL DEMAND (l/day)							356415

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Gitareni

LOCATION : Karingani
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9958000 mN Long. = 356000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 20 (km²)			
CLASSIFICATION	Rural Area	: High Potential	=	40 % population
		Medium Potential	=	60 % population
		Low Potential	=	0 % population
	Urban Area	: High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION		: 1979 (census)	=	6136 No.
		1988 (estimated)	=	8809 No.
LIVESTOCK		: Grade cow	=	2697 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	3950 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		9 Day Schools no WC ->		2160 Pupils
		2 Boarding Schools ->		250 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day	=	26 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES		: Staff	=	0 No.
BARS		:	=	2 No.
SHOPS		:	=	26 No.
INDUSTRIES			->	1 ha.

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Gitareni DIVISION : Nithi
LOCATION : Karingani DISTRICT : Meru

POPULATION : 8809 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 40 % population
Medium Potential = 60 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 14 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	8 % =	704	No.	60	42240
		Medium :	6 % =	528	No.	50	26400
		Low :	0 % =	0	No.	40	0
	with NC,	High :	32 % =	2818	No.	20	56360
		Medium :	54 % =	4756	No.	15	71340
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						196340
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2960	No.	50	148000
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2160	No.	5	10800
	Boarding Schools -> Pupils =			250	No.	50	12500
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			26	No.	20	520
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	2	No.	500	1000
SHOPS			=	26	No.	100	2600
INDUSTRIES			=	1	ha.	20000	20000
TOTAL DEMAND (l/day)							396760

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kiangondu

LOCATION : Karingani
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9965000 mN Long. = 347000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	9 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100 %	population
		Medium Potential	= 0 %	population
		Low Potential	= 0 %	population
	Urban Area :	High Class Housing	= 0 %	population
		Medium Class Housing	= 0 %	population
		Low Class Housing	= 0 %	population
POPULATION	:	1979 (census)	= 2843	No.
		1988 (estimated)	= 4082	No.
LIVESTOCK	:	Grade cow	= 1333	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 1638	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		5 Day Schools no WC ->	1890	Pupils
		1 Boarding Schools ->	323	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	0	No.
SHOPS	:	=	0	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kiangondu DIVISION : Nithi
LOCATION : Karingani DISTRICT : Meru

POPULATION : 4082 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	816	No.	60	48960
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	3265	No.	20	65300
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						114260
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1442	No.	50	72100
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1890	No.	5	9450
	Boarding Schools -> Pupils =			323	No.	50	16150
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
			TOTAL DEMAND (l/day)				211960

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kithangani

LOCATION : Karingani
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9959000 mN Long. = 359000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 39 (km²)			
CLASSIFICATION	Rural Area :	High Potential	= 0	% population
		Medium Potential	= 100	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 2318	No.
		1988 (estimated)	= 3328	No.
LIVESTOCK	:	Grade cow	= 33812	No.
		Indigenous cow	= 8453	No.
		Sheep/goats	= 96368	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	7	Day Schools no WC ->	907	Pupils
	1	Boarding Schools ->	11	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	9	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	5	No.
SHOPS	:	=	26	No.
INDUSTRIES		->	2	ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kithangani DIVISION : Nithi
LOCATION : Karingani DISTRICT : Meru

POPULATION : 3328 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 100 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 10 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	10 % =	332	No.	50	16600
		Low :	0 % =	0	No.	40	0
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	90 % =	2995	No.	15	44925
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						61525
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	43054	No.	50	2152700
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			907	No.	5	4535
	Boarding Schools -> Pupils =			11	No.	50	550
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			9	No.	20	180
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	5	No.	500	2500
SHOPS			=	26	No.	100	2600
INDUSTRIES			=	2	ha.	20000	40000
		TOTAL DEMAND (l/day)					2269590

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mariani

LOCATION : Karingani
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9964000 mN Long. = 359000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 32 (km²)			
CLASSIFICATION	Rural Area :	High Potential	= 0	% population
		Medium Potential	= 100	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 3655	No.
		1988 (estimated)	= 5247	No.
LIVESTOCK	:	Grade cow	= 2466	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 3354	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		7 Day Schools no WC ->	1119	Pupils
		0 Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	8	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	0	No.
SHOPS	:	=	0	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mariani DIVISION : Nithi
LOCATION : Karingani DISTRICT : Meru

POPULATION : 5247 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 100 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 10 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	10 % =	524	No.	50	26200
		Low :	0 % =	0	No.	40	0
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	90 % =	4722	No.	15	70830
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						97030
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2689	No.	50	134450
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1119	No.	5	5595
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			8	No.	20	160
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES	Staff =			0	No.	25	0
BARS	=			0	No.	500	0
SHOPS	=			0	No.	100	0
TOTAL DEMAND (l/day)							242235

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mugirirua

LOCATION : Karingani
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9962000 mN Long. = 349000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	15 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100 %	population
		Medium Potential	= 0 %	population
		Low Potential	= 0 %	population
	Urban Area :	High Class Housing	= 0 %	population
		Medium Class Housing	= 0 %	population
		Low Class Housing	= 0 %	population
POPULATION	:	1979 (census)	= 6318	No.
		1988 (estimated)	= 9071	No.
LIVESTOCK	:	Grade cow	= 1847	No.
		Indigenous cow	= 462	No.
		Sheep/goats	= 1115	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		6 Day Schools no WC ->	2101	Pupils
		1 Boarding Schools ->	277	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	8	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	14	No.
SHOPS	:	=	58	No.
INDUSTRIES		->	3	ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mugirirua DIVISION : Nithi
LOCATION : Karingani DISTRICT : Meru

POPULATION : 9071 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1814	No.	60	108840
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	7256	No.	20	145120
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						253960
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2075	No.	50	103750
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2101	No.	5	10505
	Boarding Schools -> Pupils =			277	No.	50	13850
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			8	No.	20	160
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	14	No.	500	7000
SHOPS			=	58	No.	100	5800
INDUSTRIES			=	3	ha.	20000	60000
	TOTAL DEMAND (l/day)						460025

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Muiru

LOCATION : Karingani
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9961000 mN Long. = 352000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 27 (km²)			
CLASSIFICATION	Rural Area :	High Potential	= 100 %	population
		Medium Potential	= 0 %	population
		Low Potential	= 0 %	population
	Urban Area :	High Class Housing	= 0 %	population
		Medium Class Housing	= 0 %	population
		Low Class Housing	= 0 %	population
POPULATION	: 1979 (census)		= 5034	No.
	1988 (estimated)		= 7227	No.
LIVESTOCK	: Grade cow		= 1720	No.
	Indigenous cow		= 0	No.
	Sheep/goats		= 3200	No.
	Donkey		= 0	No.
	Camel		= 0	No.
SCHOOLS	0 Day Schools with WC ->		0	Pupils
	6 Day Schools no WC ->		1856	Pupils
	0 Boarding Schools ->		0	Pupils
HEALTH CENTRES/DISPENSARIES			= 2	No.
HOSPITALS	0 Regional Hospitals ->		0	Beds
	0 District Hospitals ->		0	Beds
	0 Other Hospitals ->		0	Beds
	Outpatients/day =		12	No.
HOTELS	0 High Class Hotels ->		0	Beds
	0 Medium Class Hotels ->		0	Beds
	0 Low Class Hotels ->		0	Beds
ADMINISTRATION OFFICES	: Staff =		0	No.
BARS	: =		25	No.
SHOPS	: =		109	No.
INDUSTRIES	->		1	ha.

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Muiru DIVISION : Nithi
LOCATION : Karingani DISTRICT : Meru

POPULATION : 7227 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1445	No.	60	86700
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	5781	No.	20	115620
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						202320
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1933	No.	50	96650
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1856	No.	5	9280
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			12	No.	20	240
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	25	No.	500	12500
SHOPS			=	109	No.	100	10900
INDUSTRIES			=	1	ha.	20000	20000
			TOTAL DEMAND (l/day)				361890

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Ndagani

LOCATION : Karingani
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9965000 mN Long. = 351000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	14 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	70 % population
		Medium Potential	=	30 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	4278 No.
		1988 (estimated)	=	6142 No.
LIVESTOCK	:	Grade cow	=	1526 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	1685 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		6 Day Schools no WC ->		2088 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		1 District Hospitals ->		31 Beds
		1 Other Hospitals ->		4 Beds
		Outpatients/day =		240 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:	=		11 No.
SHOPS	:	=		38 No.
INDUSTRIES		->		1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Ndagani DIVISION : Nithi
LOCATION : Karingani DISTRICT : Meru

POPULATION : 6142 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 70 % population
Medium Potential = 30 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 17 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	14 % =	859	No.	60	51540
		Medium :	3 % =	184	No.	50	9200
		Low :	0 % =	0	No.	40	0
	with NC,	High :	56 % =	3439	No.	20	68780
		Medium :	27 % =	1658	No.	15	24870
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						154390
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1638	No.	50	81900
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2088	No.	5	10440
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			31	No.	200	6200
	Other Hospitals -> Beds =			4	No.	100	400
	All Hospitals Outpatients =			240	No.	20	4800
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	11	No.	500	5500
SHOPS			=	38	No.	100	3800
INDUSTRIES			=	1	ha.	20000	20000
		TOTAL DEMAND (l/day)					287430

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Iruma

LOCATION : Kiera
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9976500 mN Long. = 353000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	11 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 4265	No.
		1988 (estimated)	= 6123	No.
LIVESTOCK	:	Grade cow	= 2122	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 3614	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	5	Day Schools no WC ->	2468	Pupils
	0	Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES		=	2	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	20	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	6	No.
SHOPS	:	=	48	No.
INDUSTRIES		->	1	ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Iruma DIVISION : Nithi
LOCATION : Kiera DISTRICT : Meru

POPULATION : 6123 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1224	No.	60	73440
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	4898	No.	20	97960
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						171400
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2362	No.	50	118100
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2468	No.	5	12340
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			20	No.	20	400
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	6	No.	500	3000
SHOPS			=	48	No.	100	4800
INDUSTRIES			=	1	ha.	20000	20000
			TOTAL DEMAND (l/day)				340040

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kirumi

LOCATION : Kiera
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9974000 mN Long. = 356000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	15 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	50 % population
		Medium Potential	=	50 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	1093 No.
		1988 (estimated)	=	1569 No.
LIVESTOCK	:	Grade cow	=	1912 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	2238 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		4 Day Schools no WC ->		2229 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	2 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		20 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:	=		13 No.
SHOPS	:	=		67 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kirumi DIVISION : Nithi
LOCATION : Kiera DISTRICT : Meru

POPULATION : 1569 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 50 % population
Medium Potential = 50 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 15 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	10 % =	156	No.	60	9360
		Medium :	5 % =	78	No.	50	3900
		Low :	0 % =	0	No.	40	0
	with NC,	High :	40 % =	627	No.	20	12540
		Medium :	45 % =	706	No.	15	10590
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						36390
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2061	No.	50	103050
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2229	No.	5	11145
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			20	No.	20	400
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	13	No.	500	6500
SHOPS			=	67	No.	100	6700
			TOTAL DEMAND (l/day)				174185

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Magutuni

LOCATION : Kiera
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9975000 mN Long. = 359000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 110 (km²)			
CLASSIFICATION	Rural Area : High Potential	=	10	% population
	Medium Potential	=	90	% population
	Low Potential	=	0	% population
	Urban Area : High Class Housing	=	0	% population
	Medium Class Housing	=	0	% population
	Low Class Housing	=	0	% population
POPULATION	: 1979 (census)	=	11436	No.
	1988 (estimated)	=	16418	No.
LIVESTOCK	: Grade cow	=	3661	No.
	Indigenous cow	=	0	No.
	Sheep/goats	=	4976	No.
	Donkey	=	2	No.
	Camel	=	0	No.
SCHOOLS	0 Day Schools with WC ->		0	Pupils
	10 Day Schools no WC ->		2286	Pupils
	0 Boarding Schools ->		0	Pupils
HEALTH CENTRES/DISPENSARIES		=	4	No.
HOSPITALS	0 Regional Hospitals ->		0	Beds
	0 District Hospitals ->		0	Beds
	0 Other Hospitals ->		0	Beds
	Outpatients/day =		30	No.
HOTELS	0 High Class Hotels ->		0	Beds
	0 Medium Class Hotels ->		0	Beds
	0 Low Class Hotels ->		0	Beds
ADMINISTRATION OFFICES	: Staff =		0	No.
BARS	: =		12	No.
SHOPS	: =		123	No.
INDUSTRIES	->		1	ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Magutuni DIVISION : Nithi
LOCATION : Kiera DISTRICT : Meru

POPULATION : 16418 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 10 % population
Medium Potential = 90 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 11 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC, High :	2 % =	328	No.		60	19680
	Medium :	9 % =	1477	No.		50	73850
	Low :	0 % =	0	No.		40	0
	with NC, High :	8 % =	1313	No.		20	26260
	Medium :	81 % =	13298	No.		15	199470
	Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population						319260
URBAN POPULATION	with IC, High :	0 % =	0	No.		250	0
	Medium :	0 % =	0	No.		150	0
	Low :	0 % =	0	No.		75	0
	with NC, Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population						0
LIVESTOCK		(L.U.) =	3993	No.		50	199650
SCHOOLS	Day Schools with WC -> Pupils =		0	No.		25	0
	Day Schools no WC -> Pupils =		2286	No.		5	11430
	Boarding Schools -> Pupils =		0	No.		50	0
HEALTH	Health Centres\Dispensaries =		4	No.		5000	20000
	Regional Hospitals -> Beds =		0	No.		400	0
	District Hospitals -> Beds =		0	No.		200	0
	Other Hospitals -> Beds =		0	No.		100	0
	All Hospitals Outpatients =		30	No.		20	600
HOTELS	High Class Hotels -> Beds =		0	No.		600	0
	Medium Class Hotels -> Beds =		0	No.		300	0
	Low Class Hotels -> Beds =		0	No.		50	0
ADMINISTRATIVE OFFICES	Staff =		0	No.		25	0
BARS	=		12	No.		500	6000
SHOPS	=		123	No.		100	12300
INDUSTRIES	=		1	ha.		20000	20000
	TOTAL DEMAND (l/day)						589240

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mugumango

LOCATION : Kiera
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9972000 mN Long. = 356000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	21 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	70 % population
		Medium Potential	=	30 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	8372 No.
		1988 (estimated)	=	12019 No.
LIVESTOCK	:	Grade cow	=	871 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	441 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		8 Day Schools no WC ->		2818 Pupils
		1 Boarding Schools ->		286 Pupils
HEALTH CENTRES/DISPENSARIES			=	2 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:		=	7 No.
SHOPS	:		=	33 No.
INDUSTRIES			->	1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mugumango DIVISION : Nithi
LOCATION : Kiera DISTRICT : Meru

POPULATION : 12019 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 70 % population
Medium Potential = 30 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 17 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	14 % =	1682	No.		60	100920
		Medium :	3 % =	360	No.		50	18000
		Low :	0 % =	0	No.		40	0
	with NC,	High :	56 % =	6730	No.		20	134600
		Medium :	27 % =	3245	No.		15	48675
		Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population							302195
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	900	No.		50	45000
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			2818	No.		5	14090
	Boarding Schools -> Pupils =			286	No.		50	14300
HEALTH	Health Centres\Dispensaries =			2	No.		5000	10000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			0	No.		20	0
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.		25	0
BARS			=	7	No.		500	3500
SHOPS			=	33	No.		100	3300
INDUSTRIES			=	1	ha.		20000	20000
			TOTAL DEMAND (l/day)					412385

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Thigaa

LOCATION : Kiera
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9976500 mN Long. = 348000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	7 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	80 % population
		Medium Potential	=	20 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	1989 No.
		1988 (estimated)	=	2856 No.
LIVESTOCK	:	Grade cow	=	819 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	1129 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		2 Day Schools no WC ->		784 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	2 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		5 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:		=	0 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Thigaa DIVISION : Nithi
LOCATION : Kiera DISTRICT : Meru

POPULATION : 2856 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 80 % population
Medium Potential = 20 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 18 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	16 % =	456	No.	60	27360
		Medium :	2 % =	57	No.	50	2850
		Low :	0 % =	0	No.	40	0
	with NC,	High :	64 % =	1827	No.	20	36540
		Medium :	18 % =	514	No.	15	7710
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						74460
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	894	No.	50	44700
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			784	No.	5	3920
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			5	No.	20	100
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
TOTAL DEMAND (l/day)							133180

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Itugururu

LOCATION : Magumoni
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9955000 mN Long. = 356000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	16 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 0	% population
		Medium Potential	= 100	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 946	No.
		1988 (estimated)	= 1358	No.
LIVESTOCK	:	Grade cow	= 990	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 867	No.
		Donkey	= 3	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	3	Day Schools no WC ->	531	Pupils
	0	Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	5	No.
SHOPS	:	=	21	No.
INDUSTRIES		->	1	ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Itugururu DIVISION : Nithi
LOCATION : Magumoni DISTRICT : Meru

POPULATION : 1358 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 100 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 10 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	10 % =	135	No.	50	6750
		Low :	0 % =	0	No.	40	0
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	90 % =	1222	No.	15	18330
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						25080
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1049	No.	50	52450
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			531	No.	5	2655
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	5	No.	500	2500
SHOPS			=	21	No.	100	2100
INDUSTRIES			=	1	ha.	20000	20000
		TOTAL DEMAND (l/day)					104785

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kamwibi

LOCATION : Magumoni
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9953000 mN Long. = 358000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	51 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	60 % population
		Low Potential	=	40 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	3019 No.
		1988 (estimated)	=	4334 No.
LIVESTOCK	:	Grade cow	=	1995 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	5766 No.
		Donkey	=	3 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC	->	0 Pupils
		6 Day Schools no WC	->	1257 Pupils
		0 Boarding Schools	->	0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals	->	0 Beds
		0 District Hospitals	->	0 Beds
		0 Other Hospitals	->	0 Beds
		Outpatients/day	=	0 No.
HOTELS		0 High Class Hotels	->	0 Beds
		0 Medium Class Hotels	->	0 Beds
		0 Low Class Hotels	->	0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	3 No.
SHOPS	:		=	11 No.
INDUSTRIES			->	1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kamwibi DIVISION : Nithi
LOCATION : Magumoni DISTRICT : Meru

POPULATION : 4334 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 60 % population
Low Potential = 40 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 8 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	6 % =	260	No.	50	13000
		Low :	2 % =	86	No.	40	3440
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	54 % =	2340	No.	15	35100
		Low :	38 % =	1646	No.	10	16460
	Total Demand for RURAL population						68000
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2380	No.	50	119000
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1257	No.	5	6285
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	3	No.	500	1500
SHOPS			=	11	No.	100	1100
INDUSTRIES			=	1	ha.	20000	20000
	TOTAL DEMAND (l/day)						215885

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mukuuni

LOCATION : Magumoni
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9956000 mN Long. = 349000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	22 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	60 % population
		Medium Potential	=	40 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	5703 No.
		1988 (estimated)	=	8188 No.
LIVESTOCK	:	Grade cow	=	1788 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	1643 No.
		Donkey	=	2 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		6 Day Schools no WC ->		2110 Pupils
		1 Boarding Schools ->		192 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day	=	20 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	15 No.
SHOPS	:		=	36 No.
INDUSTRIES			->	1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mukuuni DIVISION : Nithi
LOCATION : Magumoni DISTRICT : Meru

POPULATION : 8188 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 60 % population
Medium Potential = 40 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 16 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	12 % =	982	No.		60	58920
		Medium :	4 % =	327	No.		50	16350
		Low :	0 % =	0	No.		40	0
	with NC,	High :	48 % =	3930	No.		20	78600
		Medium :	36 % =	2947	No.		15	44205
		Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population							198075
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	1898	No.		50	94900
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			2110	No.		5	10550
	Boarding Schools -> Pupils =			192	No.		50	9600
HEALTH	Health Centres\Dispensaries =			1	No.		5000	5000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			20	No.		20	400
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.		25	0
BARS			=	15	No.		500	7500
SHOPS			=	36	No.		100	3600
INDUSTRIES			=	1	ha.		20000	20000
TOTAL DEMAND (l/day)								349625

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Thuita

LOCATION : Magumoni
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9959000 mN Long. = 344000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	17 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 7366	No.
		1988 (estimated)	= 10575	No.
LIVESTOCK	:	Grade cow	= 0	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 0	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	9	Day Schools no WC ->	2611	Pupils
	3	Boarding Schools ->	173	Pupils
HEALTH CENTRES/DISPENSARIES			= 2	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	163	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	14	No.
SHOPS	:	=	79	No.
INDUSTRIES		->	1	ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Thuita DIVISION : Nithi
LOCATION : Magumoni DISTRICT : Meru

POPULATION : 10575 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	2115	No.	60	126900
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	8460	No.	20	169200
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						296100
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	0	No.	50	0
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2611	No.	5	13055
	Boarding Schools -> Pupils =			173	No.	50	8650
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			163	No.	20	3260
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	14	No.	500	7000
SHOPS			=	79	No.	100	7900
INDUSTRIES			=	1	ha.	20000	20000
			TOTAL DEMAND (l/day)				365965

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Chamunga

LOCATION : Muthambi
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9969000 mN Long. = 354000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	9 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 3953	No.
		1988 (estimated)	= 5675	No.
LIVESTOCK	:	Grade cow	= 1062	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 1299	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	2	Day Schools no WC ->	1102	Pupils
	1	Boarding Schools ->	335	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	516	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	13	No.
SHOPS	:	=	49	No.
INDUSTRIES		->	1	ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Chamunga DIVISION : Nithi
LOCATION : Muthambi DISTRICT : Meru

POPULATION : 5675 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1135	No.	60	68100
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	4540	No.	20	90800
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						158900
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1148	No.	50	57400
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1102	No.	5	5510
	Boarding Schools -> Pupils =			335	No.	50	16750
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			516	No.	20	10320
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	13	No.	500	6500
SHOPS			=	49	No.	100	4900
INDUSTRIES			=	1	ha.	20000	20000
			TOTAL DEMAND (l/day)				285280

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Gatua

LOCATION : Muthambi
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES UTM-grid = 37M
(main Centre) Lat. = 9967000 mN Long. = 348000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	14 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 5339	No.
		1988 (estimated)	= 7665	No.
LIVESTOCK	:	Grade cow	= 1683	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 393	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	8	Day Schools no WC ->	2148	Pupils
	1	Boarding Schools ->	322	Pupils
HEALTH CENTRES/DISPENSARIES		=	2	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	291	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	13	No.
SHOPS	:	=	101	No.
INDUSTRIES		->	1	ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Gatua DIVISION : Nithi
LOCATION : Muthambi DISTRICT : Meru

POPULATION : 7665 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1533	No.	60	91980
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	6132	No.	20	122640
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						214620
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1709	No.	50	85450
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2148	No.	5	10740
	Boarding Schools -> Pupils =			322	No.	50	16100
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			291	No.	20	5820
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	13	No.	500	6500
SHOPS			=	101	No.	100	10100
INDUSTRIES			=	1	ha.	20000	20000
			TOTAL DEMAND (l/day)				379330

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Igamurathi

LOCATION : Muthambi
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9996000 mN Long. = 351000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	7 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 2580	No.
		1988 (estimated)	= 3704	No.
LIVESTOCK	:	Grade cow	= 1602	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 622	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	3	Day Schools no WC ->	2315	Pupils
	3	Boarding Schools ->	1072	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	4	No.
SHOPS	:	=	13	No.
INDUSTRIES		->	1	ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Igamurathi DIVISION : Nithi
LOCATION : Muthambi DISTRICT : Meru

POPULATION : 3704 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	740	No.		60	44400
		Medium :	0 % =	0	No.		50	0
		Low :	0 % =	0	No.		40	0
	with NC,	High :	80 % =	2963	No.		20	59260
		Medium :	0 % =	0	No.		15	0
		Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population							103660
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	1643	No.		50	82150
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			2315	No.		5	11575
	Boarding Schools -> Pupils =			1072	No.		50	53600
HEALTH	Health Centres\Dispensaries =			0	No.		5000	0
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			0	No.		20	0
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.		25	0
BARS			=	4	No.		500	2000
SHOPS			=	13	No.		100	1300
INDUSTRIES			=	1	ha.		20000	20000
			TOTAL DEMAND (l/day)					274285

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Iriga

LOCATION : Muthambi
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9971000 mN Long. = 346000 mE

TYPE = 1

1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 10 (km²)			
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	: 1979 (census)		= 2785	No.
	1988 (estimated)		= 3998	No.
LIVESTOCK	: Grade cow		= 2056	No.
	Indigenous cow		= 0	No.
	Sheep/goats		= 2554	No.
	Donkey		= 0	No.
	Camel		= 0	No.
SCHOOLS	0 Day Schools with WC ->		0	Pupils
	3 Day Schools no WC ->		1058	Pupils
	1 Boarding Schools ->		156	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS	0 Regional Hospitals ->		0	Beds
	0 District Hospitals ->		0	Beds
	0 Other Hospitals ->		0	Beds
	Outpatients/day =		160	No.
HOTELS	0 High Class Hotels ->		0	Beds
	0 Medium Class Hotels ->		0	Beds
	0 Low Class Hotels ->		0	Beds
ADMINISTRATION OFFICES	: Staff =		0	No.
BARS	: =		1	No.
SHOPS	: =		80	No.
INDUSTRIES	->		1	ha.

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Iriga DIVISION : Nithi
LOCATION : Muthambi DISTRICT : Meru

POPULATION : 3998 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	799	No.	60	47940
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	3198	No.	20	63960
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						111900
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2226	No.	50	111300
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1058	No.	5	5290
	Boarding Schools -> Pupils =			156	No.	50	7800
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			160	No.	20	3200
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES	Staff =			0	No.	25	0
BARS	=			1	No.	500	500
SHOPS	=			80	No.	100	8000
INDUSTRIES	=			1	ha.	20000	20000
TOTAL DEMAND (l/day)							272990

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kadungu

LOCATION : Muthambi
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9969000 mN Long. = 366000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	24 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	10 % population
		Medium Potential	=	60 % population
		Low Potential	=	30 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	2735 No.
		1988 (estimated)	=	3927 No.
LIVESTOCK	:	Grade cow	=	1315 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	1848 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	3	Day Schools no WC ->		876 Pupils
	2	Boarding Schools ->		437 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		146 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:		=	0 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kadungu DIVISION : Nithi
LOCATION : Muthambi DISTRICT : Meru

POPULATION : 3927 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 10 % population
Medium Potential = 60 % population
Low Potential = 30 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 10 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	2 % =	78	No.		60	4680
		Medium :	6 % =	235	No.		50	11750
		Low :	2 % =	78	No.		40	3120
	with NC,	High :	8 % =	314	No.		20	6280
		Medium :	54 % =	2120	No.		15	31800
		Low :	28 % =	1099	No.		10	10990
	Total Demand for RURAL population							68620
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	1438	No.		50	71900
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			876	No.		5	4380
	Boarding Schools -> Pupils =			437	No.		50	21850
HEALTH	Health Centres\Dispensaries =			1	No.		5000	5000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			146	No.		20	2920
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.		25	0
BARS			=	0	No.		500	0
SHOPS			=	0	No.		100	0
TOTAL DEMAND (l/day)								174670

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Karimba

LOCATION : Muthambi
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9967000 mN Long. = 354000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	18 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	50 % population
		Medium Potential	=	50 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	4984 No.
		1988 (estimated)	=	7155 No.
LIVESTOCK	:	Grade cow	=	1667 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	2047 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		6 Day Schools no WC ->		2035 Pupils
		1 Boarding Schools ->		186 Pupils
HEALTH CENTRES/DISPENSARIES			=	2 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		469 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:	=		13 No.
SHOPS	:	=		66 No.
INDUSTRIES		->		1 ha.

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Karimba DIVISION : Nithi
LOCATION : Muthambi DISTRICT : Meru

POPULATION : 7155 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 50 % population
Medium Potential = 50 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 15 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	10 % =	715	No.	60	42900
		Medium :	5 % =	357	No.	50	17850
		Low :	0 % =	0	No.	40	0
	with NC,	High :	40 % =	2862	No.	20	57240
		Medium :	45 % =	3219	No.	15	48285
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						166275
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1803	No.	50	90150
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2035	No.	5	10175
	Boarding Schools -> Pupils =			186	No.	50	9300
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			469	No.	20	9380
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	13	No.	500	6500
SHOPS			=	66	No.	100	6600
INDUSTRIES			=	1	ha.	20000	20000
			TOTAL DEMAND (l/day)				328380

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kabuboni

LOCATION : Mwonge
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9959000 mN Long. = 350000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	8 (km²)		
CLASSIFICATION	Rural Area	: High Potential	= 100 %	population
		Medium Potential	= 0 %	population
		Low Potential	= 0 %	population
	Urban Area	: High Class Housing	= 0 %	population
		Medium Class Housing	= 0 %	population
		Low Class Housing	= 0 %	population
POPULATION		: 1979 (census)	= 4096	No.
		1988 (estimated)	= 5881	No.
LIVESTOCK		: Grade cow	= 1342	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 1246	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		7 Day Schools no WC ->	1698	Pupils
		2 Boarding Schools ->	302	Pupils
HEALTH CENTRES/DISPENSARIES		=	2	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	138	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES		: Staff =	0	No.
BARS		: =	5	No.
SHOPS		: =	28	No.
INDUSTRIES		->	1	ha.

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kabuboni DIVISION : Nithi
LOCATION : Mwonge DISTRICT : Meru

POPULATION : 5881 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1176	No.	60	70560
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	4704	No.	20	94080
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						164640
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1425	No.	50	71250
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1698	No.	5	8490
	Boarding Schools -> Pupils =			302	No.	50	15100
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			138	No.	20	2760
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	5	No.	500	2500
SHOPS			=	28	No.	100	2800
INDUSTRIES			=	1	ha.	20000	20000
	TOTAL DEMAND (l/day)						297540

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mwonge

LOCATION : Mwonge
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9961000 mN Long. = 349000 mE

TYPE = 1

1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	5 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 3651	No.
		1988 (estimated)	= 5242	No.
LIVESTOCK	:	Grade cow	= 187	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 154	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		4 Day Schools no WC ->	1529	Pupils
		1 Boarding Schools ->	265	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	5	No.
SHOPS	:	=	20	No.
INDUSTRIES		->	1	ha.

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mwonge DIVISION : Nithi
LOCATION : Mwonge DISTRICT : Meru

POPULATION : 5242 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1048	No.	60	62880
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	4193	No.	20	83860
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						146740
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	197	No.	50	9850
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1529	No.	5	7645
	Boarding Schools -> Pupils =			265	No.	50	13250
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	5	No.	500	2500
SHOPS			=	20	No.	100	2000
INDUSTRIES			=	1	ha.	20000	20000
			TOTAL DEMAND (l/day)				201985

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Rubate

LOCATION : Mwonge
DIVISION : Nithi

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9957000 mN Long. = 353000 mE

TYPE = 1

1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	9 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	60 % population
		Medium Potential	=	40 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	3425 No.
		1988 (estimated)	=	4917 No.
LIVESTOCK	:	Grade cow	=	530 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	775 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		4 Day Schools no WC ->		1092 Pupils
		1 Boarding Schools ->		88 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	0 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Rubate DIVISION : Nithi
LOCATION : Mwonge DISTRICT : Meru

POPULATION : 4917 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 60 % population
Medium Potential = 40 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 16 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	12 % =	590	No.	60	35400
		Medium :	4 % =	196	No.	50	9800
		Low :	0 % =	0	No.	40	0
	with NC,	High :	48 % =	2360	No.	20	47200
		Medium :	36 % =	1770	No.	15	26550
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						118950
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	581	No.	50	29050
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1092	No.	5	5460
	Boarding Schools -> Pupils =			88	No.	50	4400
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
TOTAL DEMAND (l/day)							157860

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Giaki

LOCATION : Giaki
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 3500 mN Long. = 362500 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	99 (km²)	
CLASSIFICATION	Rural Area : High Potential	=	70 % population
	Medium Potential	=	30 % population
	Low Potential	=	0 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	5478 No.
	1988 (estimated)	=	7912 No.
LIVESTOCK	: Grade cow	=	4185 No.
	Indigenous cow	=	0 No.
	Sheep/goats	=	5635 No.
	Donkey	=	0 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	8 Day Schools no WC ->		2329 Pupils
	0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES		=	1 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		68 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff =		5 No.
BARS	:	=	11 No.
SHOPS	:	=	55 No.
INDUSTRIES		->	1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Giaki DIVISION : North Imenti
LOCATION : Giaki DISTRICT : Meru

POPULATION : 7912 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 70 % population
Medium Potential = 30 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 17 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	14 % =	1107	No.	60	66420
		Medium :	3 % =	237	No.	50	11850
		Low :	0 % =	0	No.	40	0
	with NC,	High :	56 % =	4430	No.	20	88600
		Medium :	27 % =	2136	No.	15	32040
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						198910
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	4560	No.	50	228000
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2329	No.	5	11645
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			68	No.	20	1360
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	5	No.	25	125
BARS			=	11	No.	500	5500
SHOPS			=	55	No.	100	5500
INDUSTRIES			=	1	ha.	20000	20000
			TOTAL DEMAND (l/day)				476040

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kiburine

LOCATION : Giaki
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 3600 mN Long. = 360000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 47 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	10 % population
		Low Potential	=	90 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	5058 No.
		1988 (estimated)	=	7306 No.
LIVESTOCK	:	Grade cow	=	3030 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	2792 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		4 Day Schools no WC ->		1621 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		6 No.
BARS	:	=		5 No.
SHOPS	:	=		19 No.
INDUSTRIES		->		1 ha.

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kiburine DIVISION : North Imenti
LOCATION : Giaki DISTRICT : Meru

POPULATION : 7306 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 10 % population
Low Potential = 90 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 6 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.		60	0
		Medium :	1 % =	73	No.		50	3650
		Low :	5 % =	365	No.		40	14600
	with NC,	High :	0 % =	0	No.		20	0
		Medium :	9 % =	657	No.		15	9855
		Low :	85 % =	6210	No.		10	62100
	Total Demand for RURAL population							90205
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	3216	No.		50	160800
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			1621	No.		5	8105
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			0	No.		5000	0
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			0	No.		20	0
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	6	No.		25	150
BARS			=	5	No.		500	2500
SHOPS			=	19	No.		100	1900
INDUSTRIES			=	1	ha.		20000	20000
			TOTAL DEMAND (l/day)					283660

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kiirua

LOCATION : Kiirua
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 14000 mN Long. = 340000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	69 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	40 % population
		Low Potential	=	60 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	5600 No.
		1988 (estimated)	=	8089 No.
LIVESTOCK	:	Grade cow	=	1051 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	4512 No.
		Donkey	=	500 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		7 Day Schools no WC ->		1711 Pupils
		2 Boarding Schools ->		407 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		1 Other Hospitals ->		41 Beds
		Outpatients/day =		185 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:	=		20 No.
SHOPS	:	=		115 No.
INDUSTRIES		->		1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kiirua DIVISION : North Imenti
LOCATION : Kiirua DISTRICT : Meru

POPULATION : 8089 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 40 % population
Low Potential = 60 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 7 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	4 % =	323	No.	50	16150
		Low :	3 % =	242	No.	40	9680
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	36 % =	2912	No.	15	43680
		Low :	57 % =	4610	No.	10	46100
	Total Demand for RURAL population							115610
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	1551	No.	50	77550
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1711	No.	5	8555
	Boarding Schools -> Pupils =			407	No.	50	20350
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			41	No.	100	4100
	All Hospitals Outpatients =			185	No.	20	3700
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	20	No.	500	10000
SHOPS			=	115	No.	100	11500
INDUSTRIES			=	1	ha.	20000	20000
TOTAL DEMAND (l/day)								276365

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Naari

LOCATION : Kiirua
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 11000 mN Long. = 342000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	27 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 8926	No.
		1988 (estimated)	= 12893	No.
LIVESTOCK	:	Grade cow	= 3454	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 1327	No.
		Donkey	= 156	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		10 Day Schools no WC ->	2873	Pupils
		2 Boarding Schools ->	374	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	79	No.
HOTELS		1 High Class Hotels ->	50	Beds
		1 Medium Class Hotels ->	30	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	12	No.
SHOPS	:	=	50	No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Naari DIVISION : North Imenti
LOCATION : Kiirua DISTRICT : Meru

POPULATION : 12893 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	2578	No.	60	154680
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	10314	No.	20	206280
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						360960
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	3604	No.	50	180200
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2873	No.	5	14365
	Boarding Schools -> Pupils =			374	No.	50	18700
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			79	No.	20	1580
HOTELS	High Class Hotels -> Beds =			50	No.	600	30000
	Medium Class Hotels -> Beds =			30	No.	300	9000
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	12	No.	500	6000
SHOPS			=	50	No.	100	5000
TOTAL DEMAND (l/day)							630805

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Thege

LOCATION : Kiirua
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 5500 mN Long. = 343000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	5 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 754	No.
		1988 (estimated)	= 1089	No.
LIVESTOCK	:	Grade cow	= 150	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 50	No.
		Donkey	= 50	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	1	Day Schools no WC ->	150	Pupils
	0	Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	2	No.
SHOPS	:	=	1	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Thege DIVISION : North Imenti
LOCATION : Kiirua DISTRICT : Meru

POPULATION : 1089 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	217	No.	60	13020
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	871	No.	20	17420
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						30440
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	173	No.	50	8650
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			150	No.	5	750
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	2	No.	500	1000
SHOPS			=	1	No.	100	100
			TOTAL DEMAND (l/day)				40940

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Lower Igoki

LOCATION : Ntima
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 4000 mN Long. = 352000 mE

TYPE = 3
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	6 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	80 % population
		Medium Potential	=	0 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	2 % population
		Medium Class Housing	=	6 % population
		Low Class Housing	=	12 % population
POPULATION	:	1979 (census)	=	8899 No.
		1988 (estimated)	=	12679 No.
LIVESTOCK	:	Grade cow	=	850 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	945 No.
		Donkey	=	1 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		3 Day Schools no WC ->		1335 Pupils
		1 Boarding Schools ->		217 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	0 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Lower Igoki DIVISION : North Imenti
LOCATION : Ntima DISTRICT : Meru

POPULATION : 12679 Rural Pop. = 80 % Urban Pop. = 20 %

CLASSIFICATION :
High Potential = 80 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 2 % population
Medium Class Housing = 6 % population
Low Class Housing = 12 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 16 % Urban Area = 9 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	16 % =	2028	No.	60	121680
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	64 % =	8114	No.	20	162280
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						283960
URBAN POPULATION	with IC,	High :	2 % =	253	No.	250	63250
		Medium :	6 % =	760	No.	150	114000
		Low :	1 % =	126	No.	75	9450
	with NC,	Low :	11 % =	1394	No.	20	27880
	Total Demand for URBAN population						214580
LIVESTOCK			(L.U.) =	913	No.	50	45650
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1335	No.	5	6675
	Boarding Schools -> Pupils =			217	No.	50	10850
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
TOTAL DEMAND (l/day)							561715

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mpuri

LOCATION : Ntima
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 4000 mN Long. = 344000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	5 (km²)	
CLASSIFICATION	Rural Area :	High Potential =	100 % population
		Medium Potential =	0 % population
		Low Potential =	0 % population
	Urban Area :	High Class Housing =	0 % population
		Medium Class Housing =	0 % population
		Low Class Housing =	0 % population
POPULATION	:	1979 (census) =	0 No.
		1988 (estimated) =	0 No.
LIVESTOCK	:	Grade cow =	874 No.
		Indigenous cow =	0 No.
		Sheep/goats =	729 No.
		Donkey =	0 No.
		Camel =	0 No.
SCHOOLS		0 Day Schools with WC ->	0 Pupils
		4 Day Schools no WC ->	2123 Pupils
		1 Boarding Schools ->	143 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS		0 Regional Hospitals ->	0 Beds
		0 District Hospitals ->	0 Beds
		0 Other Hospitals ->	0 Beds
		Outpatients/day =	0 No.
HOTELS		0 High Class Hotels ->	0 Beds
		0 Medium Class Hotels ->	0 Beds
		0 Low Class Hotels ->	0 Beds
ADMINISTRATION OFFICES	:	Staff =	0 No.
BARS	:	=	0 No.
SHOPS	:	=	0 No.
INDUSTRIES	No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mpuri DIVISION : North Imenti
LOCATION : Ntima DISTRICT : Meru

POPULATION : 0 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	0	No.	60	0
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	0	No.	20	0
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						0
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	922	No.	50	46100
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2123	No.	5	10615
	Boarding Schools -> Pupils =			143	No.	50	7150
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
TOTAL DEMAND (l/day)							63865

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Ngonyi

LOCATION : Ntima
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 1500 mN Long. = 351500 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 10 (km²)		
CLASSIFICATION	Rural Area : High Potential	= 100	% population
	Medium Potential	= 0	% population
	Low Potential	= 0	% population
	Urban Area : High Class Housing	= 0	% population
	Medium Class Housing	= 0	% population
	Low Class Housing	= 0	% population
POPULATION	: 1979 (census)	= 0	No.
	1988 (estimated)	= 0	No.
LIVESTOCK	: Grade cow	= 633	No.
	Indigenous cow	= 0	No.
	Sheep/goats	= 674	No.
	Donkey	= 1	No.
	Camel	= 0	No.
SCHOOLS	0 Day Schools with WC ->	0	Pupils
	3 Day Schools no WC ->	1600	Pupils
	0 Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES	=	0	No.
HOSPITALS	0 Regional Hospitals ->	0	Beds
	0 District Hospitals ->	0	Beds
	0 Other Hospitals ->	0	Beds
	Outpatients/day =	0	No.
HOTELS	0 High Class Hotels ->	0	Beds
	0 Medium Class Hotels ->	0	Beds
	0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	: Staff =	0	No.
BARS	: =	0	No.
SHOPS	: =	0	No.
INDUSTRIES	No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Ngonyi DIVISION : North Imenti
LOCATION : Ntima DISTRICT : Meru

POPULATION : 0 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	0	No.	60	0
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	0	No.	20	0
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						0
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	678	No.	50	33900
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1600	No.	5	8000
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
	TOTAL DEMAND (l/day)						41900

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Ntakira

LOCATION : Ntima
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 3000 mN Long. = 349000 mE

TYPE = 3
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	10 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	77 % population
		Medium Potential	=	0 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	2 % population
		Medium Class Housing	=	7 % population
		Low Class Housing	=	14 % population
POPULATION	:	1979 (census)	=	12943 No.
		1988 (estimated)	=	18406 No.
LIVESTOCK	:	Grade cow	=	1454 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	612 No.
		Donkey	=	4 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	5	Day Schools no WC ->		2221 Pupils
	1	Boarding Schools ->		336 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day	=	0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:		Staff =	0 No.
BARS	:		=	0 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Ntakira DIVISION : North Imenti
LOCATION : Ntima DISTRICT : Meru

POPULATION : 18406 Rural Pop. = 77 % Urban Pop. = 23 %

CLASSIFICATION : High Potential = 77 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 2 % population
Medium Class Housing = 7 % population
Low Class Housing = 14 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 15 % Urban Area = 10 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	15 % =	2760	No.	60	165600
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	62 % =	11411	No.	20	228220
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						393820
URBAN POPULATION	with IC,	High :	2 % =	368	No.	250	92000
		Medium :	7 % =	1288	No.	150	193200
		Low :	1 % =	184	No.	75	13800
	with NC,	Low :	13 % =	2392	No.	20	47840
	Total Demand for URBAN population						346840
LIVESTOCK			(L.U.) =	1496	No.	50	74800
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2221	No.	5	11105
	Boarding Schools -> Pupils =			336	No.	50	16800
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
TOTAL DEMAND (l/day)							843365

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Nthimbiri

LOCATION : Ntima
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 3000 mN Long. = 347000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	9 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 6411	No.
		1988 (estimated)	= 9260	No.
LIVESTOCK	:	Grade cow	= 1554	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 763	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		3 Day Schools no WC ->	1280	Pupils
		0 Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	0	No.
SHOPS	:	=	0	No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Nthimbiri DIVISION : North Imenti
LOCATION : Ntima DISTRICT : Meru

POPULATION : 9260 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1852	No.	60	111120
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	7408	No.	20	148160
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						259280
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1604	No.	50	80200
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1280	No.	5	6400
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
			TOTAL DEMAND (l/day)				345880

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Town/Gakoromone

LOCATION : Ntima
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 5000 mN Long. = 351500 mE

TYPE = 4
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	5 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	0 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	10 % population
		Medium Class Housing	=	30 % population
		Low Class Housing	=	60 % population
POPULATION	:	1979 (census)	=	4750 No.
		1988 (estimated)	=	6418 No.
LIVESTOCK	:	Grade cow	=	1076 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	703 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		1 Day Schools no WC ->		655 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	2 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		1 District Hospitals ->		311 Beds
		2 Other Hospitals ->		57 Beds
		Outpatients/day =		1254 No.
HOTELS		3 High Class Hotels ->		120 Beds
		4 Medium Class Hotels ->		100 Beds
		20 Low Class Hotels ->		400 Beds
ADMINISTRATION OFFICES	:	Staff =		1000 No.
BARS	:	=		25 No.
SHOPS	:	=		354 No.
INDUSTRIES		->		450 ha.

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Town/Gakoromone DIVISION : North Imenti
LOCATION : Ntima DISTRICT : Meru

POPULATION : 6418 Rural Pop. = 0 % Urban Pop. = 100 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 10 % population
Medium Class Housing = 30 % population
Low Class Housing = 60 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 0 % Urban Area = 46 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						0
URBAN POPULATION	with IC,	High :	10 % =	641	No.	250	160250
		Medium :	30 % =	1925	No.	150	288750
		Low :	6 % =	385	No.	75	28875
	with NC,	Low :	54 % =	3465	No.	20	69300
	Total Demand for URBAN population						547175
LIVESTOCK			(L.U.) =	1122	No.	50	56100
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			655	No.	5	3275
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			311	No.	200	62200
	Other Hospitals -> Beds =			57	No.	100	5700
	All Hospitals Outpatients =			1254	No.	20	25080
HOTELS	High Class Hotels -> Beds =			120	No.	600	72000
	Medium Class Hotels -> Beds =			100	No.	300	30000
	Low Class Hotels -> Beds =			400	No.	50	20000
ADMINISTRATIVE OFFICES			Staff =	1000	No.	25	25000
BARS			=	25	No.	500	12500
SHOPS			=	354	No.	100	35400
INDUSTRIES			=	450	ha.	20000	9000000
	TOTAL DEMAND (l/day)						9904430

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Upper Igoki

LOCATION : Ntima
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 6000 mN Long. = 350000 mE

TYPE = 4
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	11 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	0 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	10 % population
		Medium Class Housing	=	30 % population
		Low Class Housing	=	60 % population
POPULATION	:	1979 (census)	=	8800 No.
		1988 (estimated)	=	11890 No.
LIVESTOCK	:	Grade cow	=	716 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	703 No.
		Donkey	=	1 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		9 Day Schools no WC ->		3908 Pupils
		1 Boarding Schools ->		61 Pupils
HEALTH CENTRES/DISPENSARIES			=	2 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		121 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:		=	0 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Upper Igoki DIVISION : North Imenti
LOCATION : Ntima DISTRICT : Meru

POPULATION : 11890 Rural Pop. = 0 % Urban Pop. = 100 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 10 % population
Medium Class Housing = 30 % population
Low Class Housing = 60 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 0 % Urban Area = 46 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.		60	0
		Medium :	0 % =	0	No.		50	0
		Low :	0 % =	0	No.		40	0
	with NC,	High :	0 % =	0	No.		20	0
		Medium :	0 % =	0	No.		15	0
		Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population							0
URBAN POPULATION	with IC,	High :	10 % =	1189	No.		250	297250
		Medium :	30 % =	3567	No.		150	535050
		Low :	6 % =	713	No.		75	53475
	with NC,	Low :	54 % =	6420	No.		20	128400
	Total Demand for URBAN population							1014175
LIVESTOCK			(L.U.) =	763	No.		50	38150
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			3908	No.		5	19540
	Boarding Schools -> Pupils =			61	No.		50	3050
HEALTH	Health Centres\Dispensaries =			2	No.		5000	10000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			121	No.		20	2420
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.		25	0
BARS			=	0	No.		500	0
SHOPS			=	0	No.		100	0
TOTAL DEMAND (l/day)								1087335

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Chugu

LOCATION : Nyaki
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 9000 mN Long. = 352000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	4 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 8164	No.
		1988 (estimated)	= 11792	No.
LIVESTOCK	:	Grade cow	= 333	No.
		Indigenous cow	= 83	No.
		Sheep/goats	= 420	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		5 Day Schools no WC ->	2772	Pupils
		3 Boarding Schools ->	298	Pupils
HEALTH CENTRES/DISPENSARIES		=	0	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	0	No.
SHOPS	:	=	0	No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Chugu DIVISION : North Imenti
LOCATION : Nyaki DISTRICT : Meru

POPULATION : 11792 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	2358	No.	60	141480
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	9433	No.	20	188660
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						330140
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	388	No.	50	19400
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2772	No.	5	13860
	Boarding Schools -> Pupils =			298	No.	50	14900
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
	TOTAL DEMAND (l/day)						378300

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mulathankari

LOCATION : Nyaki
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 8000 mN Long. = 351000 mE

TYPE = 3
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	5 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	0 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	10 % population
		Medium Class Housing	=	30 % population
		Low Class Housing	=	60 % population
POPULATION	:	1979 (census)	=	2104 No.
		1988 (estimated)	=	2843 No.
LIVESTOCK	:	Grade cow	=	614 No.
		Indigenous cow	=	153 No.
		Sheep/goats	=	330 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		3 Day Schools no WC ->		981 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day	=	0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	10 No.
BARS	:		=	3 No.
SHOPS	:		=	12 No.
INDUSTRIES	No			

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mulathankari DIVISION : North Imenti
LOCATION : Nyaki DISTRICT : Meru

POPULATION : 2843 Rural Pop. = 0 % Urban Pop. = 100 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 10 % population
Medium Class Housing = 30 % population
Low Class Housing = 60 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 0 % Urban Area = 46 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						0
URBAN POPULATION	with IC,	High :	10 % =	284	No.	250	71000
		Medium :	30 % =	852	No.	150	127800
		Low :	6 % =	170	No.	75	12750
	with NC,	Low :	54 % =	1535	No.	20	30700
	Total Demand for URBAN population						242250
LIVESTOCK			(L.U.) =	687	No.	50	34350
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			981	No.	5	4905
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	10	No.	25	250
BARS			=	3	No.	500	1500
SHOPS			=	12	No.	100	1200
	TOTAL DEMAND (l/day)						284455

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Munithu

LOCATION : Nyaki
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 11000 mN Long. = 354000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 34 (km²)		
CLASSIFICATION	Rural Area : High Potential	= 100 %	population
	Medium Potential	= 0 %	population
	Low Potential	= 0 %	population
	Urban Area : High Class Housing	= 0 %	population
	Medium Class Housing	= 0 %	population
	Low Class Housing	= 0 %	population
POPULATION	: 1979 (census)	= 6150	No.
	1988 (estimated)	= 8883	No.
LIVESTOCK	: Grade cow	= 3547	No.
	Indigenous cow	= 549	No.
	Sheep/goats	= 4566	No.
	Donkey	= 0	No.
	Camel	= 0	No.
SCHOOLS	0 Day Schools with WC ->	0	Pupils
	4 Day Schools no WC ->	2650	Pupils
	0 Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES		= 1	No.
HOSPITALS	0 Regional Hospitals ->	0	Beds
	0 District Hospitals ->	0	Beds
	0 Other Hospitals ->	0	Beds
	Outpatients/day =	170	No.
HOTELS	0 High Class Hotels ->	0	Beds
	0 Medium Class Hotels ->	0	Beds
	0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	: Staff =	3	No.
BARS	: =	9	No.
SHOPS	: =	40	No.
INDUSTRIES	->	1	ha.

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Munithu DIVISION : North Imenti
LOCATION : Nyaki DISTRICT : Meru

POPULATION : 8883 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1776	No.	60	106560
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	7106	No.	20	142120
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						248680
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	4034	No.	50	201700
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2650	No.	5	13250
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			170	No.	20	3400
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	3	No.	25	75
BARS			=	9	No.	500	4500
SHOPS			=	40	No.	100	4000
INDUSTRIES			=	1	ha.	20000	20000
	TOTAL DEMAND (l/day)						500605

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Nkabune

LOCATION : Nyaki
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 3500 mN Long. = 354500 mE

TYPE = 1

1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	6 (km²)	
CLASSIFICATION	Rural Area : High Potential	=	100 % population
	Medium Potential	=	0 % population
	Low Potential	=	0 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	5712 No.
	1988 (estimated)	=	8250 No.
LIVESTOCK	: Grade cow	=	932 No.
	Indigenous cow	=	233 No.
	Sheep/goats	=	1175 No.
	Donkey	=	0 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	0 Day Schools no WC ->		0 Pupils
	0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES		=	1 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		13 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff	=	0 No.
BARS	:	=	0 No.
SHOPS	:	=	0 No.
INDUSTRIES	: No		

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Nkabune DIVISION : North Imenti
LOCATION : Nyaki DISTRICT : Meru

POPULATION : 8250 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION					RATE	DEMAND
RURAL POPULATION	with IC, High :	20 % =	1650	No.	60	99000
	Medium :	0 % =	0	No.	50	0
	Low :	0 % =	0	No.	40	0
	with NC, High :	80 % =	6600	No.	20	132000
	Medium :	0 % =	0	No.	15	0
	Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population					231000
URBAN POPULATION	with IC, High :	0 % =	0	No.	250	0
	Medium :	0 % =	0	No.	150	0
	Low :	0 % =	0	No.	75	0
	with NC, Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population					0
LIVESTOCK	(L.U.) =		1088	No.	50	54400
SCHOOLS	Day Schools with WC -> Pupils =		0	No.	25	0
	Day Schools no WC -> Pupils =		0	No.	5	0
	Boarding Schools -> Pupils =		0	No.	50	0
HEALTH	Health Centres\Dispensaries =		1	No.	5000	5000
	Regional Hospitals -> Beds =		0	No.	400	0
	District Hospitals -> Beds =		0	No.	200	0
	Other Hospitals -> Beds =		0	No.	100	0
	All Hospitals Outpatients =		13	No.	20	260
HOTELS	High Class Hotels -> Beds =		0	No.	600	0
	Medium Class Hotels -> Beds =		0	No.	300	0
	Low Class Hotels -> Beds =		0	No.	50	0
ADMINISTRATIVE OFFICES	Staff =		0	No.	25	0
BARS	=		0	No.	500	0
SHOPS	=		0	No.	100	0
TOTAL DEMAND (l/day)						290660

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Thuura

LOCATION : Nyaki
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 6000 mN Long. = 356000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA Total = 33 (km²)

CLASSIFICATION	Rural Area :	High Potential	= 100 % population
		Medium Potential	= 0 % population
		Low Potential	= 0 % population
	Urban Area :	High Class Housing	= 0 % population
		Medium Class Housing	= 0 % population
		Low Class Housing	= 0 % population
POPULATION	:	1979 (census)	= 6506 No.
		1988 (estimated)	= 9397 No.
LIVESTOCK	:	Grade cow	= 2196 No.
		Indigenous cow	= 549 No.
		Sheep/goats	= 2770 No.
		Donkey	= 0 No.
		Camel	= 0 No.
SCHOOLS		0 Day Schools with WC ->	0 Pupils
		4 Day Schools no WC ->	2446 Pupils
		0 Boarding Schools ->	0 Pupils
HEALTH CENTRES/DISPENSARIES			= 0 No.
HOSPITALS		0 Regional Hospitals ->	0 Beds
		0 District Hospitals ->	0 Beds
		0 Other Hospitals ->	0 Beds
		Outpatients/day =	0 No.
HOTELS		0 High Class Hotels ->	0 Beds
		0 Medium Class Hotels ->	0 Beds
		0 Low Class Hotels ->	0 Beds
ADMINISTRATION OFFICES	:	Staff =	5 No.
BARS	:	=	10 No.
SHOPS	:	=	49 No.
INDUSTRIES	: No		

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Thuura DIVISION : North Imenti
LOCATION : Nyaki DISTRICT : Meru

POPULATION : 9397 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1879	No.	60	112740
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	7517	No.	20	150340
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						263080
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2563	No.	50	128150
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2446	No.	5	12230
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	5	No.	25	125
BARS			=	10	No.	500	5000
SHOPS			=	49	No.	100	4900
TOTAL DEMAND (l/day)							413485

Appendix 3

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Ruiri

LOCATION : Ruiri
DIVISION : North Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 19000 mN Long. = 348000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 178 (km²)		
CLASSIFICATION	Rural Area : High Potential	=	0 % population
	Medium Potential	=	50 % population
	Low Potential	=	50 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	9531 No.
	1988 (estimated)	=	13766 No.
LIVESTOCK	: Grade cow	=	6957 No.
	Indigenous cow	=	0 No.
	Sheep/goats	=	2699 No.
	Donkey	=	248 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	16 Day Schools no WC ->		4177 Pupils
	1 Boarding Schools ->		152 Pupils
HEALTH CENTRES/DISPENSARIES		=	2 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		87 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff =		100 No.
BARS	: =		14 No.
SHOPS	: =		110 No.
INDUSTRIES	->		1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Ruiri DIVISION : North Imenti
LOCATION : Ruiri DISTRICT : Meru

POPULATION : 13766 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 50 % population
Low Potential = 50 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 8 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC, High :	0 % =	0	No.		60	0
	Medium :	5 % =	688	No.		50	34400
	Low :	3 % =	412	No.		40	16480
	with NC, High :	0 % =	0	No.		20	0
	Medium :	45 % =	6194	No.		15	92910
	Low :	47 % =	6470	No.		10	64700
	Total Demand for RURAL population						208490
URBAN POPULATION	with IC, High :	0 % =	0	No.		250	0
	Medium :	0 % =	0	No.		150	0
	Low :	0 % =	0	No.		75	0
	with NC, Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population						0
LIVESTOCK	(L.U.) =		7236	No.		50	361800
SCHOOLS	Day Schools with WC -> Pupils =		0	No.		25	0
	Day Schools no WC -> Pupils =		4177	No.		5	20885
	Boarding Schools -> Pupils =		152	No.		50	7600
HEALTH	Health Centres\Dispensaries =		2	No.		5000	10000
	Regional Hospitals -> Beds =		0	No.		400	0
	District Hospitals -> Beds =		0	No.		200	0
	Other Hospitals -> Beds =		0	No.		100	0
	All Hospitals Outpatients =		87	No.		20	1740
HOTELS	High Class Hotels -> Beds =		0	No.		600	0
	Medium Class Hotels -> Beds =		0	No.		300	0
	Low Class Hotels -> Beds =		0	No.		50	0
ADMINISTRATIVE OFFICES	Staff =		100	No.		25	2500
BARS	=		14	No.		500	7000
SHOPS	=		110	No.		100	11000
INDUSTRIES	=		1	ha.		20000	20000
	TOTAL DEMAND (l/day)						651015

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Antubetwe-Kiongo

LOCATION : Antubetwe-Kiongo
DIVISION : Ntonyiri

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 37500 mN Long. = 387000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 110 (km²)			
CLASSIFICATION	Rural Area :	High Potential	= 10	% population
		Medium Potential	= 60	% population
		Low Potential	= 30	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	: 1979 (census)		= 10146	No.
	1988 (estimated)		= 14655	No.
LIVESTOCK	: Grade cow		= 2228	No.
	Indigenous cow		= 8911	No.
	Sheep/goats		= 12743	No.
	Donkey		= 66	No.
	Camel		= 0	No.
SCHOOLS	0 Day Schools with WC ->		0	Pupils
	9 Day Schools no WC ->		2366	Pupils
	0 Boarding Schools ->		0	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS	0 Regional Hospitals ->		0	Beds
	0 District Hospitals ->		0	Beds
	0 Other Hospitals ->		0	Beds
	Outpatients/day =		15	No.
HOTELS	0 High Class Hotels ->		0	Beds
	0 Medium Class Hotels ->		0	Beds
	0 Low Class Hotels ->		0	Beds
ADMINISTRATION OFFICES	: Staff =		3	No.
BARS	: =		51	No.
SHOPS	: =		81	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Antubetwe-Kiongo DIVISION : Ntonyiri
LOCATION : Antubetwe-Kiongo DISTRICT : Meru

POPULATION : 14655 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 10 % population
Medium Potential = 60 % population
Low Potential = 30 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 10 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	2 % =	293	No.		60	17580
		Medium :	6 % =	879	No.		50	43950
		Low :	2 % =	293	No.		40	11720
	with NC,	High :	8 % =	1172	No.		20	23440
		Medium :	54 % =	7913	No.		15	118695
		Low :	28 % =	4103	No.		10	41030
	Total Demand for RURAL population							256415
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	6074	No.		50	303700
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			2366	No.		5	11830
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			1	No.		5000	5000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			15	No.		20	300
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	3	No.		25	75
BARS			=	51	No.		500	25500
SHOPS			=	81	No.		100	8100
TOTAL DEMAND (l/day)								610920

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Athiru Ruujine

LOCATION : Athiru-Ruujine
DIVISION : Ntonyiri

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 34500 mN Long. = 385000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 109 (km²)		
CLASSIFICATION	Rural Area : High Potential	=	20 % population
	Medium Potential	=	40 % population
	Low Potential	=	40 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	12634 No.
	1988 (estimated)	=	18248 No.
LIVESTOCK	: Grade cow	=	1154 No.
	Indigenous cow	=	4616 No.
	Sheep/goats	=	10318 No.
	Donkey	=	315 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	10 Day Schools no WC ->		2629 Pupils
	0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		0 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff	=	17 No.
BARS	:	=	34 No.
SHOPS	:	=	40 No.
INDUSTRIES	No		

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Athiru Ruujine DIVISION : Ntonyiri
LOCATION : Athiru-Ruujine DISTRICT : Meru

POPULATION : 18248 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 20 % population
Medium Potential = 40 % population
Low Potential = 40 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 10 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC, High :	4 % =	729	No.		60	43740
	Medium :	4 % =	729	No.		50	36450
	Low :	2 % =	364	No.		40	14560
	with NC, High :	16 % =	2919	No.		20	58380
	Medium :	36 % =	6569	No.		15	98535
	Low :	38 % =	6934	No.		10	69340
	Total Demand for RURAL population						321005
URBAN POPULATION	with IC, High :	0 % =	0	No.		250	0
	Medium :	0 % =	0	No.		150	0
	Low :	0 % =	0	No.		75	0
	with NC, Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population						0
LIVESTOCK	(L.U.) =		3506	No.		50	175300
SCHOOLS	Day Schools with WC -> Pupils =		0	No.		25	0
	Day Schools no WC -> Pupils =		2629	No.		5	13145
	Boarding Schools -> Pupils =		0	No.		50	0
HEALTH	Health Centres\Dispensaries =		0	No.		5000	0
	Regional Hospitals -> Beds =		0	No.		400	0
	District Hospitals -> Beds =		0	No.		200	0
	Other Hospitals -> Beds =		0	No.		100	0
	All Hospitals Outpatients =		0	No.		20	0
HOTELS	High Class Hotels -> Beds =		0	No.		600	0
	Medium Class Hotels -> Beds =		0	No.		300	0
	Low Class Hotels -> Beds =		0	No.		50	0
ADMINISTRATIVE OFFICES	Staff =		17	No.		25	425
BARS	=		34	No.		500	17000
SHOPS	=		40	No.		100	4000
	TOTAL DEMAND (l/day)						530875

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Akirangondu

LOCATION : Ithima
DIVISION : Ntonyiri

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 36000 mN Long. = 380000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 214 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	30 % population
		Medium Potential	=	20 % population
		Low Potential	=	50 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	: 1979 (census)		=	12467 No.
	1988 (estimated)		=	18007 No.
LIVESTOCK	: Grade cow		=	2822 No.
	Indigenous cow		=	10917 No.
	Sheep/goats		=	9325 No.
	Donkey		=	103 No.
	Camel		=	0 No.
SCHOOLS	0 Day Schools with WC ->			0 Pupils
	8 Day Schools no WC ->			3358 Pupils
	0 Boarding Schools ->			0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0 Regional Hospitals ->			0 Beds
	0 District Hospitals ->			0 Beds
	0 Other Hospitals ->			0 Beds
	Outpatients/day =			0 No.
HOTELS	0 High Class Hotels ->			0 Beds
	0 Medium Class Hotels ->			0 Beds
	0 Low Class Hotels ->			0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	0 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Akirangondu DIVISION : Ntonyiri
LOCATION : Ithima DISTRICT : Meru

POPULATION : 18007 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 30 % population
Medium Potential = 20 % population
Low Potential = 50 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 11 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	6 % =	1080	No.	60	64800
		Medium :	2 % =	360	No.	50	18000
		Low :	3 % =	540	No.	40	21600
	with NC,	High :	24 % =	4321	No.	20	86420
		Medium :	18 % =	3241	No.	15	48615
		Low :	47 % =	8463	No.	10	84630
	Total Demand for RURAL population						324065
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	7123	No.	50	356150
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			3358	No.	5	16790
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
TOTAL DEMAND (l/day)							697005

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Antuambui

LOCATION : Ithima
DIVISION : Ntonyiri

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 41000 mN Long. = 381000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 79 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	30 % population
		Medium Potential	=	20 % population
		Low Potential	=	50 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	: 1979 (census)		=	11791 No.
	1988 (estimated)		=	17031 No.
LIVESTOCK	: Grade cow		=	3420 No.
	Indigenous cow		=	13680 No.
	Sheep/goats		=	7954 No.
	Donkey		=	200 No.
	Camel		=	0 No.
SCHOOLS	0 Day Schools with WC ->			0 Pupils
	8 Day Schools no WC ->			3358 Pupils
	0 Boarding Schools ->			0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS	0 Regional Hospitals ->			0 Beds
	0 District Hospitals ->			0 Beds
	0 Other Hospitals ->			0 Beds
	Outpatients/day =			110 No.
HOTELS	0 High Class Hotels ->			0 Beds
	0 Medium Class Hotels ->			0 Beds
	0 Low Class Hotels ->			0 Beds
ADMINISTRATION OFFICES	:	Staff	=	103 No.
BARS	:		=	99 No.
SHOPS	:		=	525 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Antuambui DIVISION : Ntonyiri
LOCATION : Ithima DISTRICT : Meru

POPULATION : 17031 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 30 % population
Medium Potential = 20 % population
Low Potential = 50 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 11 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	6 % =	1021	No.	60	61260
		Medium :	2 % =	340	No.	50	17000
		Low :	3 % =	510	No.	40	20400
	with NC,	High :	24 % =	4087	No.	20	81740
		Medium :	18 % =	3065	No.	15	45975
		Low :	47 % =	8004	No.	10	80040
	Total Demand for RURAL population						306415
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	8590	No.	50	429500
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			3358	No.	5	16790
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			110	No.	20	2200
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	103	No.	25	2575
BARS			=	99	No.	500	49500
SHOPS			=	525	No.	100	52500
TOTAL DEMAND (l/day)							864480

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Ntunene

LOCATION : Ithima
DIVISION : Ntonyiri

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 39000 mN Long. = 379000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	207 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	30 % population
		Medium Potential	=	20 % population
		Low Potential	=	50 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	6650 No.
		1988 (estimated)	=	9605 No.
LIVESTOCK	:	Grade cow	=	2640 No.
		Indigenous cow	=	10560 No.
		Sheep/goats	=	9020 No.
		Donkey	=	100 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		4 Day Schools no WC ->		1679 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		250 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		35 No.
BARS	:	=		29 No.
SHOPS	:	=		85 No.
INDUSTRIES		->		1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Ntunene DIVISION : Ntonyiri
LOCATION : Ithima DISTRICT : Meru

POPULATION : 9605 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 30 % population
Medium Potential = 20 % population
Low Potential = 50 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 11 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	6 % =	576	No.		60	34560
		Medium :	2 % =	192	No.		50	9600
		Low :	3 % =	288	No.		40	11520
	with NC,	High :	24 % =	2305	No.		20	46100
		Medium :	18 % =	1728	No.		15	25920
		Low :	47 % =	4514	No.		10	45140
	Total Demand for RURAL population							172840
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	6801	No.		50	340050
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			1679	No.		5	8395
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			1	No.		5000	5000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			250	No.		20	5000
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	35	No.		25	875
BARS			=	29	No.		500	14500
SHOPS			=	85	No.		100	8500
INDUSTRIES			=	1	ha.		20000	20000
TOTAL DEMAND (l/day)								575160

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Amwathi 1

LOCATION : Mutuati
DIVISION : Ntonyiri

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 50000 mN Long. = 388000 mE

TYPE = 1

1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 265 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	20 % population
		Medium Potential	=	20 % population
		Low Potential	=	60 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	: 1979 (census)		=	10135 No.
	1988 (estimated)		=	14639 No.
LIVESTOCK	: Grade cow		=	243 No.
	Indigenous cow		=	972 No.
	Sheep/goats		=	12090 No.
	Donkey		=	41 No.
	Camel		=	0 No.
SCHOOLS	0 Day Schools with WC ->			0 Pupils
	7 Day Schools no WC ->			2445 Pupils
	0 Boarding Schools ->			0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0 Regional Hospitals ->			0 Beds
	0 District Hospitals ->			0 Beds
	0 Other Hospitals ->			0 Beds
	Outpatients/day =			0 No.
HOTELS	0 High Class Hotels ->			0 Beds
	0 Medium Class Hotels ->			0 Beds
	0 Low Class Hotels ->			0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	63 No.
SHOPS	:		=	120 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Amwathi 1 DIVISION : Ntonyiri
LOCATION : Mutuati DISTRICT : Meru

POPULATION : 14639 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 20 % population
Medium Potential = 20 % population
Low Potential = 60 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 9 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	4 % =	585	No.	60	35100
		Medium :	2 % =	292	No.	50	14600
		Low :	3 % =	439	No.	40	17560
	with NC,	High :	16 % =	2342	No.	20	46840
		Medium :	18 % =	2635	No.	15	39525
		Low :	57 % =	8344	No.	10	83440
	Total Demand for RURAL population						237065
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1389	No.	50	69450
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2445	No.	5	12225
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	63	No.	500	31500
SHOPS			=	120	No.	100	12000
	TOTAL DEMAND (l/day)						362240

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Amwathi 2

LOCATION : Mutuati
DIVISION : Ntonyiri

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 45200 mN Long. = 388300 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 257 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	30 % population
		Low Potential	=	70 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	6289 No.
		1988 (estimated)	=	9084 No.
LIVESTOCK	:	Grade cow	=	239 No.
		Indigenous cow	=	956 No.
		Sheep/goats	=	1925 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	5	Day Schools no WC ->		1746 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day	=	0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	1 No.
BARS	:		=	9 No.
SHOPS	:		=	8 No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Amwathi 2 DIVISION : Ntonyiri
LOCATION : Mutuati DISTRICT : Meru

POPULATION : 9084 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 30 % population
Low Potential = 70 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 7 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	3 % =	272	No.	50	13600
		Low :	4 % =	363	No.	40	14520
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	27 % =	2452	No.	15	36780
		Low :	66 % =	5995	No.	10	59950
	Total Demand for RURAL population						124850
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	686	No.	50	34300
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1746	No.	5	8730
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	1	No.	25	25
BARS			=	9	No.	500	4500
SHOPS			=	8	No.	100	800
TOTAL DEMAND (l/day)							173205

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Naathu

LOCATION : Mutuati
DIVISION : Ntonyiri

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 43000 mN Long. = 383000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 125 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	20 % population
		Medium Potential	=	20 % population
		Low Potential	=	60 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	10678 No.
		1988 (estimated)	=	15423 No.
LIVESTOCK	:	Grade cow	=	115 No.
		Indigenous cow	=	459 No.
		Sheep/goats	=	5703 No.
		Donkey	=	19 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		8 Day Schools no WC ->		2794 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day	=	0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	0 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Naathu DIVISION : Ntonyiri
LOCATION : Mutuati DISTRICT : Meru

POPULATION : 15423 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 20 % population
Medium Potential = 20 % population
Low Potential = 60 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 9 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	4 % =	616	No.	60	36960
		Medium :	2 % =	308	No.	50	15400
		Low :	3 % =	462	No.	40	18480
	with NC,	High :	16 % =	2467	No.	20	49340
		Medium :	18 % =	2776	No.	15	41640
		Low :	57 % =	8791	No.	10	87910
	Total Demand for RURAL population						249730
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	655	No.	50	32750
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2794	No.	5	13970
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
			TOTAL DEMAND (l/day)				296450

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Upper Githangari

LOCATION : Abogeta
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9989000 mN Long. = 345000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	21 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 4613	No.
		1988 (estimated)	= 6600	No.
LIVESTOCK	:	Grade cow	= 2118	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 861	No.
		Donkey	= 4	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		3 Day Schools no WC ->	1148	Pupils
		1 Boarding Schools ->	160	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	2	No.
BARS	:	=	9	No.
SHOPS	:	=	38	No.
INDUSTRIES		->	1	ha.

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Upper Githangari DIVISION : South Imenti
LOCATION : Abogeta DISTRICT : Meru

POPULATION : 6600 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1320	No.	60	79200
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	5280	No.	20	105600
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						184800
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2177	No.	50	108850
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1148	No.	5	5740
	Boarding Schools -> Pupils =			160	No.	50	8000
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	2	No.	25	50
BARS			=	9	No.	500	4500
SHOPS			=	38	No.	100	3800
INDUSTRIES			=	1	ha.	20000	20000
TOTAL DEMAND (l/day)							335740

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Upper Kiungone

LOCATION : Abogeta
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9986500 mN Long. = 344000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	28 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100 %	population
		Medium Potential	= 0 %	population
		Low Potential	= 0 %	population
	Urban Area :	High Class Housing	= 0 %	population
		Medium Class Housing	= 0 %	population
		Low Class Housing	= 0 %	population
POPULATION	:	1979 (census)	= 6623	No.
		1988 (estimated)	= 9476	No.
LIVESTOCK	:	Grade cow	= 2824	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 1148	No.
		Donkey	= 5	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	8	Day Schools no WC ->	2758	Pupils
	1	Boarding Schools ->	314	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	11	No.
SHOPS	:	=	12	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Upper Kiungone DIVISION : South Imenti
LOCATION : Abogeta DISTRICT : Meru

POPULATION : 9476 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1895	No.	60	113700
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	7580	No.	20	151600
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						265300
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2902	No.	50	145100
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2758	No.	5	13790
	Boarding Schools -> Pupils =			314	No.	50	15700
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	11	No.	500	5500
SHOPS			=	12	No.	100	1200
			TOTAL DEMAND (l/day)				446590

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Gikui

LOCATION : Igoji
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9978000 mN Long. = 357000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	16 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	70 % population
		Medium Potential	=	30 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	7132 No.
		1988 (estimated)	=	10204 No.
LIVESTOCK	:	Grade cow	=	1611 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	1888 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		4 Day Schools no WC ->		1375 Pupils
		3 Boarding Schools ->		1538 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		1 Other Hospitals ->		37 Beds
		Outpatients/day =		69 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	5 No.
BARS	:		=	17 No.
SHOPS	:		=	32 No.
INDUSTRIES			->	1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Gikui DIVISION : South Imenti
LOCATION : Igoji DISTRICT : Meru

POPULATION : 10204 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 70 % population
Medium Potential = 30 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 17 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	14 % =	1428	No.	60	85680
		Medium :	3 % =	306	No.	50	15300
		Low :	0 % =	0	No.	40	0
	with NC,	High :	56 % =	5714	No.	20	114280
		Medium :	27 % =	2755	No.	15	41325
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						256585
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1736	No.	50	86800
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1375	No.	5	6875
	Boarding Schools -> Pupils =			1538	No.	50	76900
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			37	No.	100	3700
	All Hospitals Outpatients =			69	No.	20	1380
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	5	No.	25	125
BARS			=	17	No.	500	8500
SHOPS			=	32	No.	100	3200
INDUSTRIES			=	1	ha.	20000	20000
TOTAL DEMAND (l/day)							464065

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Karia

LOCATION : Igoji
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9979000 mN Long. = 348000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	21 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 6460	No.
		1988 (estimated)	= 9242	No.
LIVESTOCK	:	Grade cow	= 1906	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 1738	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	4	Day Schools no WC ->	2411	Pupils
	1	Boarding Schools ->	92	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	30	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	13	No.
SHOPS	:	=	15	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Karia DIVISION : South Imenti
LOCATION : Igoji DISTRICT : Meru

POPULATION : 9242 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1848	No.	60	110880
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	7393	No.	20	147860
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						258740
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2021	No.	50	101050
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2411	No.	5	12055
	Boarding Schools -> Pupils =			92	No.	50	4600
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			30	No.	20	600
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	13	No.	500	6500
SHOPS			=	15	No.	100	1500
			TOTAL DEMAND (l/day)				390045

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kothine

LOCATION : Igoki
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9988500 mN Long. = 354000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	9 (km²)	
CLASSIFICATION	Rural Area :	High Potential =	100 % population
		Medium Potential =	0 % population
		Low Potential =	0 % population
	Urban Area :	High Class Housing =	0 % population
		Medium Class Housing =	0 % population
		Low Class Housing =	0 % population
POPULATION	:	1979 (census) =	2953 No.
		1988 (estimated) =	4224 No.
LIVESTOCK	:	Grade cow =	3067 No.
		Indigenous cow =	0 No.
		Sheep/goats =	1795 No.
		Donkey =	0 No.
		Camel =	0 No.
SCHOOLS		0 Day Schools with WC ->	0 Pupils
		1 Day Schools no WC ->	367 Pupils
		1 Boarding Schools ->	132 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS		0 Regional Hospitals ->	0 Beds
		0 District Hospitals ->	0 Beds
		0 Other Hospitals ->	0 Beds
		Outpatients/day =	0 No.
HOTELS		0 High Class Hotels ->	0 Beds
		0 Medium Class Hotels ->	0 Beds
		0 Low Class Hotels ->	0 Beds
ADMINISTRATION OFFICES	:	Staff =	0 No.
BARS	:	=	0 No.
SHOPS	:	=	0 No.
INDUSTRIES	No		

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kothine DIVISION : South Imenti
LOCATION : Igoki DISTRICT : Meru

POPULATION : 4224 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	844	No.	60	50640
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	3379	No.	20	67580
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						118220
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	3186	No.	50	159300
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			367	No.	5	1835
	Boarding Schools -> Pupils =			132	No.	50	6600
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
TOTAL DEMAND (l/day)							285955

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mwichure

LOCATION : Igoki
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9989500 mN Long. = 351000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	9 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 1771	No.
		1988 (estimated)	= 2534	No.
LIVESTOCK	:	Grade cow	= 3683	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 3053	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		2 Day Schools no WC ->	1598	Pupils
		0 Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	75	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	0	No.
SHOPS	:	=	0	No.
INDUSTRIES	No			

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mwichure DIVISION : South Imenti
LOCATION : Igoki DISTRICT : Meru

POPULATION : 2534 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	506	No.	60	30360
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	2027	No.	20	40540
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						70900
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	3886	No.	50	194300
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1598	No.	5	7990
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			75	No.	20	1500
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
			TOTAL DEMAND (l/day)				279690

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Upper Chure

LOCATION : Igoki
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9990000 mN Long. = 346000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 20 (km²)			
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	: 1979 (census)		= 3986	No.
	1988 (estimated)		= 5703	No.
LIVESTOCK	: Grade cow		= 3554	No.
	Indigenous cow		= 0	No.
	Sheep/goats		= 3308	No.
	Donkey		= 0	No.
	Camel		= 0	No.
SCHOOLS	0 Day Schools with WC ->		0	Pupils
	7 Day Schools no WC ->		2273	Pupils
	1 Boarding Schools ->		303	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS	0 Regional Hospitals ->		0	Beds
	0 District Hospitals ->		0	Beds
	0 Other Hospitals ->		0	Beds
	Outpatients/day =		30	No.
HOTELS	0 High Class Hotels ->		0	Beds
	0 Medium Class Hotels ->		0	Beds
	0 Low Class Hotels ->		0	Beds
ADMINISTRATION OFFICES	: Staff =		1	No.
BARS	: =		5	No.
SHOPS	: =		28	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Upper Chure DIVISION : South Imenti
LOCATION : Igoki DISTRICT : Meru

POPULATION : 5703 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1140	No.	60	68400
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	4562	No.	20	91240
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						159640
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	3774	No.	50	188700
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2273	No.	5	11365
	Boarding Schools -> Pupils =			303	No.	50	15150
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			30	No.	20	600
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	1	No.	25	25
BARS			=	5	No.	500	2500
SHOPS			=	28	No.	100	2800
	TOTAL DEMAND (l/day)						385780

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kanyakine

LOCATION : Kanyakine
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9986500 mN Long. = 352500 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	19 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 8988	No.
		1988 (estimated)	= 12859	No.
LIVESTOCK	:	Grade cow	= 1913	No.
		Indigenous cow	= 0	No.
		Sheep/goats	= 1968	No.
		Donkey	= 0	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		9 Day Schools no WC ->	2854	Pupils
		3 Boarding Schools ->	757	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	192	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	5	No.
BARS	:	=	16	No.
SHOPS	:	=	58	No.
INDUSTRIES		->	1	ha.

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kanyakine DIVISION : South Imenti
LOCATION : Kanyakine DISTRICT : Meru

POPULATION : 12859 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	2571	No.	60	154260
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	10287	No.	20	205740
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						360000
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2044	No.	50	102200
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2854	No.	5	14270
	Boarding Schools -> Pupils =			757	No.	50	37850
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			192	No.	20	3840
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	5	No.	25	125
BARS			=	16	No.	500	8000
SHOPS			=	58	No.	100	5800
INDUSTRIES			=	1	ha.	20000	20000
TOTAL DEMAND (l/day)							557085

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kiringa

LOCATION : Kanyakine
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9985000 mN Long. = 359000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 43 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	30 % population
		Medium Potential	=	70 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	: 1979 (census)		=	5918 No.
	1988 (estimated)		=	8467 No.
LIVESTOCK	: Grade cow		=	2258 No.
	Indigenous cow		=	0 No.
	Sheep/goats		=	2859 No.
	Donkey		=	0 No.
	Camel		=	0 No.
SCHOOLS	0 Day Schools with WC ->			0 Pupils
	3 Day Schools no WC ->			2060 Pupils
	2 Boarding Schools ->			421 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0 Regional Hospitals ->			0 Beds
	0 District Hospitals ->			0 Beds
	0 Other Hospitals ->			0 Beds
	Outpatients/day =			0 No.
HOTELS	0 High Class Hotels ->			0 Beds
	0 Medium Class Hotels ->			0 Beds
	0 Low Class Hotels ->			0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	11 No.
SHOPS	:		=	15 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kiringa DIVISION : South Imenti
LOCATION : Kanyakine DISTRICT : Meru

POPULATION : 8467 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 30 % population
Medium Potential = 70 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 13 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	6 % =	508	No.	60	30480
		Medium :	7 % =	592	No.	50	29600
		Low :	0 % =	0	No.	40	0
	with NC,	High :	24 % =	2032	No.	20	40640
		Medium :	63 % =	5334	No.	15	80010
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						180730
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2448	No.	50	122400
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2060	No.	5	10300
	Boarding Schools -> Pupils =			421	No.	50	21050
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	11	No.	500	5500
SHOPS			=	15	No.	100	1500
TOTAL DEMAND (l/day)							341480

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kianjogu

LOCATION : Mitine
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9985000 mN Long. = 346000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	20 (km²)	
CLASSIFICATION	Rural Area : High Potential	=	0 % population
	Medium Potential	=	0 % population
	Low Potential	=	100 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	5969 No.
	1988 (estimated)	=	8540 No.
LIVESTOCK	: Grade cow	=	1677 No.
	Indigenous cow	=	0 No.
	Sheep/goats	=	1414 No.
	Donkey	=	0 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	7 Day Schools no WC ->		2247 Pupils
	2 Boarding Schools ->		1672 Pupils
HEALTH CENTRES/DISPENSARIES		=	1 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		20 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff	=	0 No.
BARS	:	=	8 No.
SHOPS	:	=	30 No.
INDUSTRIES	No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kianjogu DIVISION : South Imenti
LOCATION : Mitine DISTRICT : Meru

POPULATION : 8540 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 0 % population
Low Potential = 100 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 5 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	0 % =	0	No.	50	0
		Low :	5 % =	427	No.	40	17080
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	0 % =	0	No.	15	0
		Low :	95 % =	8113	No.	10	81130
	Total Demand for RURAL population						98210
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1771	No.	50	88550
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2247	No.	5	11235
	Boarding Schools -> Pupils =			1672	No.	50	83600
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			20	No.	20	400
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	8	No.	500	4000
SHOPS			=	30	No.	100	3000
	TOTAL DEMAND (l/day)						293995

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kinoro

LOCATION : Mitine
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9985500 mN Long. = 342000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 31 (km²)			
CLASSIFICATION	Rural Area :	High Potential	= 100 %	population
		Medium Potential	= 0 %	population
		Low Potential	= 0 %	population
	Urban Area :	High Class Housing	= 0 %	population
		Medium Class Housing	= 0 %	population
		Low Class Housing	= 0 %	population
POPULATION	: 1979 (census)		= 5422	No.
	1988 (estimated)		= 7757	No.
LIVESTOCK	: Grade cow		= 707	No.
	Indigenous cow		= 0	No.
	Sheep/goats		= 441	No.
	Donkey		= 0	No.
	Camel		= 0	No.
SCHOOLS	0 Day Schools with WC ->		0	Pupils
	6 Day Schools no WC ->		2048	Pupils
	1 Boarding Schools ->		148	Pupils
HEALTH CENTRES/DISPENSARIES			= 1	No.
HOSPITALS	0 Regional Hospitals ->		0	Beds
	0 District Hospitals ->		0	Beds
	0 Other Hospitals ->		0	Beds
	Outpatients/day =		100	No.
HOTELS	0 High Class Hotels ->		0	Beds
	0 Medium Class Hotels ->		0	Beds
	0 Low Class Hotels ->		0	Beds
ADMINISTRATION OFFICES	: Staff =		2	No.
BARS	: =		14	No.
SHOPS	: =		40	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kinoro DIVISION : South Imenti
LOCATION : Mitine DISTRICT : Meru

POPULATION : 7757 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1551	No.	60	93060
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	6205	No.	20	124100
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						217160
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	736	No.	50	36800
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2048	No.	5	10240
	Boarding Schools -> Pupils =			148	No.	50	7400
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			100	No.	20	2000
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	2	No.	25	50
BARS			=	14	No.	500	7000
SHOPS			=	40	No.	100	4000
TOTAL DEMAND (l/day)							289650

Appendix 3

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mweru

LOCATION : Mitine
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9982000 mN Long. = 356000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	36 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	50 % population
		Medium Potential	=	50 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	5865 No.
		1988 (estimated)	=	8391 No.
LIVESTOCK	:	Grade cow	=	1236 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	1697 No.
		Donkey	=	2 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	9	Day Schools no WC ->		2174 Pupils
	1	Boarding Schools ->		191 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day	=	0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	7 No.
SHOPS	:		=	22 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mweru DIVISION : South Imenti
LOCATION : Mitine DISTRICT : Meru

POPULATION : 8391 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 50 % population
Medium Potential = 50 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 15 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	10 % =	839	No.	60	50340
		Medium :	5 % =	419	No.	50	20950
		Low :	0 % =	0	No.	40	0
	with NC,	High :	40 % =	3356	No.	20	67120
		Medium :	45 % =	3775	No.	15	56625
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						195035
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1349	No.	50	67450
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2174	No.	5	10870
	Boarding Schools -> Pupils =			191	No.	50	9550
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	7	No.	500	3500
SHOPS			=	22	No.	100	2200
TOTAL DEMAND (l/day)							288605

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kirendene

LOCATION : Mitunguu
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9988000 mN Long. = 367000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	54 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	70 % population
		Low Potential	=	30 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	4232 No.
		1988 (estimated)	=	6055 No.
LIVESTOCK	:	Grade cow	=	1918 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	2337 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		4 Day Schools no WC ->		1032 Pupils
		1 Boarding Schools ->		64 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day	=	0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	2 No.
BARS	:		=	14 No.
SHOPS	:		=	90 No.
INDUSTRIES			->	1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kirendene DIVISION : South Imenti
LOCATION : Mitunguu DISTRICT : Meru

POPULATION : 6055 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 70 % population
Low Potential = 30 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 9 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.		60	0
		Medium :	7 % =	423	No.		50	21150
		Low :	2 % =	121	No.		40	4840
	with NC,	High :	0 % =	0	No.		20	0
		Medium :	63 % =	3814	No.		15	57210
		Low :	28 % =	1695	No.		10	16950
	Total Demand for RURAL population							100150
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	2073	No.		50	103650
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			1032	No.		5	5160
	Boarding Schools -> Pupils =			64	No.		50	3200
HEALTH	Health Centres\Dispensaries =			0	No.		5000	0
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			0	No.		20	0
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	2	No.		25	50
BARS			=	14	No.		500	7000
SHOPS			=	90	No.		100	9000
INDUSTRIES			=	1	ha.		20000	20000
			TOTAL DEMAND (l/day)					248210

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Ngonyi

LOCATION : Mitunguu
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9989000 mN Long. = 362000 mE

TYPE = 1

1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 20 (km²)			
CLASSIFICATION	Rural Area	: High Potential	=	70 % population
		Medium Potential	=	30 % population
		Low Potential	=	0 % population
	Urban Area	: High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION		: 1979 (census)	=	9301 No.
		1988 (estimated)	=	9082 No.
LIVESTOCK		: Grade cow	=	1836 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	1625 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		6 Day Schools no WC ->		2918 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day	=	0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES		: Staff	=	0 No.
BARS		:	=	7 No.
SHOPS		:	=	8 No.
INDUSTRIES		No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Ngonyi DIVISION : South Imenti
LOCATION : Mitunguu DISTRICT : Meru

POPULATION : 9082 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 70 % population
Medium Potential = 30 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 17 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	14 % =	1271	No.	60	76260
		Medium :	3 % =	272	No.	50	13600
		Low :	0 % =	0	No.	40	0
	with NC,	High :	56 % =	5085	No.	20	101700
		Medium :	27 % =	2452	No.	15	36780
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						228340
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1944	No.	50	97200
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2918	No.	5	14590
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	7	No.	500	3500
SHOPS			=	8	No.	100	800
TOTAL DEMAND (l/day)							344430

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kathera

LOCATION : Nkuene
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9994000 mN Long. = 343000 mE

TYPE = 4
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 19 (km²)			
CLASSIFICATION	Rural Area :	High Potential	= 65	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 14	% population
		Low Class Housing	= 21	% population
POPULATION	: 1979 (census)		= 9151	No.
	1988 (estimated)		= 14521	No.
LIVESTOCK	: Grade cow		= 2113	No.
	Indigenous cow		= 0	No.
	Sheep/goats		= 1184	No.
	Donkey		= 0	No.
	Camel		= 0	No.
SCHOOLS	0 Day Schools with WC ->		0	Pupils
	5 Day Schools no WC ->		2580	Pupils
	3 Boarding Schools ->		1104	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS	0 Regional Hospitals ->		0	Beds
	0 District Hospitals ->		0	Beds
	1 Other Hospitals ->		320	Beds
	Outpatients/day =		500	No.
HOTELS	0 High Class Hotels ->		0	Beds
	0 Medium Class Hotels ->		0	Beds
	0 Low Class Hotels ->		0	Beds
ADMINISTRATION OFFICES	: Staff =		4	No.
BARS	: =		27	No.
SHOPS	: =		142	No.
INDUSTRIES	->		2	ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kathera DIVISION : South Imenti
LOCATION : Nkuene DISTRICT : Meru

POPULATION : 14521 Rural Pop. = 65 % Urban Pop. = 35 %

CLASSIFICATION :
High Potential = 65 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 14 % population
Low Class Housing = 21 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 13 % Urban Area = 16 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	13 % =	1887	No.	60	113220
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	52 % =	7550	No.	20	151000
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						264220
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	14 % =	2032	No.	150	304800
		Low :	2 % =	290	No.	75	21750
	with NC,	Low :	19 % =	2758	No.	20	55160
	Total Demand for URBAN population						381710
LIVESTOCK			(L.U.) =	2191	No.	50	109550
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2580	No.	5	12900
	Boarding Schools -> Pupils =			1104	No.	50	55200
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			320	No.	100	32000
	All Hospitals Outpatients =			500	No.	20	10000
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES	Staff =			4	No.	25	100
BARS	=			27	No.	500	13500
SHOPS	=			142	No.	100	14200
INDUSTRIES	=			2	ha.	20000	40000
TOTAL DEMAND (l/day)							933380

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kigane

LOCATION : Nkuene
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9995000 mN Long. = 343000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	8 (km²)	
CLASSIFICATION	Rural Area :	High Potential =	100 % population
		Medium Potential =	0 % population
		Low Potential =	0 % population
	Urban Area :	High Class Housing =	0 % population
		Medium Class Housing =	0 % population
		Low Class Housing =	0 % population
POPULATION	:	1979 (census) =	5114 No.
		1988 (estimated) =	7316 No.
LIVESTOCK	:	Grade cow =	1026 No.
		Indigenous cow =	0 No.
		Sheep/goats =	537 No.
		Donkey =	0 No.
		Camel =	0 No.
SCHOOLS	0	Day Schools with WC ->	0 Pupils
	2	Day Schools no WC ->	1383 Pupils
	0	Boarding Schools ->	0 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS	0	Regional Hospitals ->	0 Beds
	0	District Hospitals ->	0 Beds
	0	Other Hospitals ->	0 Beds
		Outpatients/day =	0 No.
HOTELS	0	High Class Hotels ->	0 Beds
	0	Medium Class Hotels ->	0 Beds
	0	Low Class Hotels ->	0 Beds
ADMINISTRATION OFFICES	:	Staff =	0 No.
BARS	:	=	1 No.
SHOPS	:	=	16 No.
INDUSTRIES	No		

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kigane DIVISION : South Imenti
LOCATION : Nkuene DISTRICT : Meru

POPULATION : 7316 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	1463	No.	60	87780
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	5852	No.	20	117040
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						204820
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1061	No.	50	53050
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1383	No.	5	6915
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	1	No.	500	500
SHOPS			=	16	No.	100	1600
			TOTAL DEMAND (l/day)				266885

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mikumbune

LOCATION : Nkuene
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9995000 mN Long. = 343000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	8 (km²)	
CLASSIFICATION	Rural Area : High Potential	= 100	% population
	Medium Potential	= 0	% population
	Low Potential	= 0	% population
	Urban Area : High Class Housing	= 0	% population
	Medium Class Housing	= 0	% population
	Low Class Housing	= 0	% population
POPULATION	: 1979 (census)	= 5210	No.
	1988 (estimated)	= 7454	No.
LIVESTOCK	: Grade cow	= 1941	No.
	Indigenous cow	= 0	No.
	Sheep/goats	= 1140	No.
	Donkey	= 0	No.
	Camel	= 0	No.
SCHOOLS	0 Day Schools with WC ->	0	Pupils
	3 Day Schools no WC ->	2097	Pupils
	2 Boarding Schools ->	501	Pupils
HEALTH CENTRES/DISPENSARIES		= 1	No.
HOSPITALS	0 Regional Hospitals ->	0	Beds
	0 District Hospitals ->	0	Beds
	0 Other Hospitals ->	0	Beds
	Outpatients/day =	79	No.
HOTELS	0 High Class Hotels ->	0	Beds
	0 Medium Class Hotels ->	0	Beds
	0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	: Staff =	0	No.
BARS	: =	9	No.
SHOPS	: =	48	No.
INDUSTRIES	No		

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mikumbune DIVISION : South Imenti
LOCATION : Nkuene DISTRICT : Meru

POPULATION : 7454 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC, High :	20 % =	1490	No.		60	89400
	Medium :	0 % =	0	No.		50	0
	Low :	0 % =	0	No.		40	0
	with NC, High :	80 % =	5963	No.		20	119260
	Medium :	0 % =	0	No.		15	0
	Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population						208660
URBAN POPULATION	with IC, High :	0 % =	0	No.		250	0
	Medium :	0 % =	0	No.		150	0
	Low :	0 % =	0	No.		75	0
	with NC, Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population						0
LIVESTOCK		(L.U.) =	2017	No.		50	100850
SCHOOLS	Day Schools with WC -> Pupils =		0	No.		25	0
	Day Schools no WC -> Pupils =		2097	No.		5	10485
	Boarding Schools -> Pupils =		501	No.		50	25050
HEALTH	Health Centres\Dispensaries =		1	No.		5000	5000
	Regional Hospitals -> Beds =		0	No.		400	0
	District Hospitals -> Beds =		0	No.		200	0
	Other Hospitals -> Beds =		0	No.		100	0
	All Hospitals Outpatients =		79	No.		20	1580
HOTELS	High Class Hotels -> Beds =		0	No.		600	0
	Medium Class Hotels -> Beds =		0	No.		300	0
	Low Class Hotels -> Beds =		0	No.		50	0
ADMINISTRATIVE OFFICES	Staff =		0	No.		25	0
BARS	=		9	No.		500	4500
SHOPS	=		48	No.		100	4800
TOTAL DEMAND (l/day)							360925

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Uruku

LOCATION : Nkuene
DIVISION : South Imenti

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9996500 mN Long. = 345000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	22 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	100 % population
		Medium Potential	=	0 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	7788 No.
		1988 (estimated)	=	11142 No.
LIVESTOCK	:	Grade cow	=	2219 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	902 No.
		Donkey	=	4 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	5	Day Schools no WC ->		2708 Pupils
	3	Boarding Schools ->		751 Pupils
HEALTH CENTRES/DISPENSARIES			=	2 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		210 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	9 No.
SHOPS	:		=	48 No.
INDUSTRIES	No			

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Uruku DIVISION : South Imenti
LOCATION : Nkuene DISTRICT : Meru

POPULATION : 11142 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	2228	No.	60	133680
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	8913	No.	20	178260
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						311940
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2280	No.	50	114000
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2708	No.	5	13540
	Boarding Schools -> Pupils =			751	No.	50	37550
HEALTH	Health Centres\Dispensaries =			2	No.	5000	10000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			210	No.	20	4200
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	9	No.	500	4500
SHOPS			=	48	No.	100	4800
TOTAL DEMAND (l/day)							500530

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Irunduni

LOCATION : Gikingo
DIVISION : Tharaka

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9987000 mN Long. = 398000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	34 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	10 % population
		Low Potential	=	90 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	1435 No.
		1988 (estimated)	=	2073 No.
LIVESTOCK	:	Grade cow	=	0 No.
		Indigenous cow	=	889 No.
		Sheep/goats	=	20 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	9	Day Schools no WC ->		2089 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:		Staff =	0 No.
BARS	:		=	0 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Irunduni DIVISION : Tharaka
LOCATION : Gikingo DISTRICT : Meru

POPULATION : 2073 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 10 % population
Low Potential = 90 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 6 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	1 % =	20	No.	50	1000
		Low :	5 % =	103	No.	40	4120
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	9 % =	186	No.	15	2790
		Low :	85 % =	1762	No.	10	17620
	Total Demand for RURAL population						25530
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	297	No.	50	14850
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2089	No.	5	10445
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
TOTAL DEMAND (l/day)							50825

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kanjoro

LOCATION : Gikingo
DIVISION : Tharaka

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 6500 mN Long. = 388000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 148 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	10 % population
		Low Potential	=	90 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	6183 No.
		1988 (estimated)	=	8931 No.
LIVESTOCK	:	Grade cow	=	0 No.
		Indigenous cow	=	3831 No.
		Sheep/goats	=	84 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	13	Day Schools no WC ->		1833 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	4 No.
SHOPS	:		=	61 No.
INDUSTRIES	No			

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kanjoro DIVISION : Tharaka
LOCATION : Gikingo DISTRICT : Meru

POPULATION : 8931 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 10 % population
Low Potential = 90 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 6 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	1 % =	89	No.	50	4450
		Low :	5 % =	446	No.	40	17840
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	9 % =	803	No.	15	12045
		Low :	85 % =	7591	No.	10	75910
	Total Demand for RURAL population						110245
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1282	No.	50	64100
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1833	No.	5	9165
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	4	No.	500	2000
SHOPS			=	61	No.	100	6100
			TOTAL DEMAND (l/day)				191610

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kanyuru

LOCATION : Marimanti
DIVISION : Tharaka

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9979000 mN Long. = 377000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 119 (km²)		
CLASSIFICATION	Rural Area : High Potential	=	0 % population
	Medium Potential	=	40 % population
	Low Potential	=	60 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	4654 No.
	1988 (estimated)	=	6722 No.
LIVESTOCK	: Grade cow	=	0 No.
	Indigenous cow	=	5421 No.
	Sheep/goats	=	17885 No.
	Donkey	=	124 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	6 Day Schools no WC ->		692 Pupils
	1 Boarding Schools ->		20 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		0 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff	=	0 No.
BARS	:	=	2 No.
SHOPS	:	=	27 No.
INDUSTRIES	: No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kanyuru DIVISION : Tharaka
LOCATION : Marimanti DISTRICT : Meru

POPULATION : 6722 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 40 % population
Low Potential = 60 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 7 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	4 % =	268	No.	50	13400
		Low :	3 % =	201	No.	40	8040
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	36 % =	2419	No.	15	36285
		Low :	57 % =	3831	No.	10	38310
	Total Demand for RURAL population						96035
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	3048	No.	50	152400
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			692	No.	5	3460
	Boarding Schools -> Pupils =			20	No.	50	1000
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	2	No.	500	1000
SHOPS			=	27	No.	100	2700
	TOTAL DEMAND (l/day)						256595

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Marimanti

LOCATION : Marimanti
DIVISION : Tharaka

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9984000 mN Long. = 385000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	93 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	0 % population
		Low Potential	=	100 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	5703 No.
		1988 (estimated)	=	8237 No.
LIVESTOCK	:	Grade cow	=	0 No.
		Indigenous cow	=	6642 No.
		Sheep/goats	=	21916 No.
		Donkey	=	152 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		10 Day Schools no WC ->		1602 Pupils
		1 Boarding Schools ->		555 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		43 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:	=		5 No.
SHOPS	:	=		56 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Marimanti DIVISION : Tharaka
LOCATION : Marimanti DISTRICT : Meru

POPULATION : 8237 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 0 % population
Low Potential = 100 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 5 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60		0
		Medium :	0 % =	0	No.	50		0
		Low :	5 % =	411	No.	40		16440
	with NC,	High :	0 % =	0	No.	20		0
		Medium :	0 % =	0	No.	15		0
		Low :	95 % =	7825	No.	10		78250
	Total Demand for RURAL population							94690
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250		0
		Medium :	0 % =	0	No.	150		0
		Low :	0 % =	0	No.	75		0
	with NC,	Low :	0 % =	0	No.	20		0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	3735	No.	50		186750
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25		0
	Day Schools no WC -> Pupils =			1602	No.	5		8010
	Boarding Schools -> Pupils =			555	No.	50		27750
HEALTH	Health Centres\Dispensaries =			1	No.	5000		5000
	Regional Hospitals -> Beds =			0	No.	400		0
	District Hospitals -> Beds =			0	No.	200		0
	Other Hospitals -> Beds =			0	No.	100		0
	All Hospitals Outpatients =			43	No.	20		860
HOTELS	High Class Hotels -> Beds =			0	No.	600		0
	Medium Class Hotels -> Beds =			0	No.	300		0
	Low Class Hotels -> Beds =			0	No.	50		0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25		0
BARS			=	5	No.	500		2500
SHOPS			=	56	No.	100		5600
TOTAL DEMAND (l/day)								331160

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Nkondi

LOCATION : Marimanti
DIVISION : Tharaka

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9993000 mN Long. = 385000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	96 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	70 % population
		Low Potential	=	30 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	7089 No.
		1988 (estimated)	=	10239 No.
LIVESTOCK	:	Grade cow	=	0 No.
		Indigenous cow	=	8258 No.
		Sheep/goats	=	27243 No.
		Donkey	=	189 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		21 Day Schools no WC ->		2867 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		35 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:	=		4 No.
SHOPS	:	=		44 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Nkondi DIVISION : Tharaka
LOCATION : Marimanti DISTRICT : Meru

POPULATION : 10239 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 70 % population
Low Potential = 30 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 9 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	7 % =	716	No.	50	35800
		Low :	2 % =	204	No.	40	8160
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	63 % =	6450	No.	15	96750
		Low :	28 % =	2866	No.	10	28660
	Total Demand for RURAL population						169370
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	4644	No.	50	232200
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2867	No.	5	14335
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			35	No.	20	700
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	4	No.	500	2000
SHOPS			=	44	No.	100	4400
TOTAL DEMAND (l/day)							428005

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Turima

LOCATION : Marimanti
DIVISION : Tharaka

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9979000 mN Long. = 377000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	73 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	70 % population
		Low Potential	=	30 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	2844 No.
		1988 (estimated)	=	4108 No.
LIVESTOCK	:	Grade cow	=	0 No.
		Indigenous cow	=	3313 No.
		Sheep/goats	=	10930 No.
		Donkey	=	76 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	15	Day Schools no WC ->		2276 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:		Staff =	0 No.
BARS	:		=	2 No.
SHOPS	:		=	39 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Turima DIVISION : Tharaka
LOCATION : Marimanti DISTRICT : Meru

POPULATION : 4108 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 70 % population
Low Potential = 30 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 9 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	7 % =	287	No.	50	14350
		Low :	2 % =	82	No.	40	3280
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	63 % =	2588	No.	15	38820
		Low :	28 % =	1150	No.	10	11500
	Total Demand for RURAL population						67950
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1863	No.	50	93150
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2276	No.	5	11380
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	2	No.	500	1000
SHOPS			=	39	No.	100	3900
TOTAL DEMAND (l/day)							177380

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Gatue

LOCATION : North Tharaka
DIVISION : Tharaka

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9979000 mN Long. = 399000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 209 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	40 % population
		Low Potential	=	60 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	2796 No.
		1988 (estimated)	=	4039 No.
LIVESTOCK	:	Grade cow	=	0 No.
		Indigenous cow	=	5420 No.
		Sheep/goats	=	32063 No.
		Donkey	=	281 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	7	Day Schools no WC ->		890 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day	=	0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	0 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Gatue DIVISION : Tharaka
LOCATION : North Tharaka DISTRICT : Meru

POPULATION : 4039 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 40 % population
Low Potential = 60 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 7 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	4 % =	161	No.	50	8050
		Low :	3 % =	121	No.	40	4840
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	36 % =	1454	No.	15	21810
		Low :	57 % =	2302	No.	10	23020
	Total Demand for RURAL population						57720
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	4056	No.	50	202800
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			890	No.	5	4450
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
			TOTAL DEMAND (l/day)				264970

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Gatunga

LOCATION : North Tharaka
DIVISION : Tharaka

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9989000 mN Long. = 380000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 104 (km²)			
CLASSIFICATION	Rural Area :	High Potential =	0	% population
		Medium Potential =	20	% population
		Low Potential =	80	% population
	Urban Area :	High Class Housing =	0	% population
		Medium Class Housing =	0	% population
		Low Class Housing =	0	% population
POPULATION	: 1979 (census) =		4594	No.
	1988 (estimated) =		6636	No.
LIVESTOCK	: Grade cow =		0	No.
	Indigenous cow =		1007	No.
	Sheep/goats =		51	No.
	Donkey =		56	No.
	Camel =		0	No.
SCHOOLS	0 Day Schools with WC ->		0	Pupils
	7 Day Schools no WC ->		981	Pupils
	0 Boarding Schools ->		0	Pupils
HEALTH CENTRES/DISPENSARIES	=		1	No.
HOSPITALS	0 Regional Hospitals ->		0	Beds
	0 District Hospitals ->		0	Beds
	0 Other Hospitals ->		0	Beds
	Outpatients/day =		20	No.
HOTELS	0 High Class Hotels ->		0	Beds
	0 Medium Class Hotels ->		0	Beds
	0 Low Class Hotels ->		0	Beds
ADMINISTRATION OFFICES	: Staff =		0	No.
BARS	: =		5	No.
SHOPS	: =		61	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Gatunga DIVISION : Tharaka
LOCATION : North Tharaka DISTRICT : Meru

POPULATION : 6636 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 20 % population
Low Potential = 80 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 6 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	2 % =	132	No.	50	6600
		Low :	4 % =	265	No.	40	10600
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	18 % =	1194	No.	15	17910
		Low :	76 % =	5043	No.	10	50430
	Total Demand for RURAL population						85540
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	361	No.	50	18050
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			981	No.	5	4905
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			20	No.	20	400
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	5	No.	500	2500
SHOPS			=	61	No.	100	6100
			TOTAL DEMAND (l/day)				122495

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kathangachini

LOCATION : North Tharaka
DIVISION : Tharaka

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9993000 mN Long. = 410000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA Total = 292 (km²)

CLASSIFICATION	Rural Area	: High Potential	=	0 % population
		Medium Potential	=	20 % population
		Low Potential	=	80 % population
	Urban Area	: High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION		: 1979 (census)	=	2083 No.
		1988 (estimated)	=	3009 No.
LIVESTOCK		: Grade cow	=	0 No.
		Indigenous cow	=	2847 No.
		Sheep/goats	=	145 No.
		Donkey	=	168 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		7 Day Schools no WC ->		520 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		43 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES		: Staff	=	0 No.
BARS		:	=	0 No.
SHOPS		:	=	0 No.
INDUSTRIES		No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kathangachini DIVISION : Tharaka
LOCATION : North Tharaka DISTRICT : Meru

POPULATION : 3009 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 20 % population
Low Potential = 80 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 6 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.		60	0
		Medium :	2 % =	60	No.		50	3000
		Low :	4 % =	120	No.		40	4800
	with NC,	High :	0 % =	0	No.		20	0
		Medium :	18 % =	541	No.		15	8115
		Low :	76 % =	2286	No.		10	22860
	Total Demand for RURAL population							38775
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	1025	No.		50	51250
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			520	No.		5	2600
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			1	No.		5000	5000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			43	No.		20	860
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.		25	0
BARS			=	0	No.		500	0
SHOPS			=	0	No.		100	0
TOTAL DEMAND (l/day)								98485

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Chiokariga

LOCATION : South Tharaka
DIVISION : Tharaka

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9973000 mN Long. = 373000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA Total = 123 (km²)

CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	30 % population
		Low Potential	=	70 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	4859 No.
		1988 (estimated)	=	7018 No.
LIVESTOCK	:	Grade cow	=	0 No.
		Indigenous cow	=	1171 No.
		Sheep/goats	=	19 No.
		Donkey	=	69 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	9	Day Schools no WC ->		1281 Pupils
	1	Boarding Schools ->		362 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		89 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	4 No.
SHOPS	:		=	51 No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Chiokariga DIVISION : Tharaka
LOCATION : South Tharaka DISTRICT : Meru

POPULATION : 7018 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 30 % population
Low Potential = 70 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 7 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	3 % =	210	No.	50	10500
		Low :	4 % =	280	No.	40	11200
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	27 % =	1894	No.	15	28410
		Low :	66 % =	4631	No.	10	46310
	Total Demand for RURAL population						96420
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	419	No.	50	20950
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1281	No.	5	6405
	Boarding Schools -> Pupils =			362	No.	50	18100
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			89	No.	20	1780
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	4	No.	500	2000
SHOPS			=	51	No.	100	5100
TOTAL DEMAND (l/day)							155755

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kamanyaki

LOCATION : South Tharaka
DIVISION : Tharaka

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9957000 mN Long. = 382000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 105 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	20 % population
		Low Potential	=	80 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	: 1979 (census)		=	3584 No.
	1988 (estimated)		=	5177 No.
LIVESTOCK	: Grade cow		=	0 No.
	Indigenous cow		=	1003 No.
	Sheep/goats		=	16 No.
	Donkey		=	59 No.
	Camel		=	0 No.
SCHOOLS	0 Day Schools with WC ->			0 Pupils
	6 Day Schools no WC ->			739 Pupils
	0 Boarding Schools ->			0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS	0 Regional Hospitals ->			0 Beds
	0 District Hospitals ->			0 Beds
	0 Other Hospitals ->			0 Beds
	Outpatients/day =			20 No.
HOTELS	0 High Class Hotels ->			0 Beds
	0 Medium Class Hotels ->			0 Beds
	1 Low Class Hotels ->			0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	0 No.
SHOPS	:		=	30 No.
INDUSTRIES	No			

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kamanyaki DIVISION : Tharaka
LOCATION : South Tharaka DISTRICT : Meru

POPULATION : 5177 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 20 % population
Low Potential = 80 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 6 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	2 % =	103	No.	50	5150
		Low :	4 % =	207	No.	40	8280
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	18 % =	931	No.	15	13965
		Low :	76 % =	3934	No.	10	39340
	Total Demand for RURAL population						66735
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	359	No.	50	17950
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			739	No.	5	3695
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			20	No.	20	400
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	30	No.	100	3000
	TOTAL DEMAND (l/day)						96780

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Tunyai

LOCATION : South Tharaka
DIVISION : Tharaka

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37M
Lat. = 9978000 mN Long. = 371000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	63 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	80 % population
		Low Potential	=	20 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	4452 No.
		1988 (estimated)	=	6430 No.
LIVESTOCK	:	Grade cow	=	0 No.
		Indigenous cow	=	600 No.
		Sheep/goats	=	10 No.
		Donkey	=	35 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	11	Day Schools no WC ->		2529 Pupils
	1	Boarding Schools ->		314 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		22 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:		=	4 No.
SHOPS	:		=	47 No.
INDUSTRIES	No			

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Tunyai DIVISION : Tharaka
LOCATION : South Tharaka DISTRICT : Meru

POPULATION : 6430 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 80 % population
Low Potential = 20 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 9 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	8 % =	514	No.	50	25700
		Low :	1 % =	64	No.	40	2560
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	72 % =	4629	No.	15	69435
		Low :	19 % =	1221	No.	10	12210
	Total Demand for RURAL population						109905
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	214	No.	50	10700
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2529	No.	5	12645
	Boarding Schools -> Pupils =			314	No.	50	15700
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			22	No.	20	440
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	4	No.	500	2000
SHOPS			=	47	No.	100	4700
TOTAL DEMAND (l/day)							161090

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Athwana

LOCATION : Akithii
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 22500 mN Long. = 362400 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 20 (km²)		
CLASSIFICATION	Rural Area : High Potential	=	0 % population
	Medium Potential	=	20 % population
	Low Potential	=	80 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	5010 No.
	1988 (estimated)	=	7236 No.
LIVESTOCK	: Grade cow	=	1534 No.
	Indigenous cow	=	6133 No.
	Sheep/goats	=	7387 No.
	Donkey	=	551 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	5 Day Schools no WC ->		1879 Pupils
	0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		0 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff =		6 No.
BARS	:	=	0 No.
SHOPS	:	=	8 No.
INDUSTRIES	No		

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Athwana DIVISION : Tigania
LOCATION : Akithii DISTRICT : Meru

POPULATION : 7236 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 20 % population
Low Potential = 80 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 6 % Urban Area = 0 %

DEMAND CALCULATION					RATE	DEMAND
RURAL POPULATION	with IC, High :	0 % =	0	No.	60	0
	Medium :	2 % =	144	No.	50	7200
	Low :	4 % =	289	No.	40	11560
	with NC, High :	0 % =	0	No.	20	0
	Medium :	18 % =	1302	No.	15	19530
	Low :	76 % =	5499	No.	10	54990
	Total Demand for RURAL population					93280
URBAN POPULATION	with IC, High :	0 % =	0	No.	250	0
	Medium :	0 % =	0	No.	150	0
	Low :	0 % =	0	No.	75	0
	with NC, Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population					0
LIVESTOCK	(L.U.) =		4291	No.	50	214550
SCHOOLS	Day Schools with WC -> Pupils =		0	No.	25	0
	Day Schools no WC -> Pupils =		1879	No.	5	9395
	Boarding Schools -> Pupils =		0	No.	50	0
HEALTH	Health Centres\Dispensaries =		0	No.	5000	0
	Regional Hospitals -> Beds =		0	No.	400	0
	District Hospitals -> Beds =		0	No.	200	0
	Other Hospitals -> Beds =		0	No.	100	0
	All Hospitals Outpatients =		0	No.	20	0
HOTELS	High Class Hotels -> Beds =		0	No.	600	0
	Medium Class Hotels -> Beds =		0	No.	300	0
	Low Class Hotels -> Beds =		0	No.	50	0
ADMINISTRATIVE OFFICES	Staff =		6	No.	25	150
BARS	=		0	No.	500	0
SHOPS	=		8	No.	100	800
	TOTAL DEMAND (l/day)					318175

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kitheo

LOCATION : Akithii
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 0 mN Long. = 367700 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	18 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	10 % population
		Low Potential	=	90 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	7315 No.
		1988 (estimated)	=	10566 No.
LIVESTOCK	:	Grade cow	=	440 No.
		Indigenous cow	=	1760 No.
		Sheep/goats	=	1527 No.
		Donkey	=	4 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		10 Day Schools no WC ->		2758 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		1 Other Hospitals ->		90 Beds
		Outpatients/day =		150 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	50 No.
BARS	:		=	0 No.
SHOPS	:		=	29 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kitheo DIVISION : Tigania
LOCATION : Akithii DISTRICT : Meru

POPULATION : 10566 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 10 % population
Low Potential = 90 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 6 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.		60	0
		Medium :	1 % =	105	No.		50	5250
		Low :	5 % =	528	No.		40	21120
	with NC,	High :	0 % =	0	No.		20	0
		Medium :	9 % =	950	No.		15	14250
		Low :	85 % =	8981	No.		10	89810
	Total Demand for RURAL population							130430
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	1130	No.		50	56500
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			2758	No.		5	13790
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			1	No.		5000	5000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			90	No.		100	9000
	All Hospitals Outpatients =			150	No.		20	3000
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	50	No.		25	1250
BARS			=	0	No.		500	0
SHOPS			=	29	No.		100	2900
TOTAL DEMAND (l/day)								221870

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Nchooro

LOCATION : Akithii
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 22300 mN Long. = 365200 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 20 (km²)		
CLASSIFICATION	Rural Area : High Potential	=	30 % population
	Medium Potential	=	30 % population
	Low Potential	=	40 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	7590 No.
	1988 (estimated)	=	10963 No.
LIVESTOCK	: Grade cow	=	665 No.
	Indigenous cow	=	2659 No.
	Sheep/goats	=	2759 No.
	Donkey	=	44 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	4 Day Schools no WC ->		1606 Pupils
	0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		0 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff	=	61 No.
BARS	:	=	8 No.
SHOPS	:	=	15 No.
INDUSTRIES	No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Nchooro DIVISION : Tigania
LOCATION : Akithii DISTRICT : Meru

POPULATION : 10963 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 30 % population
Medium Potential = 30 % population
Low Potential = 40 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 11 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	6 % =	657	No.	60	39420
		Medium :	3 % =	328	No.	50	16400
		Low :	2 % =	219	No.	40	8760
	with NC,	High :	24 % =	2631	No.	20	52620
		Medium :	27 % =	2960	No.	15	44400
		Low :	38 % =	4165	No.	10	41650
	Total Demand for RURAL population						203250
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1752	No.	50	87600
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1606	No.	5	8030
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	61	No.	25	1525
BARS			=	8	No.	500	4000
SHOPS			=	15	No.	100	1500
	TOTAL DEMAND (l/day)						305905

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Thinyaine

LOCATION : Akithii
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 22000 mN Long. = 362000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 13 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	20 % population
		Low Potential	=	80 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	5100 No.
		1988 (estimated)	=	7366 No.
LIVESTOCK	:	Grade cow	=	830 No.
		Indigenous cow	=	3320 No.
		Sheep/goats	=	9971 No.
		Donkey	=	299 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	10	Day Schools no WC ->		2853 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:		Staff =	9 No.
BARS	:		=	1 No.
SHOPS	:		=	6 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Thinyaine DIVISION : Tigania
LOCATION : Akithii DISTRICT : Meru

POPULATION : 7366 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 0 % population
Medium Potential = 20 % population
Low Potential = 80 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 6 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	2 % =	147	No.	50	7350
		Low :	4 % =	294	No.	40	11760
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	18 % =	1325	No.	15	19875
		Low :	76 % =	5598	No.	10	55980
	Total Demand for RURAL population						94965
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2721	No.	50	136050
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2853	No.	5	14265
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	9	No.	25	225
BARS			=	1	No.	500	500
SHOPS			=	6	No.	100	600
TOTAL DEMAND (l/day)							246605

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Karama

LOCATION : Karama
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 27000 mN Long. = 369600 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	88 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	70 % population
		Medium Potential	=	20 % population
		Low Potential	=	10 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	10891 No.
		1988 (estimated)	=	15731 No.
LIVESTOCK	:	Grade cow	=	21 No.
		Indigenous cow	=	85 No.
		Sheep/goats	=	814 No.
		Donkey	=	84 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		10 Day Schools no WC ->		2466 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		17 No.
BARS	:		=	29 No.
SHOPS	:		=	54 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Karama DIVISION : Tigania
LOCATION : Karama DISTRICT : Meru

POPULATION : 15731 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 70 % population
Medium Potential = 20 % population
Low Potential = 10 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 17 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	14 % =	2202	No.		60	132120
		Medium :	2 % =	314	No.		50	15700
		Low :	1 % =	157	No.		40	6280
	with NC,	High :	56 % =	8809	No.		20	176180
		Medium :	18 % =	2831	No.		15	42465
		Low :	9 % =	1415	No.		10	14150
	Total Demand for RURAL population							386895
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	137	No.		50	6850
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			2466	No.		5	12330
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			0	No.		5000	0
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			0	No.		20	0
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	17	No.		25	425
BARS			=	29	No.		500	14500
SHOPS			=	54	No.		100	5400
			TOTAL DEMAND (l/day)					426400

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kianjai

LOCATION : Kianjai
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 18600 mN Long. = 361500 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 24 (km²)			
CLASSIFICATION	Rural Area :	High Potential	= 40	% population
		Medium Potential	= 60	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 8237	No.
		1988 (estimated)	= 11897	No.
LIVESTOCK	:	Grade cow	= 620	No.
		Indigenous cow	= 2480	No.
		Sheep/goats	= 2762	No.
		Donkey	= 18	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	10	Day Schools no WC ->	3017	Pupils
	1	Boarding Schools ->	115	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS	0	High Class Hotels ->	0	Beds
	0	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	105	No.
BARS	:	=	16	No.
SHOPS	:	=	159	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kianjai DIVISION : Tigania
LOCATION : Kianjai DISTRICT : Meru

POPULATION : 11897 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 40 % population
Medium Potential = 60 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 14 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	8 % =	951	No.	60	57060
		Medium :	6 % =	713	No.	50	35650
		Low :	0 % =	0	No.	40	0
	with NC,	High :	32 % =	3807	No.	20	76140
		Medium :	54 % =	6424	No.	15	96360
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						265210
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1638	No.	50	81900
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			3017	No.	5	15085
	Boarding Schools -> Pupils =			115	No.	50	5750
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	105	No.	25	2625
BARS			=	16	No.	500	8000
SHOPS			=	159	No.	100	15900
			TOTAL DEMAND (l/day)				394470

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Miathene

LOCATION : Kianjai
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 17000 mN Long. = 365400 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA Total = 13 (km²)

CLASSIFICATION	Rural Area :	High Potential =	100 % population
		Medium Potential =	0 % population
		Low Potential =	0 % population
	Urban Area :	High Class Housing =	0 % population
		Medium Class Housing =	0 % population
		Low Class Housing =	0 % population
POPULATION	:	1979 (census) =	7864 No.
		1988 (estimated) =	11359 No.
LIVESTOCK	:	Grade cow =	1978 No.
		Indigenous cow =	7912 No.
		Sheep/goats =	13258 No.
		Donkey =	298 No.
		Camel =	0 No.
SCHOOLS		0 Day Schools with WC ->	0 Pupils
		25 Day Schools no WC ->	2567 Pupils
		27 Boarding Schools ->	794 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS		0 Regional Hospitals ->	0 Beds
		0 District Hospitals ->	0 Beds
		2 Other Hospitals ->	80 Beds
		Outpatients/day =	656 No.
HOTELS		0 High Class Hotels ->	0 Beds
		0 Medium Class Hotels ->	0 Beds
		0 Low Class Hotels ->	0 Beds
ADMINISTRATION OFFICES	:	Staff =	102 No.
BARS	:	=	9 No.
SHOPS	:	=	36 No.
INDUSTRIES	No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Miathene DIVISION : Tigania
LOCATION : Kianjai DISTRICT : Meru

POPULATION : 11359 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	2271	No.	60	136260
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	9087	No.	20	181740
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						318000
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	5618	No.	50	280900
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2567	No.	5	12835
	Boarding Schools -> Pupils =			794	No.	50	39700
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			80	No.	100	8000
	All Hospitals Outpatients =			656	No.	20	13120
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	102	No.	25	2550
BARS			=	9	No.	500	4500
SHOPS			=	36	No.	100	3600
TOTAL DEMAND (l/day)							683205

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kiorimba

LOCATION : Mbeu
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 4600 mN Long. = 369500 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	36 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	20 % population
		Medium Potential	=	80 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	6838 No.
		1988 (estimated)	=	9877 No.
LIVESTOCK	:	Grade cow	=	322 No.
		Indigenous cow	=	1286 No.
		Sheep/goats	=	1738 No.
		Donkey	=	1 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	0	Day Schools no WC ->		0 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	6 No.
BARS	:		=	10 No.
SHOPS	:		=	42 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kiorimba DIVISION : Tigania
LOCATION : Mbeu DISTRICT : Meru

POPULATION : 9877 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 20 % population
Medium Potential = 80 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 12 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	4 % =	395	No.	60	23700
		Medium :	8 % =	790	No.	50	39500
		Low :	0 % =	0	No.	40	0
	with NC,	High :	16 % =	1580	No.	20	31600
		Medium :	72 % =	7111	No.	15	106665
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						201465
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	866	No.	50	43300
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			0	No.	5	0
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	6	No.	25	150
BARS			=	10	No.	500	5000
SHOPS			=	42	No.	100	4200
TOTAL DEMAND (l/day)							254115

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mbeu

LOCATION : Mbeu
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 10000 mN Long. = 363900 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 16 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	20 % population
		Medium Potential	=	80 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	2933 No.
		1988 (estimated)	=	4236 No.
LIVESTOCK	:	Grade cow	=	1093 No.
		Indigenous cow	=	4374 No.
		Sheep/goats	=	3363 No.
		Donkey	=	41 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	5	Day Schools no WC ->		1837 Pupils
	1	Boarding Schools ->		54 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		3 No.
BARS	:	=		11 No.
SHOPS	:	=		171 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mbeu DIVISION : Tigania
LOCATION : Mbeu DISTRICT : Meru

POPULATION : 4236 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 20 % population
Medium Potential = 80 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 12 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	4 % =	169	No.		60	10140
		Medium :	8 % =	338	No.		50	16900
		Low :	0 % =	0	No.		40	0
	with NC,	High :	16 % =	677	No.		20	13540
		Medium :	72 % =	3049	No.		15	45735
		Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population							86315
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	2791	No.		50	139550
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			1837	No.		5	9185
	Boarding Schools -> Pupils =			54	No.		50	2700
HEALTH	Health Centres\Dispensaries =			0	No.		5000	0
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			0	No.		20	0
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	3	No.		25	75
BARS			=	11	No.		500	5500
SHOPS			=	171	No.		100	17100
TOTAL DEMAND (l/day)								260425

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Akaiga

LOCATION : Mikinduri
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 7000 mN Long. = 376000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 46 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	50 % population
		Medium Potential	=	50 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	5557 No.
		1988 (estimated)	=	8026 No.
LIVESTOCK	:	Grade cow	=	428 No.
		Indigenous cow	=	1712 No.
		Sheep/goats	=	2836 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	3	Day Schools no WC ->		1101 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:		Staff =	0 No.
BARS	:		=	11 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Akaiga DIVISION : Tigania
LOCATION : Mikinduri DISTRICT : Meru

POPULATION : 8026 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 50 % population
Medium Potential = 50 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 15 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	10 % =	802	No.	60	48120
		Medium :	5 % =	401	No.	50	20050
		Low :	0 % =	0	No.	40	0
	with NC,	High :	40 % =	3210	No.	20	64200
		Medium :	45 % =	3611	No.	15	54165
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						186535
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1187	No.	50	59350
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1101	No.	5	5505
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	11	No.	500	5500
SHOPS			=	0	No.	100	0
TOTAL DEMAND (l/day)							256890

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Antuamburi

LOCATION : Mikinduri
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 9000 mN Long. = 370000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	26 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	0 % population
		Low Potential	=	100 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	7964 No.
		1988 (estimated)	=	11503 No.
LIVESTOCK	:	Grade cow	=	444 No.
		Indigenous cow	=	1775 No.
		Sheep/goats	=	5285 No.
		Donkey	=	40 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC	->	0 Pupils
		10 Day Schools no WC	->	3720 Pupils
		1 Boarding Schools	->	16 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals	->	0 Beds
		0 District Hospitals	->	0 Beds
		0 Other Hospitals	->	0 Beds
		Outpatients/day	=	160 No.
HOTELS		0 High Class Hotels	->	0 Beds
		0 Medium Class Hotels	->	0 Beds
		0 Low Class Hotels	->	0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	44 No.
SHOPS	:		=	165 No.
INDUSTRIES			->	2 ha.

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Antuamburi DIVISION : Tigania
LOCATION : Mikinduri DISTRICT : Meru

POPULATION : 11503 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 0 % population
Low Potential = 100 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 5 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.		60	0
		Medium :	0 % =	0	No.		50	0
		Low :	5 % =	575	No.		40	23000
	with NC,	High :	0 % =	0	No.		20	0
		Medium :	0 % =	0	No.		15	0
		Low :	95 % =	10927	No.		10	109270
	Total Demand for RURAL population							132270
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	1404	No.		50	70200
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			3720	No.		5	18600
	Boarding Schools -> Pupils =			16	No.		50	800
HEALTH	Health Centres\Dispensaries =			1	No.		5000	5000
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			160	No.		20	3200
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.		25	0
BARS			=	44	No.		500	22000
SHOPS			=	165	No.		100	16500
INDUSTRIES			=	2	ha.		20000	40000
			TOTAL DEMAND (l/day)					308570

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Athwana

LOCATION : Mikinduri
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 13200 mN Long. = 371200 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	4 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	30 % population
		Medium Potential	=	70 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	3346 No.
		1988 (estimated)	=	4833 No.
LIVESTOCK	:	Grade cow	=	264 No.
		Indigenous cow	=	1055 No.
		Sheep/goats	=	1214 No.
		Donkey	=	2 No.
		Camel	=	0 No.
SCHOOLS	0	Day Schools with WC ->		0 Pupils
	10	Day Schools no WC ->		2145 Pupils
	0	Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS	0	Regional Hospitals ->		0 Beds
	0	District Hospitals ->		0 Beds
	0	Other Hospitals ->		0 Beds
		Outpatients/day	=	0 No.
HOTELS	0	High Class Hotels ->		0 Beds
	0	Medium Class Hotels ->		0 Beds
	0	Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	2 No.
BARS	:		=	11 No.
SHOPS	:		=	13 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Athwana DIVISION : Tigania
LOCATION : Mikinduri DISTRICT : Meru

POPULATION : 4833 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 30 % population
Medium Potential = 70 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 13 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	6 % =	289	No.	60	17340
		Medium :	7 % =	338	No.	50	16900
		Low :	0 % =	0	No.	40	0
	with NC,	High :	24 % =	1159	No.	20	23180
		Medium :	63 % =	3044	No.	15	45660
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						103080
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	697	No.	50	34850
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2145	No.	5	10725
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	2	No.	25	50
BARS			=	11	No.	500	5500
SHOPS			=	13	No.	100	1300
			TOTAL DEMAND (l/day)				155505

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kiguchua

LOCATION : Mikinduri
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 17300 mN Long. = 371300 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	23 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 100	% population
		Medium Potential	= 0	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 8642	No.
		1988 (estimated)	= 12482	No.
LIVESTOCK	:	Grade cow	= 361	No.
		Indigenous cow	= 1445	No.
		Sheep/goats	= 774	No.
		Donkey	= 6	No.
		Camel	= 0	No.
SCHOOLS		0 Day Schools with WC ->	0	Pupils
		10 Day Schools no WC ->	2729	Pupils
		0 Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS		0 Regional Hospitals ->	0	Beds
		0 District Hospitals ->	0	Beds
		0 Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS		0 High Class Hotels ->	0	Beds
		0 Medium Class Hotels ->	0	Beds
		0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	0	No.
BARS	:	=	27	No.
SHOPS	:	=	42	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kiguchua DIVISION : Tigania
LOCATION : Mikinduri DISTRICT : Meru

POPULATION : 12482 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	20 % =	2496	No.	60	149760
		Medium :	0 % =	0	No.	50	0
		Low :	0 % =	0	No.	40	0
	with NC,	High :	80 % =	9985	No.	20	199700
		Medium :	0 % =	0	No.	15	0
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						349460
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	896	No.	50	44800
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2729	No.	5	13645
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	27	No.	500	13500
SHOPS			=	42	No.	100	4200
			TOTAL DEMAND (l/day)				425605

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mituntu

LOCATION : Mituntu
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 18500 mN Long. = 356000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 353 (km²)			
CLASSIFICATION	Rural Area :	High Potential =	5	% population
		Medium Potential =	15	% population
		Low Potential =	80	% population
	Urban Area :	High Class Housing =	0	% population
		Medium Class Housing =	0	% population
		Low Class Housing =	0	% population
POPULATION	: 1979 (census) =		5949	No.
	1988 (estimated) =		8593	No.
LIVESTOCK	: Grade cow =		599	No.
	Indigenous cow =		2398	No.
	Sheep/goats =		1669	No.
	Donkey =		76	No.
	Camel =		0	No.
SCHOOLS	0 Day Schools with WC ->		0	Pupils
	10 Day Schools no WC ->		2646	Pupils
	0 Boarding Schools ->		0	Pupils
HEALTH CENTRES/DISPENSARIES	=		0	No.
HOSPITALS	0 Regional Hospitals ->		0	Beds
	0 District Hospitals ->		0	Beds
	0 Other Hospitals ->		0	Beds
	Outpatients/day =		0	No.
HOTELS	0 High Class Hotels ->		0	Beds
	0 Medium Class Hotels ->		0	Beds
	0 Low Class Hotels ->		0	Beds
ADMINISTRATION OFFICES	: Staff =		2	No.
BARS	: =		18	No.
SHOPS	: =		0	No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mituntu DIVISION : Tigania
LOCATION : Mituntu DISTRICT : Meru

POPULATION : 8593 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 5 % population
Medium Potential = 15 % population
Low Potential = 80 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 7 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	1 % =	85	No.	60	5100
		Medium :	2 % =	171	No.	50	8550
		Low :	4 % =	343	No.	40	13720
	with NC,	High :	4 % =	343	No.	20	6860
		Medium :	13 % =	1117	No.	15	16755
		Low :	76 % =	6530	No.	10	65300
	Total Demand for RURAL population						116285
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1540	No.	50	77000
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2646	No.	5	13230
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	2	No.	25	50
BARS			=	18	No.	500	9000
SHOPS			=	0	No.	100	0
			TOTAL DEMAND (l/day)				215565

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Athanja

LOCATION : Muthara
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 26000 mN Long. = 360000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	6 (km²)	
CLASSIFICATION	Rural Area : High Potential	=	40 % population
	Medium Potential	=	10 % population
	Low Potential	=	50 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	6722 No.
	1988 (estimated)	=	9709 No.
LIVESTOCK	: Grade cow	=	6847 No.
	Indigenous cow	=	27387 No.
	Sheep/goats	=	14136 No.
	Donkey	=	507 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	10 Day Schools no WC ->		3644 Pupils
	0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day	=	0 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff	=	0 No.
BARS	:	=	0 No.
SHOPS	:	=	0 No.
INDUSTRIES	No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Athanja DIVISION : Tigania
LOCATION : Muthara DISTRICT : Meru

POPULATION : 9709 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 40 % population
Medium Potential = 10 % population
Low Potential = 50 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 12 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	8 % =	776	No.	60	46560
		Medium :	1 % =	97	No.	50	4850
		Low :	3 % =	291	No.	40	11640
	with NC,	High :	32 % =	3106	No.	20	62120
		Medium :	9 % =	873	No.	15	13095
		Low :	47 % =	4563	No.	10	45630
	Total Demand for RURAL population						183895
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	17121	No.	50	856050
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			3644	No.	5	18220
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES		Staff =		0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
	TOTAL DEMAND (l/day)						1058165

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Athinga

LOCATION : Muthara
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 24000 mN Long. = 365200 mE

TYPE = 1

1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	17 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	30 % population
		Medium Potential	=	10 % population
		Low Potential	=	60 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	4575 No.
		1988 (estimated)	=	6608 No.
LIVESTOCK	:	Grade cow	=	3063 No.
		Indigenous cow	=	12252 No.
		Sheep/goats	=	6324 No.
		Donkey	=	227 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		6 Day Schools no WC ->		1379 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	8 No.
SHOPS	:		=	35 No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Athinga DIVISION : Tigania
LOCATION : Muthara DISTRICT : Meru

POPULATION : 6608 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 30 % population
Medium Potential = 10 % population
Low Potential = 60 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 10 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	6 % =	396	No.	60	23760
		Medium :	1 % =	66	No.	50	3300
		Low :	3 % =	198	No.	40	7920
	with NC,	High :	24 % =	1585	No.	20	31700
		Medium :	9 % =	594	No.	15	8910
		Low :	57 % =	3766	No.	10	37660
	Total Demand for RURAL population						113250
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	7659	No.	50	382950
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1379	No.	5	6895
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	8	No.	500	4000
SHOPS			=	35	No.	100	3500
		TOTAL DEMAND (l/day)					510595

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kitharene

LOCATION : Muthara
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 21600 mN Long. = 368800 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 33 (km²)		
CLASSIFICATION	Rural Area : High Potential	=	50 % population
	Medium Potential	=	10 % population
	Low Potential	=	40 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	6685 No.
	1988 (estimated)	=	9656 No.
LIVESTOCK	: Grade cow	=	1001 No.
	Indigenous cow	=	4003 No.
	Sheep/goats	=	5935 No.
	Donkey	=	112 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	2 Day Schools no WC ->		612 Pupils
	0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		0 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff =		0 No.
BARS	:	=	7 No.
SHOPS	:	=	53 No.
INDUSTRIES	No		

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kitharene DIVISION : Tigania
LOCATION : Muthara DISTRICT : Meru

POPULATION : 9656 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 50 % population
Medium Potential = 10 % population
Low Potential = 40 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 13 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC, High :	10 % =	965	No.		60	57900
	Medium :	1 % =	96	No.		50	4800
	Low :	2 % =	193	No.		40	7720
	with NC, High :	40 % =	3862	No.		20	77240
	Medium :	9 % =	869	No.		15	13035
	Low :	38 % =	3669	No.		10	36690
	Total Demand for RURAL population						197385
URBAN POPULATION	with IC, High :	0 % =	0	No.		250	0
	Medium :	0 % =	0	No.		150	0
	Low :	0 % =	0	No.		75	0
	with NC, Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population						0
LIVESTOCK	(L.U.) =		2775	No.		50	138750
SCHOOLS	Day Schools with WC -> Pupils =		0	No.		25	0
	Day Schools no WC -> Pupils =		612	No.		5	3060
	Boarding Schools -> Pupils =		0	No.		50	0
HEALTH	Health Centres\Dispensaries =		0	No.		5000	0
	Regional Hospitals -> Beds =		0	No.		400	0
	District Hospitals -> Beds =		0	No.		200	0
	Other Hospitals -> Beds =		0	No.		100	0
	All Hospitals Outpatients =		0	No.		20	0
HOTELS	High Class Hotels -> Beds =		0	No.		600	0
	Medium Class Hotels -> Beds =		0	No.		300	0
	Low Class Hotels -> Beds =		0	No.		50	0
ADMINISTRATIVE OFFICES	Staff =		0	No.		25	0
BARS	=		7	No.		500	3500
SHOPS	=		53	No.		100	5300
	TOTAL DEMAND (l/day)						347995

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Ankamia

LOCATION : Thangatha
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 15000 mN Long. = 375000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA Total = 27 (km²)

CLASSIFICATION	Rural Area	: High Potential	=	40 % population
		Medium Potential	=	60 % population
		Low Potential	=	0 % population
	Urban Area	: High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION		: 1979 (census)	=	8518 No.
		1988 (estimated)	=	12303 No.
LIVESTOCK		: Grade cow	=	465 No.
		Indigenous cow	=	1859 No.
		Sheep/goats	=	2479 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		10 Day Schools no WC ->		3214 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES		: Staff	=	23 No.
BARS		:	=	31 No.
SHOPS		:	=	41 No.
INDUSTRIES		No		

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Ankamia DIVISION : Tigania
LOCATION : Thangatha DISTRICT : Meru

POPULATION : 12303 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 40 % population
Medium Potential = 60 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 14 % Urban Area = 0 %

DEMAND CALCULATION							RATE	DEMAND
RURAL POPULATION	with IC,	High :	8 % =	984	No.		60	59040
		Medium :	6 % =	738	No.		50	36900
		Low :	0 % =	0	No.		40	0
	with NC,	High :	32 % =	3936	No.		20	78720
		Medium :	54 % =	6643	No.		15	99645
		Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population							274305
URBAN POPULATION	with IC,	High :	0 % =	0	No.		250	0
		Medium :	0 % =	0	No.		150	0
		Low :	0 % =	0	No.		75	0
	with NC,	Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population							0
LIVESTOCK			(L.U.) =	1249	No.		50	62450
SCHOOLS	Day Schools with WC -> Pupils =			0	No.		25	0
	Day Schools no WC -> Pupils =			3214	No.		5	16070
	Boarding Schools -> Pupils =			0	No.		50	0
HEALTH	Health Centres\Dispensaries =			0	No.		5000	0
	Regional Hospitals -> Beds =			0	No.		400	0
	District Hospitals -> Beds =			0	No.		200	0
	Other Hospitals -> Beds =			0	No.		100	0
	All Hospitals Outpatients =			0	No.		20	0
HOTELS	High Class Hotels -> Beds =			0	No.		600	0
	Medium Class Hotels -> Beds =			0	No.		300	0
	Low Class Hotels -> Beds =			0	No.		50	0
ADMINISTRATIVE OFFICES			Staff =	23	No.		25	575
BARS			=	31	No.		500	15500
SHOPS			=	41	No.		100	4100
TOTAL DEMAND (l/day)								373000

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Giithu

LOCATION : Thangatha
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 13500 mN Long. = 381000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	24 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	0 % population
		Medium Potential	=	100 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	3209 No.
		1988 (estimated)	=	4635 No.
LIVESTOCK	:	Grade cow	=	156 No.
		Indigenous cow	=	623 No.
		Sheep/goats	=	2434 No.
		Donkey	=	0 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		3 Day Schools no WC ->		1454 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		26 No.
BARS	:		=	19 No.
SHOPS	:		=	27 No.
INDUSTRIES	No			

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Giithu DIVISION : Tigania
LOCATION : Thangatha DISTRICT : Meru

POPULATION : 4635 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 100 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 10 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	10 % =	463	No.	50	23150
		Low :	0 % =	0	No.	40	0
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	90 % =	4171	No.	15	62565
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						85715
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	525	No.	50	26250
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1454	No.	5	7270
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	26	No.	25	650
BARS			=	19	No.	500	9500
SHOPS			=	27	No.	100	2700
TOTAL DEMAND (l/day)							132085

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Igarii

LOCATION : Thangatha
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 10300 mN Long. = 382600 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 37 (km²)		
CLASSIFICATION	Rural Area : High Potential	=	0 % population
	Medium Potential	=	0 % population
	Low Potential	=	100 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	1993 No.
	1988 (estimated)	=	2879 No.
LIVESTOCK	: Grade cow	=	603 No.
	Indigenous cow	=	2414 No.
	Sheep/goats	=	3117 No.
	Donkey	=	18 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	1 Day Schools no WC ->		252 Pupils
	0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		0 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff	=	27 No.
BARS	:	=	10 No.
SHOPS	:	=	37 No.
INDUSTRIES	No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Igarii DIVISION : Tigania
LOCATION : Thangatha DISTRICT : Meru

POPULATION : 2879 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 0 % population
Low Potential = 100 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 5 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC, High :	0 % =	0	No.		60	0
	Medium :	0 % =	0	No.		50	0
	Low :	5 % =	143	No.		40	5720
	with NC, High :	0 % =	0	No.		20	0
	Medium :	0 % =	0	No.		15	0
	Low :	95 % =	2735	No.		10	27350
	Total Demand for RURAL population						33070
URBAN POPULATION	with IC, High :	0 % =	0	No.		250	0
	Medium :	0 % =	0	No.		150	0
	Low :	0 % =	0	No.		75	0
	with NC, Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population						0
LIVESTOCK	(L.U.) =		1622	No.		50	81100
SCHOOLS	Day Schools with WC -> Pupils =		0	No.		25	0
	Day Schools no WC -> Pupils =		252	No.		5	1260
	Boarding Schools -> Pupils =		0	No.		50	0
HEALTH	Health Centres\Dispensaries =		0	No.		5000	0
	Regional Hospitals -> Beds =		0	No.		400	0
	District Hospitals -> Beds =		0	No.		200	0
	Other Hospitals -> Beds =		0	No.		100	0
	All Hospitals Outpatients =		0	No.		20	0
HOTELS	High Class Hotels -> Beds =		0	No.		600	0
	Medium Class Hotels -> Beds =		0	No.		300	0
	Low Class Hotels -> Beds =		0	No.		50	0
ADMINISTRATIVE OFFICES	Staff =		27	No.		25	675
BARS	=		10	No.		500	5000
SHOPS	=		37	No.		100	3700
	TOTAL DEMAND (l/day)						124805

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kunati

LOCATION : Thangatha
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 11200 mN Long. = 379800 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	60 (km²)		
CLASSIFICATION	Rural Area :	High Potential	= 0	% population
		Medium Potential	= 100	% population
		Low Potential	= 0	% population
	Urban Area :	High Class Housing	= 0	% population
		Medium Class Housing	= 0	% population
		Low Class Housing	= 0	% population
POPULATION	:	1979 (census)	= 4386	No.
		1988 (estimated)	= 6335	No.
LIVESTOCK	:	Grade cow	= 233	No.
		Indigenous cow	= 934	No.
		Sheep/goats	= 4180	No.
		Donkey	= 55	No.
		Camel	= 0	No.
SCHOOLS	0	Day Schools with WC ->	0	Pupils
	5	Day Schools no WC ->	1731	Pupils
	0	Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES			= 0	No.
HOSPITALS	0	Regional Hospitals ->	0	Beds
	0	District Hospitals ->	0	Beds
	0	Other Hospitals ->	0	Beds
		Outpatients/day =	0	No.
HOTELS	0	High Class Hotels ->	0	Beds
	1	Medium Class Hotels ->	0	Beds
	0	Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	:	Staff =	8	No.
BARS	:	=	20	No.
SHOPS	:	=	67	No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kunati DIVISION : Tigania
LOCATION : Thangatha DISTRICT : Meru

POPULATION : 6335 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 100 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 10 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	10 % =	633	No.	50	31650
		Low :	0 % =	0	No.	40	0
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	90 % =	5701	No.	15	85515
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						117165
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	845	No.	50	42250
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1731	No.	5	8655
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	8	No.	25	200
BARS			=	20	No.	500	10000
SHOPS			=	67	No.	100	6700
			TOTAL DEMAND (l/day)				184970

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Nkomo

LOCATION : Uringu
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 15000 mN Long. = 359000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 40 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	80 % population
		Medium Potential	=	20 % population
		Low Potential	=	0 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	: 1979 (census)		=	5822 No.
	1988 (estimated)		=	8409 No.
LIVESTOCK	: Grade cow		=	438 No.
	Indigenous cow		=	1752 No.
	Sheep/goats		=	1690 No.
	Donkey		=	50 No.
	Camel		=	63 No.
SCHOOLS	0 Day Schools with WC ->			0 Pupils
	10 Day Schools no WC ->			2873 Pupils
	0 Boarding Schools ->			0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS	0 Regional Hospitals ->			0 Beds
	0 District Hospitals ->			0 Beds
	0 Other Hospitals ->			0 Beds
	Outpatients/day =			225 No.
HOTELS	0 High Class Hotels ->			0 Beds
	0 Medium Class Hotels ->			0 Beds
	0 Low Class Hotels ->			0 Beds
ADMINISTRATION OFFICES	:	Staff	=	40 No.
BARS	:		=	26 No.
SHOPS	:		=	119 No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Nkomo DIVISION : Tigania
LOCATION : Uringu DISTRICT : Meru

POPULATION : 8409 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 80 % population
Medium Potential = 20 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 18 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	16 % =	1345	No.	60	80700
		Medium :	2 % =	168	No.	50	8400
		Low :	0 % =	0	No.	40	0
	with NC,	High :	64 % =	5381	No.	20	107620
		Medium :	18 % =	1513	No.	15	22695
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						219415
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1186	No.	50	59300
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2873	No.	5	14365
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			225	No.	20	4500
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	40	No.	25	1000
BARS			=	26	No.	500	13000
SHOPS			=	119	No.	100	11900
TOTAL DEMAND (l/day)							328480

MINISTRY OF WATER DEVELOPMENT

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Uringu

LOCATION : Uringu
DIVISION : Tigania

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 13000 mN Long. = 362500 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 28 (km²)		
CLASSIFICATION	Rural Area : High Potential	=	100 % population
	Medium Potential	=	0 % population
	Low Potential	=	0 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	5505 No.
	1988 (estimated)	=	7951 No.
LIVESTOCK	: Grade cow	=	369 No.
	Indigenous cow	=	1474 No.
	Sheep/goats	=	1345 No.
	Donkey	=	27 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	10 Day Schools no WC ->		2006 Pupils
	0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		0 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff =		15 No.
BARS	:	=	5 No.
SHOPS	:	=	105 No.
INDUSTRIES	No		

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WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Uringu DIVISION : Tigania
LOCATION : Uringu DISTRICT : Meru

POPULATION : 7951 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC, High :	20 % =	1590	No.		60	95400
	Medium :	0 % =	0	No.		50	0
	Low :	0 % =	0	No.		40	0
	with NC, High :	80 % =	6360	No.		20	127200
	Medium :	0 % =	0	No.		15	0
	Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population						222600
URBAN POPULATION	with IC, High :	0 % =	0	No.		250	0
	Medium :	0 % =	0	No.		150	0
	Low :	0 % =	0	No.		75	0
	with NC, Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population						0
LIVESTOCK		(L.U.) =	960	No.		50	48000
SCHOOLS	Day Schools with WC -> Pupils =		0	No.		25	0
	Day Schools no WC -> Pupils =		2006	No.		5	10030
	Boarding Schools -> Pupils =		0	No.		50	0
HEALTH	Health Centres\Dispensaries =		0	No.		5000	0
	Regional Hospitals -> Beds =		0	No.		400	0
	District Hospitals -> Beds =		0	No.		200	0
	Other Hospitals -> Beds =		0	No.		100	0
	All Hospitals Outpatients =		0	No.		20	0
HOTELS	High Class Hotels -> Beds =		0	No.		600	0
	Medium Class Hotels -> Beds =		0	No.		300	0
	Low Class Hotels -> Beds =		0	No.		50	0
ADMINISTRATIVE OFFICES	Staff =		15	No.		25	375
BARS		=	5	No.		500	2500
SHOPS		=	105	No.		100	10500
	TOTAL DEMAND (l/day)						294005

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Kithithina

LOCATION : Kirimara
DIVISION : Timau

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 4000 mN Long. = 312000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total =	49 (km²)		
CLASSIFICATION	Rural Area :	High Potential	=	10 % population
		Medium Potential	=	50 % population
		Low Potential	=	40 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	:	1979 (census)	=	2040 No.
		1988 (estimated)	=	2946 No.
LIVESTOCK	:	Grade cow	=	417 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	4170 No.
		Donkey	=	16 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		3 Day Schools no WC ->		1192 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		21 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	:	Staff =		0 No.
BARS	:	=		0 No.
SHOPS	:	=		0 No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Kithithina DIVISION : Timau
LOCATION : Kirimara DISTRICT : Meru

POPULATION : 2946 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 10 % population
Medium Potential = 50 % population
Low Potential = 40 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 9 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	2 % =	58	No.	60	3480
		Medium :	5 % =	147	No.	50	7350
		Low :	2 % =	58	No.	40	2320
	with NC,	High :	8 % =	235	No.	20	4700
		Medium :	45 % =	1325	No.	15	19875
		Low :	38 % =	1119	No.	10	11190
	Total Demand for RURAL population						48915
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	701	No.	50	35050
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			1192	No.	5	5960
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			21	No.	20	420
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	0	No.	500	0
SHOPS			=	0	No.	100	0
TOTAL DEMAND (l/day)							95345

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WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Ngushishi

LOCATION : Kirimara
DIVISION : Timau

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 10000 mN Long. = 310000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 124 (km²)			
CLASSIFICATION	Rural Area :	High Potential	=	10 % population
		Medium Potential	=	40 % population
		Low Potential	=	50 % population
	Urban Area :	High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION	: 1979 (census)		=	5190 No.
	1988 (estimated)		=	7497 No.
LIVESTOCK	: Grade cow		=	1055 No.
	Indigenous cow		=	0 No.
	Sheep/goats		=	10553 No.
	Donkey		=	40 No.
	Camel		=	0 No.
SCHOOLS	0 Day Schools with WC ->			0 Pupils
	4 Day Schools no WC ->			1493 Pupils
	0 Boarding Schools ->			0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS	0 Regional Hospitals ->			0 Beds
	0 District Hospitals ->			0 Beds
	0 Other Hospitals ->			0 Beds
	Outpatients/day =			593 No.
HOTELS	0 High Class Hotels ->			0 Beds
	0 Medium Class Hotels ->			0 Beds
	0 Low Class Hotels ->			0 Beds
ADMINISTRATION OFFICES	:	Staff	=	0 No.
BARS	:		=	0 No.
SHOPS	:		=	0 No.
INDUSTRIES	No			

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Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Ngushishi DIVISION : Timau
LOCATION : Kirimara DISTRICT : Meru

POPULATION : 7497 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 10 % population
Medium Potential = 40 % population
Low Potential = 50 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 9 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC, High :	2 % =	149	No.		60	8940
	Medium :	4 % =	299	No.		50	14950
	Low :	3 % =	224	No.		40	8960
	with NC, High :	8 % =	599	No.		20	11980
	Medium :	36 % =	2698	No.		15	40470
	Low :	47 % =	3523	No.		10	35230
	Total Demand for RURAL population						120530
URBAN POPULATION	with IC, High :	0 % =	0	No.		250	0
	Medium :	0 % =	0	No.		150	0
	Low :	0 % =	0	No.		75	0
	with NC, Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population						0
LIVESTOCK	(L.U.) =		1774	No.		50	88700
SCHOOLS	Day Schools with WC -> Pupils =		0	No.		25	0
	Day Schools no WC -> Pupils =		1493	No.		5	7465
	Boarding Schools -> Pupils =		0	No.		50	0
HEALTH	Health Centres\Dispensaries =		1	No.		5000	5000
	Regional Hospitals -> Beds =		0	No.		400	0
	District Hospitals -> Beds =		0	No.		200	0
	Other Hospitals -> Beds =		0	No.		100	0
	All Hospitals Outpatients =		593	No.		20	11860
HOTELS	High Class Hotels -> Beds =		0	No.		600	0
	Medium Class Hotels -> Beds =		0	No.		300	0
	Low Class Hotels -> Beds =		0	No.		50	0
ADMINISTRATIVE OFFICES	Staff =		0	No.		25	0
BARS	=		0	No.		500	0
SHOPS	=		0	No.		100	0
	TOTAL DEMAND (l/day)						233555

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Buuri

LOCATION : Kisima
DIVISION : Timau

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 24000 mN Long. = 313000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 141 (km²)		
CLASSIFICATION	Rural Area : High Potential	= 100 %	population
	Medium Potential	= 0 %	population
	Low Potential	= 0 %	population
	Urban Area : High Class Housing	= 0 %	population
	Medium Class Housing	= 0 %	population
	Low Class Housing	= 0 %	population
POPULATION	: 1979 (census)	= 2984	No.
	1988 (estimated)	= 4310	No.
LIVESTOCK	: Grade cow	= 1200	No.
	Indigenous cow	= 0	No.
	Sheep/goats	= 12000	No.
	Donkey	= 45	No.
	Camel	= 0	No.
SCHOOLS	0 Day Schools with WC ->	0	Pupils
	1 Day Schools no WC ->	282	Pupils
	0 Boarding Schools ->	0	Pupils
HEALTH CENTRES/DISPENSARIES	=	0	No.
HOSPITALS	0 Regional Hospitals ->	0	Beds
	0 District Hospitals ->	0	Beds
	0 Other Hospitals ->	0	Beds
	Outpatients/day =	0	No.
HOTELS	0 High Class Hotels ->	0	Beds
	0 Medium Class Hotels ->	0	Beds
	0 Low Class Hotels ->	0	Beds
ADMINISTRATION OFFICES	: Staff =	4	No.
BARS	: =	9	No.
SHOPS	: =	109	No.
INDUSTRIES	No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Buuri DIVISION : Timau
LOCATION : Kisima DISTRICT : Meru

POPULATION : 4310 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 100 % population
Medium Potential = 0 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 20 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC, High :	20 % =	862	No.		60	51720
	Medium :	0 % =	0	No.		50	0
	Low :	0 % =	0	No.		40	0
	with NC, High :	80 % =	3448	No.		20	68960
	Medium :	0 % =	0	No.		15	0
	Low :	0 % =	0	No.		10	0
	Total Demand for RURAL population						120680
URBAN POPULATION	with IC, High :	0 % =	0	No.		250	0
	Medium :	0 % =	0	No.		150	0
	Low :	0 % =	0	No.		75	0
	with NC, Low :	0 % =	0	No.		20	0
	Total Demand for URBAN population						0
LIVESTOCK	(L.U.) =		2018	No.		50	100900
SCHOOLS	Day Schools with WC -> Pupils =		0	No.		25	0
	Day Schools no WC -> Pupils =		282	No.		5	1410
	Boarding Schools -> Pupils =		0	No.		50	0
HEALTH	Health Centres\Dispensaries =		0	No.		5000	0
	Regional Hospitals -> Beds =		0	No.		400	0
	District Hospitals -> Beds =		0	No.		200	0
	Other Hospitals -> Beds =		0	No.		100	0
	All Hospitals Outpatients =		0	No.		20	0
HOTELS	High Class Hotels -> Beds =		0	No.		600	0
	Medium Class Hotels -> Beds =		0	No.		300	0
	Low Class Hotels -> Beds =		0	No.		50	0
ADMINISTRATIVE OFFICES	Staff =		4	No.		25	100
BARS	=		9	No.		500	4500
SHOPS	=		109	No.		100	10900
	TOTAL DEMAND (l/day)						238490

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Mutunyi

LOCATION : Kisima
DIVISION : Timau

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 24000 mN Long. = 336000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 113 (km²)		
CLASSIFICATION	Rural Area : High Potential	=	0 % population
	Medium Potential	=	30 % population
	Low Potential	=	70 % population
	Urban Area : High Class Housing	=	0 % population
	Medium Class Housing	=	0 % population
	Low Class Housing	=	0 % population
POPULATION	: 1979 (census)	=	2374 No.
	1988 (estimated)	=	3429 No.
LIVESTOCK	: Grade cow	=	7667 No.
	Indigenous cow	=	0 No.
	Sheep/goats	=	11472 No.
	Donkey	=	70 No.
	Camel	=	0 No.
SCHOOLS	0 Day Schools with WC ->		0 Pupils
	4 Day Schools no WC ->		983 Pupils
	0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES		=	0 No.
HOSPITALS	0 Regional Hospitals ->		0 Beds
	0 District Hospitals ->		0 Beds
	0 Other Hospitals ->		0 Beds
	Outpatients/day =		0 No.
HOTELS	0 High Class Hotels ->		0 Beds
	0 Medium Class Hotels ->		0 Beds
	0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES	: Staff	=	3 No.
BARS	:	=	1 No.
SHOPS	:	=	5 No.
INDUSTRIES		->	1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Mutunyi DIVISION : Timau
LOCATION : Kisima DISTRICT : Meru

POPULATION : 3429 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 30 % population
Low Potential = 70 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 7 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	3 % =	102	No.	50	5100
		Low :	4 % =	137	No.	40	5480
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	27 % =	925	No.	15	13875
		Low :	66 % =	2263	No.	10	22630
	Total Demand for RURAL population						47085
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	8459	No.	50	422950
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			983	No.	5	4915
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	3	No.	25	75
BARS			=	1	No.	500	500
SHOPS			=	5	No.	100	500
INDUSTRIES			=	1	ha.	20000	20000
	TOTAL DEMAND (l/day)						496025

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Ngare Ndare

LOCATION : Kisima
DIVISION : Timau

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 24500 mN Long. = 313500 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA	Total = 127 (km²)			
CLASSIFICATION	Rural Area	: High Potential	=	0 % population
		Medium Potential	=	20 % population
		Low Potential	=	80 % population
	Urban Area	: High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION		: 1979 (census)	=	2687 No.
		1988 (estimated)	=	3881 No.
LIVESTOCK		: Grade cow	=	1567 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	4867 No.
		Donkey	=	7 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		1 Day Schools no WC ->		281 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	0 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		0 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES		: Staff	=	6 No.
BARS		:	=	4 No.
SHOPS		:	=	12 No.
INDUSTRIES		No		

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Ngare Ndare DIVISION : Timau
LOCATION : Kisima DISTRICT : Meru

POPULATION : 3881 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION : High Potential = 0 % population
Medium Potential = 20 % population
Low Potential = 80 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 6 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	0 % =	0	No.	60	0
		Medium :	2 % =	77	No.	50	3850
		Low :	4 % =	155	No.	40	6200
	with NC,	High :	0 % =	0	No.	20	0
		Medium :	18 % =	698	No.	15	10470
		Low :	76 % =	2949	No.	10	29490
	Total Demand for RURAL population						50010
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	1894	No.	50	94700
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			281	No.	5	1405
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			0	No.	5000	0
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			0	No.	20	0
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	6	No.	25	150
BARS			=	4	No.	500	2000
SHOPS			=	12	No.	100	1200
TOTAL DEMAND (l/day)							149465

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DATA (1988)

SUB-LOCATION : Ontulili

LOCATION : Ontulili
DIVISION : Timau

DISTRICT : Meru PROVINCE : Eastern

COORDINATES (main Centre) UTM-grid = 37N
Lat. = 4000 mN Long. = 293000 mE

TYPE = 1
1 = Rural
2 = Market or Local Centre < 2000 population
3 = Rural Centre > 2000 population
4 = Urban Centre > 5000 population

AREA Total = 207 (km²)

CLASSIFICATION	Rural Area	: High Potential	=	80 % population
		Medium Potential	=	20 % population
		Low Potential	=	0 % population
	Urban Area	: High Class Housing	=	0 % population
		Medium Class Housing	=	0 % population
		Low Class Housing	=	0 % population
POPULATION		: 1979 (census)	=	8114 No.
		1988 (estimated)	=	11720 No.
LIVESTOCK		: Grade cow	=	2553 No.
		Indigenous cow	=	0 No.
		Sheep/goats	=	1075 No.
		Donkey	=	17 No.
		Camel	=	0 No.
SCHOOLS		0 Day Schools with WC ->		0 Pupils
		6 Day Schools no WC ->		2488 Pupils
		0 Boarding Schools ->		0 Pupils
HEALTH CENTRES/DISPENSARIES			=	1 No.
HOSPITALS		0 Regional Hospitals ->		0 Beds
		0 District Hospitals ->		0 Beds
		0 Other Hospitals ->		0 Beds
		Outpatients/day =		25 No.
HOTELS		0 High Class Hotels ->		0 Beds
		0 Medium Class Hotels ->		0 Beds
		0 Low Class Hotels ->		0 Beds
ADMINISTRATION OFFICES		: Staff	=	0 No.
BARS		:	=	6 No.
SHOPS		:	=	19 No.
INDUSTRIES			->	1 ha.

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MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

WATER DEVELOPMENT PLANNING - BASE YEAR DEMAND (1988)

SUB-LOCATION : Ontulili DIVISION : Timau
LOCATION : Ontulili DISTRICT : Meru

POPULATION : 11720 Rural Pop. = 100 % Urban Pop. = 0 %

CLASSIFICATION :
High Potential = 80 % population
Medium Potential = 20 % population
Low Potential = 0 % population
High Class Housing = 0 % population
Medium Class Housing = 0 % population
Low Class Housing = 0 % population

ASSESSMENT OF IC-POTENTIAL : Rural Area = 18 % Urban Area = 0 %

DEMAND CALCULATION						RATE	DEMAND
RURAL POPULATION	with IC,	High :	16 % =	1875	No.	60	112500
		Medium :	2 % =	234	No.	50	11700
		Low :	0 % =	0	No.	40	0
	with NC,	High :	64 % =	7500	No.	20	150000
		Medium :	18 % =	2109	No.	15	31635
		Low :	0 % =	0	No.	10	0
	Total Demand for RURAL population						305835
URBAN POPULATION	with IC,	High :	0 % =	0	No.	250	0
		Medium :	0 % =	0	No.	150	0
		Low :	0 % =	0	No.	75	0
	with NC,	Low :	0 % =	0	No.	20	0
	Total Demand for URBAN population						0
LIVESTOCK			(L.U.) =	2631	No.	50	131550
SCHOOLS	Day Schools with WC -> Pupils =			0	No.	25	0
	Day Schools no WC -> Pupils =			2488	No.	5	12440
	Boarding Schools -> Pupils =			0	No.	50	0
HEALTH	Health Centres\Dispensaries =			1	No.	5000	5000
	Regional Hospitals -> Beds =			0	No.	400	0
	District Hospitals -> Beds =			0	No.	200	0
	Other Hospitals -> Beds =			0	No.	100	0
	All Hospitals Outpatients =			25	No.	20	500
HOTELS	High Class Hotels -> Beds =			0	No.	600	0
	Medium Class Hotels -> Beds =			0	No.	300	0
	Low Class Hotels -> Beds =			0	No.	50	0
ADMINISTRATIVE OFFICES			Staff =	0	No.	25	0
BARS			=	6	No.	500	3000
SHOPS			=	19	No.	100	1900
INDUSTRIES			=	1	ha.	20000	20000
TOTAL DEMAND (l/day)							480225

APPENDIX 4

DEMAND SUMMARIES

DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: CENTRAL IMENTI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abothuguchi	Githongo	420915	341115	79800	240140	0	79800	69650	15400	0	15925
	Katheri	791260	539760	251500	474320	0	251500	52740	0	0	12700
	Kithirune	518680	341630	177050	301700	0	177050	28555	0	0	11375
	Total (l/day):	1730855	1222505	508350	1016160	0	508350	150945	15400	0	40000
Gatimbi	Kariene	541165	479815	61350	407960	0	61350	42255	11000	0	18600
	Mariene	328105	239205	88900	202880	0	88900	30025	0	0	6300
	Ruiga	353795	315295	38500	297240	0	38500	16530	0	0	1525
	Total (l/day):	1223065	1034315	188750	908080	0	188750	88810	11000	0	26425
Kibirichia	Kiamiogo	311090	221140	89950	193655	0	89950	6485	0	0	21000
	Kimbo	309370	226470	82900	218405	0	82900	5690	0	0	2375
	Mboroga	115275	75325	39950	69545	0	39950	2480	0	0	3300
	Ntumburi	171420	118170	53250	65715	0	53250	49930	0	0	2525
	Total (l/day):	907155	641105	266050	547320	0	266050	64585	0	0	29200
Mwangathia	Gaitu	345325	224125	121200	184675	0	121200	10310	16540	0	12600
	Gitie	322595	194895	127700	163140	0	127700	27755	0	0	4000
	Igane	299065	197515	101550	180745	0	101550	9920	0	0	6850
	Kaongo	315925	218275	97650	185130	0	97650	8045	15600	0	9500
	Kiamuri	200070	105370	94700	94315	0	94700	6080	0	0	4975
	Makandune	136610	76610	60000	63910	0	60000	4725	5400	0	2575
	Total (l/day):	1619590	1016790	602800	871915	0	602800	66835	37540	0	40500
	Division Total (l/day):	5480665	3914715	1565950	3343475	0	1565950	371175	63940	0	136125

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DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: IGEMBE

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akachiu	Amungenti	339720	311020	28700	269310	0	28700	30210	8000	0	3500
	Athiru Gaiti	241520	221870	19650	205305	0	19650	7865	5200	0	3500
	Auki	214935	200885	14050	190980	0	14050	8105	0	0	1800
	Kirindine	366715	301865	64850	272225	0	64850	9360	5380	0	14900
	Total (l/day):	1162890	1035640	127250	937820	0	127250	55540	18580	0	23700
Kangeta	Kangeta	290885	220635	70250	180065	0	70250	13430	8140	0	19000
	Liliaba	283980	133630	150350	102855	0	150350	25975	0	0	4800
	Total (l/day):	574865	354265	220600	282920	0	220600	39405	8140	0	23800
Kiegoi	Kiegoi	322830	298580	24250	285460	0	24250	13120	0	0	0
	Total (l/day):	322830	298580	24250	285460	0	24250	13120	0	0	0
Maua	Amwathi	873360	803560	69800	465355	277830	69800	48675	11700	0	0
	Antubetwe Njoune	217030	180280	36750	162275	0	36750	5005	0	0	13000
	Kanjoo	79945	32495	47450	22915	0	47450	3920	5660	0	0
	Total (l/day):	1170335	1016335	154000	650545	277830	154000	57600	17360	0	13000
Njia	Buri Eruri	514555	473205	41350	420160	0	41350	30745	0	0	22300
	Njia Cia Mwendwa	466765	378465	88300	335720	0	88300	36245	0	0	6500
	Total (l/day):	981320	851670	129650	755880	0	129650	66990	0	0	28800
	Division Total (l/day):	4212240	3556490	655750	2912625	277830	655750	232655	44080	0	89300

DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: NITHI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Chogoria	Chogoria	666400	580750	85650	295960	137485	65650	102605	35000	20000	9700
	Kiraro	179620	124620	55000	108640	0	35000	13180	0	20000	2800
	Murugi	680095	498045	182050	421720	0	162050	57425	11000	20000	7900
	Total (l/day):	1526115	1203415	322700	826320	137485	262700	173210	46000	60000	20400
Kanjuki	Kamaindi	83180	35480	47700	33100	0	47700	2380	0	0	0
	Kanjuki	249480	112230	137250	89205	0	137250	9545	7880	0	5600
	Mutino	108890	88890	20000	71350	0	0	6700	5140	20000	5700
	Total (l/day):	441550	236600	204950	193655	0	184950	18625	13020	20000	11300
Karingani	Chuka Township	356415	345865	10550	81360	203005	10550	0	0	0	61500
	Gitareni	396760	228760	168000	196340	0	148000	23300	5520	20000	3600
	Kiangondu	211960	139860	72100	114260	0	72100	25600	0	0	0
	Kithangani	2269590	76890	2192700	61525	0	2152700	5085	5180	40000	5100
	Mariani	242235	107785	134450	97030	0	134450	5595	5160	0	0
	Mugirirua	460025	296275	163750	253960	0	103750	24355	5160	60000	12800
	Muiru	361890	245240	116650	202320	0	96650	9280	10240	20000	23400
	Ndagani	287430	185530	101900	154390	0	81900	10440	11400	20000	9300
	Total (l/day):	4586305	1626205	2960100	1161185	203005	2800100	103655	42660	160000	115700
Kiera	Iruma	340040	201940	138100	171400	0	118100	12340	10400	20000	7800
	Kirumi	174185	71135	103050	36390	0	103050	11145	10400	0	13200
	Magutuni	589240	369590	219650	319260	0	199650	11430	20600	20000	18300
	Mugumango	412385	347385	65000	302195	0	45000	28390	10000	20000	6800

Continued on next page

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DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: NITHI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kiera	Thigaa	133180	88480	44700	74460	0	44700	3920	10100	0	0
	Total (l/day):	1649030	1078530	570500	903705	0	510500	67225	61500	60000	46100
Magumoni	Itugururu	104785	32335	72450	25080	0	52450	2655	0	20000	4600
	Kamwibi	215885	76885	139000	68000	0	119000	6285	0	20000	2600
	Mukuuni	349625	234725	114900	198075	0	94900	20150	5400	20000	11100
	Thuita	365965	345965	20000	296100	0	0	21705	13260	20000	14900
	Total (l/day):	1036260	689910	346350	587255	0	266350	50795	18660	80000	33200
Muthambi	Chamunga	285280	207880	77400	158900	0	57400	22260	15320	20000	11400
	Gatua	379330	273880	105450	214620	0	85450	26840	15820	20000	16600
	Igamurathi	274285	172135	102150	103660	0	82150	65175	0	20000	3300
	Iriga	272990	141690	131300	111900	0	111300	13090	8200	20000	8500
	Kadungu	174670	102770	71900	68620	0	71900	26230	7920	0	0
	Karimba	328380	218230	110150	166275	0	90150	19475	19380	20000	13100
	Total (l/day):	1714935	1116585	598350	823975	0	498350	173070	66640	100000	52900
Mwonge	Kabuboni	297540	206290	91250	164640	0	71250	23590	12760	20000	5300
	Mwonge	201985	172135	29850	146740	0	9850	20895	0	20000	4500
	Rubate	157860	128810	29050	118950	0	29050	9860	0	0	0
	Total (l/day):	657385	507235	150150	430330	0	110150	54345	12760	40000	9800
	Division Total (l/day):	11611580	6458480	5153100	4926425	340490	4633100	640925	261240	520000	289400

DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: NORTH IMENTI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Giaki	Giaki	476040	228040	248000	198910	0	228000	11645	6360	20000	11125
	Kiburine	283660	102860	180800	90205	0	160800	8105	0	20000	4550
	Total (l/day):	759700	330900	428800	289115	0	388800	19750	6360	40000	15675
Kiirua	Kiirua	276365	178815	97550	115610	0	77550	28905	12800	20000	21500
	Naari	630805	450605	180200	360960	0	180200	33065	6580	0	50000
	Thege	40940	32290	8650	30440	0	8650	750	0	0	1100
	Total (l/day):	948110	661710	286400	507010	0	266400	62720	19380	20000	72600
Ntima	Lower Igoki	561715	516065	45650	283960	214580	45650	17525	0	0	0
	Mpuri	63865	17765	46100	0	0	46100	17765	0	0	0
	Ngonyi	41900	8000	33900	0	0	33900	8000	0	0	0
	Ntakira	843365	768565	74800	393820	346840	74800	27905	0	0	0
	Nthimbiri	345880	265680	80200	259280	0	80200	6400	0	0	0
	Town/Gakoromone	9904430	848330	9056100	0	547175	56100	3275	102980	9000000	194900
	Upper Igoki	1087335	1049185	38150	0	1014175	38150	22590	12420	0	0
	Total (l/day):	12848490	3473590	9374900	937060	2122770	374900	103460	115400	9000000	194900
Nyaki	Chugu	378300	358900	19400	330140	0	19400	28760	0	0	0
	Mulathankari	284455	250105	34350	0	242250	34350	4905	0	0	2950
	Munithu	500605	278905	221700	248680	0	201700	13250	8400	20000	8575
	Nkabune	290660	236260	54400	231000	0	54400	0	5260	0	0
	Thuura	413485	285335	128150	263080	0	128150	12230	0	0	10025
	Total (l/day):	1867505	1409505	458000	1072900	242250	438000	59145	13660	20000	21550

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MINISTRY OF WATER DEVELOPMENT

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DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: NORTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Ruiri	Ruiri	651015	269215	381800	208490	0	361800	28485	11740	20000	20500
	Total (l/day):	651015	269215	381800	208490	0	361800	28485	11740	20000	20500
	Division Total (l/day):	17074820	6144920	10929900	3014575	2365020	1829900	273560	166540	9100000	325225

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

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DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: NTONYIRI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Antubetwe-Kiongo	Antubetwe-Kiongo	610920	307220	303700	256415	0	303700	11830	5300	0	33675
	Total (l/day):	610920	307220	303700	256415	0	303700	11830	5300	0	33675
Athiru-Ruujine	Athiru Ruujine	530875	355575	175300	321005	0	175300	13145	0	0	21425
	Total (l/day):	530875	355575	175300	321005	0	175300	13145	0	0	21425
Ithima	Akirangondu	697005	340855	356150	324065	0	356150	16790	0	0	0
	Antuambui	864480	434980	429500	306415	0	429500	16790	7200	0	104575
	Ntunene	575160	215110	360050	172840	0	340050	8395	10000	20000	23875
	Total (l/day):	2136645	990945	1145700	803320	0	1125700	41975	17200	20000	128450
Mutuati	Amwathi 1	362240	292790	69450	237065	0	69450	12225	0	0	43500
	Amwathi 2	173205	138905	34300	124850	0	34300	8730	0	0	5325
	Naathu	296450	263700	32750	249730	0	32750	13970	0	0	0
	Total (l/day):	831895	695395	136500	611645	0	136500	34925	0	0	48825
	Division Total (l/day):	4110335	2349135	1761200	1992385	0	1741200	101875	22500	20000	232375

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DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: SOUTH IMENTI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abogeta	Upper Githangari	335740	206890	128850	184800	0	108850	13740	0	20000	8350
	Upper Kiungone	446590	301490	145100	265300	0	145100	29490	0	0	6700
	Total (l/day):	782330	508380	273950	450100	0	253950	43230	0	20000	15050
Igoji	Gikui	464065	357265	106800	256585	0	86800	83775	5080	20000	11825
	Karia	390045	288995	101050	258740	0	101050	16655	5600	0	8000
	Total (l/day):	854110	646260	207850	515325	0	187850	100430	10680	20000	19825
Igoki	Kothine	285955	126655	159300	118220	0	159300	8435	0	0	0
	Mwichure	279690	85390	194300	70900	0	194300	7990	6500	0	0
	Upper Chure	385780	197080	188700	159640	0	188700	26515	5600	0	5325
	Total (l/day):	951425	409125	542300	348760	0	542300	42940	12100	0	5325
Kanyakine	Kanyakine	557085	434885	122200	360000	0	102200	52120	8840	20000	13925
	Kiringa	341480	219080	122400	180730	0	122400	31350	0	0	7000
	Total (l/day):	898565	653965	244600	540730	0	224600	83470	8840	20000	20925
Mitine	Kianjogu	293995	205445	88550	98210	0	88550	94835	5400	0	7000
	Kinoro	289650	252850	36800	217160	0	36800	17640	7000	0	11050
	Mweru	288605	221155	67450	195035	0	67450	20420	0	0	5700
	Total (l/day):	872250	679450	192800	510405	0	192800	132895	12400	0	23750

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DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: SOUTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mitunguu	Kirendene	248210	124560	123650	100150	0	103650	8360	0	20000	16050
	Ngonyi	344430	247230	97200	228340	0	97200	14590	0	0	4300
	Total (l/day):	592640	371790	220850	328490	0	200850	22950	0	20000	20350
Nkuene	Kathera	933380	783830	149550	264220	381710	109550	68100	42000	40000	27800
	Kigane	266885	213835	53050	204820	0	53050	6915	0	0	2100
	Mikumbune	360925	260075	100850	208660	0	100850	35535	6580	0	9300
	Uruku	500530	386530	114000	311940	0	114000	51090	14200	0	9300
	Total (l/day):	2061720	1644270	417450	989640	381710	377450	161640	62780	40000	48500
	Division Total (l/day):	7013040	4913240	2099800	3683450	381710	1979800	587555	106800	120000	153725

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DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: THARAKA

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Gikingo	Irunduni	50825	35975	14850	25530	0	14850	10445	0	0	0
	Kanjoro	191610	127510	64100	110245	0	64100	9165	0	0	8100
	Total (l/day):	242435	163485	78950	135775	0	78950	19610	0	0	8100
Marimanti	Kanyuru	256595	104195	152400	96035	0	152400	4460	0	0	3700
	Marimanti	331160	144410	186750	94690	0	186750	35760	5860	0	8100
	Nkondi	428005	195805	232200	169370	0	232200	14335	5700	0	6400
	Turima	177380	84230	93150	67950	0	93150	11380	0	0	4900
	Total (l/day):	1193140	528640	664500	428045	0	664500	65935	11560	0	23100
North Tharaka	Gatue	264970	62170	202800	57720	0	202800	4450	0	0	0
	Gatunga	122495	104445	18050	85540	0	18050	4905	5400	0	8600
	Kathangachini	98485	47235	51250	38775	0	51250	2600	5860	0	0
	Total (l/day):	485950	213850	272100	182035	0	272100	11955	11260	0	8600
South Tharaka	Chiokariga	155755	134805	20950	96420	0	20950	24505	6780	0	7100
	Kamanyaki	96780	78830	17950	66735	0	17950	3695	5400	0	3000
	Tunyai	161090	150390	10700	109905	0	10700	28345	5440	0	6700
	Total (l/day):	413625	364025	49600	273060	0	49600	56545	17620	0	16800
	Division Total (l/day):	2335150	1270000	1065150	1018915	0	1065150	154045	40440	0	56600

DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: TIGANIA **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akithii	Athwana	318175	103625	214550	93280	0	214550	9395	0	0	950
	Kitheo	221870	165370	56500	130430	0	56500	13790	17000	0	4150
	Nchooro	305905	218305	87600	203250	0	87600	8030	0	0	7025
	Thinyaine	246605	110555	136050	94965	0	136050	14265	0	0	1325
	Total (l/day):	1092555	597855	494700	521925	0	494700	45480	17000	0	13450
Karama	Karama	426400	419550	6850	386895	0	6850	12330	0	0	20325
	Total (l/day):	426400	419550	6850	386895	0	6850	12330	0	0	20325
Kianjai	Kianjai	394470	312570	81900	265210	0	81900	20835	0	0	26525
	Miathene	683205	402305	280900	318000	0	280900	52535	21120	0	10650
	Total (l/day):	1077675	714875	362800	583210	0	362800	73370	21120	0	37175
Mbeu	Kiorimba	254115	210815	43300	201465	0	43300	0	0	0	9350
	Mbeu	260425	120875	139550	86315	0	139550	11885	0	0	22675
	Total (l/day):	514540	331690	182850	287780	0	182850	11885	0	0	32025
Mikinduri	Akaiga	256890	197540	59350	186535	0	59350	5505	0	0	5500
	Antuamburi	308570	198370	110200	132270	0	70200	19400	8200	40000	38500
	Athwana	155505	120655	34850	103080	0	34850	10725	0	0	6850
	Kiguchua	425605	380805	44800	349460	0	44800	13645	0	0	17700
	Total (l/day):	1146570	897370	249200	771345	0	209200	49275	8200	40000	68550

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DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: TIGANIA (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mituntu	Mituntu	215565	138565	77000	116285	0	77000	13230	0	0	9050
	Total (l/day):	215565	138565	77000	116285	0	77000	13230	0	0	9050
Muthara	Athanja	1058165	202115	856050	183895	0	856050	18220	0	0	0
	Athinga	510595	127645	382950	113250	0	382950	6895	0	0	7500
	Kitharene	347995	209245	138750	197385	0	138750	3060	0	0	8800
	Total (l/day):	1916755	539005	1377750	494530	0	1377750	28175	0	0	16300
Thangatha	Ankamia	373000	310550	62450	274305	0	62450	16070	0	0	20175
	Giithu	132085	105835	26250	85715	0	26250	7270	0	0	12850
	Igarii	124805	43705	81100	33070	0	81100	1260	0	0	9375
	Kunati	184970	142720	42250	117165	0	42250	8655	0	0	16900
	Total (l/day):	814860	602810	212050	510255	0	212050	33255	0	0	59300
Uringu	Nkomo	328480	269180	59300	219415	0	59300	14365	9500	0	25900
	Uringu	294005	246005	48000	222600	0	48000	10030	0	0	13375
	Total (l/day):	622485	515185	107300	442015	0	107300	24395	9500	0	39275
	Division Total (l/day):	7827405	4756905	3070500	4114240	0	3030500	291395	55820	40000	295450

DISTRICT WATER DEMAND SUMMARY (1988)

DIVISION: TIMAU

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kirimara	Kithithina	95345	60295	35050	48915	0	35050	5960	5420	0	0
	Ngushishi	233555	144855	88700	120530	0	88700	7465	16860	0	0
	Total (l/day):	328900	205150	123750	169445	0	123750	13425	22280	0	0
Kisima	Buuri	238490	137590	100900	120680	0	100900	1410	0	0	15500
	Mutunyi	496025	53075	442950	47085	0	422950	4915	0	20000	1075
	Ngare Ndare	149465	54765	94700	50010	0	94700	1405	0	0	3350
	Total (l/day):	883980	245430	638550	217775	0	618550	7730	0	20000	19925
Ontulili	Ontulili	480225	328675	151550	305835	0	131550	12440	5500	20000	4900
	Total (l/day):	480225	328675	151550	305835	0	131550	12440	5500	20000	4900
	Division Total (l/day):	1693105	779255	913850	693055	0	873850	33595	27780	40000	24825

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: CENTRAL IMENTI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abothuguchi	Githongo	515795	427695	88100	292180	0	88100	96680	16560	0	22275
	Katheri	950005	672355	277650	577080	0	277650	77475	0	0	17800
	Kithirune	620565	425115	195450	367080	0	195450	41935	0	0	16100
	Total (l/day):	2086365	1525165	561200	1236340	0	561200	216090	16560	0	56175
Gatimbi	Kariene	659290	591540	67750	496340	0	67750	56750	12300	0	26150
	Mariene	390630	292480	98150	246840	0	98150	36840	0	0	8800
	Ruiga	429615	387115	42500	361640	0	42500	23250	0	0	2225
	Total (l/day):	1479535	1271135	208400	1104820	0	208400	116840	12300	0	37175
Kibirichia	Kiamiogo	372410	273110	99300	234380	0	99300	9530	0	0	29200
	Kimbo	367040	275540	91500	263755	0	91500	8360	0	0	3425
	Mboroga	136195	92045	44150	83600	0	44150	3645	0	0	4800
	Ntumburi	166700	107850	58850	74055	0	58850	30270	0	0	3525
	Total (l/day):	1042345	748545	293800	655790	0	293800	51805	0	0	40950
Mwangathia	Gaitu	410220	276420	133800	221490	0	133800	15150	21880	0	17900
	Gitie	374520	233520	141000	193535	0	141000	34385	0	0	5600
	Igane	355325	243175	112150	218850	0	112150	14575	0	0	9750
	Kaongo	373010	265210	107800	223470	0	107800	11820	16820	0	13100
	Kiamuri	227990	123440	104550	107605	0	104550	8935	0	0	6900
	Makandune	157820	91570	66250	75345	0	66250	6945	5480	0	3800
	Total (l/day):	1898885	1233335	665550	1040295	0	665550	91810	44180	0	57050
	Division Total (l/day):	6507130	4778180	1728950	4037245	0	1728950	476545	73040	0	191350

DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: IGEMBE **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akachiu	Amungenti	411030	379330	31700	321395	0	31700	44395	8640	0	4900
	Athiru Gaiti	288035	266335	21700	244440	0	21700	11555	5240	0	5100
	Auki	262415	246915	15500	232400	0	15500	11915	0	0	2600
	Kirindine	438080	366480	71600	326465	0	71600	13755	5460	0	20800
	Total (l/day):	1399560	1259060	140500	1124700	0	140500	81620	19340	0	33400
Kangeta	Kangeta	340575	263025	77550	207970	0	77550	19735	8820	0	26500
	Liliaba	323555	157555	166000	120010	0	166000	30945	0	0	6600
	Total (l/day):	664130	420580	243550	327980	0	243550	50680	8820	0	33100
Kiegoi	Kiegoi	393370	366620	26750	347340	0	26750	19280	0	0	0
	Total (l/day):	393370	366620	26750	347340	0	26750	19280	0	0	0
Maua	Amwathi	1120750	1043650	77100	564215	393675	77100	71500	14260	0	0
	Antubetwe Njoune	260585	219985	40600	194530	0	40600	7355	0	0	18100
	Kanjoo	88000	35650	52350	26520	0	52350	3330	5800	0	0
	Total (l/day):	1469335	1299285	170050	785265	393675	170050	82185	20060	0	18100
Njia	Buri Eruri	633255	587655	45600	511180	0	45600	45175	0	0	31300
	Njia Cia Mwendwa	551405	453905	97500	408420	0	97500	36385	0	0	9100
	Total (l/day):	1184660	1041560	143100	919600	0	143100	81560	0	0	40400
	Division Total (l/day):	5111055	4387105	723950	3504885	393675	723950	315325	48220	0	125000

MINISTRY OF WATER DEVELOPMENT

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: NITHI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Chogoria	Chogoria	846655	754155	92500	362220	197135	72500	138420	42580	20000	13800
	Kiraro	213325	154625	58700	132180	0	38700	18445	0	20000	4000
	Murugi	818590	619690	198900	513100	0	178900	84370	11220	20000	11000
	Total (l/day):	1878570	1528470	350100	1007500	197135	290100	241235	53800	60000	28800
Kanjuki	Kamaindi	93550	40850	52700	37355	0	52700	3495	0	0	0
	Kanjuki	286365	134815	151550	104275	0	151550	14040	8500	0	8000
	Mutino	125655	105655	20000	82630	0	0	9845	5180	20000	8000
	Total (l/day):	505570	281320	224250	224260	0	204250	27380	13680	20000	16000
Karingani	Chuka Township	480700	469000	11700	102280	280620	11700	0	0	0	86100
	Gitareni	464400	281000	183400	236040	0	163400	34220	5640	20000	5100
	Kiangondu	239305	159705	79600	139020	0	79600	20685	0	0	0
	Kithangani	2508290	92890	2415400	73105	0	2355400	7465	5220	60000	7100
	Mariani	277140	128690	148450	115270	0	148450	8220	5200	0	0
	Mugirirua	562615	368065	194550	308980	0	114550	35785	5200	80000	18100
	Muiru	429595	302895	126700	246160	0	106700	13635	10300	20000	32800
	Ndagani	337405	226955	110450	186860	0	90450	13355	13940	20000	12800
	Total (l/day):	5299450	2029200	3270250	1407715	280620	3070250	133365	45500	200000	162000
Kiera	Iruma	393640	243190	150450	208600	0	130450	13410	10480	20000	10700
	Kirumi	189900	76150	113750	43875	0	113750	3395	10480	0	18400
	Magutuni	688870	448420	240450	380105	0	220450	16795	25720	20000	25800
	Mugumango	496785	427085	69700	365780	0	49700	41705	10000	20000	9600

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: NITHI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kiera	Thigaa	155450	106100	49350	90220	0	49350	5760	10120	0	0
	Total (l/day):	1924645	1300945	623700	1088580	0	563700	81065	66800	60000	64500
Magumoni	Itugururu	117020	39120	77900	29815	0	57900	2905	0	20000	6400
	Kamwibi	243410	92010	151400	79420	0	131400	9090	0	20000	3500
	Mukuuni	414545	289795	124750	239215	0	104750	29600	5480	20000	15500
	Thuita	447160	427160	20000	360220	0	0	31880	13960	20000	21100
	Total (l/day):	1222135	848085	374050	708670	0	294050	73475	19440	80000	46500
Muthambi	Chamunga	342895	259495	83400	193340	0	63400	32695	17560	20000	15900
	Gatua	452180	337880	114300	261100	0	94300	36500	17080	20000	23200
	Igamurathi	272835	162135	110700	126140	0	90700	31195	0	20000	4800
	Iriga	318520	175620	142900	136140	0	122900	18880	8900	20000	11700
	Kadungu	200525	121125	79400	79430	0	79400	33135	8560	0	0
	Karimba	386790	267240	119550	200380	0	99550	27140	21420	20000	18300
	Total (l/day):	1973745	1323495	650250	996530	0	550250	179545	73520	100000	73900
Mwonge	Kabuboni	350135	251485	98650	200340	0	78650	30385	13360	20000	7400
	Mwonge	242425	211575	30850	178540	0	10850	26735	0	20000	6300
	Rubate	190240	158140	32100	143665	0	32100	14475	0	0	0
	Total (l/day):	782800	621200	161600	522545	0	121600	71595	13360	40000	13700
	Division Total (l/day):	13586915	7932715	5654200	5955800	477755	5094200	807660	286100	560000	405400

DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: NORTH IMENTI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Giaki	Giaki	551615	279865	271750	240720	0	251750	17110	6660	20000	15375
	Kiburine	318365	120865	197500	102555	0	177500	11910	0	20000	6400
	Total (l/day):	869980	400730	469250	343275	0	429250	29020	6660	40000	21775
Kiirua	Kiirua	326585	220985	105600	133915	0	85600	42470	14500	20000	30100
	Naari	763755	564805	198950	439180	0	198950	48605	6920	0	70100
	Thege	49350	39800	9550	37100	0	9550	1100	0	0	1600
	Total (l/day):	1139690	825590	314100	610195	0	294100	92175	21420	20000	101800
Ntima	Lower Igoki	684100	633750	50350	346140	261850	50350	25760	0	0	0
	Mpuri	50900	0	50900	0	0	50900	0	0	0	0
	Ngonyi	37450	0	37450	0	0	37450	0	0	0	0
	Ntakira	1026595	944045	82550	480240	422790	82550	41015	0	0	0
	Nthimbiri	413425	324825	88600	315420	0	88600	9405	0	0	0
	Town/Gakoromone	13755025	1073075	12681950	0	672120	61950	4810	123020	12620000	273125
	Upper Igoki	1330615	1288465	42150	0	1245590	42150	29935	12940	0	0
	Total (l/day):	17298110	4264160	13033950	1141800	2602350	413950	110925	135960	12620000	273125
Nyaki	Chugu	465395	443945	21450	401680	0	21450	42265	0	0	0
	Mulathankari	345910	308010	37900	0	297675	37900	6285	0	0	4050
	Munithu	586075	343375	242700	302580	0	222700	19455	9140	20000	12200
	Nkabune	346370	286320	60050	281000	0	60050	0	5320	0	0
	Thuura	493625	352125	141500	320080	0	141500	17970	0	0	14075
	Total (l/day):	2237375	1733775	503600	1305340	297675	483600	85975	14460	20000	30325

Continued on next page

DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: NORTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Ruiri	Ruiri	736055	316605	419450	237810	0	399450	37775	12120	20000	28900
	Total (l/day):	736055	316605	419450	237810	0	399450	37775	12120	20000	28900
	Division Total (l/day):	22281210	7540860	14740350	3638420	2900025	2020350	355870	190620	12720000	455925

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: NTONYIRI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Antubetwe-Kiongo	Antubetwe-Kiongo	702240	366940	335300	296700	0	335300	17380	5360	0	47500
	Total (l/day):	702240	366940	335300	296700	0	335300	17380	5360	0	47500
Athiru-Ruujine	Athiru Ruujine	621155	427605	193550	378090	0	193550	19315	0	0	30200
	Total (l/day):	621155	427605	193550	378090	0	193550	19315	0	0	30200
Ithima	Akirangondu	792270	399020	393250	374350	0	393250	24670	0	0	0
	Antuambui	987265	513065	474200	354015	0	474200	24670	7680	0	126700
	Ntunene	652155	256705	395450	199665	0	375450	12335	11080	20000	33625
	Total (l/day):	2431690	1168790	1262900	928030	0	1242900	61675	18760	20000	160325
Mutuati	Amwathi 1	432080	355430	76650	276665	0	76650	17965	0	0	60800
	Amwathi 2	199020	161170	37850	140720	0	37850	12825	0	0	7625
	Naathu	348160	311960	36200	291435	0	36200	20525	0	0	0
	Total (l/day):	979260	828560	150700	708820	0	150700	51315	0	0	68425
	Division Total (l/day):	4734345	2791895	1942450	2311640	0	1922450	149685	24120	20000	306450

DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: SOUTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abogeta	Upper Githangari	397050	256900	140150	224840	0	120150	20185	0	20000	11875
	Upper Kiungone	531990	371790	160200	322760	0	160200	39830	0	0	9200
	Total (l/day):	929040	628690	300350	547600	0	280350	60015	0	20000	21075
Igoji	Gikui	572365	456465	115900	310510	0	95900	123100	6180	20000	16675
	Karia	467615	356065	111550	314780	0	111550	24465	5720	0	11100
	Total (l/day):	1039980	812530	227450	625290	0	207450	147565	11900	20000	27775
Igoki	Kothine	332135	156235	175900	143840	0	175900	12395	0	0	0
	Mwichure	313150	98650	214500	86280	0	214500	5550	6820	0	0
	Upper Chure	441455	233105	208350	194240	0	208350	25720	5720	0	7425
	Total (l/day):	1086740	487990	598750	424360	0	598750	43665	12540	0	7425
Kanyakine	Kanyakine	676380	543580	132800	438060	0	112800	76565	9680	20000	19275
	Kiringa	407530	272380	135150	216695	0	135150	46085	0	0	9600
	Total (l/day):	1083910	815960	267950	654755	0	247950	122650	9680	20000	28875
Mitine	Kianjogu	308250	210450	97800	111100	0	97800	84170	5480	0	9700
	Kinoro	353880	313230	40650	264220	0	40650	25895	7440	0	15675
	Mweru	347570	273070	74500	234950	0	74500	30020	0	0	8100
	Total (l/day):	1009700	796750	212950	610270	0	212950	140085	12920	0	33475

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: SOUTH IMENTI (Continued)

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mitunguu	Kirendene	284935	150435	134500	115480	0	114500	12280	0	20000	22675
	Ngonyi	409540	302240	107300	276390	0	107300	19750	0	0	6100
	Total (l/day):	694475	452675	241800	391870	0	221800	32030	0	20000	28775
Nkuene	Kathera	1218970	1037970	181000	321240	526565	121000	100055	51060	60000	39050
	Kigane	320660	262060	58600	249200	0	58600	10160	0	0	2700
	Mikumbune	429975	318675	111300	253880	0	111300	44675	6920	0	13200
	Uruku	605795	479895	125900	379540	0	125900	72055	15100	0	13200
	Total (l/day):	2575400	2098600	476800	1203860	526565	416800	226945	73080	60000	68150
	Division Total (l/day):	8419245	6093195	2326050	4458005	526565	2186050	772955	120120	140000	215550

DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: THARAKA **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Gikingo	Irunduni	49685	33285	16400	29040	0	16400	4245	0	0	0
	Kanjoro	221200	150400	70800	125335	0	70800	13465	0	0	11600
	Total (l/day):	270885	183685	87200	154375	0	87200	17710	0	0	11600
Marimanti	Kanyuru	291380	123080	168300	111245	0	168300	6535	0	0	5300
	Marimanti	383290	177090	206200	107130	0	206200	52520	6040	0	11400
	Nkondi	487825	231475	256350	195350	0	256350	21065	5860	0	9200
	Turima	196840	93990	102850	78335	0	102850	8655	0	0	7000
	Total (l/day):	1359335	625635	733700	492060	0	733700	88775	11900	0	32900
North Tharaka	Gatue	297260	73360	223900	66820	0	223900	6540	0	0	0
	Gatunga	142865	122915	19950	98130	0	19950	7205	5480	0	12100
	Kathangachini	110925	54325	56600	44465	0	56600	3820	6040	0	0
	Total (l/day):	551050	250600	300450	209415	0	300450	17565	11520	0	12100
South Tharaka	Chiokariga	185180	162080	23100	108710	0	23100	36010	7160	0	10200
	Kamanyaki	111480	91680	19800	76570	0	19800	5430	5480	0	4200
	Tunyai	183830	171980	11850	129675	0	11850	27165	5540	0	9600
	Total (l/day):	480490	425740	54750	314955	0	54750	68605	18180	0	24000
	Division Total (l/day):	2661760	1485660	1176100	1170805	0	1176100	192655	41600	0	80600

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: TIGANIA

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akithii	Athwana	358965	122115	236850	107010	0	236850	13805	0	0	1300
	Kitheo	256325	193975	62350	148325	0	62350	20260	19540	0	5850
	Nchooro	358260	261510	96750	239960	0	96750	11800	0	0	9750
	Thinyaine	275870	125720	150150	108945	0	150150	15150	0	0	1625
	Total (l/day):	1249420	703320	546100	604240	0	546100	61015	19540	0	18525
Karama	Karama	515765	508215	7550	461400	0	7550	18115	0	0	28700
	Total (l/day):	515765	508215	7550	461400	0	7550	18115	0	0	28700
Kianjai	Kianjai	476840	386440	90400	318850	0	90400	30615	0	0	36975
	Miathene	815055	504905	310150	386960	0	310150	77210	25660	0	15075
	Total (l/day):	1291895	891345	400550	705810	0	400550	107825	25660	0	52050
Mbeu	Kiorimba	301385	253535	47850	240435	0	47850	0	0	0	13100
	Mbeu	300220	146120	154100	103080	0	154100	11440	0	0	31600
	Total (l/day):	601605	399655	201950	343515	0	201950	11440	0	0	44700
Mikinduri	Akaiga	305855	240305	65550	224715	0	65550	8090	0	0	7500
	Antuamburi	374415	236965	137450	149640	0	77450	24325	8900	60000	54100
	Athwana	181855	143405	38450	123620	0	38450	10410	0	0	9375
	Kiguchua	519630	470130	49500	425180	0	49500	20050	0	0	24900
	Total (l/day):	1381755	1090805	290950	923155	0	230950	62875	8900	60000	95875

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: TIGANIA (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mituntu	Mituntu	248915	163915	85000	133640	0	85000	17700	0	0	12575
	Total (l/day):	248915	163915	85000	133640	0	85000	17700	0	0	12575
Muthara	Athanja	1179830	234680	945150	214215	0	945150	20465	0	0	0
	Athinga	575715	152915	422800	132385	0	422800	10130	0	0	10400
	Kitharene	405220	252020	153200	235125	0	153200	4495	0	0	12400
	Total (l/day):	2160765	639615	1521150	581725	0	1521150	35090	0	0	22800
Thangatha	Ankamia	450355	381405	68950	329695	0	68950	23610	0	0	28100
	Giithu	158920	129920	29000	101810	0	29000	9910	0	0	18200
	Igarii	141970	52420	89550	37420	0	89550	1850	0	0	13150
	Kunati	222155	175555	46600	139165	0	46600	12715	0	0	23675
	Total (l/day):	973400	739300	234100	608090	0	234100	48085	0	0	83125
Uringu	Nkomo	396100	330600	65500	265690	0	65500	18330	10480	0	36100
	Uringu	357280	304280	53000	270820	0	53000	14735	0	0	18725
	Total (l/day):	753380	634880	118500	536510	0	118500	33065	10480	0	54825
	Division Total (l/day):	9176900	5771050	3405850	4898085	0	3345850	395210	64580	60000	413175

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 1

DIVISION: TIMAU

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kirimara	Kithithina	107760	69060	38700	57350	0	38700	6190	5520	0	0
	Ngushishi	266400	168450	97950	138060	0	97950	10970	19420	0	0
	Total (l/day):	374160	237510	136650	195410	0	136650	17160	24940	0	0
Kisima	Buuri	282200	170800	111400	146780	0	111400	2070	0	0	21950
	Mutunyi	548530	61530	487000	53140	0	467000	7090	0	20000	1300
	Ngare Ndare	168885	64335	104550	57370	0	104550	2065	0	0	4900
	Total (l/day):	999615	296665	702950	257290	0	682950	11225	0	20000	28150
Ontulili	Ontulili	566130	400880	165250	370300	0	145250	18280	5600	20000	6700
	Total (l/day):	566130	400880	165250	370300	0	145250	18280	5600	20000	6700
	Division Total (l/day):	1939905	935055	1004850	823000	0	964850	46665	30540	40000	34850

DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: CENTRAL IMENTI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abothuguchi	Githongo	875065	767665	107400	556100	0	107400	143095	24720	0	43750
	Katheri	1618750	1280300	338450	1098280	0	338450	147120	0	0	34900
	Kithirune	1041255	803005	238250	698600	0	238250	72505	0	0	31900
	Total (l/day):	3535070	2850970	684100	2352980	0	684100	362720	24720	0	110550
Gatimbi	Kariene	1186915	1104315	82600	944660	0	82600	92505	15800	0	51350
	Mariene	661495	541845	119650	469800	0	119650	54545	0	0	17500
	Ruiga	779035	727185	51850	688320	0	51850	34415	0	0	4450
	Total (l/day):	2627445	2373345	254100	2102780	0	254100	181465	15800	0	73300
Kibirichia	Kiamiogo	637490	516440	121050	438565	0	121050	20575	0	0	57300
	Kimbo	624760	513210	111550	488335	0	111550	18050	0	0	6825
	Mboroga	222480	168680	53800	151310	0	53800	7870	0	0	9500
	Ntumburi	236180	164430	71750	117415	0	71750	39965	0	0	7050
	Total (l/day):	1720910	1362760	358150	1195625	0	358150	86460	0	0	80675
Mwangathia	Gaitu	653795	490645	163150	395780	0	163150	26685	32780	0	35400
	Gitie	587065	415165	171900	354715	0	171900	49350	0	0	11100
	Igane	588460	451760	136700	409530	0	136700	22830	0	0	19400
	Kaongo	620410	489010	131400	413800	0	131400	24110	25100	0	26000
	Kiamuri	333775	206375	127400	175065	0	127400	17510	0	0	13800
	Makandune	228730	147980	80750	123685	0	80750	10975	5720	0	7600
	Total (l/day):	3012235	2200935	811300	1872575	0	811300	151460	63600	0	113300
	Division Total (l/day):	10895660	8788010	2107650	7523960	0	2107650	782105	104120	0	377825

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: IGEMBE

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akachiu	Amungenti	712390	673740	38650	557740	0	38650	95820	10380	0	9800
	Athiru Gaiti	483805	457305	26500	416900	0	26500	24945	5360	0	10100
	Auki	491400	472500	18900	442260	0	18900	25040	0	0	5200
	Kirindine	746915	659565	87350	583390	0	87350	29695	5680	0	40800
	Total (l/day):	2434510	2263110	171400	2000290	0	171400	175500	21420	0	65900
Kangeta	Kangeta	553150	458650	94500	366995	0	94500	28795	10660	0	52200
	Liliaba	457290	254940	202350	200010	0	202350	41730	0	0	13200
	Total (l/day):	1010440	713590	296850	567005	0	296850	70525	10660	0	65400
Kiegoi	Kiegoi	726680	694030	32650	660980	0	32650	33050	0	0	0
	Total (l/day):	726680	694030	32650	660980	0	32650	33050	0	0	0
Maua	Amwathi	2086005	1992005	94000	1005225	847705	94000	117995	21080	0	0
	Antubetwe Njoune	448585	399085	49500	347705	0	49500	15880	0	0	35500
	Kanjoo	116670	52820	63850	42195	0	63850	4445	6180	0	0
	Total (l/day):	2651260	2443910	207350	1395125	847705	207350	138320	27260	0	35500
Njia	Buri Eruri	1187825	1132225	55600	972900	0	55600	97525	0	0	61800
	Njia Cia Mwendwa	969360	850510	118850	777340	0	118850	55070	0	0	18100
	Total (l/day):	2157185	1982735	174450	1750240	0	174450	152595	0	0	79900
	Division Total (l/day):	8980075	8097375	882700	6373640	847705	882700	569990	59340	0	246700

DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: NITHI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Chogoria	Chogoria	1556265	1427915	128350	686600	434400	88350	216515	63000	40000	27400
	Kiraro	373985	286835	87150	251640	0	47150	27295	0	40000	7900
	Murugi	1410565	1152465	258100	976520	0	218100	137345	16800	40000	21800
	Total (l/day):	3340815	2867215	473600	1914760	434400	353600	381155	79800	120000	57100
Kanjuki	Kamaindi	129960	65710	64250	59130	0	64250	6580	0	0	0
	Kanjuki	409945	225245	184700	170165	0	184700	28900	10180	0	16000
	Mutino	206380	166380	40000	131385	0	0	13835	5260	40000	15900
	Total (l/day):	746285	457335	288950	360680	0	248950	49315	15440	40000	31900
Karingani	Chuka Township	953465	939215	14250	189160	618655	14250	0	0	0	131400
	Gitareni	735255	496055	239200	427135	0	199200	52880	5940	40000	10100
	Kiangondu	392200	295200	97000	264600	0	97000	30600	0	0	0
	Kithangani	3071385	153185	2918200	122650	0	2798200	11115	5320	120000	14100
	Mariani	395455	214505	180950	193380	0	180950	15825	5300	0	0
	Mugirirua	988640	688990	299650	588060	0	139650	60230	5300	160000	35400
	Muiru	742110	572010	170100	468540	0	130100	23430	15440	40000	64600
	Ndagani	565485	415235	150250	349795	0	110250	19500	20540	40000	25400
	Total (l/day):	7843995	3774395	4069600	2603320	618655	3669600	213580	57840	400000	281000
Kiera	Iruma	652750	453750	199000	396980	0	159000	19850	15720	40000	21200
	Kirumi	275640	136990	138650	80360	0	138650	4910	15720	0	36000
	Magutuni	1079840	771140	308700	648320	0	268700	36260	36060	40000	50500
	Mugumango	888985	788385	100600	684595	0	60600	69790	15000	40000	19000

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: NITHI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kiera	Thigaa	252960	192810	60150	168500	0	60150	9130	15180	0	0
	Total (l/day):	3150175	2343075	807100	1978755	0	687100	139940	97680	120000	126700
Magumoni	Itugururu	177395	66845	110550	50050	0	70550	4095	0	40000	12700
	Kamwibi	349195	149045	200150	129690	0	160150	12355	0	40000	7000
	Mukuuni	691810	524110	167700	442935	0	127700	45155	5720	40000	30300
	Thuita	841235	801235	40000	685620	0	0	53455	20860	40000	41300
	Total (l/day):	2059635	1541235	518400	1308295	0	358400	115060	26580	160000	91300
Muthambi	Chamunga	596930	479630	117300	367920	0	77300	57010	23600	40000	31100
	Gatua	776865	621865	155000	496980	0	115000	54005	25480	40000	45400
	Igamurathi	446375	295825	150550	240120	0	110550	46205	0	40000	9500
	Iriga	510725	320925	189800	259200	0	149800	27945	10780	40000	23000
	Kadungu	285580	188830	96750	132835	0	96750	45735	10260	0	0
	Karimba	635215	473865	161350	366945	0	121350	39220	31900	40000	35800
	Total (l/day):	3251690	2380940	870750	1864000	0	670750	270120	102020	200000	144800
Mwonge	Kabuboni	596805	460905	135900	381240	0	95900	44985	19980	40000	14700
	Mwonge	445125	391925	53200	339840	0	13200	39585	0	40000	12500
	Rubate	330960	291860	39100	265965	0	39100	25895	0	0	0
	Total (l/day):	1372890	1144690	228200	987045	0	148200	110465	19980	80000	27200
	Division Total (l/day):	21765485	14508885	7256600	11016855	1053055	6136600	1279635	399340	1120000	760000

DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: NORTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Giaki	Giaki	860570	513670	346900	450645	0	306900	25115	7460	40000	30450
	Kiburine	438195	181795	256400	149760	0	216400	19335	0	40000	12700
	Total (l/day):	1298765	695465	603300	600405	0	523300	44450	7460	80000	43150
Kiirua	Kiirua	496610	352210	144400	212800	0	104400	61150	19060	40000	59200
	Naari	1309360	1066810	242550	835840	0	242550	85130	7840	0	138000
	Thege	87785	76135	11650	70560	0	11650	2375	0	0	3200
	Total (l/day):	1893755	1495155	398600	1119200	0	358600	148655	26900	40000	200400
Ntima	Lower Igoki	1205320	1143920	61400	661400	426890	61400	55630	0	0	0
	Mpuri	62050	0	62050	0	0	62050	0	0	0	0
	Ngonyi	45600	0	45600	0	0	45600	0	0	0	0
	Ntakira	1800565	1699965	100600	927620	683770	100600	88575	0	0	0
	Nthimbiri	728605	620605	108000	600300	0	108000	20305	0	0	0
	Town/Gakoromone	26713010	1817460	24895550	0	1092945	75550	10385	182380	24820000	531750
	Upper Igoki	2141945	2090595	51350	0	2025445	51350	45790	19360	0	0
	Total (l/day):	32697095	7372545	25324550	2189320	4229050	504550	220685	201740	24820000	531750
Nyaki	Chugu	862345	836145	26200	764480	0	26200	71665	0	0	0
	Mulathankari	547945	501745	46200	0	484260	46200	9485	0	0	8000
	Munithu	951515	640015	311500	575900	0	271500	28795	11120	40000	24200
	Nkabune	613430	540280	73150	534800	0	73150	0	5480	0	0
	Thuura	840135	667635	172500	609220	0	172500	30465	0	0	27950
	Total (l/day):	3815370	3185820	629550	2484400	484260	589550	140410	16600	40000	60150

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: NORTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Ruiri	Ruiri	1041730	514830	526900	386835	0	486900	53180	18140	40000	56675
	Total (l/day):	1041730	514830	526900	386835	0	486900	53180	18140	40000	56675
	Division Total (l/day):	40746715	13263815	27482900	6780160	4713310	2462900	607380	270840	25020000	892125

DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: NTONYIRI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Antubetwe-Kiongo	Antubetwe-Kiongo	1019785	611035	408750	495875	0	408750	37520	5540	0	72100
	Total (l/day):	1019785	611035	408750	495875	0	408750	37520	5540	0	72100
Athiru-Ruujine	Athiru Ruujine	981285	745335	235950	644460	0	235950	41700	0	0	59175
	Total (l/day):	981285	745335	235950	644460	0	235950	41700	0	0	59175
Ithima	Akirangondu	1189890	710490	479400	660495	0	479400	49995	0	0	0
	Antuambui	1417160	839110	578050	624675	0	578050	49000	8960	0	156475
	Ntunene	956890	459240	497650	352310	0	457650	26630	14000	40000	66300
	Total (l/day):	3563940	2008840	1555100	1637480	0	1515100	125625	22960	40000	222775
Mutuati	Amwathi 1	675890	582440	93450	461155	0	93450	38785	0	0	82500
	Amwathi 2	309310	263160	46150	223115	0	46150	24795	0	0	15250
	Naathu	573370	529220	44150	485815	0	44150	43405	0	0	0
	Total (l/day):	1558570	1374820	183750	1170085	0	183750	106985	0	0	97750
	Division Total (l/day):	7123580	4740030	2383550	3947900	0	2343550	311830	28500	40000	451800

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: SOUTH IMENTI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abogeta	Upper Githangari	681420	494970	186450	427860	0	146450	43560	0	40000	23550
	Upper Kiungone	886870	691570	195300	614340	0	195300	58930	0	0	18300
	Total (l/day):	1568290	1186540	381750	1042200	0	341750	102490	0	40000	41850
Igoji	Gikui	966345	809445	156900	581175	0	116900	186340	9180	40000	32750
	Karia	802660	666660	136000	599140	0	136000	39860	6060	0	21600
	Total (l/day):	1769005	1476105	292900	1180315	0	252900	226200	15240	40000	54350
Igoki	Kothine	515020	300570	214450	273800	0	214450	26770	0	0	0
	Mwichure	441625	180175	261450	164260	0	261450	8215	7700	0	0
	Upper Chure	682540	428590	253950	369720	0	253950	38060	6060	0	14750
	Total (l/day):	1639185	909335	729850	807780	0	729850	73045	13760	0	14750
Kanyakine	Kanyakine	1181225	1003675	177550	833660	0	137550	120345	11920	40000	37750
	Kiringa	637045	472295	164750	387215	0	164750	65980	0	0	19100
	Total (l/day):	1818270	1475970	342300	1220875	0	302300	186325	11920	40000	56850
Mitine	Kianjogu	412735	293535	119200	160750	0	119200	107765	5720	0	19300
	Kinoro	632100	582550	49550	502920	0	49550	40360	8620	0	30650
	Mweru	582575	491725	90850	430245	0	90850	45380	0	0	16100
	Total (l/day):	1627410	1367810	259600	1093915	0	259600	193505	14340	0	66050

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: SOUTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mitunguu	Kirendene	443115	263565	179550	192600	0	139550	26515	0	40000	44450
	Ngonyi	689165	558365	130800	517335	0	130800	28830	0	0	12200
	Total (l/day):	1132280	821930	310350	709935	0	270350	55345	0	40000	56650
Nkuene	Kathera	2404120	2136620	267500	621100	1154275	147500	208745	75600	120000	76900
	Kigane	572985	501535	71450	474300	0	71450	21935	0	0	5300
	Mikumbune	719060	583360	135700	483220	0	135700	66100	7840	0	26200
	Uruku	1031160	877710	153450	722340	0	153450	106630	22540	0	26200
	Total (l/day):	4727325	4099225	628100	2300960	1154275	508100	403410	105980	120000	134600
	Division Total (l/day):	14281765	11336915	2944850	8355980	1154275	2664850	1240320	161240	280000	425100

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: THARAKA

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Gikingo	Irunduni	67925	47925	20000	42440	0	20000	5485	0	0	0
	Kanjoro	315930	229630	86300	183095	0	86300	23635	0	0	22900
	Total (l/day):	383855	277555	106300	225535	0	106300	29120	0	0	22900
Marimanti	Kanyuru	406570	201420	205150	176790	0	205150	14130	0	0	10500
	Marimanti	506680	255280	251400	155040	0	251400	71200	6540	0	22500
	Nkondi	692420	379870	312550	325770	0	312550	29620	6280	0	18200
	Turima	281710	156360	125350	130680	0	125350	11880	0	0	13800
	Total (l/day):	1887380	992930	894450	788280	0	894450	126830	12820	0	65000
North Tharaka	Gatue	390365	117415	272950	106225	0	272950	11190	0	0	0
	Gatunga	221095	196795	24300	151620	0	24300	15555	5720	0	23900
	Kathangachini	152350	83350	69000	68715	0	69000	8095	6540	0	0
	Total (l/day):	763810	397560	366250	326560	0	366250	34840	12260	0	23900
South Tharaka	Chiokariga	286085	257885	28200	172300	0	28200	57185	8200	0	20200
	Kamanyaki	168115	144015	24100	118270	0	24100	11725	5720	0	8300
	Tunyai	289635	275185	14450	212750	0	14450	37635	5800	0	19000
	Total (l/day):	743835	677085	66750	503320	0	66750	106545	19720	0	47500
	Division Total (l/day):	3778880	2345130	1433750	1843695	0	1433750	297335	44800	0	159300

DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: TIGANIA **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akithii	Athwana	476125	187375	288750	165315	0	288750	19460	0	0	2600
	Kitheo	358665	282665	76000	216670	0	76000	27965	26480	0	11550
	Nchooro	577645	459695	117950	414895	0	117950	25475	0	0	19325
	Thinyaine	374490	191390	183100	168330	0	183100	19810	0	0	3250
	Total (l/day):	1786925	1121125	665800	965210	0	665800	92710	26480	0	36725
Karama	Karama	969065	959865	9200	864080	0	9200	39110	0	0	56675
	Total (l/day):	969065	959865	9200	864080	0	9200	39110	0	0	56675
Kianjai	Kianjai	809015	698765	110250	576935	0	110250	49205	0	0	72625
	Miathene	1297420	919370	378050	736400	0	378050	115125	38020	0	29825
	Total (l/day):	2106435	1618135	488300	1313335	0	488300	164330	38020	0	102450
Mbeu	Kiorimba	501575	443225	58350	417225	0	58350	0	0	0	26000
	Mbeu	445480	257630	187850	178935	0	187850	16295	0	0	62400
	Total (l/day):	947055	700855	246200	596160	0	246200	16295	0	0	88400
Mikinduri	Akaiga	523995	444045	79950	411580	0	79950	17465	0	0	15000
	Antuamburi	567870	353420	214450	216580	0	94450	31160	10780	120000	94900
	Athwana	301490	254590	46900	221035	0	46900	14905	0	0	18650
	Kiguchua	959110	898760	60350	809200	0	60350	40460	0	0	49100
	Total (l/day):	2352465	1950815	401650	1658395	0	281650	103990	10780	120000	177650

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: TIGANIA (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mituntu	Mituntu	353710	250110	103600	202260	0	103600	23200	0	0	24650
	Total (l/day):	353710	250110	103600	202260	0	103600	23200	0	0	24650
Muthara	Athanja	1562295	410145	1152150	381960	0	1152150	28185	0	0	0
	Athinga	783770	268320	515450	228975	0	515450	18745	0	0	20600
	Kitharene	645920	459170	186750	424865	0	186750	9705	0	0	24600
	Total (l/day):	2991985	1137635	1854350	1035800	0	1854350	56635	0	0	45200
Thangatha	Ankamia	774300	690250	84050	596555	0	84050	38220	0	0	55475
	Giithu	255980	220580	35400	170830	0	35400	13975	0	0	35775
	Igarii	193430	84230	109200	54160	0	109200	3995	0	0	26075
	Kunati	355905	299105	56800	233450	0	56800	19105	0	0	46550
	Total (l/day):	1579615	1294165	285450	1054995	0	285450	75295	0	0	163875
Uringu	Nkomo	687300	607500	79800	496355	0	79800	26875	13120	0	71150
	Uringu	642820	578220	64600	515520	0	64600	25775	0	0	36925
	Total (l/day):	1330120	1185720	144400	1011875	0	144400	52650	13120	0	108075
	Division Total (l/day):	14417375	10218425	4198950	8702110	0	4078950	624215	88400	120000	803700

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 1

DIVISION: TIMAU **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kirimara	Kithithina	155370	108220	47150	94000	0	47150	8460	5760	0	0
	Ngushishi	396855	277455	119400	229880	0	119400	21235	26340	0	0
	Total (l/day):	552225	385675	166550	323880	0	166550	29695	32100	0	0
Kisima	Buuri	463050	327250	135800	279380	0	135800	4470	0	0	43400
	Mutunyi	705450	96200	609250	84240	0	569250	9360	0	40000	2600
	Ngare Ndare	230235	102785	127450	88625	0	127450	4460	0	0	9700
	Total (l/day):	1398735	526235	872500	452245	0	832500	18290	0	40000	55700
Ontulili	Ontulili	965500	748450	217050	691815	0	177050	37455	5880	40000	13300
	Total (l/day):	965500	748450	217050	691815	0	177050	37455	5880	40000	13300
	Division Total (l/day):	2916460	1660360	1256100	1467940	0	1176100	85440	37980	80000	69000

MINISTRY OF WATER DEVELOPMENT

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: CENTRAL IMENTI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abothuguchi	Githongo	1647620	1516720	130900	1189040	0	130900	211800	34380	0	81500
	Katheri	3100915	2688315	412600	2348320	0	412600	271195	0	0	68800
	Kithirune	1969720	1679270	290450	1493760	0	290450	122810	0	0	62700
	Total (l/day):	6718255	5884305	833950	5031120	0	833950	605805	34380	0	213000
Gatimbi	Kariene	2400965	2300315	100650	2019940	0	100650	158595	20980	0	100800
	Mariene	1265575	1119675	145900	1004560	0	145900	80715	0	0	34400
	Ruiga	1593805	1530555	63250	1471660	0	63250	49995	0	0	8900
	Total (l/day):	5260345	4950545	309800	4496160	0	309800	289305	20980	0	144100
Kibirichia	Kiamiogo	1202780	1055180	147600	906570	0	147600	35710	0	0	112900
	Kimbo	1185650	1049700	135950	997205	0	135950	38970	0	0	13525
	Mboroga	399350	333800	65550	300935	0	65550	13965	0	0	18900
	Ntumburi	351575	264125	87450	197155	0	87450	52870	0	0	14100
	Total (l/day):	3139355	2702805	436550	2401865	0	436550	141515	0	0	159425
Mwangathia	Gaitu	1131135	932285	198850	775325	0	198850	38240	49120	0	69600
	Gitie	1021675	812125	209550	719085	0	209550	70940	0	0	22100
	Igane	1084580	917930	166650	846510	0	166650	33345	0	0	38075
	Kaongo	1126335	966135	160200	845025	0	160200	35050	34960	0	51100
	Kiamuri	509730	354430	155300	303805	0	155300	23625	0	0	27000
	Makandune	359800	261350	98450	224870	0	98450	15220	6060	0	15200
	Total (l/day):	5233255	4244255	989000	3714620	0	989000	216420	90140	0	223075
	Division Total (l/day):	20351210	17781910	2569300	15643765	0	2569300	1253045	145500	0	739600

DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: IGEMBE **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akachiu	Amungenti	1340210	1293060	47150	1092450	0	47150	168150	12960	0	19500
	Athiru Gaiti	893960	861660	32300	790550	0	32300	45470	5540	0	20100
	Auki	1015975	992975	23000	945620	0	23000	37055	0	0	10300
	Kirindine	1385400	1278950	106450	1142855	0	106450	49995	6000	0	80100
	Total (l/day):	4635545	4426645	208900	3971475	0	208900	300670	24500	0	130000
Kangeta	Kangeta	970085	854885	115200	711700	0	115200	39605	13380	0	90200
	Liliaba	705915	459215	246700	376955	0	246700	56460	0	0	25800
	Total (l/day):	1676000	1314100	361900	1088655	0	361900	96065	13380	0	116000
Kiegoi	Kiegoi	1502085	1462285	39800	1413360	0	39800	48925	0	0	0
	Total (l/day):	1502085	1462285	39800	1413360	0	39800	48925	0	0	0
Maua	Amwathi	4266130	4151580	114550	2014340	1909245	114550	196795	31200	0	0
	Antubetwe Njoune	844710	784360	60350	681165	0	60350	33595	0	0	69600
	Kanjoo	162635	84785	77850	72105	0	77850	5940	6740	0	0
	Total (l/day):	5273475	5020725	252750	2767610	1909245	252750	236330	37940	0	69600
Njia	Buri Eruri	2404805	2337005	67800	2080260	0	67800	173245	0	0	83500
	Njia Cia Mwendwa	1931445	1786545	144900	1662100	0	144900	88845	0	0	35600
	Total (l/day):	4336250	4123550	212700	3742360	0	212700	262090	0	0	119100
	Division Total (l/day):	17423355	16347305	1076050	12983460	1909245	1076050	944080	75820	0	434700

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: NITHI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Chogoria	Chogoria	3062685	2874985	187700	1466100	912340	107700	349525	93220	80000	53800
	Kiraro	731505	594005	137500	538000	0	57500	40405	0	80000	15600
	Murugi	2761615	2415765	345850	2088060	0	265850	262345	22660	80000	42700
	Total (l/day):	6555805	5884755	671050	4092160	912340	431050	652275	115880	240000	112100
Kanjuki	Kamaindi	186340	108040	78300	99335	0	78300	8705	0	0	0
	Kanjuki	608520	383370	225150	299945	0	225150	39365	12660	0	31400
	Mutino	359715	279715	80000	224345	0	0	18490	5380	80000	31500
	Total (l/day):	1154575	771125	383450	623625	0	303450	66560	18040	80000	62900
Karingani	Chuka Township	1919525	1902175	17350	408060	1344715	17350	0	0	0	149400
	Gitareni	1276555	953705	322850	849250	0	242850	78055	6400	80000	20000
	Kiangondu	729340	611040	118300	565760	0	118300	45280	0	0	0
	Kithangani	3855300	277250	3578050	228085	0	3338050	15685	5480	240000	28000
	Mariani	607960	387360	220600	359600	0	220600	22320	5440	0	0
	Mugirirua	1916815	1426615	490200	1257360	0	170200	94015	5440	320000	69800
	Muiru	1404480	1165880	238600	1001840	0	158600	34680	20660	80000	108700
	Ndagani	1046245	831845	214400	722985	0	134400	28480	30380	80000	50000
	Total (l/day):	12756220	7555870	5200350	5392940	1344715	4400350	318515	73800	800000	425900
Kiera	Iruma	1214565	940765	273800	848820	0	193800	29385	21060	80000	41500
	Kirumi	430190	261190	169000	162125	0	169000	7105	21060	0	70900
	Magutuni	1837890	1430340	407550	1229385	0	327550	49995	51560	80000	99400
	Mugumango	1747855	1593955	153900	1414920	0	73900	121835	20000	80000	37200

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: NITHI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kiera	Thigaa	463560	390260	73300	356610	0	73300	13390	20260	0	0
	Total (l/day):	5694060	4616510	1077550	4011860	0	837550	221710	133940	240000	249000
Magumoni	Itugururu	290000	124000	166000	93025	0	86000	5775	0	80000	25200
	Kamwibi	534580	259330	275250	228595	0	195250	16835	0	80000	13900
	Mukuuni	1272205	1036555	235650	904515	0	155650	66180	6060	80000	59800
	Thuita	1745180	1665180	80000	1465880	0	0	89220	28680	80000	81400
	Total (l/day):	3841965	3085065	756900	2692015	0	436900	178010	34740	320000	180300
Muthambi	Chamunga	1139235	964985	174250	786760	0	94250	84385	32540	80000	61300
	Gatua	1487675	1267475	220200	1062620	0	140200	79935	35520	80000	89400
	Igamurathi	815455	600655	214800	513360	0	134800	68395	0	80000	18900
	Iriga	917010	654410	262600	554180	0	182600	41370	13560	80000	45300
	Kadungu	445435	327435	118000	251395	0	118000	63260	12780	0	0
	Karimba	1139815	911915	227900	739655	0	147900	56740	45020	80000	70500
	Total (l/day):	5944625	4726875	1217750	3907970	0	817750	394085	139420	400000	285400
Mwonge	Kabuboni	1135195	938245	196950	815160	0	116950	66605	27380	80000	29100
	Mwonge	906190	810090	96100	726700	0	16100	58590	0	80000	24800
	Rubate	628465	580815	47650	543165	0	47650	37650	0	0	0
	Total (l/day):	2669850	2329150	340700	2085025	0	180700	162845	27380	160000	53900
	Division Total (l/day):	38617100	28969350	9647750	22805595	2257055	7407750	1994000	543200	2240000	1369500

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: NORTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Giaki	Giaki	1490855	1036705	454150	931475	0	374150	36690	8640	80000	59900
	Kiburine	640760	296960	343800	246755	0	263800	25030	0	80000	25175
	Total (l/day):	2131615	1333665	797950	1178230	0	637950	61720	8640	160000	85075
Kiirua	Kiirua	790085	582835	207250	363340	0	127250	81735	25860	80000	111900
	Naari	2517135	2221485	295650	1787240	0	295650	153945	9200	0	271100
	Thege	176645	162445	14200	150920	0	14200	5125	0	0	6400
	Total (l/day):	3483865	2966765	517100	2301500	0	437100	240805	35060	80000	389400
Ntima	Lower Igoki	2286550	2211750	74800	1419660	672015	74800	120075	0	0	0
	Mpuri	75650	0	75650	0	0	75650	0	0	0	0
	Ngonyi	55650	0	55650	0	0	55650	0	0	0	0
	Ntakira	3381230	3258580	122650	1994500	1098885	122650	165195	0	0	0
	Nthimbiri	1459105	1327455	131650	1283620	0	131650	43835	0	0	0
	Town/Gakoromone	51857100	2945050	48912050	0	1768075	92050	22420	267780	48820000	886775
	Upper Igoki	3429370	3366770	62600	0	3275615	62600	64695	26460	0	0
	Total (l/day):	62544655	13109605	49435050	4697780	6814590	615050	416220	294240	48820000	886775
Nyaki	Chugu	1793485	1761585	31900	1634620	0	31900	126965	0	0	0
	Mulathankari	869565	813265	56300	0	783075	56300	14315	0	0	15875
	Munithu	1746445	1335545	410900	1231360	0	330900	42625	14060	80000	47500
	Nkabune	1238460	1149260	89200	1143540	0	89200	0	5720	0	0
	Thuura	1613055	1402755	210300	1302660	0	210300	45095	0	0	55000
	Total (l/day):	7261010	6462410	798600	5312180	783075	718600	229000	19780	80000	118375

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: NORTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Ruiri	Ruiri	1563925	890375	673550	671350	0	593550	82760	24640	80000	111625
	Total (l/day):	1563925	890375	673550	671350	0	593550	82760	24640	80000	111625
	Division Total (l/day):	76985070	24762820	52222250	14161040	7597665	3002250	1030505	382360	49220000	1591250

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: NTONYIRI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Antubetwe-Kiongo	Antubetwe-Kiongo	1586680	1088430	498250	938635	0	498250	49995	5800	0	94000
	Total (l/day):	1586680	1088430	498250	938635	0	498250	49995	5800	0	94000
Athiru-Ruujine	Athiru Ruujine	1652615	1365015	287600	1241620	0	287600	49995	0	0	73400
	Total (l/day):	1652615	1365015	287600	1241620	0	287600	49995	0	0	73400
Ithima	Akirangondu	1915055	1330705	584350	1280710	0	584350	49995	0	0	0
	Antuambui	2140105	1435455	704650	1211275	0	704650	49995	10860	0	163325
	Ntunene	1477570	839720	637850	683155	0	557850	38020	18320	80000	100225
	Total (l/day):	5532730	3605880	1926850	3175140	0	1846850	138010	29180	80000	263550
Mutuati	Amwathi 1	1147290	1033340	113950	868945	0	113950	49995	0	0	114400
	Amwathi 2	493490	437190	56300	374485	0	56300	32805	0	0	29900
	Naathu	1019290	965490	53800	915495	0	53800	49995	0	0	0
	Total (l/day):	2660070	2436020	224050	2158925	0	224050	132795	0	0	144300
	Division Total (l/day):	11432095	8495345	2936750	7514320	0	2856750	370795	34980	80000	575250

DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: SOUTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abogeta	Upper Githangari	1286160	1027660	258500	914860	0	178500	66500	0	80000	46300
	Upper Kiungone	1681980	1443880	238100	1313580	0	238100	94300	0	0	36000
	Total (l/day):	2968140	2471540	496600	2228440	0	416600	160800	0	80000	82300
Igoji	Gikui	1773785	1551285	222500	1201320	0	142500	272185	13580	80000	64200
	Karia	1558525	1392675	165850	1281080	0	165850	62435	6560	0	42600
	Total (l/day):	3332310	2943960	388350	2482400	0	308350	334620	20140	80000	106800
Igoki	Kothine	904735	643335	261400	585520	0	261400	57815	0	0	0
	Mwichure	691120	372420	318700	351260	0	318700	12160	9000	0	0
	Upper Chure	1192235	882685	309550	790580	0	309550	56345	6560	0	29200
	Total (l/day):	2788090	1898440	889650	1727360	0	889650	126320	15560	0	29200
Kanyakine	Kanyakine	2333765	2086065	247700	1782480	0	167700	213845	15240	80000	74500
	Kiringa	1091670	890820	200850	758650	0	200850	94570	0	0	37600
	Total (l/day):	3425435	2976885	448550	2541130	0	368550	308415	15240	80000	112100
Mitine	Kianjogu	580390	435090	145300	253290	0	145300	137940	6060	0	37800
	Kinoro	1266560	1206160	60400	1075360	0	60400	60040	10360	0	60400
	Mweru	1076290	965590	110700	867345	0	110700	66745	0	0	31500
	Total (l/day):	2923240	2606840	316400	2195995	0	316400	264725	16420	0	129700

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: SOUTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mitunguu	Kirendene	719060	468960	250100	344625	0	170100	36735	0	80000	87600
	Ngonyi	1294605	1135155	159450	1069235	0	159450	42120	0	0	23800
	Total (l/day):	2013665	1604115	409550	1413860	0	329550	78855	0	80000	111400
Nkuene	Kathera	4912110	4492310	419800	1324240	2513835	179800	415295	111940	240000	127000
	Kigane	1146835	1059785	87050	1014180	0	87050	35105	0	0	10500
	Mikumbune	1357210	1191810	165400	1033240	0	165400	97870	9200	0	51500
	Uruku	1989380	1802280	187100	1544520	0	187100	175100	31160	0	51500
	Total (l/day):	9405535	8546185	859350	4916180	2513835	619350	723370	152300	240000	240500
	Division Total (l/day):	26856415	23047965	3808450	17505365	2513835	3248450	1997105	219660	560000	812000

DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: THARAKA **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Gikingo	Irunduni	101450	77050	24400	69950	0	24400	7100	0	0	0
	Kanjoro	482610	377410	105200	301615	0	105200	30595	0	0	45200
	Total (l/day):	584060	454460	129600	371565	0	129600	37695	0	0	45200
Marimanti	Kanyuru	603330	353230	250100	301925	0	250100	30505	0	0	20800
	Marimanti	693665	387215	306450	244320	0	306450	91115	7280	0	44500
	Nkondi	1047350	666350	381000	582710	0	381000	40740	6900	0	36000
	Turima	430035	277235	152800	233695	0	152800	16340	0	0	27200
	Total (l/day):	2774380	1684030	1090350	1362650	0	1090350	178700	14180	0	128500
North Tharaka	Gatue	529040	196340	332700	181390	0	332700	14950	0	0	0
	Gatunga	356245	326595	29650	249960	0	29650	23375	6060	0	47200
	Kathangachini	215350	131250	84100	113365	0	84100	10605	7280	0	0
	Total (l/day):	1100635	654185	446450	544715	0	446450	48930	13340	0	47200
South Tharaka	Chiokariga	448975	414625	34350	289325	0	34350	75660	9740	0	39900
	Kamanyaki	265050	235650	29400	195050	0	29400	18240	6060	0	16300
	Tunyai	500305	482705	17600	386740	0	17600	52185	6180	0	37600
	Total (l/day):	1214330	1132980	81350	871115	0	81350	146085	21980	0	93800
	Division Total (l/day):	5673405	3925655	1747750	3150045	0	1747750	411410	49500	0	314700

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: TIGANIA

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akithii	Athwana	655155	303155	352000	272590	0	352000	25490	0	0	5075
	Kitheo	545220	452520	92700	356885	0	92700	36200	36760	0	22675
	Nchooro	1038010	894210	143800	811950	0	143800	44360	0	0	37900
	Thinyaine	532985	309785	223200	277460	0	223200	25950	0	0	6375
	Total (l/day):	2771370	1959670	811700	1718885	0	811700	132000	36760	0	72025
Karama	Karama	1937015	1925815	11200	1794520	0	11200	49995	0	0	81300
	Total (l/day):	1937015	1925815	11200	1794520	0	11200	49995	0	0	81300
Kianjai	Kianjai	1503970	1369570	134400	1147100	0	134400	79345	0	0	143125
	Miathene	2338765	1877915	460850	1574560	0	460850	188470	56260	0	58625
	Total (l/day):	3842735	3247485	595250	2721660	0	595250	267815	56260	0	201750
Mbeu	Kiorimba	939465	868365	71100	817290	0	71100	0	0	0	51075
	Mbeu	725395	496445	228950	350495	0	228950	23250	0	0	122700
	Total (l/day):	1664860	1364810	300050	1167785	0	300050	23250	0	0	173775
Mikinduri	Akaiga	992895	895445	97450	829610	0	97450	36335	0	0	29500
	Antuamburi	889035	533885	355150	341200	0	115150	40325	13560	240000	138800
	Athwana	548250	491100	57150	433040	0	57150	21360	0	0	36700
	Kiguchua	1926065	1852515	73550	1730220	0	73550	49995	0	0	72300
	Total (l/day):	4356245	3772945	583300	3334070	0	343300	148015	13560	240000	277300

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: TIGANIA (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mituntu	Mituntu	559910	433610	126300	354815	0	126300	30495	0	0	48300
	Total (l/day):	559910	433610	126300	354815	0	126300	30495	0	0	48300
Muthara	Athanja	2186315	781815	1404500	742825	0	1404500	38990	0	0	0
	Athinga	1132165	503865	628300	437950	0	628300	25515	0	0	40400
	Kitharene	1143240	915540	227700	846390	0	227700	20950	0	0	48200
	Total (l/day):	4461720	2201220	2260500	2027165	0	2260500	85455	0	0	88600
Thangatha	Ankamia	1413565	1311115	102450	1186120	0	102450	49995	0	0	75000
	Giithu	448280	405130	43150	317615	0	43150	19715	0	0	67800
	Igarii	278395	145295	133100	85370	0	133100	8625	0	0	51300
	Kunati	617305	548055	69250	434130	0	69250	26950	0	0	86975
	Total (l/day):	2757545	2409595	347950	2023235	0	347950	105285	0	0	281075
Uringu	Nkomo	1323510	1226210	97300	1050165	0	97300	39425	17020	0	119600
	Uringu	1292030	1213280	78750	1102200	0	78750	38155	0	0	72925
	Total (l/day):	2615540	2439490	176050	2152365	0	176050	77580	17020	0	192525
	Division Total (l/day):	24966940	19754640	5212300	17294500	0	4972300	919890	123600	240000	1416650

MINISTRY OF WATER DEVELOPMENT

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 1

DIVISION: TIMAU

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kirimara	Kithithina	250940	193440	57500	175730	0	57500	11590	6120	0	0
	Ngushishi	634625	489075	145550	423655	0	145550	28840	36580	0	0
	Total (l/day):	885565	682515	203050	599385	0	203050	40430	42700	0	0
Kisima	Buuri	857980	692430	165550	597480	0	165550	9650	0	0	85300
	Mutunyi	932900	158950	773950	141365	0	693950	12385	0	80000	5200
	Ngare Ndare	330480	175080	155400	146175	0	155400	9630	0	0	19275
	Total (l/day):	2121360	1026460	1094900	885020	0	1014900	31665	0	80000	109775
Ontulili	Ontulili	1841650	1545850	295800	1463655	0	215800	49995	6300	80000	25900
	Total (l/day):	1841650	1545850	295800	1463655	0	215800	49995	6300	80000	25900
	Division Total (l/day):	4848575	3254825	1593750	2948060	0	1433750	122090	49000	160000	135675

DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: CENTRAL IMENTI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abothuguchi	Githongo	540845	443745	97100	299320	0	97100	99030	22220	0	23175
	Katheri	1000570	694620	305950	591100	0	305950	84920	0	0	18600
	Kithirune	653955	438555	215400	375960	0	215400	45995	0	0	16600
	Total (l/day):	2195370	1576920	618450	1266380	0	618450	229945	22220	0	58375
Gatimbi	Kariene	681480	606830	74650	508380	0	74650	58105	13020	0	27325
	Mariene	408205	300005	108200	252840	0	108200	37765	0	0	9400
	Ruiga	443330	396480	46850	370440	0	46850	23815	0	0	2225
	Total (l/day):	1533015	1303315	229700	1131660	0	229700	119685	13020	0	38950
Kibirichia	Kiamiogo	390980	281530	109450	239985	0	109450	10445	0	0	31100
	Kimbo	383735	282885	100850	270170	0	100850	9165	0	0	3550
	Mboroga	145535	94535	51000	85640	0	51000	3995	0	0	4900
	Ntumburi	181710	110410	71300	75875	0	71300	31010	0	0	3525
	Total (l/day):	1101960	769360	332600	671670	0	332600	54615	0	0	43075
Mwangathia	Gaitu	438605	283955	154650	226890	0	154650	16605	22060	0	18400
	Gitie	394530	239180	155350	198265	0	155350	35215	0	0	5700
	Igane	373170	249620	123550	223670	0	123550	15975	0	0	9975
	Kaongo	397100	278300	118800	228945	0	118800	12955	22500	0	13900
	Kiamuri	248350	127450	120900	110260	0	120900	9790	0	0	7400
	Makandune	170745	94195	76550	77245	0	76550	7610	5540	0	3800
	Total (l/day):	2022500	1272700	749800	1065275	0	749800	98150	50100	0	59175
	Division Total (l/day):	6852845	4922295	1930550	4134985	0	1930550	502395	85340	0	199575

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: IGEMBE

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akachiu	Amungenti	428555	391905	36650	329220	0	36650	48665	9020	0	5000
	Athiru Gaiti	298595	273495	25100	250370	0	25100	12665	5260	0	5200
	Auki	270810	253760	17050	238000	0	17050	13060	0	0	2700
	Kirindine	459435	376685	82750	334410	0	82750	15075	5500	0	21700
	Total (l/day):	1457395	1295845	161550	1152000	0	161550	89465	19780	0	34600
Kangeta	Kangeta	365830	271830	94000	213075	0	94000	21555	9200	0	28000
	Liliaba	362990	161790	201200	122870	0	201200	31720	0	0	7200
	Total (l/day):	728820	433620	295200	335945	0	295200	53275	9200	0	35200
Kiegoi	Kiegoi	406370	376870	29500	355740	0	29500	21130	0	0	0
	Total (l/day):	406370	376870	29500	355740	0	29500	21130	0	0	0
Maua	Amwathi	1166545	1077445	89100	579275	404135	89100	78395	15640	0	0
	Antubetwe Njoune	273145	226245	46900	199285	0	46900	8060	0	0	18900
	Kanjoo	99870	36420	63450	27125	0	63450	3415	5880	0	0
	Total (l/day):	1539560	1340110	199450	805685	404135	199450	89870	21520	0	18900
Njia	Buri Eruri	656225	605925	50300	523600	0	50300	49525	0	0	32800
	Njia Cia Mwendwa	572735	465285	107450	418340	0	107450	37245	0	0	9700
	Total (l/day):	1228960	1071210	157750	941940	0	157750	86770	0	0	42500
	Division Total (l/day):	5361105	4517655	843450	3591310	404135	843450	340510	50500	0	131200

DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: NITHI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Chogoria	Chogoria	876950	777050	99900	371800	202275	79900	142075	46800	20000	14100
	Kiraro	220955	158355	62600	135380	0	42600	18875	0	20000	4100
	Murugi	860385	643185	217200	525560	0	197200	89585	16340	20000	11700
	Total (l/day):	1958290	1578590	379700	1032740	202275	319700	250535	63140	60000	29900
Kanjuki	Kamaindi	105965	42115	63850	38280	0	63850	3835	0	0	0
	Kanjuki	314325	139175	175150	106830	0	175150	15385	8860	0	8100
	Mutino	128710	108710	20000	84700	0	0	10630	5180	20000	8200
	Total (l/day):	549000	290000	259000	229810	0	239000	29850	14040	20000	16300
Karingani	Chuka Township	508065	495165	12900	103940	300725	12900	0	0	0	90500
	Gitareni	499220	290320	208900	241775	0	188900	37545	5700	20000	5300
	Kiangondu	251270	163570	87700	142400	0	87700	21170	0	0	0
	Kithangani	2826300	95500	2730800	74860	0	2670800	8100	5240	60000	7300
	Mariani	303905	132305	171600	118075	0	171600	9010	5220	0	0
	Mugirirua	586100	379900	206200	316460	0	126200	39220	5220	80000	19000
	Muiru	454505	316905	137600	252140	0	117600	14945	15320	20000	34500
	Ndagani	353190	233540	119650	191140	0	99650	13680	15120	20000	13600
	Total (l/day):	5782555	2107205	3675350	1440790	300725	3475350	143670	51820	200000	170200
Kiera	Iruma	418265	254515	163750	213640	0	143750	13735	15540	20000	11600
	Kirumi	208640	83290	125350	44970	0	125350	3480	15540	0	19300
	Magutuni	735515	460715	274800	389405	0	254800	18410	25800	20000	27100
	Mugumango	520040	445290	74750	374750	0	54750	45740	15000	20000	9800

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: NITHI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kiera	Thigaa	168140	113790	54350	92335	0	54350	6315	15140	0	0
	Total (l/day):	2050600	1357600	693000	1115100	0	633000	87680	87020	60000	67800
Magumoni	Itugururu	127065	40115	86950	30540	0	66950	2975	0	20000	6600
	Kamwibi	266250	94350	171900	81435	0	151900	9315	0	20000	3600
	Mukuuni	434130	298680	135450	245015	0	115450	31825	5540	20000	16300
	Thuita	465375	445375	20000	368940	0	0	34975	19360	20000	22100
	Total (l/day):	1292820	878520	414300	725930	0	334300	79090	24900	80000	48600
Muthambi	Chamunga	359225	269375	89850	197980	0	69850	35875	18820	20000	16700
	Gatua	475850	351900	123950	267420	0	103950	37400	22780	20000	24300
	Igamurathi	286050	166100	119950	129220	0	99950	31980	0	20000	4900
	Iriga	335755	180355	155400	139460	0	135400	19315	9280	20000	12300
	Kadungu	216005	124255	91750	81385	0	91750	33970	8900	0	0
	Karimba	409530	279830	129700	205240	0	109700	27830	27560	20000	19200
	Total (l/day):	2082415	1371815	710600	1020705	0	610600	186370	87340	100000	77400
Mwonge	Kabuboni	369260	262560	106700	205160	0	86700	31100	18700	20000	7600
	Mwonge	248680	216680	32000	182860	0	12000	27420	0	20000	6400
	Rubate	198345	162995	35350	147100	0	35350	15895	0	0	0
	Total (l/day):	816285	642235	174050	535120	0	134050	74415	18700	40000	14000
	Division Total (l/day):	14531965	8225965	6306000	6100195	503000	5746000	851610	346960	560000	424200

DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: NORTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Giaki	Giaki	584790	287340	297450	246625	0	277450	17620	6820	20000	16275
	Kiburine	359870	124670	235200	105090	0	215200	13055	0	20000	6525
	Total (l/day):	944660	412010	532650	351715	0	492650	30675	6820	40000	22800
Kiirua	Kiirua	354350	230550	123800	137160	0	103800	46530	15460	20000	31400
	Naari	802745	583495	219250	449840	0	219250	53235	7120	0	73300
	Thege	51270	40770	10500	37960	0	10500	1210	0	0	1600
	Total (l/day):	1208365	854815	353550	624960	0	333550	100975	22580	20000	106300
Ntima	Lower Igoki	708190	652640	55550	355620	268820	55550	28200	0	0	0
	Mpuri	56100	0	56100	0	0	56100	0	0	0	0
	Ngonyi	41250	0	41250	0	0	41250	0	0	0	0
	Ntakira	1064035	973035	91000	493540	434560	91000	44935	0	0	0
	Nthimbiri	431025	333425	97600	323120	0	97600	10305	0	0	0
	Town/Gakoromone	14417845	1129545	13288300	0	698585	68300	5275	139360	13220000	286325
	Upper Igoki	1389895	1343495	46400	0	1294160	46400	31095	18240	0	0
	Total (l/day):	18108340	4432140	13676200	1172280	2696125	456200	119810	157600	13220000	286325
Nyaki	Chugu	481380	457780	23600	411460	0	23600	46320	0	0	0
	Mulathankari	361610	319860	41750	0	309155	41750	6530	0	0	4175
	Munithu	617325	351925	265400	309960	0	245400	19925	9540	20000	12500
	Nkabune	359330	293180	66150	287840	0	66150	0	5340	0	0
	Thuura	518400	362450	155950	327880	0	155950	19695	0	0	14875
	Total (l/day):	2338045	1785195	552850	1337140	309155	532850	92470	14880	20000	31550

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MINISTRY OF WATER DEVELOPMENT

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: NORTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Ruiri	Ruiri	811805	330055	481750	243610	0	461750	38750	17320	20000	30375
	Total (l/day):	811805	330055	481750	243610	0	461750	38750	17320	20000	30375
	Division Total (l/day):	23411215	7814215	15597000	3729705	3005280	2277000	382680	219200	13320000	477350

MINISTRY OF WATER DEVELOPMENT

Water Resources Assessment & Planning Project - Documentation Section

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: NTONYIRI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Antubetwe-Kiongo	Antubetwe-Kiongo	765435	377835	387600	303885	0	387600	19050	5400	0	49500
	Total (l/day):	765435	377835	387600	303885	0	387600	19050	5400	0	49500
Athiru-Ruujine	Athiru Ruujine	674635	440035	234600	387340	0	234600	21170	0	0	31525
	Total (l/day):	674635	440035	234600	387340	0	234600	21170	0	0	31525
Ithima	Akirangondu	887245	410645	476600	383605	0	476600	27040	0	0	0
	Antuambui	1102825	528025	574800	362670	0	574800	27040	7940	0	130375
	Ntunene	740060	264960	475100	204465	0	455100	13520	11700	20000	35275
	Total (l/day):	2730130	1203630	1526500	950740	0	1506500	67600	19640	20000	165650
Mutuati	Amwathi 1	460100	367150	92950	283360	0	92950	19690	0	0	64100
	Amwathi 2	211905	166005	45900	144220	0	45900	14060	0	0	7725
	Naathu	364980	321130	43850	298630	0	43850	22500	0	0	0
	Total (l/day):	1036985	854285	182700	726210	0	182700	56250	0	0	71825
	Division Total (l/day):	5207185	2875785	2331400	2368175	0	2311400	164070	25040	20000	318500

MINISTRY OF WATER DEVELOPMENT

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: SOUTH IMENTI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abogeta	Upper Githangari	417020	264620	152400	230300	0	132400	22145	0	20000	12175
	Upper Kiungone	557780	381230	176550	330600	0	176550	40830	0	0	9800
	Total (l/day):	974800	645850	328950	560900	0	308950	62975	0	20000	21975
Igoji	Gikui	598660	473010	125650	318070	0	105650	130725	6840	20000	17375
	Karia	489755	366755	123000	322440	0	123000	26815	5800	0	11700
	Total (l/day):	1088415	839765	248650	640510	0	228650	157540	12640	20000	29075
Igoki	Kothine	354745	160945	193800	147340	0	193800	13605	0	0	0
	Mwichure	337465	101065	236400	88380	0	236400	5685	7000	0	0
	Upper Chure	468325	238725	229600	198960	0	229600	26340	5800	0	7625
	Total (l/day):	1160535	500735	659800	434680	0	659800	45630	12800	0	7625
Kanyakine	Kanyakine	707065	562765	144300	448700	0	124300	83250	10140	20000	20675
	Kiringa	435655	279405	156250	221995	0	156250	47210	0	0	10200
	Total (l/day):	1142720	842170	300550	670695	0	280550	130460	10140	20000	30875
Mitine	Kianjogu	334555	216055	118500	113850	0	118500	86265	5540	0	10400
	Kinoro	367475	322725	44750	270640	0	44750	27930	7680	0	16475
	Mweru	363135	281035	82100	240690	0	82100	32145	0	0	8200
	Total (l/day):	1065165	819815	245350	625180	0	245350	146340	13220	0	35075

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: SOUTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mitunguu	Kirendene	307865	155565	152300	118330	0	132300	13460	0	20000	23775
	Ngonyi	427240	308990	118250	282565	0	118250	20225	0	0	6200
	Total (l/day):	735105	464555	270550	400895	0	250550	33685	0	20000	29975
Nkuene	Kathera	1298075	1104725	193350	326860	570960	133350	109675	56180	60000	41050
	Kigane	333825	269275	64550	255240	0	64550	11135	0	0	2900
	Mikumbune	449205	326505	122700	260040	0	122700	45745	7120	0	13600
	Uruku	635570	496820	138750	388780	0	138750	73820	20620	0	13600
	Total (l/day):	2716675	2197325	519350	1230920	570960	459350	240375	83920	60000	71150
	Division Total (l/day):	8883415	6310215	2573200	4563780	570960	2433200	817005	132720	140000	225750

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: THARAKA

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Gikingo	Irunduni	54020	34120	19900	29775	0	19900	4345	0	0	0
	Kanjoro	241040	155240	85800	128480	0	85800	14760	0	0	12000
	Total (l/day):	295060	189360	105700	158255	0	105700	19105	0	0	12000
Marimanti	Kanyuru	330640	126640	204000	113970	0	204000	7170	0	0	5500
	Marimanti	434615	184665	249950	109790	0	249950	57015	6160	0	11700
	Nkondi	533990	237640	296350	200095	0	296350	22105	5940	0	9500
	Turima	215215	96315	118900	80245	0	118900	8870	0	0	7200
	Total (l/day):	1514460	645260	869200	504100	0	869200	95160	12100	0	33900
North Tharaka	Gatue	347065	75665	271400	68500	0	271400	7165	0	0	0
	Gatunga	150640	126490	24150	100550	0	24150	7900	5540	0	12500
	Kathangachini	124500	55900	68600	45555	0	68600	4185	6160	0	0
	Total (l/day):	622205	258055	364150	214605	0	364150	19250	11700	0	12500
South Tharaka	Chiokariga	196730	168730	28000	111385	0	28000	39465	7380	0	10500
	Kamanyaki	118335	94335	24000	78445	0	24000	5950	5540	0	4400
	Tunyai	189795	176095	13700	132810	0	13700	27805	5580	0	9900
	Total (l/day):	504860	439160	65700	322640	0	65700	73220	18500	0	24800
	Division Total (l/day):	2936585	1531835	1404750	1199600	0	1404750	206735	42300	0	83200

DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: TIGANIA **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akithii	Athwana	413300	126200	287100	109645	0	287100	15130	0	0	1425
	Kitheo	276890	201290	75600	151985	0	75600	22160	21020	0	6125
	Nchooro	386445	269195	117250	245815	0	117250	12930	0	0	10450
	Thinyaine	310895	128845	182050	111600	0	182050	15520	0	0	1725
	Total (l/day):	1387530	725530	662000	619045	0	662000	65740	21020	0	19725
Karama	Karama	530900	522550	8350	472665	0	8350	19860	0	0	30025
	Total (l/day):	530900	522550	8350	472665	0	8350	19860	0	0	30025
Kianjai	Kianjai	503850	399350	104500	326555	0	104500	33545	0	0	39250
	Miathene	861610	519810	341800	396340	0	341800	79660	28260	0	15550
	Total (l/day):	1365460	919160	446300	722895	0	446300	113205	28260	0	54800
Mbeu	Kiorimba	315555	260255	55300	246330	0	55300	0	0	0	13925
	Mbeu	328605	150505	178100	105600	0	178100	11705	0	0	33200
	Total (l/day):	644160	410760	233400	351930	0	233400	11705	0	0	47125
Mikinduri	Akaiga	319355	247105	72250	230240	0	72250	8865	0	0	8000
	Antuamburi	398150	244250	153900	153320	0	93900	24950	9280	60000	56700
	Athwana	191815	147315	44500	126680	0	44500	10660	0	0	9975
	Kiguchua	538215	483715	54500	435540	0	54500	21975	0	0	26200
	Total (l/day):	1447535	1122385	325150	945780	0	265150	66450	9280	60000	100875

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DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: TIGANIA (Continued)

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mituntu	Mituntu	271115	168065	103050	136860	0	103050	18130	0	0	13075
	Total (l/day):	271115	168065	103050	136860	0	103050	18130	0	0	13075
Muthara	Athanja	1386010	240410	1145600	219440	0	1145600	20970	0	0	0
	Athinga	670395	157895	512500	135690	0	512500	11105	0	0	11100
	Kitharene	427500	258650	168850	240920	0	168850	4930	0	0	12800
	Total (l/day):	2483905	656955	1826950	596050	0	1826950	37005	0	0	23900
Thangatha	Ankamia	473160	393460	79700	337730	0	79700	25880	0	0	29850
	Giithu	166925	133375	33550	104275	0	33550	10150	0	0	18950
	Igarii	162830	54280	108550	38350	0	108550	2030	0	0	13900
	Kunati	234915	181015	53900	142540	0	53900	13875	0	0	24600
	Total (l/day):	1037830	762130	275700	622895	0	275700	51935	0	0	87300
Uringu	Nkomo	412030	339880	72150	272115	0	72150	18770	11020	0	37975
	Uringu	371385	312985	58400	277380	0	58400	16155	0	0	19450
	Total (l/day):	783415	652865	130550	549495	0	130550	34925	11020	0	57425
	Division Total (l/day):	9951850	5940400	4011450	5017615	0	3951450	418955	69580	60000	434250

DISTRICT WATER DEMAND SUMMARY (1993) - Scenario 2

DIVISION: TIMAU **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kirimara	Kithithina	115400	70700	44700	58795	0	44700	6345	5560	0	0
	Ngushishi	293085	174335	118750	141435	0	118750	12020	20880	0	0
	Total (l/day):	408485	245035	163450	200230	0	163450	18365	26440	0	0
Kisima	Buuri	298030	175280	122750	150360	0	122750	2270	0	0	22650
	Mutunyi	649070	63020	586050	54455	0	566050	7265	0	20000	1300
	Ngare Ndare	192745	66045	126700	58755	0	126700	2265	0	0	5025
	Total (l/day):	1139845	304345	835500	263570	0	815500	11800	0	20000	28975
Ontulili	Ontulili	592345	412295	180050	379300	0	160050	20035	5660	20000	7300
	Total (l/day):	592345	412295	180050	379300	0	160050	20035	5660	20000	7300
	Division Total (l/day):	2140675	961675	1179000	843100	0	1139000	50200	32100	40000	36275

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: CENTRAL IMENTI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abothuguchi	Githongo	983260	839560	143700	597600	0	143700	153765	37920	0	50275
	Katheri	1855190	1402340	452850	1180260	0	452850	182180	0	0	39900
	Kithirune	1183855	865005	318850	750780	0	318850	78400	0	0	35825
	Total (l/day):	4022305	3106905	915400	2528640	0	915400	414345	37920	0	126000
Gatimbi	Kariene	1318100	1207600	110500	1015120	0	110500	109120	24360	0	59000
	Mariene	743835	583685	160150	504900	0	160150	58685	0	0	20100
	Ruiga	850575	781175	69400	739640	0	69400	36985	0	0	4550
	Total (l/day):	2912510	2572460	340050	2259660	0	340050	204790	24360	0	83650
Kibirichia	Kiamiogo	726790	564790	162000	471320	0	162000	26270	0	0	67200
	Kimbo	705355	556055	149300	524910	0	149300	23770	0	0	7375
	Mboroga	266685	183585	83100	162625	0	83100	10360	0	0	10600
	Ntumburi	304635	176885	127750	126360	0	127750	42975	0	0	7550
	Total (l/day):	2003465	1481315	522150	1285215	0	522150	103375	0	0	92725
Mwangathia	Gaitu	784440	532490	251950	425425	0	251950	28685	38680	0	39700
	Gitie	676545	446545	230000	381350	0	230000	52995	0	0	12200
	Igane	662820	479870	182950	433845	0	182950	24525	0	0	21500
	Kaongo	715235	539335	175900	444780	0	175900	25915	38440	0	30200
	Kiamuri	420050	223100	196950	188245	0	196950	18830	0	0	16025
	Makandune	288675	163975	124700	132995	0	124700	11795	10960	0	8225
	Total (l/day):	3547765	2385315	1162450	2006640	0	1162450	162745	88080	0	127850
	Division Total (l/day):	12486045	9545995	2940050	8080155	0	2940050	885255	150360	0	430225

DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: IGEMBE **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akachiu	Amungenti	793075	733375	59700	599535	0	59700	105940	17200	0	10700
	Athiru Gaiti	543565	502665	40900	448155	0	40900	32850	10460	0	11200
	Auki	532985	507735	25250	475220	0	25250	26915	0	0	5600
	Kirindine	858730	723880	134850	627080	0	134850	39100	10900	0	46800
	Total (l/day):	2728355	2467655	260700	2149990	0	260700	204805	38560	0	74300
Kangeta	Kangeta	671610	503210	168400	394535	0	168400	30955	17520	0	60200
	Liliaba	635895	275595	360300	215125	0	360300	44870	0	0	15600
	Total (l/day):	1307505	778805	528700	609660	0	528700	75825	17520	0	75800
Kiegoi	Kiegoi	789570	745820	43750	710300	0	43750	35520	0	0	0
	Total (l/day):	789570	745820	43750	710300	0	43750	35520	0	0	0
Maua	Amwathi	2320725	2175575	145150	1089340	918660	145150	139595	27980	0	0
	Antubetwe Njoune	511855	435405	76450	373800	0	76450	20905	0	0	40700
	Kanjoo	175340	61690	113650	45330	0	113650	4780	11580	0	0
	Total (l/day):	3007920	2672670	335250	1508470	918660	335250	165280	39560	0	40700
Njia	Buri Eruri	1303300	1228850	74450	1045460	0	74450	113790	0	0	69600
	Njia Cia Mwendwa	1078015	918965	159050	835300	0	159050	62965	0	0	20700
	Total (l/day):	2381315	2147815	233500	1880760	0	233500	176755	0	0	90300
	Division Total (l/day):	10214665	8812765	1401900	6859180	918660	1401900	658185	95640	0	281100

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: NITHI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Chogoria	Chogoria	1720640	1562390	158250	743440	470355	118250	234395	83800	40000	30400
	Kiraro	411375	308275	103100	270360	0	63100	29315	0	40000	8600
	Murugi	1601400	1269500	331900	1049400	0	291900	167400	27400	40000	25300
	Total (l/day):	3733415	3140165	593250	2063200	470355	473250	431110	111200	120000	64300
Kanjuki	Kamaindi	185100	70750	114350	63670	0	114350	7080	0	0	0
	Kanjuki	533795	248445	285350	182960	0	285350	31065	16920	0	17500
	Mutino	224050	184050	40000	141250	0	0	14880	10320	40000	17600
	Total (l/day):	942945	503245	439700	387880	0	399700	53025	27240	40000	35100
Karingani	Chuka Township	1064415	1045315	19100	205640	703275	19100	0	0	0	136400
	Gitareni	886080	538380	347700	459060	0	307700	56860	11260	40000	11200
	Kiangondu	447145	317295	129850	284400	0	129850	32895	0	0	0
	Kithangani	4430800	169950	4260850	131825	0	4140850	12005	10420	120000	15700
	Mariani	514810	235310	279500	207900	0	279500	17010	10400	0	0
	Mugirirua	1114850	748000	366850	631980	0	186850	64720	10400	180000	40900
	Muiru	842815	628715	214100	503460	0	174100	25175	25580	40000	74500
	Ndagani	635675	448125	187550	370580	0	147550	20945	27000	40000	29600
	Total (l/day):	9936590	4131090	5805500	2794845	703275	5385500	229610	95060	420000	308300
Kiera	Iruma	751360	498610	252750	426520	0	212750	21330	25960	40000	24800
	Kirumi	344890	159340	185550	86405	0	185550	5275	25960	0	41700
	Magutuni	1304765	849715	455050	696925	0	415050	47750	46440	40000	58600
	Mugumango	983685	862585	121100	735760	0	81100	80425	25000	40000	21400

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: NITHI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kiera	Thigaa	296605	216155	80450	181085	0	80450	9810	25260	0	0
	Total (l/day):	3681305	2586405	1094900	2126695	0	974900	164590	148620	120000	146500
Magumoni	Itugururu	221490	72390	149100	53790	0	109100	4400	0	40000	14200
	Kamwibi	448180	160780	287400	139490	0	247400	13290	0	40000	8000
	Mukuuni	781355	570455	210900	476070	0	170900	48525	10960	40000	34900
	Thuita	916240	876240	40000	736740	0	0	59200	32800	40000	47500
	Total (l/day):	2367265	1679865	687400	1406090	0	527400	125415	43760	160000	104600
Muthambi	Chamunga	670705	527355	143350	395360	0	103350	61255	34740	40000	36000
	Gatua	877435	683485	193950	533980	0	153950	58065	38940	40000	52500
	Igamurathi	506260	318310	187950	258040	0	147950	49670	0	40000	10600
	Iriga	593080	352680	240400	278480	0	200400	30040	17660	40000	26500
	Kadungu	358450	209000	149450	142810	0	149450	49210	16980	0	0
	Karimba	727795	525445	202350	394300	0	162350	42245	47500	40000	41400
	Total (l/day):	3733725	2616275	1117450	2002970	0	917450	290485	155820	200000	167000
Mwonge	Kabuboni	674315	506015	168300	409700	0	128300	48295	31620	40000	16400
	Mwonge	479295	421545	57750	365140	0	17750	42605	0	40000	13800
	Rubate	366125	313725	52400	285865	0	52400	27860	0	0	0
	Total (l/day):	1519735	1241285	278450	1060705	0	198450	118760	31620	80000	30200
	Division Total (l/day):	25914980	15898330	10016650	11842385	1173630	8876650	1412995	613320	1140000	856000

DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: NORTH IMENTI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Giaki	Giaki	1010635	559985	450650	484355	0	410650	26995	13260	40000	35375
	Kiburine	621310	195910	425400	161135	0	385400	20800	0	40000	13975
	Total (l/day):	1631945	755895	876050	645490	0	796050	47795	13260	80000	49350
Kiirua	Kiirua	617205	391305	225900	228855	0	185900	65770	28680	40000	68000
	Naari	1494670	1170120	324550	898220	0	324550	99500	13800	0	158600
	Thege	97690	82140	15550	75800	0	15550	3140	0	0	3200
	Total (l/day):	2209565	1643565	566000	1202875	0	526000	168410	42480	40000	229800
Ntima	Lower Igoki	1335000	1252800	82200	717020	462645	82200	73135	0	0	0
	Mpuri	83000	0	83000	0	0	83000	0	0	0	0
	Ngonyi	61050	0	61050	0	0	61050	0	0	0	0
	Ntakira	2006005	1871255	134750	985200	769515	134750	116540	0	0	0
	Nthimbiri	816350	671850	144500	645120	0	144500	26730	0	0	0
	Town/Gakoromone	30720640	2079540	28641100	0	1225935	101100	13680	247700	28540000	592225
	Upper Igoki	2423785	2355135	68650	0	2271295	68650	53040	30800	0	0
	Total (l/day):	37445830	8230580	29215250	2347340	4729390	675250	283125	278500	28540000	592225
Nyaki	Chugu	938500	903550	34950	821520	0	34950	82030	0	0	0
	Mulathankari	624755	562905	61850	0	543065	61850	10640	0	0	9200
	Munithu	1098050	694850	403200	618840	0	363200	30945	18140	40000	26925
	Nkabune	683290	585340	97950	574740	0	97950	0	10600	0	0
	Thuura	950120	719270	230850	654660	0	230850	32735	0	0	31875
	Total (l/day):	4294715	3465915	828800	2669760	543065	788800	156350	28740	40000	68000

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: NORTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Ruiri	Ruiri	1363395	571245	792150	415975	0	752150	60685	29160	40000	65425
	Total (l/day):	1363395	571245	792150	415975	0	752150	60685	29160	40000	65425
	Division Total (l/day):	46945450	14667200	32278250	7281440	5272455	3538250	716365	392140	28740000	1004800

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: NTONYIRI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Antubetwe-Kiongo	Antubetwe-Kiongo	1296625	665225	631400	533155	0	631400	45925	10720	0	75425
	Total (l/day):	1296625	665225	631400	533155	0	631400	45925	10720	0	75425
Athiru-Ruujine	Athiru Ruujine	1226700	806550	420150	693005	0	420150	49995	0	0	63550
	Total (l/day):	1226700	806550	420150	693005	0	420150	49995	0	0	63550
Ithima	Akirangondu	1613680	760130	853550	710135	0	853550	49995	0	0	0
	Antuambui	1923830	894430	1029400	671625	0	1029400	49995	15260	0	157550
	Ntunene	1361695	506695	855000	378730	0	815000	29715	22000	40000	76250
	Total (l/day):	4899205	2161255	2737950	1760490	0	2697950	129705	37260	40000	233800
Mutuati	Amwathi 1	794110	627660	166450	495860	0	166450	44300	0	0	87500
	Amwathi 2	365450	283300	82150	239985	0	82150	26665	0	0	16650
	Naathu	647625	569075	78550	522400	0	78550	46675	0	0	0
	Total (l/day):	1807185	1480035	327150	1258245	0	327150	117640	0	0	104150
	Division Total (l/day):	9229715	5113065	4116650	4244895	0	4076650	343265	47980	40000	476925

DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: SOUTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abogeta	Upper Githangari	770425	534375	236050	459800	0	196050	48325	0	40000	26250
	Upper Kiungone	1006295	744945	261350	660160	0	261350	63385	0	0	21400
	Total (l/day):	1776720	1279320	497400	1119960	0	457400	111710	0	40000	47650
Igoji	Gikui	1070965	874615	196350	624610	0	156350	200230	12300	40000	37475
	Karia	905455	723405	182050	643860	0	182050	42905	11440	0	25200
	Total (l/day):	1976420	1598020	378400	1268470	0	338400	243135	23740	40000	62675
Igoki	Kothine	616465	329565	286900	294300	0	286900	35265	0	0	0
	Mwichure	548855	198905	349950	176500	0	349950	8825	13580	0	0
	Upper Chure	805950	466050	339900	397280	0	339900	40880	11440	0	16450
	Total (l/day):	1971270	994520	976750	868080	0	976750	84970	25020	0	16450
Kanyakine	Kanyakine	1324935	1100885	224050	895860	0	184050	141050	19200	40000	44775
	Kiringa	763915	509415	254500	416310	0	254500	70905	0	0	22200
	Total (l/day):	2088850	1610300	478550	1312170	0	438550	211955	19200	40000	66975
Mitine	Kianjogu	534530	322330	212200	172940	0	212200	115930	10960	0	22500
	Kinoro	700245	633945	66300	540440	0	66300	43355	14800	0	35350
	Mweru	650640	529090	121550	462405	0	121550	48785	0	0	17900
	Total (l/day):	1885415	1485365	400050	1175785	0	400050	208070	25760	0	75750

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: SOUTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mitunguu	Kirendene	542550	287000	255550	207115	0	215550	28735	0	40000	51150
	Ngonyi	767605	592505	175100	547935	0	175100	30970	0	0	13600
	Total (l/day):	1310155	879505	430650	755050	0	390650	59705	0	40000	64750
Nkuene	Kathera	2722540	2405140	317400	653700	1324570	197400	237885	100560	120000	88425
	Kigane	636895	541345	95550	509660	0	95550	25485	0	0	6200
	Mikumbune	815060	633460	181600	519300	0	181600	71060	13800	0	29300
	Uruku	1161540	956140	205400	776240	0	205400	115540	35060	0	29300
	Total (l/day):	5336035	4536085	799950	2458900	1324570	679950	449970	149420	120000	153225
	Division Total (l/day):	16344865	12383115	3961750	8958415	1324570	3681750	1369515	243140	280000	487475

DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: THARAKA **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Gikingo	Irunduni	87245	51595	35650	45695	0	35650	5900	0	0	0
	Kanjoro	402030	248330	153700	197005	0	153700	25425	0	0	25900
	Total (l/day):	489275	299925	189350	242700	0	189350	31325	0	0	25900
Marimanti	Kanyuru	585735	220385	365350	190190	0	365350	18595	0	0	11600
	Marimanti	728295	280695	447600	166810	0	447600	76605	12080	0	25200
	Nkondi	897050	414250	482800	350225	0	482800	31845	11680	0	20500
	Turima	362310	168660	193650	140580	0	193650	12780	0	0	15300
	Total (l/day):	2573390	1083990	1489400	847805	0	1489400	139825	23760	0	72600
North Tharaka	Gatue	612330	126280	486050	114250	0	486050	12030	0	0	0
	Gatunga	263480	220180	43300	163125	0	43300	19195	10960	0	26900
	Kathangachini	217585	94685	122900	73900	0	122900	8705	12080	0	0
	Total (l/day):	1093395	441145	652250	351275	0	652250	39930	23040	0	26900
South Tharaka	Chiokariga	334010	283810	50200	185385	0	50200	61465	14260	0	22700
	Kamanyaki	205590	162640	42950	127205	0	42950	14975	10960	0	9500
	Tunyai	323935	301635	22300	228750	0	22300	40445	11040	0	21400
	Total (l/day):	863535	748085	115450	541340	0	115450	116885	36260	0	53600
	Division Total (l/day):	5019595	2573145	2446450	1983120	0	2446450	327965	83060	0	179000

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: TIGANIA

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akithii	Athwana	716090	201890	514200	177885	0	514200	20930	0	0	3075
	Kitheo	450475	315075	135400	233045	0	135400	30080	38700	0	13250
	Nchooro	712295	502245	210050	446160	0	210050	33535	0	0	22550
	Thinyaine	531955	205905	326050	181000	0	326050	21305	0	0	3600
	Total (l/day):	2410815	1225115	1185700	1038090	0	1185700	105850	38700	0	42475
Karama	Karama	1056055	1043755	12300	928810	0	12300	49995	0	0	64950
	Total (l/day):	1056055	1043755	12300	928810	0	12300	49995	0	0	64950
Kianjai	Kianjai	931135	760985	170150	620080	0	170150	56105	0	0	84800
	Miathene	1505690	999740	505950	791300	0	505950	124300	50640	0	33500
	Total (l/day):	2436825	1760725	676100	1411380	0	676100	180405	50640	0	118300
Mbeu	Kiorimba	568465	478415	90050	448540	0	90050	0	0	0	29875
	Mbeu	571830	281730	290100	192315	0	290100	17490	0	0	71925
	Total (l/day):	1140295	760145	380150	640855	0	380150	17490	0	0	101800
Mikinduri	Akaiga	589705	482755	106950	442260	0	106950	22995	0	0	17500
	Antuamburi	674355	386155	288200	232960	0	168200	33835	17660	120000	101700
	Athwana	347850	275400	72450	237630	0	72450	16020	0	0	21750
	Kiguchua	1050160	969460	80700	869580	0	80700	43480	0	0	56400
	Total (l/day):	2662070	2113770	548300	1782430	0	428300	116330	17660	120000	197350

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: TIGANIA (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mituntu	Mituntu	455150	270600	184550	217500	0	184550	24950	0	0	28150
	Total (l/day):	455150	270600	184550	217500	0	184550	24950	0	0	28150
Muthara	Athanja	2492575	440975	2051600	410670	0	2051600	30305	0	0	0
	Athinga	1208115	290315	917800	246165	0	917800	20150	0	0	24000
	Kitharene	747315	497365	249950	456780	0	249950	12785	0	0	27800
	Total (l/day):	4448005	1228655	3219350	1113615	0	3219350	63240	0	0	51800
Thangatha	Ankamia	876465	746615	129850	641210	0	129850	41080	0	0	64325
	Giithu	293880	239280	54600	183605	0	54600	15025	0	0	40650
	Igarii	287805	93405	194400	58290	0	194400	5265	0	0	29850
	Kunati	412625	324825	87800	250940	0	87800	20535	0	0	53350
	Total (l/day):	1870775	1404125	466650	1134045	0	466650	81905	0	0	188175
Uringu	Nkomo	771835	665035	106800	533400	0	106800	28880	20780	0	81975
	Uringu	709950	623450	86500	553880	0	86500	27695	0	0	41875
	Total (l/day):	1481785	1288485	193300	1087280	0	193300	56575	20780	0	123850
	Division Total (l/day):	17961775	11095375	6866400	9354005	0	6746400	696740	127780	120000	916850

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DISTRICT WATER DEMAND SUMMARY (2003) - Scenario 2

DIVISION: TIMAU

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kirimara	Kithithina	194035	121135	72900	101035	0	72900	9100	11000	0	0
	Ngushishi	521170	308520	212650	247250	0	212650	22830	38440	0	0
	Total (l/day):	715205	429655	285550	348285	0	285550	31930	49440	0	0
Kisima	Buuri	536655	354955	181700	300240	0	181700	5890	0	0	48825
	Mutunyi	1157055	103355	1053700	90560	0	1013700	10070	0	40000	2725
	Ngare Ndare	339020	112070	226950	95320	0	226950	5875	0	0	10875
	Total (l/day):	2032730	570380	1462350	486120	0	1422350	21835	0	40000	62425
Ontulili	Ontulili	1087330	810380	276950	743450	0	236950	40250	11180	40000	15500
	Total (l/day):	1087330	810380	276950	743450	0	236950	40250	11180	40000	15500
	Division Total (l/day):	3835265	1810415	2024850	1577855	0	1944850	94015	60620	80000	77925

DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: CENTRAL IMENTI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abothuguchi	Githongo	1950230	1737530	212700	1340560	0	212700	238830	68140	0	90000
	Katheri	3807775	3137425	670350	2647580	0	670350	404945	0	0	84900
	Kithirune	2391490	1919490	472000	1684080	0	472000	158335	0	0	77075
	Total (l/day):	8149495	6794445	1355050	5672220	0	1355050	802110	68140	0	251975
Gatimbi	Kariene	2823255	2659605	163650	2277140	0	163650	218195	45720	0	118550
	Mariene	1509280	1272180	237100	1132560	0	237100	96220	0	0	43400
	Ruiga	1821735	1719035	102700	1659240	0	102700	49995	0	0	9800
	Total (l/day):	6154270	5650820	503450	5068940	0	503450	364410	45720	0	171750
Kibirichia	Kiamiogo	1440560	1200810	239750	1022150	0	239750	40260	0	0	138400
	Kimbo	1408265	1187215	221050	1124645	0	221050	46645	0	0	15925
	Mboroga	513440	378040	135400	339390	0	135400	15750	0	0	22900
	Ntumburi	527145	298345	228800	222560	0	228800	59685	0	0	16100
	Total (l/day):	3889410	3064410	825000	2708745	0	825000	162340	0	0	193325
Mwangathia	Gaitu	1485170	1074720	410450	874490	0	410450	43130	71600	0	85500
	Gitie	1260320	919820	340500	811135	0	340500	82585	0	0	26100
	Igane	1307205	1036405	270800	952615	0	270800	37565	0	0	46225
	Kaongo	1387255	1126905	260350	952920	0	260350	39525	69060	0	65400
	Kiamuri	724860	404060	320800	342920	0	320800	26665	0	0	34475
	Makandune	513455	310305	203150	253740	0	203150	17170	21720	0	17675
	Total (l/day):	6678265	4872215	1806050	4187820	0	1806050	246640	162380	0	275375
	Division Total (l/day):	24871440	20381890	4489550	17637725	0	4489550	1575500	276240	0	892425

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: IGEMBE

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akachiu	Amungenti	1605095	1507845	97250	1232245	0	97250	219800	32900	0	22900
	Athiru Gaiti	1053275	986675	66600	891760	0	66600	49995	20820	0	24100
	Auki	1158405	1121005	37400	1066060	0	37400	42845	0	0	12100
	Kirindine	1670415	1450715	219700	1289000	0	219700	49995	21620	0	90100
	Total (l/day):	5487190	5066240	420950	4479065	0	420950	362635	75340	0	149200
Kangeta	Kangeta	1283370	981820	301550	802975	0	301550	44685	33460	0	100700
	Liliaba	1168070	522820	645250	425460	0	645250	63760	0	0	33600
	Total (l/day):	2451440	1504640	946800	1228435	0	946800	108445	33460	0	134300
Kiegoi	Kiegoi	1708095	1643395	64700	1593400	0	64700	49995	0	0	0
	Total (l/day):	1708095	1643395	64700	1593400	0	64700	49995	0	0	0
Maua	Amwathi	5063530	4827130	236400	2307585	2187050	236400	282395	50100	0	0
	Antubetwe Njoune	1007505	883005	124500	768215	0	124500	37890	0	0	76900
	Kanjoo	314340	110840	203500	81315	0	203500	6705	22820	0	0
	Total (l/day):	6385375	5820975	564400	3157115	2187050	564400	326990	72920	0	76900
Njia	Buri Eruri	2775645	2665395	110250	2345200	0	110250	227295	0	0	92900
	Njia Cia Mwendwa	2264915	2029515	235400	1873820	0	235400	111095	0	0	44600
	Total (l/day):	5040560	4694910	345650	4219020	0	345650	338390	0	0	137500
	Division Total (l/day):	21072660	18730160	2342500	14677035	2187050	2342500	1186455	181720	0	497900

DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: NITHI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Chogoria	Chogoria	3634600	3379550	255050	1651000	1109340	175050	432410	121400	80000	65400
	Kiraro	843960	670560	173400	606440	0	93400	45520	0	80000	18600
	Murugi	3343755	2831655	512100	2354040	0	432100	373715	49300	80000	54600
	Total (l/day):	7822315	6881765	940550	4611480	1109340	700550	851645	170700	240000	138600
Kanjuki	Kamaindi	326885	122035	204850	112205	0	204850	9830	0	0	0
	Kanjuki	917710	452860	464850	338455	0	464850	44405	32400	0	37600
	Mutino	412495	332495	80000	253250	0	0	20865	20580	80000	37800
	Total (l/day):	1657090	907390	749700	703910	0	669700	75100	52980	80000	75400
Karingani	Chuka Township	2286580	2258280	28300	459800	1649080	28300	0	0	0	149400
	Gitareni	1684520	1103320	581200	957795	0	501200	99065	22260	80000	24200
	Kiangondu	881210	688960	192250	637900	0	192250	51060	0	0	0
	Kithangani	6399875	329525	6070350	257295	0	5810350	17770	20760	260000	33700
	Mariani	906880	451530	455350	405630	0	455350	25180	20720	0	0
	Mugirirua	2302905	1646355	656550	1417580	0	276550	119855	20720	380000	88200
	Muiru	1676275	1338575	337700	1129440	0	257700	39095	46040	80000	124000
	Ndagani	1256675	958275	298400	813690	0	218400	32085	48400	80000	64100
	Total (l/day):	17394920	8774820	8620100	6079130	1649080	7740100	384110	178900	880000	483600
Kiera	Iruma	1485090	1090140	394950	956800	0	314950	33120	46720	80000	53500
	Kirumi	602540	327890	274650	182860	0	274650	8010	46720	0	90300
	Magutuni	2401825	1645725	756100	1386750	0	676100	49995	82580	80000	126400
	Mugumango	2050175	1850125	200050	1595530	0	120050	163595	45000	80000	46000

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: NITHI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kiera	Thigaa	581755	462655	119100	402100	0	119100	15095	45460	0	0
	Total (l/day):	7121385	5376535	1744850	4524040	0	1504850	269815	266480	240000	316200
Magumoni	Itugururu	399630	141930	257700	104915	0	177700	6515	0	80000	30500
	Kamwibi	777280	294230	483050	258125	0	403050	19005	0	80000	17100
	Mukuuni	1531760	1198810	332950	1019960	0	252950	83030	21720	80000	74100
	Thuita	2008525	1928525	80000	1652620	0	0	114445	58960	80000	102500
	Total (l/day):	4717195	3563495	1153700	3035620	0	833700	222995	80680	320000	224200
Muthambi	Chamunga	1357300	1124300	233000	886860	0	153000	95140	64300	80000	78000
	Gatua	1787905	1480055	307850	1197880	0	227850	98615	69960	80000	113600
	Igamurathi	977975	678925	299050	578880	0	219050	77145	0	80000	22900
	Iriga	1138895	762245	376650	624780	0	296650	46645	33720	80000	57100
	Kadungu	631140	387690	243450	283775	0	243450	71415	32500	0	0
	Karimba	1397015	1076665	320350	834050	0	240350	67715	85300	80000	89600
	Total (l/day):	7290230	5509880	1780350	4406225	0	1380350	456675	285780	400000	361200
Mwonge	Kabuboni	1356125	1086175	269950	919100	0	189950	75015	56860	80000	35200
	Mwonge	1021175	914875	106300	819120	0	26300	66155	0	80000	29600
	Rubate	732580	655030	77550	612525	0	77550	42505	0	0	0
	Total (l/day):	3109880	2656080	453800	2350745	0	293800	183675	56860	160000	64800
	Division Total (l/day):	49113015	33669965	15443050	25711150	2758420	13123050	2444015	1092380	2320000	1664000

DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: NORTH IMENTI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Giaki	Giaki	1882070	1194170	687900	1050355	0	607900	41375	25840	80000	76600
	Kiburine	1107125	336975	770150	278685	0	690150	28265	0	80000	30025
	Total (l/day):	2989195	1531145	1458050	1329040	0	1298050	69640	25840	160000	106625
Kiirua	Kiirua	1097545	684695	412850	410195	0	332850	92700	53500	80000	128300
	Naari	3071745	2591295	480450	2015000	0	480450	207295	26800	0	342200
	Thege	205890	182890	23000	170100	0	23000	5890	0	0	6900
	Total (l/day):	4375180	3458880	916300	2595295	0	836300	305885	80300	80000	477400
Ntima	Lower Igoki	2681915	2560215	121700	1624080	768790	121700	167345	0	0	0
	Mpuri	122850	0	122850	0	0	122850	0	0	0	0
	Ngonyi	90350	0	90350	0	0	90350	0	0	0	0
	Ntakira	3965265	3765815	199450	2219480	1314390	199450	231945	0	0	0
	Nthimbiri	1711055	1497155	213900	1447160	0	213900	49995	0	0	0
	Town/Gakoromone	65390055	3620405	61769650	0	2140405	149650	35480	376820	61620000	1067700
	Upper Igoki	4197285	4095635	101650	0	3965610	101650	74645	55380	0	0
	Total (l/day):	78158775	15539225	62619550	5290720	8189195	999550	559410	432200	61620000	1067700
Nyaki	Chugu	2062625	2010875	51750	1842880	0	51750	167995	0	0	0
	Mulathankari	1076565	985015	91550	0	948060	91550	17330	0	0	19625
	Munithu	2146360	1528710	617650	1388200	0	537650	48055	34580	80000	57875
	Nkabune	1455420	1310420	145000	1289340	0	145000	0	21080	0	0
	Thuura	1928975	1587275	341700	1468480	0	341700	49995	0	0	68800
	Total (l/day):	8669945	7422295	1247650	5988900	948060	1167650	283375	55660	80000	146300

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MINISTRY OF WATER DEVELOPMENT

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: NORTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Ruiri	Ruiri	2361595	1056395	1305200	757760	0	1225200	104995	52440	80000	141200
	Total (l/day):	2361595	1056395	1305200	757760	0	1225200	104995	52440	80000	141200
	Division Total (l/day):	96554690	29007940	67546750	15961715	9137255	5526750	1323305	646440	62020000	1939225

DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: NTONYIRI **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Antubetwe-Kiongo	Antubetwe-Kiongo	2264360	1235810	1028550	1059060	0	1028550	49995	21280	0	105475
	Total (l/day):	2264360	1235810	1028550	1059060	0	1028550	49995	21280	0	105475
Athiru-Ruujine	Athiru Ruujine	2283395	1530945	752450	1401125	0	752450	49995	0	0	79825
	Total (l/day):	2283395	1530945	752450	1401125	0	752450	49995	0	0	79825
Ithima	Akirangondu	3023825	1495225	1528600	1445230	0	1528600	49995	0	0	0
	Antuambui	3456750	1613250	1843500	1366835	0	1843500	49995	29420	0	167000
	Ntunene	2508495	968945	1539550	770825	0	1459550	42895	41500	80000	113725
	Total (l/day):	8989070	4077420	4911650	3582890	0	4831650	142885	70920	80000	280725
Mutuati	Amwathi 1	1460300	1162200	298100	980705	0	298100	49995	0	0	131500
	Amwathi 2	642705	495555	147150	422815	0	147150	37040	0	0	35700
	Naathu	1223895	1083195	140700	1033200	0	140700	49995	0	0	0
	Total (l/day):	3326900	2740950	585950	2436720	0	585950	137030	0	0	167200
	Division Total (l/day):	16863725	9585125	7278600	8479795	0	7198600	379905	92200	80000	633225

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: SOUTH IMENTI

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Abogeta	Upper Githangari	1534700	1164500	370200	1031420	0	290200	76655	0	80000	56425
	Upper Kiungone	2034285	1647385	386900	1480960	0	386900	120025	0	0	46400
	Total (l/day):	3568985	2811885	757100	2512380	0	677100	196680	0	80000	102825
Igoji	Gikui	2066940	1755490	311450	1354510	0	231450	306880	22000	80000	72100
	Karia	1867170	1597620	269550	1444300	0	269550	76140	22580	0	54600
	Total (l/day):	3934110	3353110	581000	2798810	0	501000	383020	44580	80000	126700
Igoki	Kothine	1162140	737440	424700	660140	0	424700	77300	0	0	0
	Mwichure	954110	436110	518000	395980	0	518000	13710	26420	0	0
	Upper Chure	1515735	1012635	503100	891280	0	503100	63475	22580	0	35300
	Total (l/day):	3631985	2186185	1445800	1947400	0	1445800	154485	49000	0	35300
Kanyakine	Kanyakine	2781470	2429070	352400	2009600	0	272400	292990	36480	80000	90000
	Kiringa	1435670	1021120	414550	855625	0	414550	117395	0	0	48100
	Total (l/day):	4217140	3450190	766950	2865225	0	686950	410385	36480	80000	138100
Mitine	Kianjogu	892150	512100	380050	286080	0	380050	155800	21720	0	48500
	Kinoro	1489810	1391710	98100	1212380	0	98100	74505	28600	0	76225
	Mweru	1280035	1100135	179900	978035	0	179900	83700	0	0	38400
	Total (l/day):	3661995	3003945	658050	2476495	0	658050	314005	50320	0	163125

Continued on next page

DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: SOUTH IMENTI (Continued) **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mitunguu	Kirendene	971865	540715	431150	388890	0	351150	41500	0	80000	110325
	Ngonyi	1538845	1279695	259150	1203150	0	259150	47445	0	0	29100
	Total (l/day):	2510710	1820410	690300	1592040	0	610300	88945	0	80000	139425
Nkuene	Kathera	5967370	5415170	552200	1479660	3095165	292200	549945	142800	260000	147600
	Kigane	1337505	1196055	141450	1143280	0	141450	39575	0	0	13200
	Mikumbune	1638775	1369925	268850	1164920	0	268850	115205	26800	0	63000
	Uruku	2397995	2093945	304050	1741280	0	304050	226645	63020	0	63000
	Total (l/day):	11341645	10075095	1266550	5529140	3095165	1006550	931370	232620	260000	286800
	Division Total (l/day):	32866570	26700820	6165750	19721490	3095165	5585750	2478890	413000	580000	992275

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: THARAKA

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Gikingo	Irunduni	150855	87005	63850	78985	0	63850	8020	0	0	0
	Kanjoro	706355	431105	275250	340655	0	275250	34550	0	0	55900
	Total (l/day):	857210	518110	339100	419640	0	339100	42570	0	0	55900
Marimanti	Kanyuru	1055410	401110	654300	340860	0	654300	35150	0	0	25100
	Marimanti	1258445	456795	801650	275920	0	801650	102955	23720	0	54200
	Nkondi	1557110	770710	786400	657540	0	786400	45970	23000	0	44200
	Turima	630830	315380	315450	263835	0	315450	18445	0	0	33100
	Total (l/day):	4501795	1943995	2557800	1538155	0	2557800	202520	46720	0	156600
North Tharaka	Gatue	966755	221655	745100	204780	0	745100	16875	0	0	0
	Gatunga	465790	388240	77550	282225	0	77550	26395	21720	0	57900
	Kathangachini	383765	163615	220150	127925	0	220150	11970	23720	0	0
	Total (l/day):	1816310	773510	1042800	614930	0	1042800	55240	45440	0	57900
South Tharaka	Chiokariga	578500	488600	89900	326620	0	89900	85360	27620	0	49000
	Kamanyaki	360035	283035	77000	220220	0	77000	20595	21720	0	20500
	Tunyai	599615	563265	36350	436335	0	36350	58870	21860	0	46200
	Total (l/day):	1538150	1334900	203250	983175	0	203250	164825	71200	0	115700
	Division Total (l/day):	8713465	4570515	4142950	3555900	0	4142950	465155	163360	0	386100

DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: TIGANIA **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Akithii	Athwana	1264050	343200	920850	307790	0	920850	28785	0	0	6625
	Kitheo	786375	543925	242450	403025	0	242450	40875	71400	0	28625
	Nchooro	1391070	1014870	376200	916300	0	376200	49995	0	0	48575
	Thinyaine	934100	350150	583950	313255	0	583950	29295	0	0	7600
	Total (l/day):	4375595	2252145	2123450	1940370	0	2123450	148950	71400	0	91425
Karama	Karama	2181220	2162970	18250	2023650	0	18250	49995	0	0	89325
	Total (l/day):	2181220	2162970	18250	2023650	0	18250	49995	0	0	89325
Kianjai	Kianjai	1835320	1558120	277200	1293600	0	277200	97195	0	0	167325
	Miathene	2929685	2180785	748900	1775080	0	748900	242930	90700	0	72075
	Total (l/day):	4765005	3738905	1026100	3068680	0	1026100	340125	90700	0	239400
Mbeu	Kiorimba	1132965	986265	146700	921840	0	146700	0	0	0	64425
	Mbeu	1032490	559890	472600	395365	0	472600	26150	0	0	138375
	Total (l/day):	2165455	1546155	619300	1317205	0	619300	26150	0	0	202800
Mikinduri	Akaiga	1172730	1014430	158300	935455	0	158300	40975	0	0	38000
	Antuamburi	1176540	615290	561250	385310	0	301250	46860	33720	260000	149400
	Athwana	677755	559705	118050	488390	0	118050	24090	0	0	47225
	Kiguchua	2198545	2079095	119450	1950700	0	119450	49995	0	0	78400
	Total (l/day):	5225570	4268520	957050	3759855	0	697050	161920	33720	260000	313025

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DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: TIGANIA (Continued)

DISTRICT: MERU

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Mituntu	Mituntu	815330	484780	330550	400535	0	330550	34420	0	0	49825
	Total (l/day):	815330	484780	330550	400535	0	330550	34420	0	0	49825
Muthara	Athanja	4263970	882220	3381750	838230	0	3381750	43990	0	0	0
	Athinga	2218250	574550	1643700	494065	0	1643700	28785	0	0	51700
	Kitharene	1417785	1047785	370000	954825	0	370000	33160	0	0	59800
	Total (l/day):	7900005	2504555	5395450	2287120	0	5395450	105935	0	0	111500
Thangatha	Ankamia	1680930	1469330	211600	1337785	0	211600	49995	0	0	81550
	Giithu	542060	453060	89000	358295	0	89000	22240	0	0	72525
	Igarii	519880	171730	348150	96430	0	348150	10850	0	0	64450
	Kunati	759775	616775	143000	489680	0	143000	30395	0	0	96700
	Total (l/day):	3502645	2710895	791750	2282190	0	791750	113480	0	0	315225
Uringu	Nkomo	1563890	1405740	158150	1184040	0	158150	44450	39300	0	137950
	Uringu	1503830	1375780	128050	1242540	0	128050	43015	0	0	90225
	Total (l/day):	3067720	2781520	286200	2426580	0	286200	87465	39300	0	228175
	Division Total (l/day):	33998545	22450445	11548100	19506185	0	11288100	1068440	235120	260000	1640700

DISTRICT WATER DEMAND SUMMARY (2013) - Scenario 2

DIVISION: TIMAU **DISTRICT: MERU**

Location	Sub-Location	Total Demand	Total Domestic	Total Non Domestic	Population Rural	Population Urban	Livestock	Schools	Health	Industry	Others
Kirimara	Kithithina	352015	233265	118750	198380	0	118750	13085	21800	0	0
	Ngushishi	962550	581650	380900	478165	0	380900	32545	70940	0	0
	Total (l/day):	1314565	814915	499650	676545	0	499650	45630	92740	0	0
Kisima	Buuri	1062945	793995	268950	673520	0	268950	15275	0	0	105200
	Mutunyi	2074625	179275	1895350	159615	0	1815350	13985	0	80000	5675
	Ngare Ndare	610145	203695	406450	165030	0	406450	15240	0	0	23425
	Total (l/day):	3747715	1176965	2570750	998165	0	2490750	44500	0	80000	134300
Ontulili	Ontulili	2186610	1755860	430750	1650245	0	350750	49995	22120	80000	33500
	Total (l/day):	2186610	1755860	430750	1650245	0	350750	49995	22120	80000	33500
	Division Total (l/day):	7248890	3747740	3501150	3324955	0	3341150	140125	114860	160000	167800

APPENDIX 5

CALCULATION OF WATER AVAILABILITY AND WATER USE PER LOCATION

APPENDIX 5

CALCULATION OF WATER AVAILABILITY AND WATER USE PER LOCATION

Central Imenti	5-1
Igembe	5-3
North Imenti	5-5
Nithi	5-7
Ntonyiri	5-10
South Imenti	5-12
Tigania	5-15
Timau	5-19
Tharaka	5-21
Allocation of Resources	5-23

CENTRAL IMENTI DIVISION: TOTAL (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM DIVISION to Tharaka Division	to N. Im.	Isiolo
mestic	Surfacewater (96%):	50,916	Domestic :	20,381	Domestic :	20,381			
d	Springs :	26,127	Livestock :	4,489	Livestock :	4,489	Discharge :	39,009	13,621 11,376
vestock	Groundwater :	4,705							
e							Baseflow :	11,460	11,620 1,336
	Total :	81,748	Sub-Total :	24,870	Sub-Total :	24,870	Downstream :	0	20,000 0
her Use	Surfacewater (80%):	122,076	Industries :	0	Industries +		Total	50,469	45,241 12,712
	Springs :	52,253			Irrigation +				
	Groundwater :	4,705			Other Use :	143,750			
	From Outflow :	34,000			Baseflow :	24,415			
	TO N. IMENTI :	(20,000)			Downstream :	0	WATER NOT USED		
	Total :	193,035	Total :	24,870	Total :	193,035	Total :	(0)	

OTHUGUCHI LOCATION (Area: 62 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Gatimbi Location	to N. Im.
mestic	Surfacewater (96%):	6,693	Domestic :	6,794	Domestic :	6,794	Surfacewater	
d	Springs :	17,942	Livestock :	1,355	Livestock :	1,355	Recharge :	35,632 3,257
vestock	Groundwater :	-					Return Flow :	3,762 3,762
e							Downstream :	0 20,000
	Total :	24,635	Sub-Total :	8,149	Sub-Total :	8,149	Add. Use :	(10,000)
her Use	Surfacewater (80%):	68,109	Industries :	0	Industries +		Total	29,394 27,019
	Springs :	35,884			Irrigation +			
	Groundwater :	-			Other Use :	37,621		
	From Outflow :	10,000			Baseflow :	13,622	Baseflow :	3,159 10,463
	TO KIB. & GATIMBI :	(54,500)			Downstream :	0		
							WATER NOT USED	
	Total :	59,493	Total :	8,149	Total :	59,392	Total :	101

TIMBI LOCATION (Area: 57 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Mwang. Location	to N. Im.
mestic	Surfacewater (96%):	8,616	Domestic :	5,651	Domestic :	5,651	Surfacewater	
d	Springs :	3,168	Livestock :	503	Livestock :	503	Recharge :	20,127 5,680
vestock	Groundwater :	390					Return Flow :	2,768 923
e							Downstream :	7,661 0
	Total :	12,174	Sub-Total :	6,154	Sub-Total :	6,154	Add. Use :	(5,000)
her Use	Surfacewater (80%):	21,733	Industries :	0	Industries +		Total	25,556 6,602
	Springs :	6,335			Irrigation +			
	Groundwater :	390			Other Use :	18,450		
	From Outflow :	5,000			Baseflow :	4,347	Baseflow :	3,189 1,157
	FROM ABO.-TO MWAG.:	(4,500)			Downstream :	0		
							WATER NOT USED	
	Total :	28,958	Total :	6,154	Total :	28,951	Total :	8

MWANGATHIA LOCATION (Area: 225 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Tharaka Division	
Domestic and Livestock Use	Surfacewater (96%):	22,278	Domestic :	4,872	Domestic :	4,872	Surfacewater Recharge :	41,719
	Springs :	4,643	Livestock :	1,806	Livestock :	1,806	Return Flow :	12,289
	Groundwater :	4,315					Downstream :	0
	Total :	31,236	Sub-Total :	6,678	Sub-Total :	6,678	Add. Use :	(15,000)
Other Use	Surfacewater (80%):	25,556	Industries :	0	Industries + Irrigation + Other Use :	61,447	Total	39,009
	Springs :	9,286						
	Groundwater :	4,315						
	From Outflow :	15,000			Baseflow :	5,111	Baseflow :	5,111
	FROM GATIMBI LOC. :	19,000			Downstream :	0		
	Total :	73,157	Total :	6,678	Total :	73,237	WATER NOT USED Total :	(80)

KIBIRICHIA LOCATION (Area: 131 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Isiolo District	
Domestic and Livestock Use	Surfacewater (96%):	13,328	Domestic :	3,064	Domestic :	3,064	Surfacewater Recharge :	10,129
	Springs :	374	Livestock :	825	Livestock :	825	Return Flow :	5,246
	Groundwater :	-					Downstream :	0
	Total :	13,702	Sub-Total :	3,889	Sub-Total :	3,889	Add. Use :	(4,000)
Other Use	Surfacewater (80%):	6,679	Industries :	0	Industries + Irrigation + Other Use :	26,232	Total	11,376
	Springs :	748						
	Groundwater :	-						
	From Outflow :	4,000			Baseflow :	1,336	Baseflow :	1,336
	FROM ABOTHUGUCHI :	20,000			Downstream :			
	Total :	31,427	Total :	3,889	Total :	31,456	WATER NOT USED Total :	(30)

IGEMBE DIVISION: TOTAL (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM DIVISION	to Tharaka Division	to Tana R.
Domestic and Livestock Use	Surfacewater (96%):	11,682	Domestic :	18,730	Domestic :	18,730			
	Springs :	34,992	Livestock :	2,343	Livestock :	2,343	Discharge :	29,902	47,864
	Groundwater :	8,434							
	Total :	55,108	Sub-Total :	21,073	Sub-Total :	21,073	Baseflow :	3,351	5,515
							Downstream :	0	0
Other Use	Surfacewater (80%):	44,333	Industries :	0	Industries +		Total	33,253	53,380
	Springs :	69,984			Irrigation +				
	Groundwater :	9,882			Other Use :	73,700			
					Baseflow :	8,867			
	TO NTONYIRI DIV. :	(20,500)			Downstream :	0	WATER NOT USED		
	Total :	103,699	Total :	21,073	Total :	103,640	Total :	60	

KANGETA LOCATION (Area: 112 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Isiolo District	
Domestic and Livestock Use	Surfacewater (96%):	-	Domestic :	1,505	Domestic :	1,505	Surfacewater	
	Springs :	1,728	Livestock :	947	Livestock :	947	Recharge :	-
	Groundwater :	700					Return Flow :	615
	Total :	2,428	Sub-Total :	2,452	Sub-Total :	2,452	Downstream :	0
							Total	615
Other Use	Surfacewater (80%):	-	Industries :	0	Industries +			
	Springs :	5,256			Irrigation +		Baseflow :	0
	Groundwater :	2,148			Other Use :	3,076		
					Baseflow :	0		
	TO NJIA :	(1,800)			Downstream :		WATER NOT USED	
	Total :	5,604	Total :	2,452	Total :	5,528	Total :	76

KIEGOI LOCATION (Area: 19 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Akachiu Location	to Maua
Domestic and Livestock Use	Surfacewater (96%):	-	Domestic :	1,643	Domestic :	1,643	Surfacewater	
	Springs :	1,644	Livestock :	65	Livestock :	65	Recharge :	-
	Groundwater :	-					Return Flow :	163	163
	Total :	1,644	Sub-Total :	1,708	Sub-Total :	1,708	Downstream :	0	0
							Total	163	163
Other Use	Surfacewater (80%):	-	Industries :	0	Industries +				
	Springs :	6,788			Irrigation +		Baseflow :	0	0
	Groundwater :	-			Other Use :	1,627			
					Baseflow :	0			
	TO MAUA & NJIA :	(3,500)			Downstream :	0	WATER NOT USED		
	Total :	3,288	Total :	1,708	Total :	3,335	Total :	(47)	

AKACHIU LOCATION (Area: 195 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Tharaka Division	Nat. Park
Domestic and Livestock Use	Surfacewater (96%):	8,421	Domestic :	5,066	Domestic :	5,066	Surfacewater	
	Springs :	14,872	Livestock :	421	Livestock :	421	Recharge :	26,173 26,173
	Groundwater :	2,671					Return Flow :	3,729 3,729
	Total :	25,964	Sub-Total :	5,487	Sub-Total :	5,487	Downstream :	0 0
							Total	29,902 29,902
Other Use	Surfacewater (80%):	33,513	Industries :	0	Industries +			
	Springs :	29,744			Irrigation +		Baseflow :	3,351 3,351
	Groundwater :	2,671			Other Use :	37,289		
					Baseflow :	6,703		
	TO NTONYIRI DIV. :	(16,400)			Downstream :		WATER NOT USED	
	Total :	49,528	Total :	5,487	Total :	49,479	Total :	50

MAUA LOCATION (Area: 193 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Nat. Park/Tana R.	
Domestic and Livestock Use	Surfacewater (96%):	3,261	Domestic :	5,821	Domestic :	5,821	Surfacewater	
	Springs :	14,091	Livestock :	564	Livestock :	564	Recharge :	11,447
	Groundwater :	3,173					Return Flow :	5,900
	Total :	20,525	Sub-Total :	6,385	Sub-Total :	6,385	Downstream :	0
							Total	17,347
Other Use	Surfacewater (80%):	10,820	Industries :	0	Industries +			
	Springs :	28,182			Irrigation +		Baseflow :	2,164
	Groundwater :	3,173			Other Use :	29,502		
					Baseflow :	2,164		
	FR. KIEGOI-TO NTON.	(4,100)			Downstream :		WATER NOT USED	
	Total :	38,075	Total :	6,385	Total :	38,051	Total :	24

NJIA LOCATION (Area: 115 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Maua Location	to NGA
Domestic and Livestock Use	Surfacewater (96%):	-	Domestic :	4,695	Domestic :	4,695	Surfacewater	
	Springs :	2,657	Livestock :	346	Livestock :	346	Recharge :	
	Groundwater :	1,890					Return Flow :	441
	Total :	4,547	Sub-Total :	5,041	Sub-Total :	5,041	Downstream :	0
							Total	441 0
Other Use	Surfacewater (80%):	-	Industries :	0	Industries +			
	Springs :	14			Irrigation +		Baseflow :	0
	Groundwater :	1,890			Other Use :	2,206		
					Baseflow :	0		
	FROM KANGETA&KIEGOI	5,300			Downstream :		WATER NOT USED	
	Total :	7,204	Total :	5,041	Total :	7,247	Total :	(43)

NORTH IMENTI DIVISION: TOTAL (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM DIVISION to Tharaka Division	to Isiolo
omestic	Surfacewater (96%):	50,251	Domestic :	29,007	Domestic :	29,007		
nd	Springs :	7,627	Livestock :	5,527	Livestock :	5,527	Discharge : 9,603	1,603
ivestock	Groundwater :	6,162						
se							Baseflow : 9,652	525
	Total :	64,039	Sub-Total :	34,534	Sub-Total :	34,534	Downstream : 0	0
ther Use	Surfacewater (80%):	50,889	Industries :	62,020	Industries +		Total 19,256	2,128
	Springs :	15,501			Irrigation +			
	Groundwater :	6,162			Other Use :	77,050		
	From Outflow :	16,000			Baseflow :	10,178		
	FROM C. IMENTI :	33,621			Downstream :		WATER NOT USED	
	Total :	122,173	Total :	96,554	Total :	121,762	Total : 411	

IIRUA LOCATION (Area: 114 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Isiolo District	
omestic	Surfacewater (96%):	3,809	Domestic :	3,459	Domestic :	3,459	Surfacewater	
nd	Springs :	-	Livestock :	836	Livestock :	836	Recharge :	-
ivestock	Groundwater :	625					Return Flow :	727
se							Downstream :	0
	Total :	4,434	Sub-Total :	4,295	Sub-Total :	4,295	Total	727
ther Use	Surfacewater (80%):	2,627	Industries :	80	Industries +			
	Springs :	248			Irrigation +		Baseflow :	525
	Groundwater :	625			Other Use :	3,636		
					Baseflow :	525		
	FROM C. IMENTI :	5,000			Downstream :	0	WATER NOT USED	
	Total :	8,500	Total :	4,375	Total :	8,456	Total :	44

UIRI LOCATION (Area: 148 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Isiolo District	
omestic	Surfacewater (96%):	0	Domestic :	1,056	Domestic :	1,056	Surfacewater	
nd	Springs :	1,904	Livestock :	1,225	Livestock :	1,225	Recharge :	-
ivestock	Groundwater :	2,838					Return Flow :	876
se							Downstream :	0
	Total :	4,742	Sub-Total :	2,281	Sub-Total :	2,281	Total	876
ther Use	Surfacewater (80%):	-	Industries :	80	Industries +			
	Springs :	3,807			Irrigation +		Baseflow :	0
	Groundwater :	2,838			Other Use :	4,378		
					Baseflow :	0		
	FROM C. IMENTI :	0			Downstream :	0	WATER NOT USED	
	Total :	6,645	Total :	2,361	Total :	6,659	Total :	(13)

NTIMA LOCATION (Area: 52 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Nyaki Location	Giaki Loc.
Domestic and Livestock Use	Surfacewater (96%):	11,010	Domestic :	15,539	Domestic :	15,539	Surfacewater	
	Springs :	5,235	Livestock :	1,000	Livestock :	1,000	Recharge :	4,111 5,680
	Groundwater :	-					Return Flow :	1,611 1,611
							Downstream :	0 0
	Total :	16,244	Sub-Total :	16,539	Sub-Total :	16,539		
							Total	5,721 7,290
Other Use	Surfacewater (80%):	0	Industries :	61,620	Industries +			
	Springs :	10,469			Irrigation +		Baseflow :	0 0
	Groundwater :	-			Other Use :	16,106		
					Baseflow :	0		
	FROM C. IMENTI :	22,019			Downstream :	0	WATER NOT USED	
	Total :	32,488	Total :	78,159	Total :	32,645	Total :	(157)

NYAKI LOCATION (Area: 107 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Giaki Location	
Domestic and Livestock Use	Surfacewater (96%):	10,861	Domestic :	7,422	Domestic :	7,422	Surfacewater	
	Springs :	489	Livestock :	1,168	Livestock :	1,168	Recharge :	48,378
	Groundwater :	1,466					Return Flow :	2,873
							Downstream :	0
	Total :	12,815	Sub-Total :	8,590	Sub-Total :	8,590	Add. Use :	(16,000)
							Total	35,251
Other Use	Surfacewater (80%):	5,721	Industries :	80	Industries +			
	Springs :	977			Irrigation +			
	Groundwater :	1,466			Other Use :	14,364		
	From Outflow :	16,000			Baseflow :	1,144	Baseflow :	1,144
					Downstream :			
							WATER NOT USED	
	Total :	24,164	Total :	8,670	Total :	24,098	Total :	66

GIAKI LOCATION (Area: 90 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Tharaka Division	
Domestic and Livestock Use	Surfacewater (96%):	24,571	Domestic :	1,531	Domestic :	1,531	Surfacewater	
	Springs :	-	Livestock :	1,298	Livestock :	1,298	Recharge :	1,890
	Groundwater :	1,233					Return Flow :	7,714
							Downstream :	0
	Total :	25,804	Sub-Total :	2,829	Sub-Total :	2,829		
							Total	9,603
Other Use	Surfacewater (80%):	42,541	Industries :	160	Industries +			
	Springs :	0			Irrigation +		Baseflow :	8,508
	Groundwater :	1,233			Other Use :	38,568		
					Baseflow :	8,508		
	FROM C. IMENTI :	6,602			Downstream :		WATER NOT USED	
	Total :	50,375	Total :	2,989	Total :	49,905	Total :	471

NITHI DIVISION: TOTAL (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM DIVISION to Tana River	
Domestic and Livestock Use	Surfacewater (96%)	209,368	Domestic	33,670	Domestic	33,670		
	Springs	20,436	Livestock	13,124	Livestock	13,124	Discharge	95,106
	Groundwater	0						
	Total	229,803	Sub-Total	46,794	Sub-Total	46,794	Baseflow	83,901
							Downstream	0
Other Use	Surfacewater (80%)	419,503	Industries	2,320	Industries + Irrigation + Other Use	406,700	Total	179,006
	Springs	40,871						
	Groundwater	0						
	From Outflow	77,500			Baseflow	83,901		
					Downstream	0	WATER NOT USED	
	Total	537,874	Total	49,114	Total	537,395	Total	479

MAGUMONI LOCATION (Area: 106 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Kanjuki Location	to Tana R.
Domestic and Livestock Use	Surfacewater (96%)	31,109	Domestic	3,563	Domestic	3,563	Surfacewater	
	Springs	1,043	Livestock	834	Livestock	834	Recharge	10,464 22,657
	Groundwater	-					Return Flow	5,085 5,085
	Total	32,152	Sub-Total	4,397	Sub-Total	4,397	Downstream	0 0
							Add. Use	(2,500) (5,000)
Other Use	Surfacewater (80%)	84,495	Industries	320	Industries + Irrigation + Other Use	50,846	Total	13,049 22,742
	Springs	2,086						
	Groundwater	-						
	From Outflow	7,500			Baseflow	16,899	Baseflow	4,170 12,729
	TO KARINGANI LOC.	(22,000)			Downstream			
							WATER NOT USED	
	Total	72,081	Total	4,717	Total	72,142	Total	(61)

MWONGE LOCATION (Area: 22 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Kanjuki Location	
Domestic and Livestock Use	Surfacewater (96%)	8,392	Domestic	2,656	Domestic	2,656	Surfacewater	
	Springs	231	Livestock	294	Livestock	294	Recharge	-
	Groundwater	-					Return Flow	2,035
	Total	8,623	Sub-Total	2,950	Sub-Total	2,950	Downstream	0
							Add. Use	0
Other Use	Surfacewater (80%)	20,852	Industries	160	Industries + Irrigation + Other Use	10,176	Total	2,035
	Springs	462						
	Groundwater	-						
	From Outflow	0			Baseflow	4,170	Baseflow	4,170
	TO KARINGANI LOC.	(4,000)			Downstream			
							WATER NOT USED	
	Total	17,314	Total	3,110	Total	17,296	Total	18

KARINGANI LOCATION (Area: 158 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Kanjuki Location	
Domestic and Livestock Use	Surfacewater (96%):	28,077	Domestic :	8,775	Domestic :	8,775	Surfacewater Recharge :	57,004
	Springs :	2,669	Livestock :	7,740	Livestock :	7,740	Return Flow :	13,392
	Groundwater :	-					Downstream :	0
	Total :	30,746	Sub-Total :	16,515	Sub-Total :	16,515	Add. Use :	(25,000)
Other Use	Surfacewater (80%):	15,204	Industries :	880	Industries + Irrigation + Other Use :	66,961	Total	45,396
	Springs :	5,338						
	Groundwater :	-						
	From Outflow :	25,000			Baseflow :	3,041	Baseflow :	3,041
	FROM OTHER LOCAT. :	41,000			Downstream :			
							WATER NOT USED	
	Total :	86,542	Total :	17,395	Total :	86,517	Total :	25

MUTHAMBI LOCATION (Area: 82 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Kanjuki Location	
Domestic and Livestock Use	Surfacewater (96%):	29,887	Domestic :	5,510	Domestic :	5,510	Surfacewater Recharge :	28,898
	Springs :	1,086	Livestock :	1,380	Livestock :	1,380	Return Flow :	10,631
	Groundwater :	-					Downstream :	0
	Total :	30,972	Sub-Total :	6,890	Sub-Total :	6,890	Add. Use :	(10,000)
Other Use	Surfacewater (80%):	59,970	Industries :	400	Industries + Irrigation + Other Use :	53,155	Total	29,529
	Springs :	2,171						
	Groundwater :	-						
	From Outflow :	10,000			Baseflow :	11,994	Baseflow :	11,994
	FROM CHOG.-TO KAR.:	0			Downstream :			
							WATER NOT USED	
	Total :	72,141	Total :	7,290	Total :	72,039	Total :	102

CHOGORIA LOCATION (Area: 58 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Kiera Location	
Domestic and Livestock Use	Surfacewater (96%):	13,650	Domestic :	6,882	Domestic :	6,882	Surfacewater Recharge :	30,251
	Springs :	9,397	Livestock :	701	Livestock :	701	Return Flow :	7,593
	Groundwater :	-					Downstream :	0
	Total :	23,047	Sub-Total :	7,583	Sub-Total :	7,583	Add. Use :	(10,000)
Other Use	Surfacewater (80%):	53,474	Industries :	240	Industries + Irrigation + Other Use :	37,963	Total	27,844
	Springs :	18,794						
	Groundwater :	-						
	From Outflow :	10,000			Baseflow :	10,695	Baseflow :	10,695
	TO MUTHAMBI& KIERA:	(26,000)			Downstream :	0		
							WATER NOT USED	
	Total :	56,268	Total :	7,823	Total :	56,241	Total :	28

KIERA LOCATION (Area: 137 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Kanjuki Location	
Domestic and Livestock Use	Surfacewater (96%):	34,596	Domestic :	5,377	Domestic :	5,377	Surfacewater Recharge :	44,788
	Springs :	6,010	Livestock :	1,505	Livestock :	1,505	Return Flow :	17,519
	Groundwater :	-					Downstream :	0
	Total :	40,606	Sub-Total :	6,882	Sub-Total :	6,882	Add. Use :	(25,000)
							Total	37,307
Other Use	Surfacewater (80%):	58,192	Industries :	240	Industries + Irrigation + Other Use :	87,594		
	Springs :	12,020						
	Groundwater :	-						
	From Outflow :	25,000			Baseflow :	11,638	Baseflow :	11,638
	FROM CHOG.-TO KAN.:	11,000			Downstream :	0		
							WATER NOT USED	
	Total :	106,212	Total :	7,122	Total :	106,114	Total :	98

KANJUKI LOCATION (Area: 126 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Tana River	
Domestic and Livestock Use	Surfacewater (96%):	63,658	Domestic :	907	Domestic :	907	Surfacewater Recharge :	52,363
	Springs :	-	Livestock :	670	Livestock :	670	Return Flow :	20,001
	Groundwater :	-					Downstream :	0
	Total :	63,658	Sub-Total :	1,577	Sub-Total :	1,577	Add. Use :	0
							Total	72,364
Other Use	Surfacewater (80%):	127,316	Industries :	80	Industries + Irrigation + Other Use :	100,006		
	Springs :	-						
	Groundwater :	-						
	From Outflow :	0			Baseflow :	25,463	Baseflow :	25,463
	FROM KIERA :	0			Downstream :			
							WATER NOT USED	
	Total :	127,316	Total :	1,657	Total :	127,046	Total :	270

NTONYIRI DIVISION: TOTAL (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM DIVISION to	
Domestic and Livestock Use	Surfacewater (96%):	10,250	Domestic :	9,585	Domestic :	9,585		
	Springs :	43	Livestock :	7,197	Livestock :	7,197	Discharge :	0
	Groundwater :	6,800						
	Total :	17,093	Sub-Total :	16,782	Sub-Total :	16,782	Baseflow :	0
							Downstream :	0
Other Use	Surfacewater (80%):	0	Industries :	80	Industries + Irrigation + Other Use :	16,750	Total	0
	Springs :	86			Baseflow :	0		
	Groundwater :	23,693			Downstream :		WATER NOT USED	
	FROM IGEMBE DIV. :	20,500						
	Total :	44,279	Total :	16,862	Total :	33,532	Total :	10,747

ITHIMA LOCATION (Area: 500 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION	
Domestic and Livestock Use	Surfacewater (96%):	5,500	Domestic :	4,077	Domestic :	4,077	Surfacewater Recharge :	
	Springs :	43	Livestock :	4,831	Livestock :	4,831	Return Flow :	0
	Groundwater :	3,500					Downstream :	0
	Total :	9,043	Sub-Total :	8,908	Sub-Total :	8,908		
							Total	0
Other Use	Surfacewater (80%):	-	Industries :	80	Industries + Irrigation + Other Use :	6,000	Baseflow :	
	Springs :	86			Baseflow :	0		
	Groundwater :	9,589			Downstream :		WATER NOT USED	
	FROM IGEMBE DIV. :	11,000						
	Total :	20,675	Total :	8,988	Total :	14,908	Total :	5,767

MUTUATI LOCATION (Area: 627 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION	
Domestic and Livestock Use	Surfacewater (96%):	1,900	Domestic :	2,741	Domestic :	2,741	Surfacewater Recharge :	-
	Springs :	-	Livestock :	586	Livestock :	586	Return Flow :	880
	Groundwater :	1,500					Downstream :	0
	Total :	3,400	Sub-Total :	3,327	Sub-Total :	3,327		
							Total	880
Other Use	Surfacewater (80%):	-	Industries :	0	Industries + Irrigation + Other Use :	8,800	Baseflow :	0
	Springs :	-			Baseflow :	0		
	Groundwater :	10,307			Downstream :		WATER NOT USED	
	FROM IGEMBE DIV. :	3,800						
	Total :	14,107	Total :	3,327	Total :	12,127	Total :	1,980

ANTUBETWE-KIONGO LOCATION (Area 89 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION	
Domestic and Livestock Use	Surfacewater (96%):	1,600	Domestic :	1,236	Domestic :	1,236	Surfacewater Recharge :	
	Springs :	-	Livestock :	1,028	Livestock :	1,028	Return Flow :	190
	Groundwater :	750					Downstream :	0
	Total :	2,350	Sub-Total :	2,264	Sub-Total :	2,264	Total	190
Other Use	Surfacewater (80%):	-	Industries :	0	Industries + Irrigation + Other Use :	950		
	Springs :	-					Baseflow :	0
	Groundwater :	1,707			Baseflow :	0		
	FROM IGEMBE DIV. :	3,200			Downstream :		WATER NOT USED	
	Total :	4,907	Total :	2,264	Total :	3,214	Total :	1,693

ATHIRU-RUUJINE LOCATION (Area: 109 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION	
Domestic and Livestock Use	Surfacewater (96%):	1,250	Domestic :	1,531	Domestic :	1,531	Surfacewater Recharge :	
	Springs :	-	Livestock :	752	Livestock :	752	Return Flow :	200
	Groundwater :	1,050					Downstream :	0
	Total :	2,300	Sub-Total :	2,283	Sub-Total :	2,283	Total	200
Other Use	Surfacewater (80%):	-	Industries :	0	Industries + Irrigation + Other Use :	1,000		
	Springs :	-					Baseflow :	0
	Groundwater :	2,090			Baseflow :	0		
	FROM IGEMBE DIV. :	2,500			Downstream :		WATER NOT USED	
	Total :	4,590	Total :	2,283	Total :	3,283	Total :	1,307

SOUTH IMENTI DIVISION: TOTAL (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM DIVISION to Tharaka Division	
Domestic and Livestock Use	Surfacewater (96%):	104,747	Domestic :	26,700	Domestic :	26,700		
	Springs :	40,587	Livestock :	5,586	Livestock :	5,586	Discharge :	80,849
	Groundwater :	1,014						
	Total :	146,348	Sub-Total :	32,286	Sub-Total :	32,286	Baseflow :	41,975
							Downstream :	0
Other Use	Surfacewater (80%):	209,874	Industries :	580	Industries + Irrigation + Other Use :	252,000	Total	122,824
	Springs :	81,173						
	Groundwater :	1,014						
	From Outflow :	34,200			Baseflow :	41,975		
					Downstream :	0	WATER NOT USED	
	Total :	326,261	Total :	32,866	Total :	326,261	Total :	(0)

IGOJI LOCATION (Area: 37 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Tharaka Division	
Domestic and Livestock Use	Surfacewater (96%):	13,655	Domestic :	3,353	Domestic :	3,353	Surfacewater	
	Springs :	2,200	Livestock :	501	Livestock :	501	Recharge :	13,333
	Groundwater :	-					Return Flow :	4,531
	Total :	15,854	Sub-Total :	3,854	Sub-Total :	3,854	Downstream :	0
							Add. Use :	(2,000)
Other Use	Surfacewater (80%):	36,429	Industries :	80	Industries + Irrigation + Other Use :	22,657	Total	15,865
	Springs :	4,399						
	Groundwater :	-						
	From Outflow :	2,000			Baseflow :	7,286	Baseflow :	7,286
	TO MITINE LOC. :	(9,000)			Downstream :			
							WATER NOT USED	
	Total :	33,828	Total :	3,934	Total :	33,797	Total :	31

MITINE LOCATION (Area: 86 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Kanyakine Location	to Tharaka
Domestic and Livestock Use	Surfacewater (96%):	24,190	Domestic :	3,004	Domestic :	3,004	Surfacewater	
	Springs :	2,783	Livestock :	658	Livestock :	658	Recharge :	20,472 18,090
	Groundwater :	-					Return Flow :	5,266 5,266
	Total :	26,973	Sub-Total :	3,662	Sub-Total :	3,662	Downstream :	0 0
							Add. Use :	(6,200) (4,000)
Other Use	Surfacewater (80%):	39,509	Industries :	0	Industries + Irrigation + Other Use :	52,662	Total	19,539 19,356
	Springs :	5,566						
	Groundwater :	-						
	From Outflow :	10,200			Baseflow :	7,902	Baseflow :	1,819 6,083
	FROM IGOJI&ABOGETA:	9,000			Downstream :			
							WATER NOT USED	
	Total :	64,275	Total :	3,662	Total :	64,226	Total :	50

ABOGETA LOCATION (Area: 49 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Kanyakine Location	
Domestic and Livestock Use	Surfacewater (96%):	4,026	Domestic :	2,812	Domestic :	2,812	Surfacewater	
	Springs :	12,897	Livestock :	677	Livestock :	677	Recharge :	19,777
	Groundwater :	-					Return Flow :	6,661
	Total :	16,922	Sub-Total :	3,489	Sub-Total :	3,489	Downstream :	0
							Add. Use :	(5,000)
Other Use	Surfacewater (80%):	10,486	Industries :	80	Industries + Irrigation + Other Use :	33,305	Total	21,438
	Springs :	25,793						
	Groundwater :	-						
	From Outflow :	5,000			Baseflow :	2,097	Baseflow :	2,097
	TO MITINE & IGOKI :	(2,400)			Downstream :			
							WATER NOT USED	
	Total :	38,879	Total :	3,569	Total :	38,891	Total :	(12)

IGOKI LOCATION (Area: 38 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Kanyakine Loc.	to Mitungu
Domestic and Livestock Use	Surfacewater (96%):	8,688	Domestic :	2,186	Domestic :	2,186	Surfacewater	
	Springs :	991	Livestock :	1,446	Livestock :	1,446	Recharge :	18,287 18,287
	Groundwater :	-					Return Flow :	2,327 2,327
	Total :	9,679	Sub-Total :	3,632	Sub-Total :	3,632	Downstream :	0 0
							Add. Use :	(4,000) (5,000)
Other Use	Surfacewater (80%):	7,501	Industries :	0	Industries + Irrigation + Other Use :	23,269	Total	16,614 15,614
	Springs :	1,981						
	Groundwater :	-						
	From Outflow :	9,000			Baseflow :	1,500	Baseflow :	750 750
	FROM NKUENE&ABOGETA	9,900			Downstream :			
							WATER NOT USED	
	Total :	28,382	Total :	3,632	Total :	28,401	Total :	(19)

NKUENE LOCATION (Area: 58 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Mitunguu Location	
Domestic and Livestock Use	Surfacewater (96%):	3,943	Domestic :	10,075	Domestic :	10,075	Surfacewater	
	Springs :	19,883	Livestock :	1,007	Livestock :	1,007	Recharge :	7,661
	Groundwater :	-					Return Flow :	7,063
	Total :	23,826	Sub-Total :	11,082	Sub-Total :	11,082	Downstream :	0
							Add. Use :	(3,000)
Other Use	Surfacewater (80%):	21,657	Industries :	260	Industries + Irrigation + Other Use :	35,316	Total	11,725
	Springs :	39,766						
	Groundwater :	-						
	From Outflow :	3,000			Baseflow :	4,331	Baseflow :	4,331
	TO IGOKI& MITUNGUU:	(13,700)			Downstream :	0		
							WATER NOT USED	
	Total :	50,723	Total :	11,342	Total :	50,729	Total :	(6)

MITUNGUU LOCATION (Are 74 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Tharaka Division	
Domestic and Livestock Use	Surfacewater (96%):	24,500	Domestic :	1,820	Domestic :	1,820	Surfacewater Recharge :	15,860
	Springs :	26	Livestock :	610	Livestock :	610	Return Flow :	9,063
	Groundwater :	1,014					Downstream :	0
	Total :	25,539	Sub-Total :	2,430	Sub-Total :	2,430	Add. Use :	(5,000)
							Total	19,923
Other Use	Surfacewater (80%):	36,700	Industries :	80	Industries + Irrigation + Other Use :	45,314		
	Springs :	51						
	Groundwater :	1,014						
	From Outflow :	5,000			Baseflow :	7,340	Baseflow :	7,340
	FROM OTHER LOCAT. :	12,300			Downstream :			
	Total :	55,065	Total :	2,510	Total :	55,084	WATER NOT USED Total :	(19)

KANYEKINE LOCATION (Area: 63 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Tharaka Division	
Domestic and Livestock Use	Surfacewater (96%):	25,745	Domestic :	3,450	Domestic :	3,450	Surfacewater Recharge :	17,810
	Springs :	1,809	Livestock :	687	Livestock :	687	Return Flow :	7,896
	Groundwater :	-					Downstream :	0
	Total :	27,554	Sub-Total :	4,137	Sub-Total :	4,137	Total	25,705
Other Use	Surfacewater (80%):	57,591	Industries :	80	Industries + Irrigation + Other Use :	39,478		
	Springs :	3,617					Baseflow :	11,518
	Groundwater :	-						
	TO MITUNGUU LOC. :	(6,100)			Baseflow :	11,518		
					Downstream :		WATER NOT USED	
	Total :	55,108	Total :	4,217	Total :	55,133	Total :	(25)

TIGANIA DIVISION: TOTAL (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM DIVISION to Tharaka Division	to NGA
Domestic and Livestock Use	Surfacewater (96%):	65,100	Domestic :	22,452	Domestic :	22,452		
	Springs :	39,418	Livestock :	11,287	Livestock :	11,287	Discharge : 66,061	4,743
	Groundwater :	9,934						
							Baseflow : 22,842	2,946
	Total :	114,452	Sub-Total :	33,739	Sub-Total :	33,739	Downstream : 0	0
Other Use	Surfacewater (80%):	128,941	Industries :	260	Industries +		Total 88,904	7,689
	Springs :	78,835			Irrigation +			
	Groundwater :	9,934			Other Use :	162,400		
	From Outflow :	4,400			Baseflow :	25,788		
					Downstream :	0	WATER NOT USED	
	Total :	222,110	Total :	33,999	Total :	221,927	Total : 183	

MITUNTU LOCATION (Area: 65 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to NGA	
Domestic and Livestock Use	Surfacewater (96%):	3,862	Domestic :	485	Domestic :	485	Surfacewater	
	Springs :	1,903	Livestock :	331	Livestock :	331	Recharge :	-
	Groundwater :	1,781					Return Flow :	2,353
							Downstream :	0
	Total :	7,546	Sub-Total :	816	Sub-Total :	816	Total	2,353
Other Use	Surfacewater (80%):	3,725	Industries :	0	Industries +			
	Springs :	3,806			Irrigation +		Baseflow :	745
	Groundwater :	1,781			Other Use :	11,764		
					Baseflow :	745		
	FROM AKITHI :	4,000			Downstream :	0	WATER NOT USED	
	Total :	13,312	Total :	816	Total :	13,325	Total :	(13)

URINGU LOCATION (Area: 68 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Mbeu Location	
Domestic and Livestock Use	Surfacewater (96%):	400	Domestic :	2,782	Domestic :	2,782	Surfacewater	
	Springs :	878	Livestock :	286	Livestock :	286	Recharge :	17,038
	Groundwater :	1,863					Return Flow :	995
							Downstream :	0
	Total :	3,141	Sub-Total :	3,068	Sub-Total :	3,068	Add. Use :	(4,400)
Other Use	Surfacewater (80%):	-	Industries :	0	Industries +		Total	13,633
	Springs :	1,756			Irrigation +			
	Groundwater :	1,863			Other Use :	4,973		
	From Outflow :	4,400			Baseflow :	0	Baseflow :	0
					Downstream :			
	Total :	8,019	Total :	3,068	Total :	8,041	WATER NOT USED Total :	(22)

MBEU LOCATION (Area: 52 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Thangatha Location	to Tharaka
Domestic and Livestock Use	Surfacewater (96%):	9,438	Domestic :	1,546	Domestic :	1,546	Surfacewater	
	Springs :	1,508	Livestock :	619	Livestock :	619	Recharge :	2,357 8,337
	Groundwater :	1,425					Return Flow :	1,729 1,729
	Total :	12,370	Sub-Total :	2,165	Sub-Total :	2,165	Downstream :	0 0
							Total	4,086 10,067
Other Use	Surfacewater (80%):	18,876	Industries :	0	Industries +			
	Springs :	3,015			Irrigation +		Baseflow :	832 2,943
	Groundwater :	1,425			Other Use :	17,291		
					Baseflow :	3,775		
					Downstream :		WATER NOT USED	
	Total :	23,316	Total :	2,165	Total :	23,231	Total :	85

KIANJAI LOCATION (Area: 37 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Mikinduri Loc.	to Mbeu Lo
Domestic and Livestock Use	Surfacewater (96%):	7,061	Domestic :	3,739	Domestic :	3,739	Surfacewater	
	Springs :	1,598	Livestock :	1,026	Livestock :	1,026	Recharge :	1,470 1,470
	Groundwater :	507					Return Flow :	1,075 1,075
	Total :	9,166	Sub-Total :	4,765	Sub-Total :	4,765	Downstream :	0 0
							Total	2,545 2,545
Other Use	Surfacewater (80%):	11,761	Industries :	0	Industries +			
	Springs :	3,195			Irrigation +		Baseflow :	1,176 1,176
	Groundwater :	507			Other Use :	10,745		
					Baseflow :	2,352		
	FROM AKITHI :	2,400			Downstream :	0	WATER NOT USED	
	Total :	17,863	Total :	4,765	Total :	17,863	Total :	1

AKITHII LOCATION (Area: 71 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Mikinduri & Mbeu	to Mituntu
Domestic and Livestock Use	Surfacewater (96%):	7,350	Domestic :	2,252	Domestic :	2,252	Surfacewater	
	Springs :	7,100	Livestock :	2,123	Livestock :	2,123	Recharge :	2,940 2,086
	Groundwater :	778					Return Flow :	2,458 1,639
	Total :	15,228	Sub-Total :	4,375	Sub-Total :	4,375	Downstream :	0 0
							Total	5,398 3,725
Other Use	Surfacewater (80%):	24,166	Industries :	0	Industries +			
	Springs :	14,200			Irrigation +		Baseflow :	3,164 1,669
	Groundwater :	778			Other Use :	20,482		
					Baseflow :	4,833		
	TO OTHER LOCATIONS	(9,400)			Downstream :		WATER NOT USED	
	Total :	29,744	Total :	4,375	Total :	29,690	Total :	54

MUTHARA LOCATION (Area: 88 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Akithii Location	to NGA
Domestic and Livestock Use	Surfacewater (96%):	5,384	Domestic :	2,505	Domestic :	2,505	Surfacewater	
	Springs :	11,470	Livestock :	5,395	Livestock :	5,395	Recharge : 1,669	-
	Groundwater :	723					Return Flow : 2,390	2,390
	Total :	17,577	Sub-Total :	7,900	Sub-Total :	7,900	Downstream : 0	0
							Total 4,059	2,390
Other Use	Surfacewater (80%):	10,107	Industries :	0	Industries + Irrigation + Other Use :	23,900	Baseflow : 1,655	367
	Springs :	22,940			Baseflow :	2,021		
	Groundwater :	723			Downstream :		WATER NOT USED	
	TO AKITHII :	0						
	Total :	33,770	Total :	7,900	Total :	33,821	Total : (51)	

KARAMA LOCATION (Area: 41 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Muthara Location	
Domestic and Livestock Use	Surfacewater (96%):	4,570	Domestic :	2,163	Domestic :	2,163	Surfacewater	
	Springs :	247	Livestock :	18	Livestock :	18	Recharge : 2,293	
	Groundwater :	-					Return Flow : 1,138	
	Total :	4,817	Sub-Total :	2,181	Sub-Total :	2,181	Downstream : 0	
							Total 3,431	
Other Use	Surfacewater (80%):	9,170	Industries :	0	Industries + Irrigation + Other Use :	5,691	Baseflow : 1,834	
	Springs :	493			Baseflow :	1,834		
	Groundwater :	-			Downstream :		WATER NOT USED	
	Total :	9,663	Total :	2,181	Total :	9,706	Total : (43)	

MIKINDURI LOCATION (Area: 91 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Thangatha Loc.	
Domestic and Livestock Use	Surfacewater (96%):	2,179	Domestic :	4,269	Domestic :	4,269	Surfacewater	
	Springs :	13,796	Livestock :	697	Livestock :	697	Recharge : 16,487	
	Groundwater :	1,247					Return Flow : 5,022	
	Total :	17,221	Sub-Total :	4,966	Sub-Total :	4,966	Downstream : 0	
							Total 21,509	
Other Use	Surfacewater (80%):	15,391	Industries :	260	Industries + Irrigation + Other Use :	25,109	Baseflow : 3,078	
	Springs :	27,591			Baseflow :	3,078		
	Groundwater :	1,247			Downstream :	0	WATER NOT USED	
	FR. AKITHI-THANGAT:	(11,000)						
	Total :	33,229	Total :	5,226	Total :	33,153	Total : 76	

THANGATHA LOCATION (Area: 147 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Tharaka Division	
Domestic and Livestock Use	Surfacewater (96%):	24,855	Domestic :	2,711	Domestic :	2,711	Surfacewater Recharge :	47,506
	Springs :	920	Livestock :	792	Livestock :	792	Return Flow :	8,489
	Groundwater :	1,611					Downstream :	0
	Total :	27,385	Sub-Total :	3,503	Sub-Total :	3,503	Total	55,995
Other Use	Surfacewater (80%):	35,743	Industries :	0	Industries + Irrigation + Other Use :	42,445	Baseflow :	7,149
	Springs :	1,839			Baseflow :	7,149		
	Groundwater :	1,611			Downstream :		WATER NOT USED	
	FROM MIKINDURI :	14,000						
	Total :	53,193	Total :	3,503	Total :	53,097	Total :	96

TIMAU DIVISION: TOTAL (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM DIVISION to Isiolo District	
Domestic and Livestock Use	Surfacewater (96%):	29,438	Domestic :	3,748	Domestic :	3,748		
	Springs :	5,702	Livestock :	3,342	Livestock :	3,342	Discharge :	97,577
	Groundwater :	2,088						
	Total :	37,227	Sub-Total :	7,090	Sub-Total :	7,090	Baseflow :	11,814
							Downstream :	0
Other Use	Surfacewater (80%):	59,069	Industries :	160	Industries + Irrigation + Other Use :	59,700	Total	109,391
	Springs :	11,403						
	Groundwater :	2,088						
	From Outflow :	6,000			Baseflow :	11,814		
					Downstream :	0	WATER NOT USED	
	Total :	78,560	Total :	7,250	Total :	78,604	Total :	(44)

ONTULILI LOCATION (Area: 207 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Isiolo District	
Domestic and Livestock Use	Surfacewater (96%):	12,536	Domestic :	1,756	Domestic :	1,756	Surfacewater Recharge :	11,029
	Springs :	106	Livestock :	351	Livestock :	351	Return Flow :	3,792
	Groundwater :	-					Downstream :	0
	Total :	12,642	Sub-Total :	2,107	Sub-Total :	2,107	Add. Use :	0
Other Use	Surfacewater (80%):	21,493	Industries :	80	Industries + Irrigation + Other Use :	18,959	Total	14,821
	Springs :	211						
	Groundwater :	-						
	From Outflow :	0			Baseflow :	4,299	Baseflow :	4,299
	FROM KIRIMARA :	3,650			Downstream :	0		
							WATER NOT USED	
	Total :	25,354	Total :	2,187	Total :	25,365	Total :	(11)

KIRIMARA LOCATION (Area: 173 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Isiolo District	
Domestic and Livestock Use	Surfacewater (96%):	8,367	Domestic :	815	Domestic :	815	Surfacewater Recharge :	27,686
	Springs :	2,225	Livestock :	500	Livestock :	500	Return Flow :	3,169
	Groundwater :	-					Downstream :	0
	Total :	10,592	Sub-Total :	1,315	Sub-Total :	1,315	Add. Use :	
Other Use	Surfacewater (80%):	20,450	Industries :	0	Industries + Irrigation + Other Use :	15,845	Total	30,855
	Springs :	4,450						
	Groundwater :	-						
	From Outflow :	0			Baseflow :	4,090	Baseflow :	4,090
	TO ONTULILI :	(3,650)			Downstream :	0		
							WATER NOT USED	
	Total :	21,250	Total :	1,315	Total :	21,250	Total :	0

KISIMA LOCATION (Area: 381 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Isiolo District	
Domestic and Livestock Use	Surfacewater (96%):	8,535	Domestic :	1,177	Domestic :	1,177	Surfacewater Recharge :	52,922
	Springs :	3,371	Livestock :	2,491	Livestock :	2,491	Return Flow :	4,979
	Groundwater :	2,088					Downstream :	0
	Total :	13,994	Sub-Total :	3,668	Sub-Total :	3,668	Add. Use :	(6,000)
Other Use	Surfacewater (80%):	17,126	Industries :	80	Industries + Irrigation + Other Use :	24,896	Total	51,901
	Springs :	6,742						
	Groundwater :	2,088						
	From Outflow :	6,000			Baseflow :	3,425	Baseflow :	3,425
					Downstream :	0	WATER NOT USED	
	Total :	31,956	Total :	3,748	Total :	31,989	Total :	(33)

THARAKA DIVISION: TOTAL (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM DIVISION to Tana River	
Domestic and Livestock Use	Surfacewater (96%):	138,966	Domestic :	4,571	Domestic :	4,571		
	Springs :	0	Livestock :	4,143	Livestock :	4,143	Discharge :	298,629
	Groundwater :	2,005						
	Total :	140,972	Sub-Total :	8,714	Sub-Total :	8,714	Baseflow :	0
							Downstream :	0
Other Use	Surfacewater (80%):	52,508	Industries :	0	Industries + Irrigation + Other Use :	331,200	Total	298,629
	Springs :-							
	Groundwater :	2,005						
	From Outflow :	60,000			Baseflow :	0		
	FROM OTHER DIV. :	225,425			Downstream :		WATER NOT USED	
	Total :	339,938	Total :	8,714	Total :	339,914	Total :	24

GIKINGO LOCATION (Area 183 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to N. Tharaka Loc.	
Domestic and Livestock Use	Surfacewater (96%):	20,700	Domestic :	518	Domestic :	518	Surfacewater Recharge :	44,202
	Springs :	-	Livestock :	339	Livestock :	339	Return Flow :	8,306
	Groundwater :	1,003					Downstream :	0
	Total :	21,703	Sub-Total :	857	Sub-Total :	857	Total	52,508
Other Use	Surfacewater (80%):	-	Industries :	0	Industries + Irrigation + Other Use :	41,530		
	TO N. THARAKA :	(16,500)					Baseflow :	0
	Groundwater :	1,003						
	FROM IGEMBE :	29,902			Baseflow :	0		
	FROM TIGANIA :	27,998			Downstream :		WATER NOT USED	
	Total :	42,403	Total :	857	Total :	42,387	Total :	15

MARIMANTI LOCATION (Area: 366 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Tana River	
Domestic and Livestock Use	Surfacewater (96%):	28,270	Domestic :	1,944	Domestic :	1,944	Surfacewater Recharge :	159,706
	Springs :	-	Livestock :	2,558	Livestock :	2,558	Return Flow :	16,612
	Groundwater :	1,003					Downstream :	0
	Total :	29,273	Sub-Total :	4,502	Sub-Total :	4,502	Add. Use :	(30,000)
Other Use	From Outflow :	30,000	Industries :	0	Industries + Irrigation + Other Use :	83,061	Total	146,318
	TO N. THARAKA :	(12,100)						
	Groundwater :	1,003						
	FROM S-,C-,N-IMENTI	58,573			Baseflow :	0	Baseflow :	0
	FROM TIGANIA :	10,067			Downstream :		WATER NOT USED	
	Total :	87,543	Total :	4,502	Total :	87,563	Total :	(20)

NORTH THARAKA LOCATION (Area: 605 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Tana River	
Domestic and Livestock Use	Surfacewater (96%):	54,553	Domestic :	774	Domestic :	774	Surfacewater Recharge :	130,129
	Springs :	-	Livestock :	1,043	Livestock :	1,043	Return Flow :	27,460
	Groundwater :	-					Downstream :	0
	Total :	54,553	Sub-Total :	1,817	Sub-Total :	1,817	Add. Use :	(30,000)
Other Use	Surfacewater (80%):	52,508	Industries :	0	Industries + Irrigation + Other Use :	137,300	Total	127,589
	FROM GIK. & MARIM.:	28,600						
	Groundwater :	-						
	From Outflow :	30,000			Baseflow :	0	Baseflow :	0
	FROM TIGANIA :	27,998			Downstream :			
	Total :	139,106	Total :	1,817	Total :	139,117	WATER NOT USED Total :	(11)

SOUTH THARAKA LOCATION (Area: 249 km2) (unit: m3/day)

	WATER RESOURCES AVAILABLE		WATER DEMAND IN 2013 (Scenario 2)		WATER USED IN 2013 (Scenario 2)		OUTFLOW FROM LOCATION to Tana River	
Domestic and Livestock Use	Surfacewater (96%):	35,444	Domestic :	1,335	Domestic :	1,335	Surfacewater Recharge :	10,860
	Springs :	-	Livestock :	203	Livestock :	203	Return Flow :	13,862
	Groundwater :	-					Downstream :	0
	Total :	35,444	Sub-Total :	1,538	Sub-Total :	1,538	Total	24,722
Other Use	Surfacewater (80%):	-	Industries :	0	Industries + Irrigation + Other Use :	69,309	Baseflow :	0
	Springs :	-						
	Groundwater :	-						
	FROM S. IMENTI :	70,887			Baseflow :	0		
					Downstream :		WATER NOT USED	
	Total :	70,887	Total :	1,538	Total :	70,847	Total :	40

APPENDIX 6

SURVEY OF WATER USE AND NEEDS

IN MERU DISTRICT

APPENDIX 6

SURVEY OF WATER USE AND NEEDS

IN MERU DISTRICT

Parts from a Report on a Household Survey

in the Rural Areas of South Imenti

and Tharaka Divisions

SURVEY OF WATER USE AND NEEDS IN MERU DISTRICT.

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&

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The primary objective of this rural household survey in Meru District was to check the water consumption assumptions being used in WRAP's projections of water demands for each sublocation. Secondary objectives include the identification and analyses of the factors influencing variations in water consumption between households. Particular attention was placed on the differences between the agro-ecological zones, but other variables to be examined include family size, education levels, farm size, types of crops grown or animals kept, farm and non-farm incomes, willingness/ability to invest in farm or domestic improvements, as well as the reliability of the water sources, distances or ease of access to water sources, water quality, existence of water project, etc.

1. BACKGROUND INFORMATION

(1) Household characteristics:

3 of the households lived on their main farm plot elsewhere, but 3035 persons lived in the other 321 households, an average family size of 9.46 persons. There were 802 adult males, 735 adult females and 49.4% or 1498 were children aged less than 18. 951 or 31.3% of the total population in the sample were in school, 450 (14.8%) were below school age and 97 (3.2%) were also not at school. Wide variations existed in household sizes : 6 were single-person households, but 14 contained over 20 persons, 5 of which had over 30 persons, with 38 as the largest household size. The average household sizes varied from 7.33 persons in Mitunguu LRU (Land Registration Unit) to 11.2 persons in the neighbouring Mitunguu Kithinu LRU. Higher proportions of small families (with only 1-5 persons) were found in Ukuu, Mitunguu Kithinu, and Mitunguu LRUs, and relatively small proportions of small families were apparent in Kithunguri, Taita, and Nkumari LRUs. Larger households (with over 10 members) were characteristic of Taita LRU, surrounding the urban centre of Nkubu, but the neighbouring LRUs of Ukuu, Kithunguri and Lower Mikumbune had small proportions of large households. Mitunguu, an area of in - migration due to the irrigation scheme, stood out as having relatively few large families. Makandune, a drier area of recent sub-division and in-migration, also had a relatively small proportion of larger families, but the rest of these lower drier areas in the east of the study region tended to have a relatively large proportion of these larger households.

Farming was the main occupation of 271 respondents (86%) although a further 43 of them regarded farming as a secondary occupation, and a substantial number had links with nonfarm activities. 98 respondents (30%) had previously worked in nonfarm activities, while 134 (42%) had members of their family earning money outside farming.

The family nonfarm monthly incomes for the 24 respondents giving this information ranged from 11 - to 9300/-, averaging 3511/- per month. In addition, 109 households (35%) were found to have some family members away for most of the time. Although 57 never send remittances, 17 regularly sent money back to the household head and 29 occasionally did so.

(2) Farm Crops:

Virtually all the farmers have cash incomes from their farms since only 31 (9.6%) grew no cash crops. Over half of the farmers, 174 or 54%, grew coffee, 76 (24%) produced cotton, 59 (18%) were tea farmers, and 43 (13%) grew other cash crops. 137 have coffee as their sole cash crop, 31 tea only, 55 cotton only, and 9 other cash crops only.

On the basis of these combinations of cash crops, these land registration units have been classified into 4 zones. In the tea/upper coffee zone, tea predominates in Uruku and Kathera Land Registration Units (LRUs) while coffee is more important in Ukuu and to a lesser extent in Upper Mikumbune. In the next zone down the mountain, the Coffee zone consists of Taita, Kithunguri, Lower Mikumbune and Ngonyi LRUs. In the Marginal Coffee/Cotton Zone, coffee is dominant in Nkumari while in Mitunguu, around the irrigation scheme, cotton becomes the dominant cash crop. The drier Cotton Zone includes Mitunguu Kithinu and Makandune LRUs, together with Kiamuri and parts of Tharaka which have yet to be registered.

103 farmers (32%) irrigated their crops, although none of them were able to give reliable estimates of the amounts of water used, and so were unfortunately unable to break this down into monthly consumption figures. Overhead spraying was the method of irrigation used by 67 of the 78 respondents, but 3 used piped water and 8 used a watering can. In 68 cases this water was piped from a river, while for the other 14 providing information on the source of this irrigation water, it was a furrow. Over half of those in the Coffee/tea zone were able to irrigate their crops, although there was a contrast between the high proportion doing so in Kathera LRU and the lower % further south in Upper Mikumbune. As might be expected, the influence of the Mitunguu irrigation scheme was apparent, with two-thirds of the farmers in the Mitunguu LRU irrigating, but in the neighbouring areas of Nkumari, Ngonyi and Mitunguu Kithinu LRUs at least a quarter of the farmers were also irrigating. Taita and Kithunguri LRUs stood out as having relatively low proportions of their farmers irrigating their land. The crops which were irrigated were predominantly food crops rather than cash crops. 72 irrigated food crops but only 3 households watered cash crops. 29 irrigated maize, 26 watered cabbages, 24 irrigated potatoes, 18 tomatoes, 15 beans, 5 bananas, 2 cassava and 1 each irrigated green grams, peas, sorghum and citrus, although 35 also watered other horticultural food crops. Among the cash crops, 2 irrigated tea, and 1 each also watered coffee and cotton.

(3) Livestock:

Ownership of livestock was widespread throughout the study area: 286 farmers (88%) kept cattle, 179 (55%) had goats, 104 (32%) owned sheep, while 247 (77%) kept other animals, mainly chickens.

Although the 649 local cattle exceeded the 559 grade or improved cows, the herd size of local cattle averaged 6.83 for the 95 farmers compared to the 2.73 average grade cows kept by 205 respondents. Herd sizes varied from 1 to 140 for local cattle, and from 1 to 10 for grade cows. 60% of households had only 1 or 2 improved cows, while 44% of respondents had only 1 or 2 local cattle. Improved cattle predominated in the wetter areas of the tea/coffee and coffee zones, while local cattle tended to occupy the drier areas: Kathera and Uruku had no local cattle, while Kiamuri had no grade cows; only in Tharaka, Makandune, Mitunguu Kithinu and Kiamuri were there more local cattle than grade cows.

Improved goats were far less widespread than local goats. 53 farmers kept 199 improved goats, an average herd of 3.755, although the individual sizes varied from 1 to the maximum of 50. 32 (60%) had only 1 or 2 improved goats. No improved goats were kept in Makandune and Kiamuri LRUs. 1175 local goats were owned by 126 households, an average of 9.33 goats per household; herd sizes of local goats were greatest in Tharaka and to a lesser extent, Kiamuri. 42% kept only 1 or 2 local goats, but 2 households over 200 goats, the largest having 230.

98 respondents kept 470 sheep, an average of 4.796 per household. The largest flock was 60 and the flocks were larger in the drier areas, although 50% of the respondents only owned 1 or 2 sheep. Not as many households owned sheep as goats, particularly in the upper areas. 2804, or an average of 11.78 other animals, were kept by 238 respondents. The number of chickens kept ranged from 1 to over 100.

102 of the households (31.6%) owned their own grazing land, while 4 rented grazing land, 28 used communal grazing land. 13 households stated that they let other farmers' livestock onto their land. Among the 74 respondents giving information on the area of their grazing land, the average was 1.4 hectares, with 0.05 hectares as the minimum and 8.90 hectares as the maximum. The average distance from the home was 0.55 km, ranging from 100 metres away to 2 km. For those 19 respondents preferring to give the time to walk to the grazing land, the average was 23.6 minutes. Zero grazing was common in the coffee zones and especially in the tea/coffee zone. Napier grass was grown for fodder and water was commonly taken to these cows.

Income from animals had made a significant contribution to family incomes last year. 262 animals were sold by 99 farmers, producing Kshs 336,497, an average of Kshs 3398 per household selling animals. Between 1 and 30 animals were sold, an average of 2.646 per respondent, although half of them sold only 1 animal. The amounts obtained varied between 60/- and 16000/-.

Over half of the respondents (165 or 51% of 321 respondents) kept dairy cows. A total of 344 dairy cows were owned, an average of 2.21 per owner. 33% only possessed one cow each, although one herd contained 8 cows. These farmers had been milking for an average of 5.3 years; 46% had been milking for 1 year or less, but one respondent claimed to have been milking for 29 years. The herd sizes were such that most farmers used the milk for their own family consumption, although 79 or 42% of 189 respondents (24% of all households), sold an average of KShs 216.32 litres, per month, producing an average monthly income from milk of Kshs 659.24. Total annual milk sales were KShs 569.580. Monthly amounts of milk sold were between 60 and over 1000 litres per month, and the monthly values of milk sales were between KShs 95 and KShs 3000. The milk collection points were an average of 1.78 km away (64 respondents); one was only 300 metres away while 1 household claimed that it was 14 km distant.

Cattle were dipped by 89% (254 of the 284 responding to this question), an average of 3.94 times per month. 50 of the farmers, however, sprayed their cattle at home. The average distance to the cattle dip was 2.26 km. A few were only 100 metres from the nearest dip, and 34% were within 1 km of the dip, but 18 (9% of respondents) were 5 km or more from the dip - two were 10 km and the most distant was 25 km. Perhaps not surprisingly, 64% or 131 of the 205 respondents encountered problems. In many cases these were connected with the journey to the cattle dip rather than just with the lack of water, chemicals or poor repair of the cattle dip.

78 respondents estimated the time taken to travel from their main grazing area to the main watering point. The average of 70.37 minutes, however, masked a variation between 1 minute and 10 hours. Although 46 (59%) were within 30 minutes of their watering point, 56 (72%) were within an hour of it, 19 or 24% needed 2 or more hours to get there, 7 of these having to travel 4 or more hours to water cattle. The average travel times to the watering point increased from west to east. In the Coffee/tea zone no household had to travel more than an hour to reach their cattle watering point whereas in the cotton zone 42% had to do so. A few households in the Coffee/cotton zone, and to a lesser extent in the Coffee zone, had to take their cattle on time - consuming journeys to reach water, even though the majority there, 58% and 75% respectively, only had journeys of under 15 minutes.

During the wet season 61% (174 of the 285 respondents) watered their cattle once per day, 25% (70) did so twice each day, 29 or 10% watered cattle three times daily and 12 (4%) did so 4 times per day. During the dry season, the frequency of watering increased: only 84 or 29% of 287 respondents watered once, 129 (45%) took cattle to water twice daily, 48 (17%) went 3 times, 18 (6%) did so 4 times per day, 6 went 5 times and 2 claimed 6 times daily. Due to the distance and hence the time involved, there was a clear decline in the number of times cattle were taken to watering points each day in the Cotton zone compared to the other 3 zones in both wet and dry seasons. All 4 zones exhibited the increased frequency of watering cattle, but the seasonal contrast tended to be greater in the Coffee/cotton zone, and to a lesser extent in the Coffee zone. The availability of nearby piped water, especially in the Coffee/tea zone, has meant that farmers are able to carry the water to the cattle.

A change took place in the source of the water: in the wet season 124 or 45% of the 277 respondents used piped water, 113 (41%) used a river, whereas in the dry season 128 used a river (47% of 270 informants), but only 103 (38%) used piped water. Other water sources were minor: 14 used a dam in the wet season, 14 a water furrow, 5 a borehole, 4 a dug well, 2 a spring and 1 used rainwater; in the dry season 21 used a pan or dam, 10 used a water furrow, 4 a borehole, 3 a dug well and 1 relied on a spring. Access to piped water for cattle clearly declines from west to east, namely from the higher, wetter areas close to the Mount Kenya Forest down to the lower, drier areas towards Meru Game Park. The switch from piped water in the wet season to rivers in the dry season appeared to be a feature of the Coffee/tea zone and the Coffee zone, while farmers in the Coffee/cotton zone appeared to increase their use of dams in the dry season.

Of the 266 respondents for the wet season, 98 (37%) owned the watering point themselves, and in 86 cases (32%) it was communal, 54 (20%) said government and 21 (8%) watering points belonged to a water association. During the dry season only 74 (28%) owned the watering point themselves, 89 (34%)

were communally-owned and 63 (24%) government, while water association ownership increased to 33 (12%). Among animals using a river, dam or other unimproved water facility, 44 (40% of the 109 respondents) had a trough but 65 allowed their cattle to just roam in the water. The majority, 166 or 58% of 286 respondents, however, had experienced no problems with the water supplies for their animals.

(4) Total household incomes:

When cash crop incomes were combined with the farmers' total annual income from their animals and their milk sales, the 29 tea farmers had the highest total farm incomes of Kshs. 37,324, although the 17 farmers producing both tea and coffee achieved total annual incomes of KShs. 31,480. The 140 coffee farmers averaged total incomes of KShs. 10,690, but the 66 cotton farmers only averaged KShs. 8,186, slightly less than the KShs. 8,700 for the 17 farmers producing both cotton and coffee. Total farm incomes were estimated by 271 households, which had an average annual farm income of KShs. 14,057 or a total income of KShs. 3,809,354. Overall, 80% of this farm income came from cash crops; total annual milk sales amounted to KShs. 456,990, 12% of the total farm incomes, but incomes from sales of animals was relatively unimportant since the total of KShs. 292,770, only amounted to 8% of the total farm incomes. The Coffee/tea zone had much higher total farm incomes than the Cotton zone and were over 4 times larger than in the drier area. The influence of Mitunguu irrigation scheme has meant that cotton farmers there had higher average incomes than for coffee farmers elsewhere. Cotton farmers incomes in Mitunguu Kithinu were much higher than in the rest of the Cotton zone; although average incomes from animal sales was more important in this zone, they were still only about 26% of total farm income in Tharaka. Average farm incomes in Kathera were nearly ten times higher than in Makandune. Average total farm incomes in the Coffee zone, however, were only KShs. 8675, less than might be expected, but were still higher than the average annual farm income from crops and animals in the Cotton zone, KShs. 6,021. The study region has dramatic spatial variations in farm incomes.

Information on family incomes from nonfarm activities was only supplied by 23 households, but their total nonfarm income of KShs. 1,001,240, an average of KShs. 3664 per respondent, made a significant contribution to total annual incomes in the area since it amounted to nearly 27% of the total farm income there from sales of cash crops, animals and milk. Only 1 household in the Cotton zone had nonfarm incomes, however, and the Coffee/tea zone again had the highest nonfarm income, averaging KShs. 29,786 for the 7 households providing figures, much higher than the KShs. 8984 average in the Coffee zone and the KShs. 9758 per household in the Coffee/cotton zone.

(6) Future Expectations:

When asked for their perception of the future, 40% (127 of 321 respondents) were optimistic, 25% or 80 were pessimistic and the rest did not know. As far as their personal future priorities were concerned, 97 or 30% were intending to change their farming activities, 94 (29%) wished to buy more land, 73 (23%) would make no changes, 69 (21%) were prepared to subdivide their farm, and 19% or 61 were intending to set up their own business. Virtually none were intending to take a job away from Meru, or to encourage family members to migrate away, or to sell land; there was little popularity for obtaining non-farm employment or for working on another shamba.

The overall picture which emerges from this background information on the respondents, however, is one of great diversity. Farm sizes, household sizes, family incomes from sources like cash crops, livestock, milk or animal sales, non-farm earnings or remittances, as well as the cash or food crops grown, plus livestock owned, are all factors likely to affect the use of water. Many of the variables appeared to vary geographically, with clear contrasts emerging between the wetter Coffee/tea zone, and the Coffee zone, and the drier areas of the Cotton zone.

2. WATER CONSUMPTION

In estimating the water demand in each sublocation of Meru, the Kenya Ministry of Water Development's Water Resources Assessment and Planning Project divided the 1988 population (estimated from the 1979 census) into urban and rural populations; then for the rural population it has calculated the percentages of each sublocation classified as high agricultural potential, medium potential and low potential. After estimating the populations with internal conveniences and those without conveniences, it has applied assumptions about the daily water demand in litres per day to the population figures to arrive at figures for the total water demand of the population. Based on Ministry of Water Development design guidelines, they have assumed that for populations with internal conveniences, 60 litres/day would be required in high potential areas, 50 litres per day in medium potential areas, and 40 litres per day in low potential areas. For populations without conveniences, the equivalent water demand assumptions are 20 litres per day in high potential areas, 15 litres per day in medium potential areas, and 10 litres per day for low potential areas.

Similar calculations have also been made for the urban areas: for populations estimated to have internal conveniences, it is assumed that populations in high class housing would need 250 litres per person per day, medium class housing areas required 150 litres per day, and low class housing populations would need 75 litres per day. For those without internal conveniences in urban areas, 20 litres per capita are allocated as their likely daily water demands. Comparable calculations are also made for estimated numbers of livestock units in each sublocation, as well as for schools (pupils in day schools with or without toilets, or in boarding schools), health facilities (according to the number of beds in different categories of hospitals, number of hospital outpatients, and for health centres or dispensaries), hotel beds in the 3 classes of hotels, and for the number of staff in administrative offices, together with the number of bars, shops in each sublocation. All these water demands are then totalled for each sublocation so that they can be compared with data on the water supplies available there, and thus identify areas of surplus or shortfall of water.

The primary purpose of this rural household survey was thus to check the current household water demand assumptions being used. An alternative approach might have been to conduct a census at a series of water collection points to measure how much each user carried away, but it was felt that so many points would have been required to get sufficient coverage, and at peak periods of water collection it would be difficult to obtain the necessary information. In conducting the interviews at the home instead of the water collection point it was recognised from the outset that the current water consumption figures would be dependent on the respondents being able to provide reliable estimates of how much water was normally used, and any inaccuracies in the number of persons in the household would distort the per capita daily water consumption figures. A home - based interview would enable other characteristics to be identified which might be expected to influence water consumption rates, yet which would be known by the head of the household and not necessarily by the person carrying water from the water collection point.

The person responsible for using the water in the home was asked to estimate the daily amounts used for cooking, drinking, personal hygiene, laundry or for other purposes. As a 20 litre debe or tin is a standard measure in the area it appeared that they were able to put forward realistic figures. The 305 households able to estimate their normal daily water usage for these different purposes consumed 61,271 litres per day, an average of 200.88 litres per household. The largest use of water was for laundry, 40% of the total, or 91.56 litres per household per day, followed by personal hygiene, 29% or 58.81 litres per household, and cooking which amounted to 25% of the total household daily water use or 50.1 litres per household. Small quantities were used for drinking, 7.61 litres per household, although this was often included with cooking. In addition 2237 litres (4%) or 41.43 litres per household, was used for other purposes like watering animals or irrigation.

Only 54 households provided information on water used for other purposes, however, a relatively small percentage of those irrigating crops or watering their stock at home, so this function was set aside in subsequent calculations of the per capita daily water consumption rates. In addition, the figures included the estimated water use for laundry carried out at the river and not at the home. 85 of the respondents were found to carry their clothes to the river rather than doing their laundry at home. Although 22 of them had said they used no water for this purpose, the other 61 had used 5043 litres. Their consumption figures for laundry were removed from the subsequent calculations even though the average household consumption for the 182 remaining respondents actually increased to 105.61 litres per household,

indicating that they were not large users of water for this purpose. Total household consumption dropped to 56,228 litres, or an average of 184.35 litres among the 305 households. Some of the households claimed to use substantial amounts of water daily for laundry purposes, however, although some doubts remain about whether the women actually washed clothes every day, and whether they had taken this into account and adjusted their estimates of water used for washing clothes. This appears to be partially offset by other respondents who claimed to use very little water for this purpose. These high figures would tend to reflect the higher consumption or wastage which might be expected when piped water supplies are close to the home and so are readily accessible.

For each respondent the per capita water consumption was estimated by totalling the daily amounts used for cooking, drinking, personal hygiene and laundry carried out at home, and dividing the number of litres by the household size.

WRAP's water demand assumptions vary between 10 litres per day in low potential rural areas without internal conveniences to 20 litres/day in high potential rural areas without conveniences, up to 60 litres per day with internal conveniences in high potential areas. 70 households (23%) claimed to use less than 10 litres per person per day, while 13 households (4%) had daily per capita consumption figures exceeding 60 litres/day. The minimum figure was 1.54, with a maximum of 120 litres per person per day. 17 of the households consumed less than 5.134, (1 standard deviation below 22.817 the average of the distribution), while 175 were within 1 standard deviation of this mean; the distribution is skewed, however, since 69 households are up to 1 standard deviation above the mean, (40.5) and a further 27 are between 1 and 2 standard deviations, (58.18) and another 13 are beyond this level.

There is a possibility that respondents with individual water connection inside the house might be unable to estimate the amount drawn from the tap with sufficient accuracy. Of the 69 with individual connections, only 4 were unable to estimate their consumption, 22 (32% of those with taps inside the house) did have extreme per capita consumption; although none had less than 5 litres per person per day, 7 households used less than 10 litres per person daily, and 15 consumed over 40 litres per person per day. 62% used between 10 and 40 litres, but given the ready availability of water from taps inside their houses even the extreme consumption figures do not appear too implausible. None of the households were found to have flush toilets, however, so the WRAP figures for consumption with internal conveniences could not be checked in this rural household sample survey in this sample area of Meru.

For households without access to water from a tap, whether at the source or a standpipe, the daily consumption rates were generally lower - as might be expected from more inaccessible or difficult sources. 8 consumed less than 5 litres per person, one as low as 1.54 litres daily, yet 9 still claimed they used over 40 litres per capita daily, up to the maximum of 74.62 litres per person.

Key variables were selected to investigate the broad relationships between the size categories and the daily per capita water consumptions. These included relative plot-size groups, plot areas, annual cash crop incomes, and household sizes. The standard deviations or half standard deviations above or below the mean were used to divide each variable into different categories. The total daily consumption (the sum of the litres used by each household for cooking, drinking, personal hygiene and laundry - at home or at the water source) was divided by the total number of persons in these households.

The sample selection procedure for the registered areas had selected a quota of small plots (over half standard deviation below the mean of all plots in each area), average-sized plots (between half a standard deviation below and half a standard deviation above the mean in each area), medium-sized plots (between half and 1 standard deviation above the mean in each area) and large plots (over 1 standard deviation above the mean), plus those households mortgaging their plots. For the unregistered areas of Kiamuri and Tharaka, this information was not available for the total statistical population from which the respondents were selected, so comparable classifications had to be made afterwards on the basis of the sample interviewed. For each size category in each of the 14 sub-area, the total consumption was computed and divided by the total number of persons in the households supplying information on their water consumption. This calculation reduces the influence of extreme values more readily than the computation of a simple average. In 3 cases the plots were second plots with no-one living on them, while another 20 households were unable to estimate their daily water consumptions. It was hypothesized that the larger a plot, the greater the water consumed per person. Farm incomes might be expected to be higher if more land could be cultivated, while expectations in the standard of living, home improvements and facilities (including water) might rise. Ambitious farmers, willing to risk

mortgaging their land to borrow money to undertake farm improvements, might be expected to consume most water per capita. While the daily consumption per person for the sample as a whole does indeed show the highest amount for mortgaged plots (26.09 litres per person per day) and there were slight increases from 16.76 litres for small-sized farms, 17.83 litres for average-sized plots, and 18.78 for medium-sized plots, the overall average dropped back to 17.89 litres for the large plots. However, similar trends, have not emerged for the individual subareas, perhaps due to the small number of observations in some of the individual size-categories which could be prone to being affected by the influences of extreme values.

Geographically, however, a clear distinction emerges between the land registration units of the Coffee/tea zone at the highest altitude closest to the Mount Kenya Forest, and the lower or drier land registration units of the Cotton Zone. Daily per capita water consumption average 21.95 litres for the 95 households in the Coffee/tea Zone, whereas water consumption was only 12.60 litres per capita for the 75 respondents in the Cotton Zone. Within the Coffee/tea zone, Ukuu had the highest rate of 25.44 litres per person per day, with Upper Mikumbune averaging only 19.1 litres per capita daily. The average of 18.20 litres per person per day within the Coffee zone was raised by Lower Mikumbune's 23.28, otherwise there was an eastward decline to 16.17 in Kithunguri LRU and 16.81 litres in Ngonyi LRU. The rise in the Coffee/cotton zone average of 20.80 litres reflected the influence of the irrigation scheme in Mitunguu; daily water consumption increased to 19.66 litres per person in Nkumari and 23.05 litres in Mitunguu. In the Cotton zone, Makandune LRU averaged 15.99 litres per person per day, but this fell to 10.4 litres in Kiamuri. Mitunguu Kithinu (12.84. litres) and Tharaka (11.23 litres) were slightly higher.

In WRAP's water demand calculations all 4 sublocations of Nkuene Location plus Kothine sublocation in Igoki location are classed as high potential and so a daily water demand of 20 litres per person has been assumed. Within Mitunguu Location, Ngonyi sublocation has been assumed to be 70% high potential and 30% medium potential, with Kirendene sublocation as 70% medium and 30% low potential so 18.5 litres per person per day might be expected for Kithunguri and Nkumari LRU. In Mwanganthia Location, (Central Imenti Division), Makandune sublocation was classed as being 80% medium potential and 20% low potential, contrasting with 50% medium potential and 50% low potential in Kiamuri sublocation; Makandune LRU might expect 14 litre/person/day and Kiamuri LRU might have 12.5 litres per capita daily. In Tharaka division, the classifications range from Turima (70% medium potential, 30% low potential), Kanyuru (40% medium, 60% low potential), Gatunga (20% medium, 80% low potential) down to Marimanti sublocation (100% low potential). Within Tharaka Division, 12 interviews were in Turima sublocation, 10 in Marimanti and 4 in Gatunga, but the other 16 did not indicate their sublocation; on this basis daily per capita water consumption rates of 11-13 litres might be expected from the WRAP assumptions. Inspection of detailed maps would be needed to identify the precise boundaries of the land classifications, and relate the 1989 population census data to the land registration.

The figures which have emerged from the 1989 rural household survey suggest that WRAP's water demand assumptions are broadly correct. Actual water consumption in the high potential areas is actually slightly higher than assumed by WRAP; this reflects the ready availability of piped water from nearby rivers and the active development of small water supply schemes by the local community. In the lower parts of the Coffee zone, WRAP's water demand assumption appear about right or fractionally lower than assumed. The influence of the Mitunguu irrigation scheme in the Coffee/cotton zone, however, had not been adequately taken into account in the WRAP water demand calculations, and the influence of the scheme spreads into neighbouring areas, especially Nkumari which is higher than expected. Makandune, although correctly identified as being potentially the most productive sublocation in the lower zone, had water consumption rates slightly higher than expected by WRAP's assumptions, but Kiamuri had slightly lower water consumption rates than might have been expected. In general therefore the water demand assumptions by WRAP of 20 litres, 15 litres and 10 litres, do not appear at odds with the water consumption estimates derived from this sample of rural households.

Minor variations have emerged, however, and it might be worth WRAP considering a more detailed breakdown on the basis of the actual 1989 populations in each of the agro-ecological zones. This would involve classifying the zone of each of the enumeration areas used by the 1989 population census in order to subdivide the sublocations into smaller units, and then refining the assumed water demands to reflect this finer breakdown.

3. WATER CARRYING:

As a partial check on the per capita water consumption figures, the sample of households were asked how much water was carried back to the home for use on the previous day. By asking who had carried water, the sizes of their containers, and the number of trips made by each person, it was feasible to calculate the total quantities of water carried for a period when the respondents could easily recall this information.

(1) Amounts carried:

317 people were involved in carrying water for the 164 households supplying information on their water trips; 123 were adults and 61 children. In 81 households, adults only were involved - the 106 adults involved were almost entirely women except in the rare cases of male-only households; 1 adult only was involved in 63 households, while 11 had 2 adults sharing the task and 7 had 3 adults involved in water carrying trips. In 20 households children only, without any adults at all, carried water on the day before the survey; 9 of them involved 1 child only, 10 required 2 children and 1 household had 4 children carrying water. In the remaining households, adults and children share the task of carrying water, with 73 adults and 105 children involved. The average number of water-carrying trips per household averaged 6.32. Very few made one trip only (3 households, 2%) or two trips (9 or 6%), and nearly one-third made at least 9 trips on the day in question.

The total amount carried was 24,671 litres for the 166 households supplying information - an average of 148.62 litres per household. The amount carried varied from 10 litres for one of the households to 960 litres for another one. The total number of litres, divided by the total number of household members in these households, produced the average of 15.774 litres per capita. This figure was 2.833 litres per person less than the estimated normal daily consumption, but as the survey took place in September, during the dry season, a slightly lower figure might be expected for the amount carried and consumed.

The spatial variations noted earlier for water consumption were not present, however, in the amount of water carried per consumer. Mitunguu, with its major irrigation scheme, exhibited the highest amount carried per household member - 30 litres per capita, nearly 7 litres more than the per capita daily water consumption. The Coffee/tea zone average of 16.79 litres per person was depressed by the very low figure of 6.41 litres per capita for Kathera; Ukuu, at 17.8 litres, was markedly lower than the water consumption rates since it was 7.6 litres per household member less. The other two land registration units in this zone, Uruku and U. Mikumbune, showed the highest rates for the amount of water carried, but they were slightly lower than the water consumption rates although less than 1 litre lower. The Coffee zone average of 13.73 litres carried per consumer was also depressed by lower figures for Kithunguri, 6.4 litres, and Taita, 10.3 litres per consumer compared with the water consumption rates, and were 9.8 litres and 8.4 litres less per person respectively. In contrast, the highest amount carried was 23.4 litres in L. Mikumbune, virtually the same as the water consumption rate; the Ngonyi figure of 15.2 litres was only 1.6 litres less than noted earlier. Mitunguu's high figure has meant that the Coffee/cotton zone average amount carried was 19.15 litres per consumer, despite a drop of 2.2 litres to 17.5 litres per person in Nkumari. All 4 land registration units in the Cotton zone had higher amounts of water carried than the water consumption equivalents. Makandune was highest in this drier zone with 20.8 litres per consumer, 4.8 litres higher than before, although Kiamuri was 6.1 litres per capita higher at 16.6 litres carried per consumer. Tharaka (12.6 litres) and Mitunguu Kithinu (13.9 litres) were 1.4 litres and 1.1 litres respectively higher than their water consumption averages noted earlier.

Perhaps too much should not be read into these figures in the upper areas, though, since response rates in these areas were low due to the widespread use of piped water from taps. Overall only 51% of the 324 households in the sample provided information on the amount of water carried. Although response rates were very high in the Cotton zone since 93% of those visited were able to supply information on the amounts of water carried on the previous day. Kathera (14%) and Mitunguu (21%), were particularly low, while Uruku (28%) and U. Mikumbune (32%) in the Cotton/tea zone had less than a third of the sample able to supply information. Apart from Lower Mikumbune and Nkumari, (both 61%), none of the other 4 land registration units in the Coffee Zone had more than 42% of the households supplying information.

(2) Water Storage:

A sizeable amount of water was stored overnight. 41% of all households had stored water at their home during the night before the interview took place. For the 116 households supplying information about this, an average of 33.68 litres per household was stored. This amounted to 22.66% of the water carried back during the previous day. Water storage appeared to be a common practice since 36.65 litres had been stored two nights before the interview took place. 97 households (77% of the 126 respondents) stored the water in containers, but 27 (21%) used a tank. Over half of the households in the drier Cotton zone stored water, with up to 78% storing water in Kiamuri; this contrasts with only 16% storing water in Ukuu. Mitunguu (53 litres per household) and Kathera (62.6 litres per household) stand out as storing the largest average amounts, contrasting with the smallest quantities stored overnight in Tharaka (17.85 litres) and Ngonyi (20 litres). 41% of households collected water from their roof, and 19% had a rainwater tank. The use of water from their own household water tank or storage-container would help reconcile the amounts of water carried per consumer with the daily amount of water consumed per household member.

(3) Piped water supplies:

In addition, households who obtained their water from nearby taps from piped water supplies might be unable to provide reliable figures on the water carried. 32 households (19% of those supplying data on the litres carried), were found to use individual taps and standpipes, yet had provided figures on the water carried; 3 of them even had taps inside their houses. 2 of these respondents with individual taps in Taita and 1 in L. Mikumbune were indeed found to give extremely low figures on water carried per consumer, 2-2.5 litres per household member, while 6 other respondents with taps were found to carry 10 litres or less of water per day for each consumer. For those other households without access to tapped water, 34 carried less than 10 litres per household member per day; while 19 of them were in the Cotton Zone of medium/low agricultural potential in which WRAP assumed water demand of 10-15 litres per person daily, the other 15 were in the high or medium potential areas, especially Taita, Kithunguri and Kathera, depressing the average amounts of water carried per day per consumer in these areas. 7 households in the Cotton Zone claimed to carry home over 30 litres per person, helping to increase the average there.

Over half of the households (53% or 170) had access to piped water supplies from taps during the wet season, - 8 even had taps inside their house, but 147 used individual standpipes outside their house. Although 12 did not specify more details about their taps, 2 used communal taps from pipes, but 1 relied on a communal tap at the source. 83% in the Coffee/tea zone (84 out the 101 households there) had taps, but the use of taps dropped to 67% in the Coffee Zone (53 out of 79), and 52% in the Coffee/cotton zone (32 out 62 households). Although 71% had taps in Mitunguu, the Coffee/cotton zone figure was reduced by the 40% with taps in Nkumari. Only 1 house in the Cotton Zone obtained their water from a tap (1% or 1 out of 82 households), demonstrating a marked contrast with the wetter, higher areas in the sample.

(4) Water Sources

During the wet season, most households obtained their water from rivers. Out of the 155 households without piped water supplies, 88 or 57% fetched water from a river, 21 from a water furrow (14%), and 18 from a spring (12%). Only 9 used a well although only 1 of these was a covered or improved well, while another 8 collected water from a borehole, all in the Cotton zone. Among the 170 with taps, 43 or 25% said that their water was piped from a river, but only 4 from wells, 2 springs, 1 furrow, plus 1 from a rainwater tank.
During the dry season, out of the 171 households without piped water supplies, 119 or 70% fetched water from a river, 17 (10%) from a spring, 15 (9%) from a furrow, 6 (4%) from an uncovered well. Among the 147 with taps, the source of their water was a river for 41 or 28%, 3 (2%) from a spring, 2 (1%) from a furrow. 65%, however, did not state the original source of their piped water.

(5) Distance to Water Sources:

During the wet season, among those without access to piped water supplies, the water source for these 125 respondents was 1238.5 metres away, on average. 24 were unable to estimate a distance. 15 of these water sources were within 50 metres (12%), 9 were between 51-100 metres (7%) and 37 (30%)

were from 101-500 metres away. 58 households or 46%, however, had to travel 1 km or more to their water source. 3 of these distant sources were for households in the Coffee/tea zone, 6 for these in the Coffee zone, 6 in the Coffee/cotton zone, whereas 43 or 60% of the 72 respondents in the Cotton Zone had to travel between 1-6 kms in the wet season to get to the water source.
The average distance travelled to reach the source of the household's water during the dry season increased to 1442.62 metres for the 127 respondents without access to piped water supplies. Although 3 claimed the dry season source was actually closer, 17 households had to travel longer distances in this season, and the rest travelled the same distance in both seasons. A further 23 households, though, had taps either inside or at individual standpipes outside their houses to supply their water in the wet season, but had to travel to other sources during the dry season; 5 also appeared to do so, but were unable to estimate the distance away in the wet season. 16 of those who had piped water supplies in the wet season only had to travel at least 1 km to fetch water in the dry season. The average distance to water sources in the dry season for the 160 respondents increased to 1467.82 metres.

(6) Time required to collect water:

Each return journey during the rainy season, averaged 52.8 minutes for the 155 respondents supplying information. With the addition of an assumed journey time of 10 minutes each for those 137 respondents with individual stand pipes or an assumed 1 minute for the 8 households with taps inside the house, the overall average return journey would take 31.9 minutes. In addition to those 145 with taps inside or nearby, another 37 have a return journey of 15 minutes or less, so that 60% of the sample only took 15 minutes per trip to carry water. 34 households (11% of 303 respondents) took at least 1 hour per return journey, however; 13 of these took over 2 hours per journey, with 2 claiming 300 minutes each for a return journey. The overall average return journey was 13.9 minutes in the Coffee/tea zone, 20.4 minutes in the Coffee zone, and 22.4 minutes in the Coffee/cotton zone where the influence of water from the Mitunguu irrigation scheme can be noted. In contrast, 70.4 minutes per return journey was required in the Cotton zone, ranging from 52.9 minutes in Makandune to 83.8 minutes in Tharaka.

During the dry season, the average return journey dropped to 49.8 minutes (from the 52.8 minutes of the wet season). 75 of those providing return journey times in both seasons felt that the journey time was the same in both seasons, 56 gave a lower figure for the journey in the dry season, while 18 felt the journey took longer in the dry season; these were generally in the drier Cotton Zone. In some cases, however, the drying up of their wet season water supplies necessitated a longer journey to the alternative dry season source of water. When the reduced journey times for those using taps from piped water supplies was incorporated, the average dry season return journey declined to 32.12 for the 299 respondents. The lowest average of 16.20 minutes in the Coffee/tea zone was higher than in the wet season. The same decline with altitude and rainfall as in the wet season was observed since the time involved averaged 18.95 minutes in the Coffee zone and 23.66 minutes in the Coffee/cotton zone. The average return journey of 75.8 minutes in the Cotton Zone was again dramatically different from elsewhere in the sample area, and had actually increased in comparison to the wet season time for a single return water carrying trip.

Most respondents felt that the journey to collect water was difficult: 155 or 74% stated that this was the case. Only one-third had a difficult journey in Kathera and Mitunguu, and up to half in U. Mikumbune, Ukuu and Mitunguu Kithinu (44%); apart from Ngonyi (62%), the rest ranged from two-thirds to all of the households. It was the length of the journey which created this difficulty for 94 (or 61% of the 153 respondents), but 43 (28% said it was uphill), and only 9 (6%) blamed rough paths, although 6 also said it was rough and uphill.

4. PROBLEMS WITH WATER SUPPLIES:

At the start of each interview the head of household was asked about the problems experienced with their present water supplies. Towards the end of the interview with the wife or other person responsible for carrying and using water, she was asked if she was satisfied with the existing domestic water sources, and the reasons for any dissatisfaction. 44 or 14% of the householders were happy with their water supplies, so that the other 280 households experienced problems with their water supplies. Satisfaction with the domestic water supplies was expressed by 47 women, (15% of the 320 respondents). Although in 38 households both the head of the household and the water carrier agreed that there were no problems with water supplies, 6 were satisfied initially but their partner identified problems, while for 9 others this position was reversed. None of the respondents in the Cotton zone were satisfied with their water supplies, although 26% or 26 water-users in the Coffee/tea zone had no problems, and 17 or 28% in the Coffee/cotton zone were happy with their water supplies; this perhaps reflects the degree of satisfaction in the Mitunguu irrigation scheme since 57% were happy in Mitunguu, contrasting with the dissatisfaction in Nkumari where only 7% had no problems. The latter figure is similar to the level of satisfaction in the Coffee zone where 4 households (5%) were happy with their present water supplies.

1) Problems:

All 324 heads of household provided information on up to three problems with their present water supplies. 179 householders (55%) stated that inadequate quantity was a problem, with 158 (49%) making the quantity as the single most important problem. The long distance away to the water source was blamed by 155 (36%), and poor water quality by 104 (32%). 77 (24%) noted that the water dried up in the dry season, and 66 (20%) felt that there were too many other users: both these problems influence the reliability of the water supplies. The only other problem to be blamed by a significant number of householders was having to share with animals, a problem for 33 or 10%. Minor difficulties were poor maintenance (17 or 5%), expensive supplies (14 or 4%), and queuing (9 or 3%).

320 water users, generally the women who collected the water, also ranked up to three difficulties with their domestic water supplies. Slightly more water users had a problem with water quality (144 or 45%) than with the quantity produced (138 or 43%), or with the distance to the supplies (135 or 42%). Reliability (110 or 34%) was the only other significant problem mentioned. Expensive supplies (11 or 3%) or difficulty in operating the supplies (7 or 2%) were both of minor importance. The water users appeared to show greater concern for water quality and distance, while the heads of household saw water quantity as a greater problem. The heads of household would generally be males who might perhaps be more concerned with irrigating cash crops or watering their livestock, whereas the water users would generally be women more concerned with their time and effort involved or with the health aspects of the water.

Distance to supplies grows in importance as a problem with a move eastward towards the lower, drier areas. Distance was not a major difficulty in the Coffee/tea zone, but there was an increase in the Coffee zone and again for the Coffee/cotton zone, until it was the dominant problem in the Cotton zone. 78% of household heads and 88% of the water users in the Cotton zone had a problem with distance. The same eastward trend emerged for problems with water quality: 13% of householders in the Coffee/tea zone had difficulties with water quality, contrasting with the 69% of water users in the Cotton zone. Water quantity, however, was a greater problem in the well-watered upper zones since it was the major problem in the Coffee/tea and Coffee zones, with declining proportions facing this problem in the Coffee/cotton and Cotton zones. Reliability of supplies was mentioned as a significant problem for water users in the Coffee zone, although this problem was not so dominant in the other four zones, especially for the water users in the Coffee/cotton zone.

2) Water Quality:

The members of the household responsible for collecting and using the water were asked specific questions about their perception of the quality of their water supplies. 155 households (48%) felt that their water was unclean and contained dirt. 99 or 31% said that their domestic water source had insects in it. 71 or 21.9% considered that their water smelt or tasted bad.

Water cleanliness deteriorated from west to east. 29% of households in the Cotton/tea zone had unclean water, 49% in the Coffee zone, 55% in the Coffee/cotton zone, rising to 65% for the Cotton zone.

Mitunguu was again similar in quality to the LRUs in the upper zones, while there were fewer complaints in Tharaka than in the rest of the Cotton Zone. Poor taste tended to fluctuate within the Coffee/tea, Coffee and Coffee/cotton zones, which had similar average proportions making complaints (16%, 17% and 15% respectively), rising to 40% in the Cotton zone. None of the households in Mitunguu had complaints about the taste or smell of their water. The eastward decline in quality was observed for the perception of insects in the water, ranging from 22% in the Coffee/tea zone, 29% in the Coffee zone, to 45% in the Cotton zone. The satisfaction in Mitunguu raised the average of the Coffee/cotton zone, and complaints were also less in Tharaka than in the rest of the Cotton zone.

3) Water - Related Health Problems:

Although the upper areas closer to Mount Kenya were thought to be beyond the influence of mosquitos, 233 households or 72% of respondents were found to have had a member of the household diagnosed at a clinic or hospital as having malaria in the past 5 years. A household member in 93 households, 29% of those sampled, had been diagnosed at a clinic or hospital as having skin or eye infections during that period. 90 or 28% of the households had a child who had had worms, although bilharzia which had been reported as being present in the drier areas was rare since only 9 or 3% had been diagnosed by a clinic or hospital as suffering from this water - borne disease.
The incidence of all five health problems was greatest in the drier areas of the Cotton zone: 89% of respondent in the Cotton zone had a household member diagnosed as having had malaria, 45% had had skin or eye infections, 40% had a child who had worms, 24% had a child with diarrhoea in the past month. For malaria and skin/eye infections there were increases from the Coffee/tea zone (55% malaria, 21% skin/eye infections) to the coffee zone (70% malaria, 23% skin/eye infections). Although the higher, cooler and wetter areas of the Coffee/tea zone had the lowest figures for diarrhoea (4%) and worms (15%), the Coffee zone (with 15% diarrhoea and 37% worms) had higher rates than the Coffee/cotton zone (11% diarrhoea and 21% worms); this appeared to reflect the beneficial effects of the Mitunguu Irrigation Scheme.

4) Sanitation Facilities:

The relatively high incidence of health problems appeared to be connected with the fact that only 70 households (24%) boiled their drinking water, and another 7 (2%) filtered it; the majority, 209 households (73%), however, did not treat their drinking water in any way. 40 households (12%) did not have any soap in the house on the day of the survey, although 284 (88%) did have soap. Each household was asked where their children washed: it was felt to be too personal for male interviewers to ask where the women or the person carrying water washed herself, or where the head of the household washed. The majority of children, 57% or 172 respondents, washed in a bathroom, and another 78 (26%) also washed themselves inside the house. Children washed in the compound in 34 households (11%), but 16 (5%) washed in a river. 229 (72%) disposed of the waste water in the compound, but only 37 12%) made use of this waste water on the garden or in the fields.

All except 3 households provided information on their toilets. 4 households (1%) had flush toilets; all 4 were in Uruku LRU. As a contrast, however 11 households, (3%) were without an individual household toilet; 6 of these were in the Cotton zone, 2 in the Coffee/cotton zone, 2 were in the Coffee/tea zone, and 1 in the Coffee zone. Out of the 310 with individual toilets, 50 failed to indicate the type of household toilet, but 103 (33%) had improved vented pit latrines. 153 or 49% or the respondents, however, still used unvented pit latrines. Among the 294 respondents providing information on the toilet, on average it was 33.6 metres away from the house. These average distances were least in the Coffee/tea zone (22.7 metres), and greatest for the Coffee/cotton zone (40.9 metres), although the toilets were closer to the houses in the Cotton zone (34.7 metres). When considering the distances from the toilets to the water source, however, there are great variations around the sample average of 539.0 metres for the 272 respondents. In the Coffee/tea zone the toilets averaged 240.8 metres from the water source, whereas in the Cotton zone they were 1472.3 metres away from the water source.

5. INVOLVEMENT IN WATER SUPPLY PROJECTS

1) Willingness to pay for better water and sanitation facilities:

a) Toilets:

Immediately after asking the person responsible for collecting and using the water these questions about the households' existing toilet facilities, they were asked how much they would be prepared to pay for a better latrine - one which was stable, private, had no smell or flies, and would last for up to 20 years. While the women often appeared unwilling to suggest a figure without reference to the head of household or the husband, 200 respondents were able to suggest figures. The average amount for a better latrine averaged Kshs. 1764.87, but this ranged from only KShs. 2, up to KShs. 25,000. Half of the households, 101 or 51%, would be prepared to pay less than KShs. 1000, and of these 28% would only pay less than KShs. 500. 44 (22%) said they would pay KShs. 1000-1999, 24 or 12% would offer KShs. 2000-2999, and 6 (3%) would pay KShs. 3000-3999. Among the unrealistic over-estimates, 20 respondents (10%) stated that they would pay over KShs. 5000 and 10 of these would offer over KShs. 10,000. These figures suggest that a high value was actually placed on better, more hygienic latrines.

The highest average amount per latrine was offered in Kathera (KShs. 3504), although the Coffee/tea zone average of KShs. 1992 was less than the KShs. 2081 for the Coffee zone, which was raised by the average payment of KShs. 3072 in Ngonyi. The Coffee/cotton zone average of KShs 1783, however, was depressed by the low average amount of KShs. 933 in Mitunguu. Latrines were either not valued highly in the Cotton zone, or else the amount of money available for improved sanitation there was low; the Cotton zone respondents were only prepared to pay KShs. 970 for a better latrine.

b) Communal Standpipe:

129 respondents stated that they would be prepared to pay an average of KShs. 1065 each as the maximum initial payment for access to water from a communal standpipe reasonably close their home, and 113 respondents would be prepared to pay an average maximum monthly charge of KShs. 65.9. Over half of them, (53% or 68 respondents) however, appeared to be willing to only offer an unrealistically low figure of less than KShs 1000 as their maximum initial payment, while 8 or 6% were prepared to pay KShs. 5000 or more. Except in the irrigation scheme, a monthly charge appeared to be fairly rare among water projects in the district; nevertheless 30% (34) would pay KShs 10 or less per month, 30 (27%) would pay KShs 11-20 monthly, 20 (18%) would pay KShs 21-50 per month. 27 placed a high value on water from a communal standpipe and would be prepared to pay over KShs 100 per month, 5 offering as much as KShs. 500 monthly.

While these figures could indicate either a lack of knowledge about the likely costs per household for communal water supplies, or else a lack of available cash or capital to contribute to such an investment in communal water supplies, closer inspection reveals that only 57 respondents were not already investing in a water project, so these figures suggest that a second improved connection would not be valued particularly highly. 14 of these respondents actually had individual connections already at their house.

The figures given may represent the additional contributions a household would be prepared to make to ensure the successful completion of their existing water supply scheme. When those already investing in a water project are excluded, the 57 remaining respondents would only be prepared to pay KShs 544.21 each, an unrealistically low amount; only 6 would pay over KShs 1000, and even the highest figure of KShs 2000 would be unlikely to be sufficient as a contribution towards a shared communal standpipe. 38 respondents, most of those prepared to pay these unrealistically low amounts, however, were found to live in the Cotton zone which has very few water projects at present, and have limited knowledge about current contributions for water projects.

c) Individual Water Connection at home:

218 respondents (73%) would like their own water connection at their home, contrasting with only 11 (4%) who said they did not wish such a connection. A further 69 respondents already had such an individual connection installed. All 73 respondents in the Cotton zone wanted their own individual connection, but only 83% in the Coffee zone, 62% in the Coffee/cotton zone and 52% in the Coffee/tea

zone. 36 households (39%) in the Coffee/tea zone already had their own individual connection at home, as did 23 (38%) in the Coffee/cotton zone, and 10 (14%) in the Coffee zone.

As for communal standpipe connections, many of these respondents appeared to give unrealistically low figures for individual piped water connections. 63 (31% of the 201 respondents giving figures for their maximum initial payment) would be prepared to pay less than KShs 1000 each, while 28 of the other respondents offered over KShs 3000, perhaps more than needed in some areas. 4 even offered over KShs 10,000 so that the average initial amount the 201 respondents would pay was raised to KShs 1824.

Closer inspection, however, has revealed that 108 of these respondents are already investing in a water project, which may often not be completed, working satisfactorily, or they may possibly have communal standpipes rather than individual piped water connections. Much of these households' resources available for investing in their water supplies would have already been used on these existing projects, perhaps accounting for the low figures suggested by the respondents. When compared to the figures given for communal standpipes, though, some of the figures for individual house connections appear to have doubts cast on their reliability. 50 of the respondents were found to be prepared to pay the same amount initially for both communal standpipes and individual piped water connections, and 4 were actually prepared to pay less for the better quality connections in their homes. A further 12 said that they were not prepared to pay more for these individual connections than for a communal standpipe. If these figures are interpreted as the maximum amount a household feels it has available to invest in water supplies then these available resources cannot be equated with the amount they would really expect to have to pay for water supplies, and hence do not provide a full estimate of the value they place on improved water supplies. Instead these figures appear to represent a guide to the amount which could be afforded for improved water supplies.

It would be unwise to subtract the communal payments from the individual connection payments and interpret the resultant figure as the economic value or benefit placed on individual inside supplies in preference to the more distant, less convenient communal standpipe. The number of respondents varies for the various types of contributions, however, and in a few cases a small number of extreme values appears to have led to atypical figures appearing. On the whole, however, most respondents in each of the LRUs, have appeared to place a higher value on individual rather than communal water supplies. In 13 cases, it is clear that even though they already had their own individual connection with a tap at their home, they wished to overcome the common problem of inadequate quantity of water being supplied during the dry season.

2) Investments in Water Projects:

The 324 respondents lived in 206 different villages, although this was difficult to check as the names are often very similar and these village names do not appear on the 1:50,000 topographic maps. They were asked for the names of water supply projects in their own villages. 96 respondents (30%) were unable to name any water project in their village, which appeared to have no water supply projects in them. 51% of respondents named one project, 17% could identify two projects, 6 or 2% named 3 projects, 2 identified 4 projects in their village and 1 named 5 water supply projects. As many as 72 or 88% of the respondents in the Cotton zone said there was no water project in their village, but only 7 (7%) were without water projects in the Coffee/tea zone, 7 (9%) in the Coffee zone and 10 (16%) in the Coffee/cotton zone.

The average contribution per household was KShs 2999 for the 192 respondents supplying figures on this. The 86 household contributions in the Coffee/tea zone averaged KShs 3599, declining to KShs 2934 for the 65 households in the Coffee zone, and KShs 2189 in the Coffee/cotton zone. Only 8 respondents gave figures on the contribution per household in the Cotton zone, but the average there was only KShs 420. The highest average household contribution was KShs 5030 for Uruku LRU. 65% or 124 respondents, the majority of those supplying figures on household contributions to water supply projects, stated that the contribution was KShs 3000 or less - of these 46 (24%) said that KShs 1000 or less was needed. 4 respondents, however, stated that over KShs 10,000 was the contribution per household for projects in their village. The respondents themselves might not have contributed themselves to these water projects, yet it was felt that they would know the amount of money expected from those households who were members of the water supply projects in their villages.

In all except the Cotton zone, however, the majority of the respondents had themselves invested in a

water supply project. 60% (191) in the study area had done so, but 79% (79) of the responding households in the Coffee/tea zone had invested in a water supply project, 72% (43 households) in the Coffee/cotton zone, and 69% (54 respondents) in the Coffee zone. The Cotton zone stands apart from the rest of the study area since only 15 households (19%) said they had invested in a water supply project.

Virtually all the 190 households had invested in a piped water supply project: 156 or 82% had themselves contributed to piped water, only 9 to a furrow scheme, and 2 to other supplies (although 23 also did not specify the type of supply). The amount contributed per household averaged KShs 2845 for the 175 respondents supplying figures. 28% or 49 of these had contributed KShs 1000 or less, 38% (66) had contributed KShs 1001-3000, and 33% (57 respondents) had a total contribution of KShs 3001-10,000, 3 households had spent over KShs 10,000 on a water supply project. The average expenditure in the Coffee/tea zone was KShs 4023, with a decline eastward to an average of KShs 2329 for the Coffee zone, KShs 1974 for the Coffee/cotton zone, down to the KShs 517 in the Cotton zone.

The respondents gave the starting dates for 164 of these water supply projects: 44 (27%) had been started after 1985, although the peak period had been a decade earlier. 30% or 49 projects had started between 1975 and 1979, but only 8 had started before 1970, the earliest being 1959.

The water supply projects averaged 353 members, although those in the Coffee/tea zone were smaller since the average size of those involved in water supply projects there was only 134. 11 projects had 1000 or more contributors, with the largest having 5000 members. The largest projects were in the Cotton zone, which averaged 1026 members, followed by the Coffee zone, while averaged 551 project participants. In the Coffee/cotton zone, the projects in Mitunguu were smaller than in Nkumari, so this zones' average project - size was reduced to 358 people. 59% of all these water supply projects had been completed, yet 69% of all respondents felt that the projects were unsatisfactory and still had problems.

3) Membership of Self-help Groups:

Harambee projects were active in this area. 60% of all respondents had a least one member of the family involved in self-help groups. Since independence 61% of all households had contributed their labour to a harambee project, but 76% had contributed money to a local community development project. The average monthly contribution was KShs 1748. These contributions were higher in the upper zones, with the highest average of KShs 2763 in Uruku. The Cotton zone was the lowest, - the average monthly contribution in Makandune was KShs 483 per household.

Most respondents had been actively involved in the construction of their water supply projects: 58% or 149 households had helped build these projects. There was a general eastward decline in this involvement, though; 74% of the Coffee/tea zone respondents had provided labour for the construction, 65% of those in the Coffee zone, 41% of those in the Coffee/cotton zone, but only 9% of the Cotton zone households.

Fewer households were actively involved in the operations of these water supplies, although 91 (37% of the 245 respondents) were active. There was a similar eastward decline from the 51% of the Coffee/tea zone respondents involved in operating their water supply projects to 38% of the Coffee zone respondents. Although 23% of the Coffee/cotton zone households were involved in water supply operations, only 6% of those in the Cotton zone did so.

4) Willingness to become involved with Water Supply Projects:

The farmers were asked if there was a water project nearby, whether they would be willing to contribute. 84% of the respondents in the sample would be willing to contribute an average of KShs 1721 per household. In many cases, however, they already had piped water supplies, so the amount of their contributions would be for an improved supply or for an additional project to overcome inadequate supplies during the dry season.

65% would prefer to work on a nearby project instead of contributing money. They would be prepared for a member of the household to work for an average of 8.25 days per month as their household labour input. 75% of the respondents would be prepared to form a committee to help organise such a project.

CONCLUSIONS

There are clear geographical variations within this study region for many of the variables which have been covered in this survey. The upper areas close to the Mount Kenya Forest have exhibited a marked contrast to the eastern end of the traverse in the arid and semi-arid areas. This was not only in average farm sizes, but also in the cash crops grown, food crops grown, types of animals raised, and the resulting levels of farm incomes, together with nonfarm incomes. In some cases, however, there appeared to be no regular changes between the four zones which have been identified on the basis of the main cash crops grown by the farmers in this sample. Further study is needed to help identify the underlying inter-relationships among household activities and these variables.

This survey has found that there are variations in the actual per capita levels of water consumption according to the agro-ecological zones, or cash crop zones within this study region. These figures appeared to accord well with the assumptions on water demand used by the Ministry of Water Development in its design manual, and adopted by the Water Resources Assessment and Planning Project in preparing the Meru District Water Plan. Minor variations were noted, particularly for the area influenced by the Mitunguu irrigation scheme.

Further refinement of the methods used to estimate the future water demands in an area might require the use of the unpublished figures for the enumeration areas used in the 1989 Population Census, and relating these smaller areas within each administrative sublocation to the agro-ecological zones there. Instead of generalising to the sublocation, the use of the precise grid - references of infrastructure facilities and major water - users like schools, hospitals, cattle dips, hotels, administrative offices, etc, would facilitate this more detailed analysis. It should then become feasible to compare water supplies and these more refined estimated aggregated water demands for each small area, perhaps by river valley instead of confining attention to broad water catchment areas and sublocations.

Despite being well-served with water projects in the areas of high and medium agricultural potential, this survey has found a great dissatisfaction with water quality and quantity. This is particularly marked in the dry season, characterised by unreliable water supplies. The incidence of water-related health problems, and the very great distances which have to be travelled to obtain poor quality water in the arid and semi-arid areas, however, suggests that high priority might be given to improving the water supplies in these lower, drier areas. Much time is currently being wasted in the laborious chore of carrying water, a basic human necessity. The beneficial effects of irrigation and piped water were apparent in the Mitunguu area. As an interim measure, however, local people might be supplied with treated water from water tankers at convenient distances to their homes. They might also be encouraged to establish self-help schemes to collect water communally by donkey-carts, etc; this might enable the women currently involved in the time - consuming task of water collection to devote more time to productive agriculture. Water harvesting and improved water storage facilities might have a similar beneficial effect, and could also be investigated as an alternative to costly boreholes, dams, or piped supplies from the perennial rivers flowing through the arid and semi-arid area. From the comments of the respondents, it seems clear that many of the self help water projects are not yet completed or operating successfully. This area within Meru appears to have been very active in contributing money and labour for self-help schemes, with priority in the upper areas being given to water supply projects. The incidence of piped water supplies in some areas appeared to be high; also the high cash incomes there appear to have stimulated a demand for home improvements, including internal taps and conveniences, and farm investments, including farm irrigation. There has been a great willingness to devote money and labour towards constructing or improving water supplies. From the responses, a substantial number of households placed a high value on access to better sanitation facilities, communal stand-pipes or individual water connections, and would be prepared to make further investments to ensure better or more reliable water supplies.

Although perhaps not entirely unexpected for a survey of water demand and use, farmers overwhelmingly gave priority towards water supplies throughout this survey area. Respondents were invited to rank seven types of improved facilities and services. 71% of all respondents ranked water supplies as their first priority, and it was mentioned by 88% of all respondents. When weighted by a crude scoring system, the dominance of improved water supplies is still apparent compared to alternatives like more productive agriculture, better health facilities, better schools, and better rural access roads, etc.

The respondents' dissatisfaction with their current self-help water supplies is apparent from this survey, although a systematic survey of self-help water supply projects would be necessary to confirm the reasons for these problems. The common defect appeared to be inadequate water pressure or supplies in the dry season, just the time when reliable drinking water and water for irrigating crops or watering cattle is most needed. This may have arisen as a result of self-help projects expanding to serve too many consumers or too large an area which is beyond the capacity of the streams or the diameter of the pipes originally installed. In this case early and easy access to technical advice might help prevent this difficulty. A special extension advisor who could confine attention to self-help water supply projects might be recruited, and encouraged to seek out and offer advice on the planning, design, implementation and operation of small - scale self-help water projects. On occasions this may help to check inappropriate over - expansion of existing schemes by channelling extra members into setting up their own alternative supply projects; at other times it may encourage several groups to combine into a larger, well-funded projects. The Ministry of Water Development may be able to offer to potential self-help water project leaders, local training courses on how they might plan and implement local water projects, and the technical requirements or design standards needed; alternatively a simple manual or guidelines might be circulated to avoid project leaders making expensive mistakes. University engineering students could perhaps be seconded during vacations to offer practical training advice, or to conduct site surveys, under supervision, to ease the burden on the district water engineer. Non-governmental organisations such as church groups, voluntary aid agencies, etc might be approached to assist in the provision of improved water supplies. The work of an agency like KWAHO, (Kenyan Water for Health Organisation) might perhaps also be extended to more projects in Meru District.