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JAPAN INTERNATIONAL COOPERATION AGENCY

THE FEASIBILITY STUDY ON THE NATIONAL WATER MASTER PLAN IN THE REPUBLIC OF KOREA

FINAL REPORT

MAIN REPORT

November 1978

NIPPON KOEI CO., LTD.
KOREA ENGINEERING CO., LTD.

JAPAN INTERNATIONAL COOPERATION AGENCY

THE MINISTRY OF WATER RESOURCES
THE REPUBLIC OF KENYA

THE AFTERCARE STUDY ON THE NATIONAL WATER MASTER PLAN IN THE REPUBLIC OF KENYA

FINAL REPORT

DATA BOOK

November 1998

NIPPON KOEI CO., LTD
KOKUSAI KOGYO CO., LTD.

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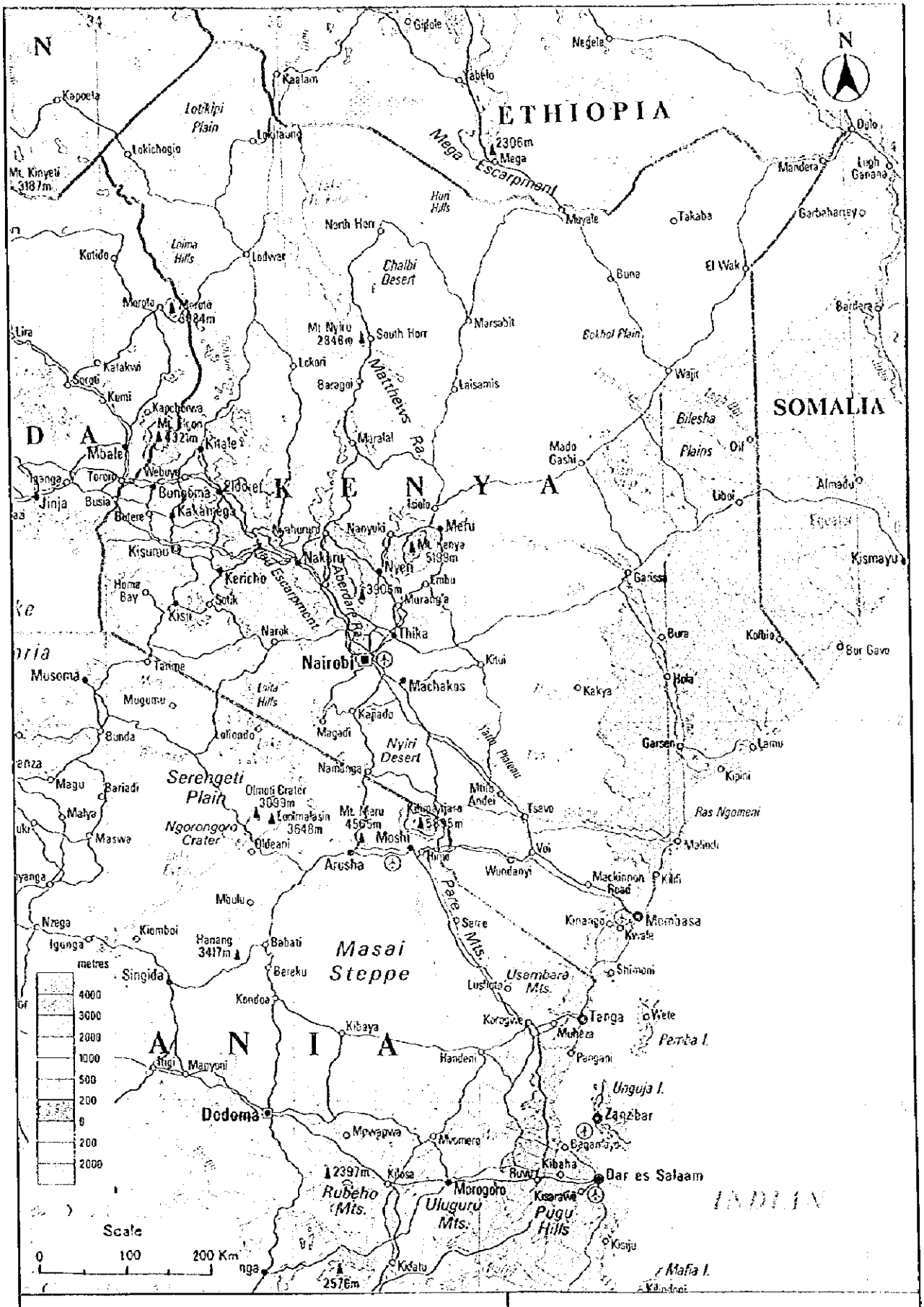

THE AFTERCARE STUDY ON THE NATIONAL WATER MASTER PLAN	LOCATION MAP
JAPAN INTERNATIONAL COOPERATION AGENCY	

THE AFTERCARE STUDY ON THE NATIONAL WATER MASTER PLAN

DATA BOOK

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ABBREVIATIONS

AG	Attorney General
AFW	Accounted for Water
ASAL	Arid, Semi-Arid Lands
CBS	Central Bureau of Statistics
CSRP	Civil Service Reform Programme
CSS	Computer Service Section of MOW
DAO	District Agricultural Officer
DC	District Commissioner
DCO	District Commissioner's Office
DDC	District Development Committee
DDP	District Development Plan
DO	District Officer
DRSRS	Department of Resource Surveys & Remote Sensing
DTO	District Treasury Office
DWB	District Water Board
DWE	District Water Engineer
DWO	District Water Office
EAMD	East Africa Meteorological Department
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GIS	Geological Information System
GOJ	Government of Japan
GOK	Government of Kenya
GRDP	Gross Regional Domestic Product
GTZ	German Agency for Technical Cooperation
HRD	Human Resource Development
IBRD	International Bank for Reconstruction and Development
ICDC	Industrial and Commercial Development Corporation
IDA	International Development Association
ILUS	Integrated Land Use Survey
IPC	Investment Promotion Center
IRS	Integrated Rural Survey
JICA	Japan International Cooperation Agency
KBS	Kenya Bureau of Standard
KIRDI	Kenya Industrial Research & Development Institute
KIU	Kenya Industrial Estates Limited
KMD	Kenya Meteorological Department
KPLC	Kenya Power and Lighting Co.
KPTC	Kenya Posts and Telecommunication Corporation
KS	Kenya Standard
KSS	Kenya Soil Survey
KTDA	Kenya Tea Development Authority
KVDA	Kerio Valley Development Authority
KWAHO	Kenya Water and Health Organization
Kshs	Kenya Shillings
K£	Kenya Pounds (20 Kenya Shillings)
LA	Local Authority
LBDA	Lake Basin Development Authority
LU	Livestock Unit
MCSS	Ministry of Culture and Social Services
MLRRWD	Ministry of Land Reclamation, Regional and Water Development (presently MOWR)
MOA	Ministry of Agriculture
MOE	Ministry of Energy
MOED	Ministry of Education
MOENR	Ministry of Environment and Natural Resources
MOF	Ministry of Finance
MOH	Ministry of Health
MOHANH	Ministry of Home Affairs and National Heritage
MOI	Ministry of Industry
MOL	Ministry of Labour
MOLA	Ministry of Local Authorities
MOLD	Ministry of Livestock Development
MOLG	Ministry of Local Government (presently MOLA)
MOLH	Ministry of Lands and Housing
MOMDE	Ministry of Manpower Development and Employment
MOP	Ministry of Planning
MOPND	Ministry of Planning and National Development
MOPW	Ministry of Public Works

MORD	Ministry of Region Development
MORST	Ministry of Research, Science and Technology
MOSM	Ministry of Supplies and Marketing
MOTC	Ministry of Transport and Communication
MOTW	Ministry of Tourism and Wildlife
MOWR	Ministry of Water Resources
MPND	Ministry of Planning and National Development
MWR	Ministry of Water Resources
NCC	Nairobi City Commission
NCPB	National Cereals and Produce Board
NEAP	National Environmental Plan
NES	National Environment Secretariat
NGO	Non-Governmental Organisation
NIB	National Irrigation Board
NMWP-I	National Master Water Plan (Stage I)
NWCPC	National Water Conservation and Pipeline Corporation
NWMP	National Water Master Plan
NWP	National Water Policy
O&M	Operation and Maintenance
OECD	Organization for Economic Cooperation and Development
OECF	Overseas Economic Cooperation Fund
OP	Office of the President
PC	Provincial Commissioner
PIP	Public Investment Programme
PIU	Project Implementation Unit
PPCSCA	Presidential Permanent Commission on Soil Conservation and Afforestation
PSC	Public Service Commission
PSP	Private Sector Participation
RTPC	Rural Trade and Production Center
RWSDP	Rural Water Supply Development Project
SDD	Social Dimensions of Development
SOK	Survey of Kenya
SWAP	Surface Water Extraction Permit
SWPD	Special Water Programmes Division (MWR)
TARDA	Tana and Athi Rivers Development Authority
UC	Urban Centre
UDD	Urban Development Department (MOLA)
UFW	Unaccounted for Water
UNDP	United Nations Development Programme
UNEP	United Nation Environment Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
UNIDO	United Nations Industrial Development Organization
UNPEP	United Nation Population Fund Programme
USAID	United States Agency for International Development
UWASAM	Urban Water and Sanitation Management
WAB	Water Apportionment Board
WDD	Water Development Department (MWR)
WHO	World Health Organization
WID	Women in Development
WRA	Water Resources Authority

ABBREVIATION OF MEASURES

Length

mm	=	millimeter
cm	=	centimeter
m	=	meter
km	=	kilometer

Area

ha	=	hectare
m^2	=	square meter
km^2	=	square kilometer

Volume

l, lit	=	liter
m^3	=	cubic meter
m^3/s, cms	=	cubic meter per second
MCM	=	million cubic meter
m^3/d, cmd	=	cubic meter per day

Weight

mg	=	milligram
g	=	gram
kg	=	kilogram
t	=	ton
MT	=	metric ton

Time

sec	=	second
hr	=	hour
d	=	day
yr	=	year

Money

Kshs.	=	Kenya shilling
KL	=	Kenya pound
US$	=	U.S. dollar
US¢	=	U.S. cent

Energy

Kcal	=	Kilocalorie
KW	=	kilowatt
MW	=	megawatt
KWh	=	kilowatt-hour
GWh	=	gigawatt-hour

Others

%	=	percent
o	=	degree
'	=	minute
"	=	second
°C	=	degree Celsius
cap.	=	capital
LU	=	livestock unit
md	=	man-day
mil.	=	million
no.	=	number
pers.	=	person
mmho	=	micromho
ppm	=	parts per million
ppb	=	parts per billion
lpcd	=	litter per capita per day

DATA BOOK I

SPECIFICATIONS FOR FIELD SURVEY ON SOCIO-ECONOMY, WATER SUPPLY AND SEWERAGE SECTORS (ENTRUSTED TO LOCAL CONSULTANT)

THE AFTERCARE STUDY ON THE NATIONAL WATER MASTER PLAN

DATA BOOK

DATA BOOK I : SPECIFICATIONS FOR FIELD SURVEY ON SOCIOECONOMY, WATER SUPPLY AND SEWERAGE SECTORS

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LIST OF ATTACHMENTS

I. GENERAL

The field surveys entrusted to the local consultant on the sub-contract basis are as follows:

1) "Survey on Socio-Economy", including preliminary study on national economy and household survey on water use and sanitation
2) "Survey on Water Source",
3) "Survey on the Existing Urban and Rural Water Supply Systems"
4) "Survey on the Existing Sewerage Systems"
5) "Water Quality Analysis for the Existing Sewerage Systems"

The areas subject to the respective surveys are selected in the following manner and the contents of the work are explained in the subsequent Section III. SPECIFICATIONS.

II. SELECTION OF SURVEY AREAS

2.1 Representative Area

2.1.1 Urban Water Supply

One hundred fifty eight (158) urban centers were selected for the survey on urban water supply. They are selected based on the previous National Water Master Plan. They are presented in Table – B2 of the subsequent Specifications.

2.1.2 Rural Water Supply

Representative areas for the survey on rural water supply were selected as mentioned below taking into account the limited time, required accuracy and effective and efficient survey. The areas were selected by district level.

1) All the districts were classified into 8 groups by climate and population density as shown in Table - 1. The representative index of the climate is rainfall.
2) The numbers of districts to be selected from each group as representative district were determined taking into account the number of districts belonging to the subject group and scale of population as given in Table-2.
3) The representative districts were determined taking into account location, transportation measures, securities, etc. The selected districts are 14 in total as shown in Table - 2.

2.1.3 Sewerage

All of the existing sewerage systems (36 systems) were selected as shown in Table-B4.

2.2 Representative Areas Subject to Each Survey

1) Socio-economic Survey

This survey was carried out for urban area and rural area, not by urban water supply, rural water supply and sewerage. For urban area survey, 37 urban centers were selected from 14 representative districts and Nairobi and Mombassa are added as shown in Table – B1 of the subsequent Specifications.

2) Water Source Survey

For urban water supply, 158 urban centers presented in Table – B2 of the subsequent Specifications were selected. For rural water supply, the 70 systems of 14 representative districts were selected as presented in Table - B3 of the subsequent Specifications.

3) Existing Water Systems Survey

For urban water supply, 158 urban centers presented in Table – B2 of the subsequent Specifications were selected. For rural water supply, the 70 systems of 14 representative districts were selected as presented in Table - B3 of the subsequent Specifications.

4) Existing Sewerage System Survey

The existing 36 sewerage systems located in the 30 urban centers presented in Table – B4 of the subsequent Specifications were subject to the survey.

5) Water Quality Analysis for the Existing Sewerage Systems.

The existing 36 sewerage systems located in the 30 urban centers presented in Table – B4 of the subsequent Specifications were subject to the survey.

III. SPECIFICATIONS

A. GENERAL SPECIFICATION

1. General

This specification shall be applied to the Survey on Socio-economy, Water Supply and Sewerage Sectors for the Aftercare Study on National Water Master Plan in the Republic of Kenya.

2. Scope of the Works

The Works shall be executed in accordance with the terms, conditions and requirements of the Contract and Technical Specifications and under the supervision of the JICA Study Team. The Works contain the following tasks;

1) "**Survey on Socio-Economy**", including preliminary study on national economy and household survey on water use and sanitation
2) "**Survey on Water Source**",
3) "**Survey on the Existing Urban and Rural Water Supply Systems**"
4) "**Survey on the Existing Sewerage Systems**"
5) "**Water Quality Analysis for the Existing Sewerage Systems**"

The surveys and analysis above shall be carried out at the following sites and districts;

Work Item	Location
1) Survey on Socio-economy	
- Survey on Economy	-data collection and analysis mainly at Nairobi
- Household Survey on Water Use and Sanitation	-at selected 14 districts and 39 urban centers
2) Survey on Water Source	-at selected 158 urban centers -at selected 70 rural water supplies in 14 districts
3) Survey on the Existing Urban and Rural Water Supply Systems	-at selected 158 urban centers and 14 districts respectively
4) Survey on the Existing Sewerage Systems	-at selected 31 sewerage systems developed at 31 urban centers in 20 districts, and 100 non-sewerd sites in 5 districts.
5) Water Quality Analysis for the Existing Sewerage Systems	-at selected 31 sewerage systems developed at 31 urban centers in 20 districts.

The study on socio-economy includes analyses of data and information. All results of the above Works shall be incorporated to Final Report to be prepared by the Contractor.

3. Work Plan

The Contractor shall submit to the JICA Study Team for his approval proposed time schedule and field operation programmes specified in Article 2.9 of the Contract. The Works shall be executed in accordance with the Approved time schedule.

4. Work Period

All the contract works including submission of the Final Report shall be completed within a period of 60 days from the agreed commencement.

B. TECHNICAL SPECIFICATION

1. General

Primary purpose of the survey is to obtain basic data for conducting the Aftercare Study for National Water Master Plan. Required data and information are on socio-economic conditions in the country, institutional and financial aspects, sectoral policy, development plans of the related sectors, major water sources, water supply conditions, salient features of the existing urban and rural water supply systems and sewerage systems, people's behavior for water use and sanitation, household income, health conditions, etc., all of which are inputs to the Aftercare Study to be carried out by the JICA Study Team. The Aftercare Study, utilizing these survey results, intends to select priority projects in the country and define their programs up to the year 2010.

2. Survey Areas

Selection of districts and urban centers for surveys were carefully made by the Engineer in view of accuracy and reliability required for the present Aftercare Study. Therefore, the Contractor shall neither decrease nor increase the number of the survey areas. In case such needs arise, the Contractor shall immediately inform reasons for canceling and omission. Without Engineer's written approval, the Contractor shall not be relieved from any duties defined in this Contract.

2.1 Survey on Socio-economy

This survey consists of a study on national economy and a questionnaire survey on water use and sanitation of typical households in Kenya. **Table B1** shows areas and number of samples tentatively selected for the household survey.

2.2 Survey on Water Sources

The existing and planned water sources for the **158** urban water supplies shall be studied through questionnaire surveys and in interview with officials and engineers concerned.

2.3 Survey on the Existing Urban and Rural Water Supply Systems

This survey shall cover **158** urban water supplies in Kenya as seen in **Table B2**. Whileas, the survey on the existing rural water supplies shall be conducted at the selected **70** systems being operated at **14** districts which are enumerated in **Table B3**. Prior to initiation of the survey the Contractor shall collect information on the present status of the existing community water supplies (rural water supplies), including number of systems being operated within the boundary, operational bodies, water sources and funding sources. The Contractor shall select the representative **5** systems for each district. Results of the selection by the Contractor shall be immediately informed to the Engineer for his approval.

2.4 Survey on the Existing Sewerage Systems

The Contractor shall visit the existing sewerage systems so far constructed at the major urban centers for the field survey. **Table B4** shows selected **31** existing sewerage systems located in **20** districts and **5** non-sewered urban centers to be surveyed.

2.5 Water Quality Analysis for the Existing Sewerage Systems

Water sampling shall be made at the inlet and outlet of the above 31 existing sewerage systems.

3. Manner of Execution of the Works

The surveys (the Works) shall be executed under the supervision of the Supervisor who will be appointed by the JICA Study Team. The Contractor shall keep close contact with him throughout the contract period to complete the Works efficiently.

The Contractor shall provide, at his own expense, surveyors, labour, vehicles, survey equipment, accommodation and all other services and materials required to complete the Works.

4. Major Tasks and Survey Methods

The Contractor shall not change the scope of works and the survey methods defined in the contract, unless otherwise instructed by the Engineer. In case needs arise, the Engineer may order the Contractor the change of scopes and methods in a written form prior to or at a mid of the Survey.

As the Survey on Water Sources shall be undertaken simultaneously with the survey on the existing urban water supply systems, description below will be made under subsection 4.2.2. As the same reason, water quality analysis will be also dealt with in subsection 4.2.3 Survey on The Existing Sewerage Systems. The survey scopes and methods to be applied shall be principally as follows:

4.1 Survey on Socio-economy

4.1.1 Preliminary Study on Socio-economy, Water Supply and Wastewater Sectors

The preliminary study has two objectives. One is to collate and verify the socio-economic aspects presented in "The Study on National Water Master Plan, July 1992" in the light of the latest information and data. The other is to identify institutions and to reveal the development policies, strategies, objectives and constraints in water supply and wastewater disposal sectors. The Contractor shall obtain data and information necessary to achieve these objectives and prepare the report meeting the objectives.

The preliminary study on the socio-economy will be carried out at two different levels, namely, national level and district/provincial levels. The surveying items will cover, but not be limited to, the following :

(1) Preliminary study on water supply and wastewater disposal sectors

1) Sector development objectives and strategies

2) Sector institution

- Government organizations, private undertakers, NGOs
- Roles, tasks and responsibility of the respective institution
- Staffing of the respective institution

3) Sector investment

The development expenditures and recurrent expenditures for the last five years shall be surveyed for the respective institution. Also future investment program shall be reported, if available.

4) Sector development constraints

There have been a number of issues, problems and constraints not only for operation and maintenance of the facilities but also institutional and management matters. Such issues, problems and constraints shall be revealed and pointed out.

5) Donor's supports

There are a number of donors supporting the sector. The donor's assisted projects shall be surveyed for the last five years and inventory shall be prepared by donor. The survey will include the name, type, principal features, implementation period and amount of assistance.

(2) Preliminary study on socio-economy

1) National level

(a) Population
- Population (total, urban, rural)
- growth rate
- life expectancy
- infant mortality

(b) Gross Domestic Product

(c) Government development and recurrent expenditures for the last five years

2) District/Provincial Level

The survey shall be conducted on the basis of district boundaries adopted for the previous national water master plan to facilitate collation of population forecast presented in the said master plan. However the Contractor shall provide the JICA Study Team with a map showing the latest district administrative boundaries.

(a) Population
- Estimate the population in the project area
- Indicate the source of data or the basis for this estimate
- Review previous population data, historic growth rates and causes
- Provide a range of estimates for future population growth within the district for the planning period and indicate the most probable growth rates,
- Name the source of these estimates and how they compare with past population growth trends,
- Identify reasons for differences between population trends within the project areas and those for the entire country.
- Provide data and make projections on housing standards, particularly

the number of people per dwelling in various parts of the project area
- Analyze the health situation within the project area, paying particular attention to diseases related to water and sanitary conditions

(b) Public health
The Contractor shall report the following aspects on a provincial basis for the last five years :
- Number of outpatients by cases
- Communicable diseases notified
- Water hygiene, water related, water contact diseases
- Break-out of epidemic and its main cause

(c) Number of school (primary school, secondary school, colleges, universities) by district

(d) Household income and expenditure

4.1.2 Household Survey on Water Use and Sanitation

Major tasks of the survey are to carry out the questionnaire survey at the selected **14** districts and **39** urban centers to obtain information on present conditions of living environment, public awareness on sanitation and water use practiced by residents in the Republic of Kenya including data editing, processing, analysis and report preparation. Total number of households surveyed are around **1,200**. The survey shall be carried out according to the following procedures:

(1) Identification of Administrative Areas

Most of topographical maps of Kenya have been published in the 1970's and 1980's. Administrative boundaries changed and they are not necessarily updated. Accordingly, the Contractor shall identify and update the administrative boundary of each urban center and rural area through interviews with municipal/city/town councils and district water engineers before initiation of the questionnaire survey.

(2) Random Sampling

In case of densely populated areas like Nairobi and Mombasa, areal meshes with a width of 500 meter or less shall be drawn on the topographical maps with a scale of 1 to 50,000 or less for random sampling, covering the entire administrative area. Meshes for sampling shall be randomly selected to be more than twenty (20) for each administrative area. Nos. of samples per mesh shall be equal among the meshes and arranged in order to meet the requirement (100 samples in total).

In case of urban centers other than the above, 40 samples or more shall be selected from urban centers and 30 samples or more from each district rural area.

(3) Team Organization, Briefing and Trial

The Contractor shall organize survey teams immediately after commencement of the Work and shall report completion of the organization to the Supervisor. To familiarize the team with the questionnaire survey, the survey team coordinator will brief the purpose of the survey, its methodology and procedures to the survey staff. The survey team also shall carry out trial

questionnaire survey.

(4) Interview

Enumerators shall visit areas of the sampled blocks/households swiftly and shall carry out interviews in an effective manner. To minimize misunderstanding by the respondents, the enumerators shall explain clearly and briefly each inquiry for their easy understanding. Such interview with each household shall be completed within a duration not more than 30 minutes.(Refer to **Attachment – 1** : Questionnaire for Household Survey)

(5) Data Processing

All data collected shall be processed for data entry after review and checking. In case inappropriate replies be found, the Contractor shall immediately inform the Supervisor of them with probable reasons why it took place. The Supervisor will instruct most proper measures for revision. Primary data and data edited shall be kept in computer for further analysis (cross tabulation by Microsoft Excel, Macintosh) and submitted to the Engineer.

(6) Analysis and Report Preparation

The Contractor shall carry out analysis of the collected data, by presenting them in cross tabulation with proper graphs. Major aspects to be clarified cover, but not necessarily limited to, the following;

- average family size, housing type
- occupation
- average income by area
- water sources by area
- health conditions by area
- water use pattern by area
- water shortage during dry season by area
- type of sanitary facilities, disposal and treatment method by area
- garbage disposal method
- socio-cultural aspects of excreta disposal (attitude towards re-use, attitude towards communal systems)

4.2 Survey on Existing Water Supply and Sewerage Systems

4.2.1 Survey on Urban Water Supply Systems

Major tasks of the survey include the following;

1) Questionnaire survey

Questionnaire survey at District Water Offices in Kenya by distributing and collecting data sheets, which shall cover **158** urban water supplies to collect general information on water sources, treatment plants and pipe networks constructed, water supply services, operation and maintenance, institutional and organizational aspects of water undertakers.

2) Field reconnaissance

Field reconnaissance at treatment works, storage reservoirs and service connections to obtain technical and operational information, which shall be conducted at **37** urban water supply schemes.

3) Preparation of summary report

As indicated above, the survey intends to clarify the present conditions and major problems of the existing waterworks at **158 urban centers**. Therefore, a survey team organized by the Contractor shall visit all District Water Offices in Kenya to disseminate and explain the contents of the data sheets (refer to **Attachment – 2(1/3 & 2/3)** : Data sheet for urban water supply schemes), requesting District Water Engineers to fill out. The Contractor shall instruct them that the data sheets distributed shall be returned in one week. All the data collected shall be arranged in an uniform format for database. Data input, edition and processing with preliminary evaluation shall be carried out by the Contractor.

In addition, the Contractor shall conduct reconnaissance surveys at the existing treatment works, storage reservoirs and service connections at the selected **37 urban water supplies**. Each survey includes, but not necessarily be limited to, the following;

<u>Reconnaissance Survey on Treatment Works</u>

- prepare a sketch that shows all facilities with size, structure, function, type, etc.
- working conditions of flow meters (inlet and outlet)
- frequency of chemical dosage (alum, chlorine)
- raw and treated water quality (turbidity or not)
- facilities needed to be rehabilitated
- treatment process
- any other problems related to operation and maintenance

Reconnaissance Survey on Service Meters

- working conditions of house meters at 10 connections randomly selected (to classify into several groups; metered, metered but not working, not metered)

4.2.2 Survey on the Existing Rural Water Supply Systems

There are many types of rural water supply schemes developed in Kenya. They are community self-help schemes, schemes operated by institution, NGOs, etc. The survey include;

1) Questionnaire survey at **70** rural water supplies in the selected **14** districts in Kenya.

1) Report preparation

Preparation of the report that summarizes basic design factors (water production capacity, served population, service area, target year, etc.), number of connections, water sources, major facilities (pipelines, storage reservoirs, break pressure tanks, etc.), construction cost, tariff system, funding sources, organization, operational problems and the Contractor's proposed solutions.

Data sheet prepared for this survey is referred to sheets (refer to **Attachment – 2(3/3)** : Data sheet for rural water supply schemes),.

4.2.3 Survey on the Existing Sewerage Systems and Water Quality Analysis

The Contractor will carry out a field survey designed to describe the existing facilities for each sanitation system, including:

- the location of each system
- the history of the development of sanitation systems in the project area and the extent of all sewers carrying wastewater (with a distinction being made between separate sanitary and storm sewers and combined sewers)
- industrial wastewater discharges and disposal systems
- privately operated wastewater systems and treatment plants,
- typical sketches of independent sanitation systems (latrines, septic tanks, etc)
- estimates of the number of each type of sanitation systems and comments on their design, construction, operation and effectiveness
- the role of the private & public sector in providing services (such as septic tank emptying and night soil collection)
- information on combined sewer overflows, treatment plant bypasses and frequency of use
- methods of disposing of effluents and sludges and information on the existing reuse of these waste products
- a comparison between the quantity of water used by all residents and industries and the amount of wastewater discharged through sewers
- quantities of wastewater, including sludges and seepage from septic tanks and latrines, in surface drains
- ultimate disposal of surface drainage and wastes therein
- drainage arrangements at public standpipes, laundry points, bathhouses and related water-sue facilities
- interference caused by solid waste disposal practices in excreta and wastewater disposal

systems and surface drains

Major tasks of this survey are as follows;

1) Questionnaire survey at the selected **31** existing sewerage systems in 20 districts by distributing and collecting data sheets.

2) Water sampling at **31** sewerage works above and laboratory testing at Nairobi

3) Field reconnaissance at **100** non-sewered households residing within and outside boundary of **5** urban centers (5 urban centers x 10 households x 2).

4) Preparation of summary report

The survey intend to clarify the present conditions and major problems of the **31** existing sewerage schemes at the selected urban centers. Therefore, a survey team organized by the Contractor shall visit these urban centers to disseminate and explain the contents of the data sheets (refer to sheets **Attachment – 3(1/2)** : Data sheet for urban sewerage schemes), requesting officials and engineers concerned to fill out. The Contractor shall inform them that the data sheets distributed shall be returned in one week. The Contractor shall take all procedures necessary for completing the work.

The Contractor shall carry out water sampling of the influent and effluents of each sewerage works and in the receiving stream upstream and downstream of discharge point for laboratory testing in Nairobi. Water testing items to be carried out are listed in the following table;

Parameter	Units	Influent	Effluent	Receiving Stream
Air Temperature	℃	x	x	x
Water Temperature	℃	x	x	x
pH	-	x	x	x
Total Suspended Solids	mg/l	x	x	x
Total BOD5	mg/l	x	x	x
COD	mg/l	x	x	x
Dissolved Oxygen	mg/l		x	x
Faecal coliform	total count/100ml		x	
Total Nitrogen	mg/l		x	
Total Phosphorous	mg/l		x	

Note: "x" implies parameters to be tested

The Contractor shall present results of the water quality testing together with his engineering evaluation and recommendation in a proper way satisfactory to the Engineer.

In addition, the Contractor shall conduct the field reconnaissance for identifying problems of the non-sewered areas located both within and outside the boundary of the urban centers (see Table B4). Data sheets prepared shall be referred to **Attachment – 3(2/2)** :

Data Sheet for survey on non-sewerd areas), (survey at 10 households within the urban center and 10 households outside boundary of the urban center).

Furthermore, the Contractor shall collect data, maps and information for submission to the Engineer. They include, but not necessarily limited to, the following:

- general plans of the existing systems, structural drawings of major facilities
- maps of sewered areas showing location of each system, and sections of the system that need to be rehabilitated
- maps of areas where septic tanks are installed
- organization chart of the sewerage works
- design manual for sewerage system development
- standard drawings of typical septic tanks
- unit cost data

5. Outputs of the Contract Works

(1) Drawing size

Sketch of general plans shall be drawn in A3 size. All the products other than general plans shall be drawn in A4 size sheet, unless otherwise specified in this Tender Documents.

(2) Drawings and data collected

One (1) set of original transparent sheet drawings and five (5) sets of blue prints or copies shall be submitted to the Supervisor.

(3) Report and Calculation data

- Draft Final Report

Five (5) copies of draft final report together with all calculation data and reports collected shall be submitted to the Supervisor one week before the end of the contract period.

- Final Report

Ten (10) copies of all documents and drawings shall be compiled into a final report in an appropriate manner satisfactory to the Supervisor. The report shall be submitted to the Supervisor by the end of the contract period.

I. SELECTION OF SURVEY AREAS

The field surveys to be entrusted to the local consultant on the sub-contract basis are as follows:

1) "Survey on Socio-Economy", including preliminary study on national economy and household survey on water use and sanitation
2) "Survey on Water Source",
3) "Survey on the Existing Urban and Rural Water Supply Systems"
4) "Survey on the Existing Sewerage Systems"
5) "Water Quality Analysis for the Existing Sewerage Systems"

The areas subject to the respective surveys are selected in the following manner.

1. Representative Area

1.1 Urban Water Supply

One hundred fifty eight (158) urban centers were selected for the survey on urban water supply. They are selected based on the previous National Water Master Plan. They are presented in Table – B2 of the subsequent Specifications.

1.2 Rural Water Supply

Representative areas for the survey on rural water supply were selected as mentioned below taking into account the limited time, required accuracy and effective and efficient survey. The areas were selected by district level.

1) All the districts were classified into 8 groups by climate and population density as shown in Table - 1. The representative index of the climate is rainfall.
2) The numbers of districts to be selected from each group as representative district were determined taking into account the number of districts belonging to the subject group and scale of population as given in Table-2.
3) The representative districts were determined taking into account location, transportation measures, securities, etc. The selected districts are 14 in total as shown in Table - 2.

1.3 Sewerage

All of the existing sewerage systems (36 systems) were selected as shown in Table-B4.

2. Representative Areas Subject to Each Survey

1) Socio-economic Survey

This survey was carried out for urban area and rural area, not by urban water supply, rural water supply and sewerage. For urban area survey, 37 urban centers were selected from 14 representative districts and Nairobi and Mombassa are added as shown in Table – B1 of the subsequent Specifications.

2) Water Source Survey

For urban water supply, 158 urban centers presented in Table – B2 of the subsequent Specifications were selected. For rural water supply, the 70 systems of 14 representative districts were selected as presented in Table - B3 of the subsequent Specifications.

3) Existing Water Systems Survey

For urban water supply, 158 urban centers presented in Table – B2 of the subsequent Specifications were selected. For rural water supply, the 70 systems of 14 representative districts were selected as presented in Table - B3 of the subsequent Specifications.

4) Existing Sewerage System Survey

The existing 36 sewerage systems located in the 30 urban centers presented in Table – B4 of the subsequent Specifications were subject to the survey.

5) Water Quality Analysis for the Existing Sewerage Systems.

The existing 36 sewerage systems located in the 30 urban centers presented in Table – B4 of the subsequent Specifications were subject to the survey.

Table B1 Areas and Samples for Household Survey

No.	Household Survey	Area	Nos. of Samples
1	Nairobi	Urban	100
2	Mombasa	Urban	100
1	Muranga	Urban	40
		Rural	30
2	Nyandarua	Urban	40
		Rural	30
3	Kilifi	Urban	40
		Rural	30
4	Taita Taveta	Urban	40
		Rural	30
5	Kitui	Urban	40
		Rural	30
6	Machakos	Urban	40
		Rural	30
7	Wajir	Urban	40
		Rural	30
8	Kisii	Urban	40
		Rural	30
9	Siaya	Urban	40
		Rural	30
10	Marakwet	Urban	40
		Rural	30
11	Narok	Urban	40
		Rural	30
12	Turkana	Urban	40
		Rural	30
13	Uasin Gishu	Urban	40
		Rural	30
14	Kakamega	Urban	40
		Rural	30
	Total	Urban	760
		Rural	420

Table B3 Rural Water Supplies To Be Surveyed

No.	Rural Water Supplies	Nos of RWS
1	Muranga	5
2	Nyandarua	5
3	Kilifi	5
4	Taita Taveta	5
5	Kitui	5
6	Machakos	5
7	Wajir	5
8	Kisii	5
9	Siaya	5
10	Elgeyo Marakwet	5
11	Narok	5
12	Turkana	5
13	Uasin Gishu	5
14	Kakamega	5
	Total	70

Table B2 Selected Urban Water Supplies To Be Surveyed including Water Sources

No.	Urban Name	No.	Urban Name	No.	Urban Name	No.	Urban Name
1	Nairobi	*51*	*Machakos*	101	Kendu Bay	151	Nambale
2	Karuri	52	Mitaboni	102	Awendo/Sare	152	Luanda
3	Kiambu	*53*	*Athi River*	103	Oloitokitok	*153*	*Vihiga+Majengo*
4	Gatundu & Ngenda	54	Uaani/Tawa	104	Ngong	154	Kaimosi
5	Limuru	55	Kangundo	105	Kajiado	155	Khayega
6	Ruiru	56	Tala	106	Namanga	*156*	*Kakamega*
7	Thika	57	Nunguni	107	Magadi	*157*	*Butere*
8	Githunguri	*58*	*Wote*	108	Sotik	158	Mumias
9	Kikuyu	59	Emali	109	Kericho		
10	Wanguru	60	Mtito Andei&Kibwezi	110	Kipkelion		
11	Sagana	61	North Horr	111	Londiani		
12	Kerugoya	62	Kargi	112	Nanyuki		
13	Kutus	63	Korr	113	Rumuruti		
14	Kandara	64	Marsabit	114	Nyahururu		
15	*Maragua*	65	Sololo	115	Gilgil		
16	*Kangema*	66	Moyale	116	Naivasha		
17	*Murang'a*	67	Meru	117	Njoro		
18	Makuyu	68	Nkubu	118	Elburgon		
19	*Ol Kalou*	69	Chogoria	119	Molo		
20	Karatina	70	Chuka	120	Nakuru		
21	Othaya	71	Maua	*121*	*Narok*		
22	Nyeri	72	Mudo Gashe	122	Nairagie Ngare		
23	*Mariakani*	73	Ijara	*123*	*Kilgoris*		
24	*Kilifi*	74	Kotile	*124*	*Lolkorian*		
25	Watamu	75	Masalani	125	Kitale		
26	Malindi	76	Garissa	126	Kimilili/Saboti+Spr.Kita		
27	Mambrui	77	Mandera	127	Endebess/Kwanza		
28	Kwale	78	Elwak	128	Moi's Bridge		
29	Kinango	79	Rhamu	*129*	*Turbo*		
30	Msambweni	*80*	*Wajir*	*130*	*Eldoret*		
31	Lungalunga	81	Buna	*131*	*Burnt Forest*		
32	Witu	*82*	*Bute*	132	Kabarnet		
33	Lamu	83	Manga	133	Maji Mazuri		
34	Mombasa	*84*	*Keroka*	134	Eldama Ravine		
35	*Taveta*	*85*	*Nyamira + Kebirigo*	135	Mogotio		
36	*Voi*	*86*	*Kisii*	136	Marigat		
37	*Wundanyi*	87	Ogembo	*137*	*Iten+Tambach*		
38	Bura & Madogo	88	Maseno	138	Nandi Hills		
39	Hola	89	Kisumu + Kibos wa	139	Kapsabet+Baraton		
40	Garsen	90	Ahero	140	Maralal		
41	Runyenjes	91	Muhoroni	141	Wamba		
42	Sinkago	*92*	*Bondo*	142	Baragoi		
43	Embu	*93*	*Yala*	*143*	*Lodwar*		
44	Isiolo	*94*	*Siaya*	144	Kapenguria/Makutano		
45	Ol Doinyo Ng'uo	95	Ukwala	145	Mawabe + Malakisi		
46	Garbatula	96	Homa Bay	146	Bungoma		
47	Merti	97	Migori	147	Kimilili		
48	*Kitui*	98	Kehancha + Tarang'anya	148	Webuye		
49	*Mutomo*	99	Nyabikaye	149	Chaptais		
50	*Mwingi*	100	Oyugis	150	Busia		

Note: Urban centers in bold and italic imply the areas where field surveys on the existing water supply systems including water sources, treatment works and service connections are required to cross check questionnaire surveys to be conducted.

Table B4 Existing Sewerage Systems To Be Surveyed

No.	District	Urban Name	Name of T/W	NWMP Projected Population 1995
1	Bungoma	Bungoma	Old and New Bungoma	52,700
2	Bungoma	Webuye	Webuye	47,500
3	Busia	Busia (South Teso)	Busia	23,300
4	Busia	Mumias	on site sanitation	36,600
5	Embu	Embu	Embu	28,800
6	Garissa	Garrissa	on site sanitation	42,500
7	Kajiado	Ngong	Ngong	26,800
8a	Kakamega	Kakamega	Kambi Somali Lagoon	76,000
8b	Kakamega	Kakamega	Shirere Lagoon	-
9	Kericho	Kericho	Kericho	56,600
10	Kiambu	Kiambu	Kiambu	6,800
11	Kiambu	Limuru	Limuru	2,200
12	Kiambu	Thika	Thika	89,400
13	Kilifi	Malindi	on site sanitation	61,000
14	Kisii	Kisii	Kisii Old and New Pond	61,700
15	Laikipia	Nanyuki	Nanyuki	39,300
16	Laikipia	Nyahururu	Nyahururu	22,300
17	Machakos	Muvuti	Machakos	188,100
18	Machakos	Mavoko (Athi River)	Athi River	39,400
19a	Mombasa	Mombasa	Kipeve Changanwe	570,400
19b	Mombasa	Mombasa	Kinzingo	-
20	Muranga	Mbiri	Muranga	31,300
21	Muranga	Muragua Ridge	on site sanitation	47,700
22a	Nairobi	Nairobi	Dandora	1,779,600
22b	Nairobi	Nairobi	Kariobangi	-
23	Nakuru	Naivasha	Naivasha	62,900
24	Nandi	Kapsabet	Kapsabet	19,500
25a	Nyeri	Nyeri	Nyeri-Kiganjo	146,700
25b	Nyeri	Nyeri	Nyeri-ADB	-
26	South Nyanza	Homabay	Homabay	33,800
27	Taita Taveta	Voi	Voi National Housing Co.	17,100
28a	Trans Nzoia	Kitale	Kitale-Conventional	85,300
28b	Trans Nzoia	Kitale	Kitale-Waste water ponds	-
29a	Uasin Gishu	Eldoret	Eldoret-Conventional	170,000
29b	Uasin Gishu	Eldoret	Eldoret-Waste water ponds	-
30	Wajir	Wajir	on site sanitation	19,300

Note: Tudor Estate treatment facility in Mombasa has been abandonned and is

Attachment - 1
Questionnaire for Household Survey

District:	
No.:	-
Interviewer:	
Date:	/Dec/'97

QUESTIONNAIRE ON WATER USE AND SANITATION

DECEMBER, 1997

Purpose: This household survey was organized under the Japan International Cooperation Agency (JICA), the Government of Japan, in close cooperation with the Ministry of Land Reclamation, Regional and Water Development (MLRRWD), the Government of Kenya. It intends to clarify present living environment and water use practiced by the people. Results are valuable information for identifying priority area. We wish your support and cooperation on this survey.

Household Survey (1)

1. Total number of occupants in the house: ☐ persons

2. Main occupation of the family head:

☐ 1) Farmer

☐ 2) Employed in an office (including teachers, priest, tea factory, etc.)

☐ 3) Business man (including hawkers, food vendors, traders, etc.)

☐ 4) Others (_____)

3. Estimated family income per month (per year)

☐ 1) less than 2,500 Kshs per month (less than 30,000 Kshs per year)

☐ 2) 2,500 to 5,000 Kshs per month (30,000 to 60,000 Kshs per year)

☐ 3) 5,000 to10,000 Kshs per month (60,000 to 120,000 Kshs per year)

☐ 4) 10,000 to 20,000 Kshs per month (120,000 to 240,000 Kshs per year)

☐ 5) 20,000 to 30,000 Kshs per month (240,000 to 360,000 Kshs per year)

☐ 6) 30,000 to 40,000 Kshs per month (360,000 to 480,000 Kshs per year)

☐ 7) 40,000 to 50,000 Kshs per month (480,000 to 600,000 Kshs per year)

☐ 8) more than 50,000 (more than 600,000 per year)

4. Where do you get water for your daily consumption?

	Drinking & Cooking		Others	
1) Piped water supply ☐	by Ministry ☐	by Community ☐	by Municipality	
- Individual connections	☐		☐	
- Yard standpipe	☐		☐	
- Kiosk/Communal water points	☐		☐	
- Neighbour supply	☐		☐	
2) River water	☐		☐	
3) Hand dug shallow well	☐		☐	
4) Deep well	☐		☐	
5) Rain Water Harvesting	☐		☐	
6) Others (_____)	☐		☐	

If you use a yard standpipe, how many families are using this tap? (_____) families

5 Is water boiled before drinking?

☐ 1) Yes

☐ 2) No

6. How far is it to the water supply/water sources?

☐ 1) Water tap located in house

☐ 2) 0 - 1/2km (less than 30 minutes)

☐ 3) 1/2 - 2km (30 min - one hour)

☐ 4) 2 - 4km (one hour - two hours)

☐ 5) 4km or more (more than two hours)

7. How many times a day do you collect water and by what means?

☐ 1) twice a day or less By means of (_____)

☐ 2) three times a day By means of (_____)

☐ 3) four times a day By means of (_____)

8. How many days in a month do you miss water from your water source?

☐ 1) less than 7 days

☐ 2) less than 14 days

☐ 3) less than 21 days

☐ 4) 21 days or more

9. Do you get water from your source in dry season?

☐ 1) Yes

☐ 2) No

If no, where do you get? (_____)

10. Do you have storage facilities?

☐ 1) Yes

☐ 2) No

If yes, let me see the type?

Type: (_____) Volume: (_____) m3

(Following inquiries 11 and 12 are valid for those who get water from piped water systems including Kiosks, Communal Water Points and Neighbour Supply)

11. How much do you pay for water per day or per month?

- ☐ 1) no payment
- ☐ 2) less than Ksh 5 per day (less than Ksh150/month)
- ☐ 3) Ksh 5 - 10 per day (Ksh 150 - 300/month)
- ☐ 4) Ksh10 - 20 per day (Ksh 300 - 600/month)
- ☐ 5) Ksh 20 per day or more (Ksh 600/month or more))

12-1 Are you satisfied with water supply services?

- ☐ 1) yes
- ☐ 2) no

If yes, go to Question No. 13.

12-2 If no, what reasons?

- ☐ 1) poor management
- ☐ 2) poor water quality
- ☐ 3) low water pressure / less water available
- ☐ 4) high water tariffs
- ☐ 5) others

12-3 If above problems are solved, will you be willing to pay for water services?

- ☐ 1) yes
- ☐ 2) no

If no, give reasons. (_____)

13. How big is your land?

- ☐ 1) landless/squatters
- ☐ 2) less than 2 acres
- ☐ 3) 2 acres - 5 acres
- ☐ 4) 5 acres or more

14. What crops do you grow?

- ☐ 1) coffee
- ☐ 2) tea
- ☐ 3) miraa
- ☐ 4) maize & beans

☐ 5) Others

15. Which of the following animals do you keep?

☐ 1) dairy cows (_____) nos.
☐ 2) zebu cattle (_____) nos.
☐ 3) shoats (_____) nos.
☐ 4) camel & donkeys (_____) nos.
☐ 5) others (_____) nos.

16. How many children do you have? ☐

(_____) in kindergarten
(_____) in primary school
(_____) in secondary school
(_____) under post second education

17. How do you dispose your refuse?

☐ 1) thrown in the garden
☐ 2) rubbish pits
☐ 3) burning
☐ 4) others

18. What kind of sanitary facilities do you have?

☐ 1) none
☐ 2) pit latrine
☐ 3) cistern flush WC
☐ 4) pour flush squat plate
☐ 5) others

19. If no latrine, where do you defecate?

☐ 1) neighbor's shared latrine
☐ 2) bush
☐ 3) river
☐ 4) drains, ditches
☐ 5) other

20. Is the liquid effluent from the toilets going

- ☐ 1) to sewer
- ☐ 2) to septic tank with drain field age (_____)
- ☐ 3) to leaching pit
- ☐ 4) direct discharge to drains, streams, rivers
- ☐ 5) other

21. If septic tank or leaching pit, how often do you remove sludge?

- ☐ 1) never
- ☐ 2) once per year
- ☐ 3) 2 to 5 years
- ☐ 4) more than 5 years

22. If you answered "1) never" above, then what is a reason?

- ☐ 1) cannot afford
- ☐ 2) inaccessible
- ☐ 3) neighbours remove and use as fertilizers
- ☐ 4) other ( )

23. If latrine or leaching pit, does the water level in the pit rise during rainfall?

- ☐ 1) does not rise
- ☐ 2) rises to just below the floor
- ☐ 3) rises and floods over the floor

24. Do you know about water related diseases?

- ☐ 1) yes
- ☐ 2) no

25. Which of the diseases have your family members suffered in the last one year?

- ☐ 1) none
- ☐ 2) malaria
- ☐ 3) typhoid
- ☐ 4) cholera
- ☐ 5) dysentry

☐ 6) others

26. Is there enough water every day for;

1) washing hands ☐ yes ☐ no
2) taking bath ☐ yes ☐ no
3) washing clothes ☐ yes ☐ no

27-1 Interviewer's Observation

1) House type

☐ Permanent (solid structure)

☐ Semi-permanent (solid foundation, temporary superstructure)

☐ Temporary

2) Electricity? & Telephone?

☐ Yes ☐ Yes

☐ No ☐ No

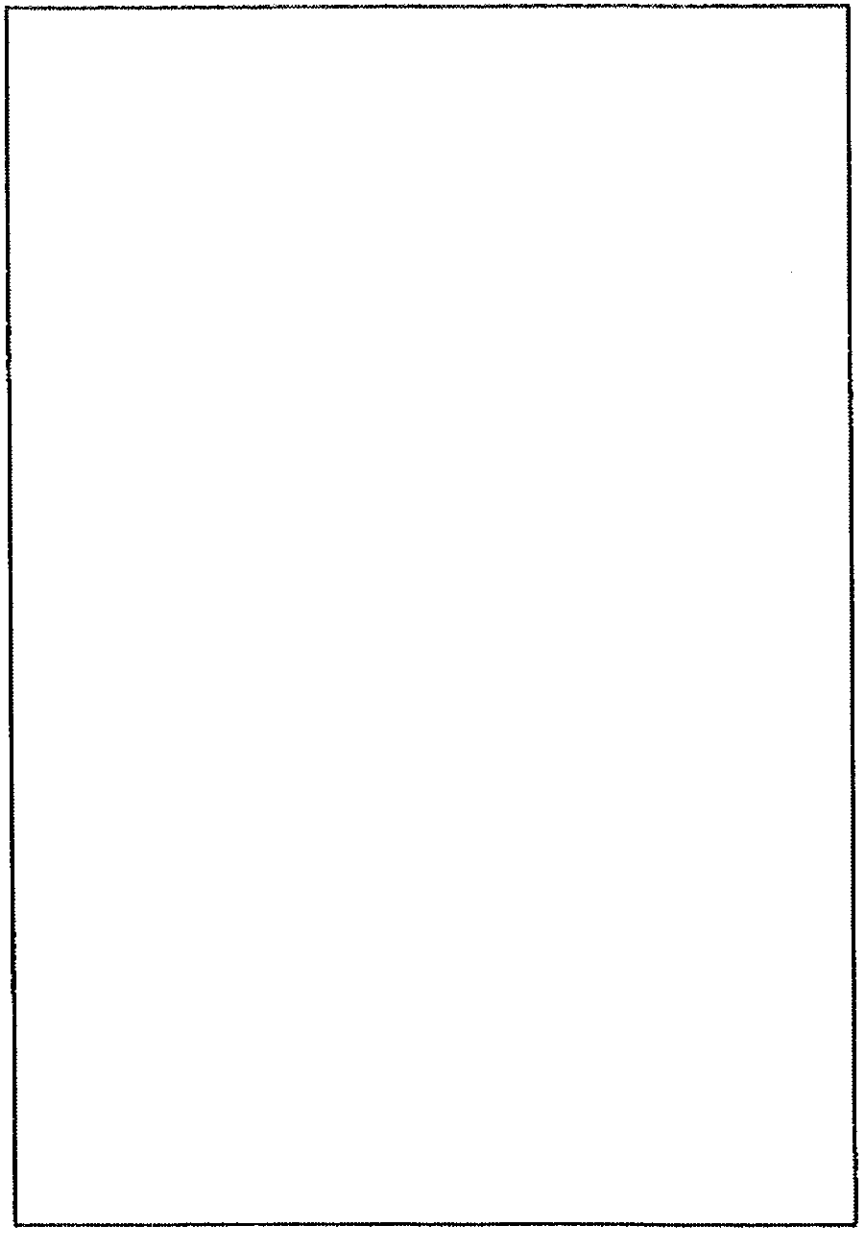
27-2 Distance from well to the nearest leaching pit or ☐ m

27-3 If piped water supply ☐ Metered ☐ Unmetered

Account No. (_____)

27-4 Comments from the surveyor

27-5 House/Plot Sketch



Urban/District	/
Name of UWS	
Prepared by	
Approved by	

Attachment -2 (1/3)
Data Sheet for Survey on Urban Water Supply Schemes (UWS1)
(tentative)

I. General Information on DWO

I-1 Water Supplies in District (under operation)

No.	scheme name	management agency	water source	annual production	population served
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Note: In case of insufficiency, an additional table shall be attached.

I-2 Organization of DWO

1) How many sections/divisions are organized under DWE? _____

2) What sections are they and how many staff for each section?

_____, _____, _____,
_____, _____, _____,
_____, _____, _____,

3) How many DWO's branch offices are there in your district? _____

4) Where are they? _____, _____, _____,
_____, _____, _____,
_____, _____, _____,
_____, _____, _____,

I-3 Water Quality Control

1) What are major activities for quality control of UWS?

2) Target chemical dosage frequency (UWS)?

_____ days/year

3) What are major activities you are undertaking for support & guidance of RWS?

I-4 Water Resource Management

1) Water right records in the district are available in DWO? ____yes/no____

If no, which office is keeping? _____

2) What are major activities for monitoring spring, river & underground water?

quality control & monitoring:

flow control:

II. Facilities (UWS)

II-1 Water Source (Intake Facilities)

1) River

	river flow	water level	Intake rate
dry season			
wet season			

method of estimation above _____

method of extraction _____

construction year _____

flow measuring devices yes/no

2) Spring

	spring yields	elevation	Intake rate
dry season			
wet season			

method of estimation above _____

protected or not yes/no

year of construction _____

flow measuring devices yes/no

3) Boreholes

numbers _____

pump capacity _____

pumps working or not yes/no

borehole diameter _____ mm

static level _____

year of construction _____

flow meters equipped yes/no

4) Pipeline Offtake

diameter (main) _____ mm

diameter (branch) _____ mm

metered or not yes/no

meter working or not yes/no

II-2 Raw Water Transmission

1) Source to Water Treatment Plant/Reservoirs

pipe diameter _____

pipe materials _____

year of installation _____

length _____

level differentials _____

gravity flow or not yes/no

2) Any other facilities during transmission

_____

II-3 Treatment Plant/Reservoirs

1) Development history

	First Const.	First Expan.	Second. Expan.
year			
production cap.			
treat. process			
funding sources			

2) Hydraulic Profile & Details

First Construction

	Nos.	Elevation	Width x Length	Retention Time (storage capacity)
Receiving basin				
Mixing chamber				
Sedimentation				
Filter				
Reservoir				

First Expansion

	Nos.	Elevation	Width x Length	Retention Time (storage capacity)
Receiving basin				
Mixing chamber				
Sedimentation				
Filter				
Reservoir				

Second Expansion

	Nos.	Elevation	Width x Length	Retention Time (storage capacity)
Receiving basin				
Mixing chamber				
Sedimentation				
Filter				
Back wash tank				

3) Chemical facilities

Chemicals (chlorine, alum)	
Dosing equipment	
Dosage rate	
Days chlorine dosed last year	
Days alum dosed last year	

4) Pumps if any

	Purpose	Nos.	Capacity x Head	Type	Conditions
(1)					
(2)					
(3)					
(4)					

H-4 Distribution Facilities

1) History of expansion

2) Distribution mains

	Diameter	Length	Materials	Installation year
(1)				
(2)				
(3)				
(4)				
(5)				
(6)				
(7)				

3) Service mains

	Diameter	Length	Materials	Installation year
(1)				
(2)				
(3)				
(4)				

4) Service Connections (number of registered customers)

	Year	total	metered	not metered
(1)	1996			
(2)	1995			
(3)	1994			
(4)	1993			
(5)	1992			
(6)	1991			
(7)	1990			
(8)	1989			
(9)	1988			
(10)	1986 or before			

5) Service reservoirs

	Location	Year constructed	Storage capacity
(1)			
(2)			
(3)			
(4)			

6) Communal water points operated by DWO/institutions/municipality/etc

	Operational body	Metererd	Numbers	Served poulation	Type (kiosk, etc)
(1)		yes/no			
(2)		yes/no			
(3)		yes/no			
(4)		yes/no			

III. Operation and Maintenance

III-1 Staffing

1) Number of staff

	Superintendent	Operators	Mechanical	Other Staff
(1) Intake & transmission				
(2) Water treatment plant				
(3) Service Reservoirs				
(4) Distribution facilities				
Total				

III-2 Water Quality Control

1) Frequency of chemical dosage

Chlorine _____ days/year

Alum _____ days/year

Others _____ days/year

2) Frequency of water sampling and testing

	Parameters for testing	Institution carrying out water testing
Daily items	_____ , _____ , _____	_____
	_____ , _____ , _____	_____
Weekly items	_____ , _____ , _____	_____
	_____ , _____ , _____	_____
Monthly items	_____ , _____ , _____	_____
	_____ , _____ , _____	_____

3) List of water testing equipment in your laboratory

_____

_____

_____

Is your laboratory equipped with a jar tester? ____yes/no

4) Organization & staffing of laboratory

number: _____

_____

_____

5) breakdown of chemicals and power expenses spent last year

	quantity	unit cost	expenditures
Electricity			
Fuel (pumps)			
Fuel (transport)			
Chemicals			
-Chlorine			
-Alum			
-Soda, etc.			
Total			

III-3 Water Pressure & Flow Control

1) Methodology

(1) Intake (source) _____

(2) Raw water transmission _____

(3) Water treatment plant _____

(4) Service resevoir _____

(5) Distribution network _____

2) Equipment Installed

	Location	Type	Installation year	Diameter	Working Conditions
Flow meters					
(1)	Inflow (WTP)				
(2)	Outflow (WTP)				
(3)	Zonal meters				
(4)	Zonal meters				
(5)	Zonal meters				
(6)	Zonal meters				
(7)	Zonal meters				
(8)	Zonal meters				
Pressure gauges					
(1)					
(2)					
(3)					
(4)					
(5)					
Level meters					
(1)					
(2)					
(3)					
(4)					
(5)					
Break pressure tanks/valves					
(1)					
(2)					
(3)					
(4)					
(5)					
Flow Controllers					
(1)					
(2)					
(3)					
(4)					
(5)					

III-4 Storage & Workshop in DWO

1) Chemicals stored

	Chlorine	Alum	Others( )
present storage (ton)			
days for stock			
purchase frequency			
days for delivery			

2) Customer meters

	dia 1/2"	dia 3/4"
How many stocks?		

Repair work shop? yes/no

How many meters have been repaired yearly?

1996		
1995		
1994		
1993		
1992		
1991		

Do you have meter calibrators? yes/no

3) Pipes & valves

Pipe stocks

Diameter(mm)	Materials	Length
200		
150		
125		
100		
75		
50		
25		
20		
13		

Valve stocks

Diameter	Type	Quantity
200		
150		
125		
100		
75		
50		
25		
20		
13		

4) List of vehicles, tools and repair equipment you maintain

Name	Nos.

III-5 Others

1) Leakage Control Activities

No. of staff	
equipment	
scope	

2) Water rationing

frequency _____

method of control (location of control valves)

areas chronically suffering from water shortage

3) Customers' Complaints

	Frequency (times)			
Year	(1)	(2)	(3)	(4)
1996				
1995				
1994				
1993				

Note:

(1) _____

(2) _____

(3) _____

(4) _____

4) Serious problems related to operation and maintenance

budget	yes/no
staffing	yes/no
water quality	yes/no
operational skill & technology	yes/no
leakage	yes/no
meter reading & billing	yes/no
others, if any.	_____

IV. Institution, Management & Finance

IV-1 Organization

Organization chart of UWS

Staffing (Nos. of staff and qualified engineers)

please specify in the above.

IV-2 Finance

Financial standing last year (water sales, O&M cost, accounts receivable)

Revenue (budget)	Kshs
_____	_____
_____	_____
_____	_____
total	_____

Expenditures	
salary	_____
chemcals, power, fuels	_____
service pipelines	_____
total	_____

Investment	
repair, rehabilitation	_____
expansion	_____
total	_____
Accounts receivable	_____

Metering and Billing

frequency	_____
nos. of meter readers	_____
meter readers performance	good/not good
billingbeing made by municipal staff?	yes/no
nos. of revenue collectors	_____

IV-3 Management of DWO/UWS

Computer system	
billing & accounting	yes/no
Data recorded	
water level	yes/no
pressure	yes/no
flow rate	yes/no
complaints	yes/no
others	yes/no
Reports prepared by Urban Water Supply	
daily	yes/no
weekly	yes/no

monthly yes/no

annually yes/no

Training (frequency and scope)

V. Water Production

Year	Water Production	Population	Served Pop.	Accounted-for Water
1996				
1995				
1994				
1993				
1992				
1991				
1989				
1988				
1987				

Note: How do you estimate the above? Please specify.

water production: _____

urban center population: _____

population served: _____

accounted-for water: _____

VI. Future Water Supply Planning

1) Existing water sources are sufficient for future expansion in terms of quality and quanty?

yes/no

2) Probable new water sources for future expansion, if any?

_____

2) Basic design factors for future expansion

Target year _____

Design population served _____

Design produciton capacity _____ m3/day

Proposed treatment process _____

Distance between water source & WTP _____ km

Distance from WTP to demand center _____ km

transmission & distribution gravity/pumping

3) Rehabilitation required

Facility & Equipment	Scope	Estimated cost

Urban/District	/
Name of UWS	
Operated by	
Prepared by	

Attachment -2 (2/3)

Data Sheet for Survey on Urban Water Supply Schemes (UWS2) (tentative)

I. Facilities (UWS)

I-1 Water Source (Intake Facilities)

1) Pipeline Offtake

diameter (main) _____ mm
diameter (branch) _____ mm
metered or not _____ yes/no
meter working or not _____ yes/no

2) Other water sources if any

- River

	river flow	water level	Intake rate
dry season			
wet season			

method of estimation above _____
method of extraction _____
construction year _____

-Spring

	spring yields	elevation
dry season		
wet season		

method of estimation above _____
protected or not _____ yes/no
year of construction _____

-Boreholes

numbers _____
pump capacity _____
working or not _____ yes/no
borehole diameter _____ mm
static level _____
year of construction _____

I-2 Raw Water Transmission

1) Source to Water Treatment Plant/Reservoirs

pipe diameter _____
pipe materials _____
year of installation _____
length _____
level differentials _____
gravity flow or not yes/no

2) Any other facilities during transmission

_____

I-3 Treatment Plant/Reservoirs if any

1) Development history

	First Const.	First Expan.	Second. Expan.
year			
production cap.			
treat. process			
funding sources			

2) Hydraulic Profile & Details

First Construction

	Nos.	Elevation	Width x Length	Retention Time (storage capacity)
Receiving basin				
Mixing chamber				
Sedimentation				
Filter				
Reservoir				

First Expansion

	Nos.	Elevation	Width x Length	Retention Time (storage capacity)
Receiving basin				
Mixing chamber				
Sedimentation				
Filter				
Reservoir				

Second Expansion

	Nos.	Elevation	Width x Length	Retention Time (storage capacity)
Receiving basin				
Mixing chamber				
Sedimentation				
Filter				
Back wash tank				

3) Chemical facilities

Chemicals (chlorine, alum)	
Dosing equipment	
Dosage rate	
Days chlorine dosed last year	
Days alum dosed last year	

4) Pumps if any

	Purpose	Nos.	Capacity x Head	Type	Conditions
(1)					
(2)					
(3)					
(4)					

I-4 Distribution Facilities

1) History of expansion

2) Distribution mains

	Diameter	Length	Materials	Installation year
(1)				
(2)				
(3)				
(4)				
(5)				
(6)				
(7)				

3) Service mains

	Diameter	Length	Materials	Installation year
(1)				
(2)				
(3)				

(4)				

4) Service Connections (number of registered customers)

	Year	Number
(1)	1996	
(2)	1995	
(3)	1994	
(4)	1993	
(5)	1992	
(6)	1991	
(7)	1990	
(8)	1989	
(9)	1988	
(10)	1986 or before	

5) Service reservoirs

	Year of Construction	Storage Capacity	Location
(1)			
(2)			
(3)			
(4)			

6) Water points operated by municipality/institutions/etc

	Operational body	Metererd	Numbers	Served poulation
(1)		yes/no		
(2)		yes/no		
(3)		yes/no		
(4)		yes/no		

II. Operation and Maintenance

II-1 Staffing

1) Number of operation staff

	Superintendent	Operators	Mechanical	Other Staff
(1) Water transmission				
(2) Water treatment plant				
(3) Service Reservoirs				
(4) Distribution facilities				

II-2 Water Quality Control

1) Frequency of chemical dosage

Chlorine _____ days/year
Alum _____ days/year
Others _____ days/year

2) Frequency of water sampling and testing

	Items	Institution carrying out wter testin
Daily items	_____ , _____ , _____	_____
	_____ , _____ , _____	_____
Weekly items	_____ , _____ , _____	_____
	_____ , _____ , _____	_____
Monthly items	_____ , _____ , _____	_____
	_____ , _____ , _____	_____

3) List of water testing equipment in your laboratory

_____
_____
_____

Is your laboratory equipped with a jar tester? _____ yes/no

4) Organization & staffing of laboratory

_____
_____
_____

5) Expenditures spent last year

	quantity	unit cost	expenditures
Electricity			
Fuel (pumps)			
Fuel (transport)			
Chemicals			
-Chlorine			
-Alum			
-Soda			
-Others			

II-3 Water Pressure & Flow Control

1) Methodology

(1) Intake (source) _____

(2) Raw water transmission _____

(3) Water treatment plant _____

(4) Service resevoir _____

(5) Distribution network _____

2) Equipment Installed

Flow meters

	Location	Type	Installation year	Diameter	Working Conditions
(1)					
(2)					
(3)					
(4)					
(5)					
(6)					
(7)					
(8)					

Pressure gauges

(1)					
(2)					
(3)					
(4)					
(5)					

Level meters

(1)					
(2)					
(3)					
(4)					
(5)					

Break pressure tanks/valves

(1)					
(2)					
(3)					
(4)					
(5)					

Flow Controllers

(1)					
(2)					
(3)					
(4)					
(5)					

II-4 Storage & Workshop in UWS

1) Chemicals stored

	Chlorine	Alum	Others( )
storage (ton)			
days for stock			
purchase frequency			
days for delivery			

2) Customer meters

	dia 1/2"	dia 3/4"
How many stocks?		

Repair work shop? _____ yes/no

How many meters have been repaired yearly?

1996		
1995		
1994		
1993		
1992		
1991		

Do you have meter calibrators? _____ yes/no

3) Pipes & valves

Pipe stocks

Diameter(mm)	Materials	Length
200		
150		
125		
100		
75		
50		
25		
20		
13		

Valve stocks

Diameter	Type	Quantity
200		
150		
125		
100		
75		
50		
25		
20		
13		

4) List of vehicles, tools and equipment for repair

Name	Nos.

II-5 Others

1) Leakage Control Activities

staffing
equipment
scope

2) Water rationing

frequency _____

method of control (location of control valves)

areas chronically restricted

3) Customers' Complaints

Year	Frequency (times) (1)	(2)	(3)	(4)
1996				
1995				
1994				
1993				

Note:

(1) _____

(2) _____

(3) _____

(4) _____

4) Most serious problems related to operation and maintenance

budget	yes/no
staffing	yes/no
water quality	yes/no
operational skill & technology	yes/no
leakage	yes/no
meter reading & billing	yes/no
others, if any.	_____

III. Institution, Management & Finance

III-1 Organization

Organization chart of UWS

Staffing (Nos. of staff and qualified engineers)

please specify in the above.

III-2 Finance

Financial statements last year (water sales, O&M cost, accounts receivable)

Revenue	Kshs
_____	_____
_____	_____
_____	_____
total	_____

Expenditures	
salary	_____
chemcals, power, fuels	_____
service pipelines	_____
total	_____

Investment	
repair, rehabilitation	_____
expansion	_____
total	_____

Accounts receivable	_____

Metering and Billing

frequency	_____
nos. of meter readers	_____
meter readers performance	_____ good/not good
billingbeing made by municipal staff?	_____ yes/no
nos. of revenue collectors	_____

III-3 Management

Computer system

billing & accounting	_____ yes/no

Data recorded

water level	_____ yes/no
pressure	_____ yes/no
flow rate	_____ yes/no
complaints	_____ yes/no
others	_____ yes/no

Reports prepared by Meru Water Supply

daily	_____ yes/no
weekly	_____ yes/no
monthly	_____ yes/no
annually	_____ yes/no

Training (frequency and scope)

IV. Water Supplied

Year	Water Supplied	Population	Served Pop.	Accounted-for Water
1996				
1995				
1994				
1993				
1992				
1991				
1989				
1988				
1987				

Note: How did you estimate the above? Please specify.

water supplied: _____

urban center population: _____

population served: _____

accounted-for water: _____

V. Future Water Supply Planning

1) The existing water sources are sufficient in terms of quality and quanty? _____ yes/no

2) Promising new water sources for future expansion, if any?

_____

2) Basic design factors

Target year _____

Design population served _____

Design produciton capacity _____ m3/day

Proposed treatment process _____

Distance between water source & WTP _____ km

Distance from WTP to demand center _____ km

Transmission & distribution gravity/pumping

3) Rehabilitation required

Facility	Scope	Estimated cost

Location/District	
Name of RWS	
Operated by	
Interviewed by	

Attachment -2 (3/3)
Data Sheet for Survey on Rural Water Supply Schemes (RWS)
(tentative)

I. History of Development

1) Year of construction from _____ to _____

2) Designed by _____

3) Constructed by _____

4) Supervised by _____

_____

5) Funded by a. _____

b. _____

c. _____

6) Total construction cost _____

7) Year of starting operation _____

II. Facilities Constructed

1) Water source spring / river / rain water / borehole / hand dug well

2) Intake facilities -method _____

-protected yes/no

3) Raw water transmissio -diameter _____

-pipe materials _____

-distance _____

4) Treatment facilities if any

_____

_____

5) Chemical being dosed none / chlorine / alum / others

6) Master meter equipped yes/no

7) Distribution pipelines -diameter _____
-pipe materials _____
-distance _____

8) Service reservoirs -structure concrete / bricks / reinforced concrete
-storage capacity _____
-number _____

9) Pumps if any? -purpose _____
-numbers _____
-capacity & head of each pump _____
_____
_____

10) How many households are served? _____

11) Customers are metered yes/no

12) Size of service area km2

III. Operation

1) Operational body _____

2) Number of memebers of the above Male: Female:

3) Accountants qualified yes/no

4) Major repair carried out so far a. _____
b. _____
c. _____
d. _____

5) Financing source for repair _____

6) Water being charged on consumption basis yes/no

7) Membership fee for new members _____

8) Where are you keeping gained profits? bank / others

9) Have you ever checked quality of water suplied? yes/no

10) If yes, specify how often. _____

11) Problems related to operation and maintenance if any?

_____

_____

III. Water Production and Consumption

1) Water Production

Year	Water production	Number of household served
1993		
1994		
1995		
1996		

2) Water consumption by purpose (estimate)

	percentage
domestic	
institution	
irrigation	
others	
total	100%

DATA BOOK II

RESULT OF SURVEY ON SOCIOECONOMY

THE AFTERCARE STUDY ON THE NATIONAL WATER MASTER PLAN

DATA BOOK

DATA BOOK II : RESULT OF SURVEY ON SOCIOECONOMY

TABLE OF CONTENTS

A. QUESTIONNAIRE FORM

Attachment - 1
Questionnaire for Household Survey

District:	
No.:	-
Interviewer:	
Date:	/Dec/'97

Questionnaire on Water Use and Sanitation

December, 1997

Purpose: This household survey was organized under the Japan International Cooperation Agency (JICA), the Government of Japan, in close cooperation with the Ministry of Land Reclamation, Regional and Water Development (MLRRWD), the Government of Kenya. It intends to clarify present living environment and water use practiced by the people. Results are valuable

1. Total number of occupants in the house: [ ] persons

2. How many children do you have?

( ) in kindergarten
( ) in primary school
( ) in secondary school
( ) under post second education

3. Main occupation of the family head:

☐ 1) Farmer
☐ 2) Employed in an office (including teachers, priest, tea factory, etc.)
☐ 3) Business man (including hawkers, food vendors, traders, etc.)
☐ 4) Other ( )

4. Estimated family income per month (per year)

☐ 1) less than 2,500 Kshs per month (less than 30,000 Kshs per year)
☐ 2) 2,500 to 5,000 Kshs per month (30,000 to 60,000 Kshs per year)
☐ 3) 5,000 to10,000 Kshs per month (60,000 to 120,000 Kshs per year)
☐ 4) 10,000 to 20,000 Kshs per month (120,000 to 240,000 Kshs per year)
☐ 5) 20,000 to 30,000 Kshs per month (240,000 to 360,000 Kshs per year)
☐ 6) 30,000 to 40,000 Kshs per month (360,000 to 480,000 Kshs per year)
☐ 7) 40,000 to 50,000 Kshs per month (480,000 to 600,000 Kshs per year)
☐ 8) more than 50,000 (more than 600,000 per year)

5. Where do you get water for your daily consumption?

1) Piped water supply owned by ( )

	Drinking & Cooking	Livestock	Others
- Individual connections	☐	☐	☐
- Yard standpipe	☐	☐	☐
- Kiosk/Communal water points	☐	☐	☐
- Neighbour supply	☐	☐	☐
2) River water	☐	☐	☐
3) Hand dug shallow well	☐	☐	☐
4) Private boreholes	☐	☐	☐
5) Rain Water Harvesting	☐	☐	☐
6) Spring	☐	☐	☐
7) Dam/pan	☐	☐	☐
8) Others ( )	☐	☐	☐

6. If piped water supply ☐ Metered ☐ Unmetered

Account No. ( )

7. If you use a yard standpipe, how many families are using this tap? (_____) families

8. Is water boiled before drinking?

☐ 1) Yes

☐ 2) No

9. State all other sources you rely on (_____)

10. How far is it to your main water source/water supply?

☐ 1) Water tap located in house

☐ 2) 0 - 1/2km (less than 30 minutes)

☐ 3) 1/2 - 2km (30 min - one hour)

☐ 4) 2 - 4km (one hour - two hours)

☐ 5) 4km or more (more than two hours)

11. How many times in a day do you collect water and by what means?

☐ 1) twice a day or less By means of (_____)

☐ 2) three times a day By means of (_____)

☐ 3) four times or more in a By means of (_____)

12. Do you get water from your source in dry season?

☐ 1) Yes

☐ 2) No

If no, go to Question 14.

13. How many days in a week in a dry season do you get water from your water sour·

☐ 1) 6 days or more

☐ 2) 4 days or more

☐ 3) 2 days or more

☐ 4) 1 day

14. Is water you get enough also for;

1) washing hands ☐ yes ☐ no

2) taking bath ☐ yes ☐ no

3) washing clothes ☐ yes ☐ no

15. Do you have storage facilities?

☐ 1) Yes

☐ 2) No

If yes, let me see the type?

Type: (_____) Volume: (_____) m3

(Following inquiries 16 and 17 are valid for those who get water from piped water systems including Kiosks, Communal Water Points and Neighbour Supply)

16. How much do you pay for water per day or per month?

- ☐ 1) no payment
- ☐ 2) less than Ksh 5 per day (less than Ksh150/month)
- ☐ 3) Ksh 5 - 10 per day (Ksh 150 - 300/month)
- ☐ 4) Ksh10 - 20 per day (Ksh 300 - 600/month)
- ☐ 5) Ksh 20 per day or more (Ksh 600/month or more))

17-1 Are you satisfied with water supply services?

- ☐ 1) yes
- ☐ 2) no

If yes, go to Question No. 18.

17-2 If no, what reasons?

- ☐ 1) poor management
- ☐ 2) poor water quality
- ☐ 3) low water pressure / less water available
- ☐ 4) high water tariffs
- ☐ 5) others

17-3 If above problems are solved, will you be willing to pay for water services?

☐ 1) yes

☐ 2) no

If no, give reasons. (_____)

18. How big is your land?

☐ 1) landless/squatters

☐ 2) less than 2 acres

☐ 3) 2 acres - 5 acres

☐ 4) 5 acres or more

19. What crops do you grow?

☐ 1) coffee

☐ 2) tea

☐ 3) miraa

☐ 4) maize & beans

☐ 5) Others

20. Which of the following animals do you keep?

☐ 1) dairy cows (_____) nos.

☐ 2) zebu cattle (_____) nos.

☐ 3) shoats (_____) nos.

☐ 4) camel & donkeys (_____) nos.

☐ 5) others (_____) nos.

21. What fish do you catch for sale?

fish (_____) x (_____) kg/day

22. How do you dispose your refuse?

☐ 1) thrown in the garden

☐ 2) rubbish pits

☐ 3) burning

☐ 4) other (_____)

23. What kind of sanitary facilities do you have?

☐ 1) none

☐ 2) pit latrine

☐ 3) cistern flush WC

☐ 4) pour flush squat plate

☐ 5) other (_____)

24. If no latrine, where do you defecate?

☐ 1) neighbor's shared latrine
☐ 2) bush
☐ 3) river
☐ 4) drains, ditches
☐ 5) other (_____)

25. Is the liquid effluent from the toilets going

☐ 1) to sewer
☐ 2) to septic tank with drain field age (_____)
☐ 3) to leaching pit
☐ 4) direct discharge to drains, streams, rivers
☐ 5) other (_____)

26. If septic tank or leaching pit, how often do you remove sludge?

☐ 1) never
☐ 2) once per year
☐ 3) 2 to 5 years
☐ 4) more than 5 years

27. If you answered "1) never" above, then what is a reason?

☐ 1) cannot afford
☐ 2) inaccessible
☐ 3) neighbours remove and use as fertilizers
☐ 4) other ( )

28. If latrine or leaching pit, does the water level in the pit rise during rainfall?

☐ 1) does not rise
☐ 2) rises to just below the floor
☐ 3) rises and floods over the floor

29. Do you know about water related diseases?

☐ 1) yes
☐ 2) no

30. Which of the diseases have your family members suffered in the last one year?

☐ 1) none
☐ 2) malaria

☐ 3) typhoid

☐ 4) cholera

☐ 5) dysentry

☐ 6) others

---

31. Interviewer's Observation

1) House type

☐ Permanent (solid structure)

☐ Semi-permanent (solid foundation, temporary superstructure)

☐ Temporary

2) Electricity? & Telephone?

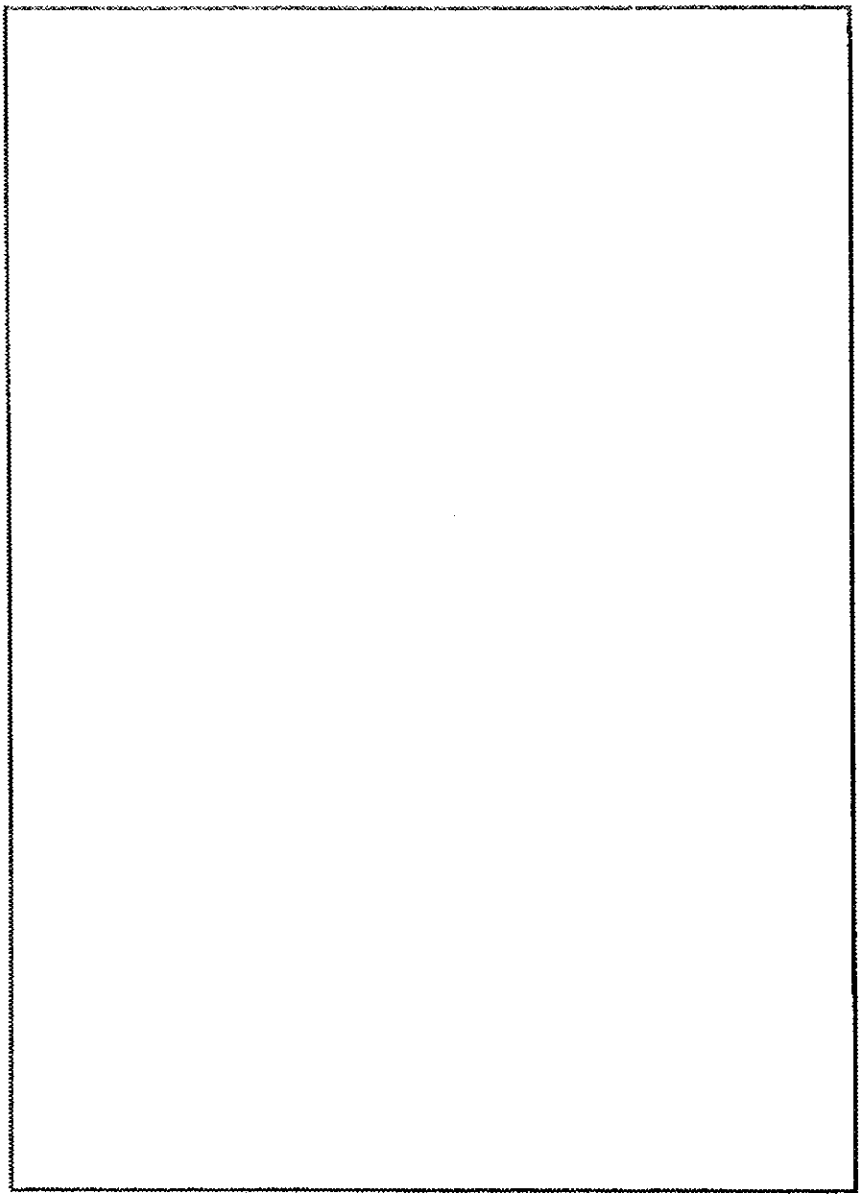
☐ Yes ☐ Yes

☐ No ☐ No

32. Distance from well to the nearest leaching pit o[ ] m

33. Comments from the surveyor

34. House/Plot Sketch

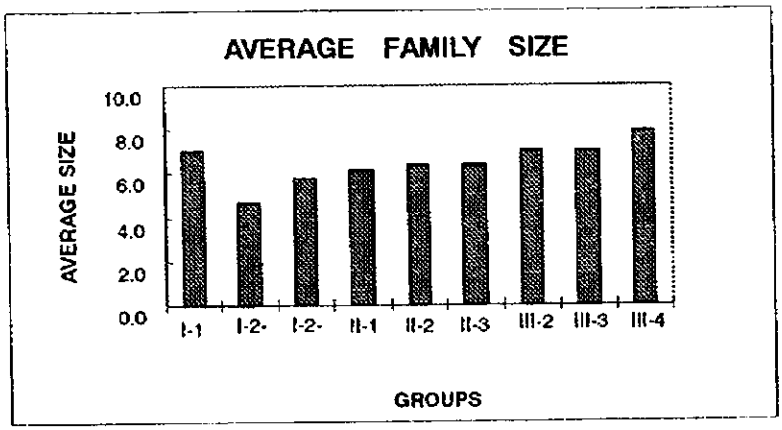


B. SUMMARY OF SURVEY RESULTS

1. Average Family Size by District Group

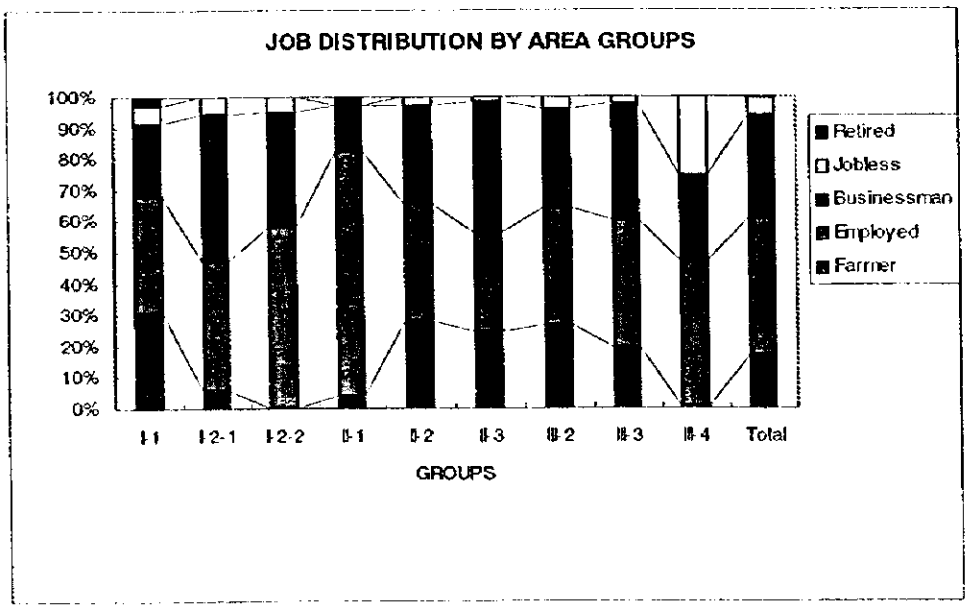
Group	District	Average Family Size Household Survey	Family Size Welfare Monitoring Survey II *
G I.1	Kisii	7.0	5.7
G I.2.1	Nairobi	4.7	3.7
G I.2.2	Mombasa	5.8	4.4
G II.1	Kericho	6.1	5.6
G II.2	Murang'a/Nyandarua/ Machakos/Siaya		5.3
G II.3	Uasin-Gishu	6.4	5.2
G III.2	Kilifi/Marakwet	7.0	6.0
G III.3	Taita/Kitui/Narok	7.0	5.1
G III.4	Wajir/Turkana	7.9	6.4
	Rural	8.4	5.6
	Urban	5.5	4.0

* Source: Central Bureau of Statistics, Welfare Monitoring Survey II 1994: Basic Report, May 1996 pg. 11-12.



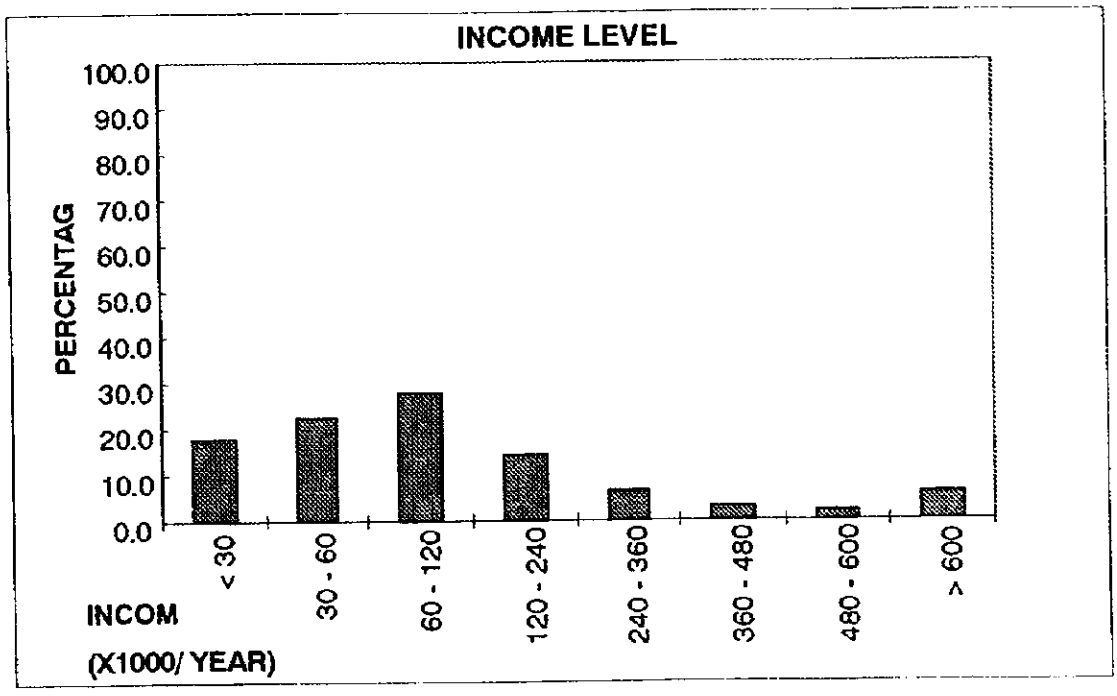
2. Distribution of Family Heads by Type of Occupation

Group	District	Type of Occupation				
		Farmer	Employed	Business Man	Jobless	Retired
G I.1	Kisii	31.4	38.6	24.3	5.7	2.9
G I.2.1	Nairobi	6.0	43.0	49.0	6.0	0.0
G I.2.2	Mombasa	0.0	58.1	36.8	5.1	0.0
G II.1	Kericho	25.4	45.1	19.7	4.2	1.4
G II.2	Murang'a/Nyandarua Siaya/Machakos	27.8	37.0	32.0	2.5	0.7
G II.3	Uasin-Gishu	24.6	31.9	42.0	1.5	0.0
G III.2	Kilifi/Marakwet	26.8	37.6	31.5	4.0	0.0
G III.3	Taita/Kitui/Narok	19.7	40.8	38.0	2.3	0.0
G III.4	Wajir/Turkana	0.7	46.5	27..1	25.7	0.
	Rural	42.5	26.2	29.7	4.8	0.4
	Urban	5.2	54.8	52.4	1.7	0.6



3. Distribution of Households by Income Level And District Group (Thousand KShs.) Per Year

Group	District	Level of Income								
		Below 30	30 to <60	60 to <120	120 to <240	240 to <360	360 to <480	480 to <600	Over 600	Total
G I.1	Kisii	32.9	25.7	24.3	7.1	2.9	4.3	2.8	0.0	100
G I.2.1	Nairobi	8.0	23.0	15.0	12.0	13.0	7.0	4.0	18.0	100
G I.2.2	Mombasa	4.3	12.8	34.2	12.0	10.3	5.1	6.0	15.3	100
G II.1	Kericho	30.0	24.3	21.4	11.4	1.4	1.4	2.9	7.2	100
G II.2	Murang'a/Nyandarua	13.2	27.4	32.4	14.6	5.0	1.8	2.5	3.1	100
G II.3	Siaya/Machakos Uasin-Gishu	13.0	13.0	33.3	27.5	5.8	2.9	2.9	1.6	100
G III.2	Kilifi/Marakwet	22.5	25.4	26.8	14.8	4.2	2.1	0.0	4.2	100
G III.3	Taita/Kitui/Narok	16.6	19.0	26.1	17.5	10.4	3.8	0.9	5.7	100
G III.4	Wajir/Turkana	32.9	23.8	27.3	11.2	3.5	1.3	0.0	0.0	100
	Rural	28.4	22.9	28.1	13.2	3.3	1.3	0.9	2.02	100
	Urban	11.7	21.9	27.2	15.8	8.5	4.1	2.9	8.0	100

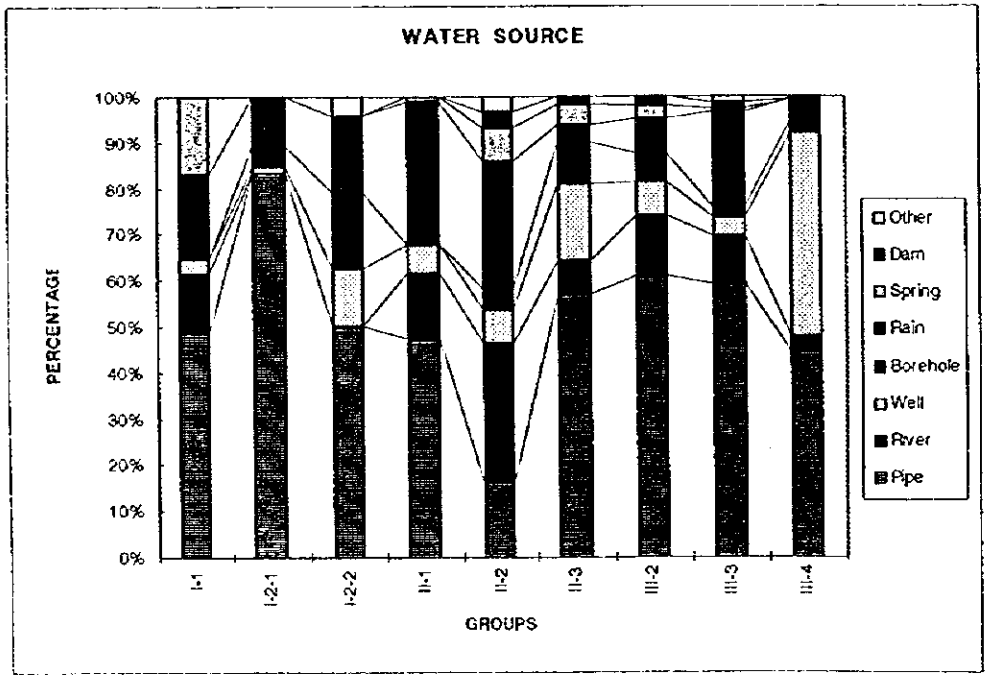


4. Water Source in the Various Area Group.

Group	District	Source of Water							
		Pipe	River	Well	Borehole	Rain water	Spring	Dam	Other
G I.1	Kisii	68.6	18.6	4.3	0.0	25.7	24.3	0.0	0.0
G I.2.1	Nairobi	99.0	0.0	2.0	5.0	13.0	0.0	0.0	0.0
G I.2.2	Mombasa	95.7	0.0	2.6	3.4	3.4	0.0	0.0	0.9
G II.1	Kericho	74.6	22.5	9.9	0.0	49.3	1.4	0.0	0.0
G II.2	Murang'a/Nyandarua Siaya/Machakos	84.2	23.9	9.2	3.5	22.5	5.3	3.2	2.8
G II.3	Uasin-Gishu	78.3	11.6	31.9	14.5	7.2	5.8	2.9	0.0
G III.2	Kilifi/Marakwet	98.7	21.5	12.1	10.1	12.1	4.7	3.4	0.0
G III.3	Taita/Kitui/Narok	90.6	16.0	6.6	2.8	32.4	0.9	1.9	2.3
G III.4	Wajir/Turkana	54.2	4.2	54.2	2.8	6.3	0.0	0.0	0.0
	Rural	75.3	26.0	20.0	2.2	22.3	7.4	4.6	1.1
	Urban	89.3	7.5	10.2	7.4	16.0	2.2	0.3	1.3

(Arid and Rainy Districts)

District	Source of Water							
	Piped	River	Well	Borehole	Rain	Spring	Dam	Other
Rainy								
Kisii	68.6	18.6	4.3	0.0	25.7	24.3	0.0	0.0
Kericho	74.6	22.5	9.9	0.0	49.3	1.4	0.0	0.0
Arid								
Wajir	12.9	2.9	91.4	2.9	10.0	0.0	0.0	0.0
Turkana	93.2	5.4	18.9	2.7	0.0	0.0	0.0	0.0



5. Percentage Distribution of Households by Distance to Main Water Source and District Group

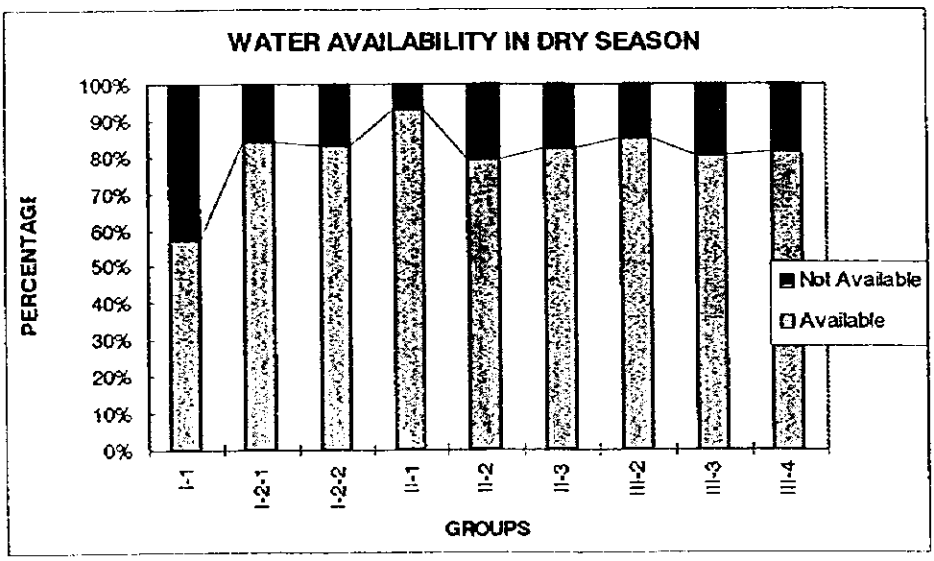
Group	District	Distance (Km) In House	<1/2	1/2-<2	2-<4	>4	Not answered	Total
G I.1	Kisii	30.0	54.3	10.0	2.9	1.4	1.4	100
G I.2.1	Nairobi	50.0	48.0	2.0	0.0	0.0	0.0	100
G I.2.2	Mombasa	59.8	46.2	1.7	0.0	0.0	0.0	100
G II.1	Kericho	12.7	83.1	4.2	0.0	0.0	0.0	100
G II.2	Murang'a/Nyandarua Siaya/Machakos	22.2	58.1	14.8	2.8	0.4	1.8	100
G II.3	Uasin-Gishu	43.5	47.8	7.2	1.5	0.0	0.0	100
G III.2	Kilifi/Marakwet	31.5	61.1	4.0	1.3	2.0	0.0	100
G III.3	Taita/Kitui/Narok	25.8	51.2	9.4	3.3	5.6	4.7	100
G III.4	Wajir/Turkana	13.9	79.2	5.6	1.4	0.0	0.0	100
	Rural	15.0	68.1	10.4	2.2	2.6	1.7	100
	Urban	39.2	52.5	6.1	1.6	0.7	0.0	100

(Arid and Rainy Districts only)

District	In House	Distance (km) < ½	½ - <2	2 - <4	4+	No Answered	Total
Rainy							
Kisii	30.0	54.3	10.0	2.9	1.4	1.4	100
Kericho	12.7	83.1	4.2	0.0	0.0	0.0	0.0
Arid							
Wajir	4.3	90.0	5.7	0.0	0.0	0.0	100
Turkana	23.0	68.9	5.4	2.7	0.0	0.0	100

6. Distribution of Availability of Water during the Dry Season

Group	District	Water Availability in dry season "yes"	Whether water is enough for Washing Hands	Taking bath	Washing Clothes
G I.1	Kisii	57.1	87.1	94.3	87.1
G I.2.1	Nairobi	84.0	87.0	93.0	87.0
G I.2.2	Mombasa	82.9	82.2	97.4	87.2
G II.1	Kericho	93.0	95.8	100.0	95.8
G II.2	Murang'a/Nyandarua Siaya/Machakos	79.6	95.4	91.9	83.8
G II.3	Uasin-Gishu	82.6	100.0	98.6	91.3
G III.2	Kilifi/Marakwet	85.2	99.3	97.3	85.2
G III.3	Taita/Kitui/Narok	80.3	87.5	95.8	88.7
G III.4	Wajir/Turkana	81.3	98.6	93.8	86.8
	Rural	76.4	96.5	94.4	86.6
	Urban	83.7	98.1	96.0	87.4



7. Percentage of Households with Water Storage Facilities and Type of Storage

Group	District	Availability of storage Facilities	Type of Storage				Total
			Container	Drum	Tank	Not applicable	
G I.1	Kisii	47.1	25.7	15.7	5.7	52.9	100
G I.2.1	Nairobi	89.0	48.0	9.0	32.0	11.0	100
G I.2.2	Mombasa	90.6	46.2	10.3	32.5	11.1	100
G II.1	Kericho	69.0	42.3	18.3	8.5	31.0	100
G II.2	Murang'a/Nyandarua Siaya/Machakos	69.4	31.0	12.0	21.1	30.6	100
G II.3	Uasin-Gishu	30.4	2.9	1.4	26.1	69.6	100
G III.2	Kilifi/Marakwet	65.1	43.6	5.4	16.1	34.9	100
G III.3	Taita/Kitui/Narok	47.4	12.2	12.7	22.5	52.6	100
G III.4	Wajir/Turkana	33.3	10.4	12.5	10.4	66.7	100
	Rural	48.2	19.3	13.7	15.2	51.8	100
	Urban	66.1	33.6	9.3	23.3	33.9	100

8. Percentage Distribution of Households by Land Size and District Group

		Land Size (Acres)					
Group	District	Landless	<2	2-5	>5	Not answered	Total
G I.1	Kisii	5.7	32.9	20.0	8.6	14.3	100
G I.2.1	Nairobi	1.0	9.0	3.0	2.0	85.0	100
G I.2.2	Mombasa	2.6	29.1	0.0	0.0	68.4	100
G II.1	Kericho	1.4	16.9	7.0	19.7	54.9	100
G II.2	Murang'a/Nyandarua Siaya/Machakos	6.3	15.5	15.8	12.7	49.6	100
G II.3	Uasin-Gishu	17.4	29.0	4.3	8.7	31.9	100
G III.2	Kilifi/Marakwet	3.4	16.1	11.4	19.5	49.7	100
G III.3	Taita/Kitui/Narok	0.5	9.9	9.4	15.5	64.8	100
G III.4	Wajir/Turkana	11.8	16.7	0.0	0.0	71.5	100
	Rural	4.6	19.3	18.9	27.3	29.9	100
	Urban	5.4	16.1	2.6	1.9	73.9	100

9. Percentage Distribution of Households by Type of Crops Grown and District Group

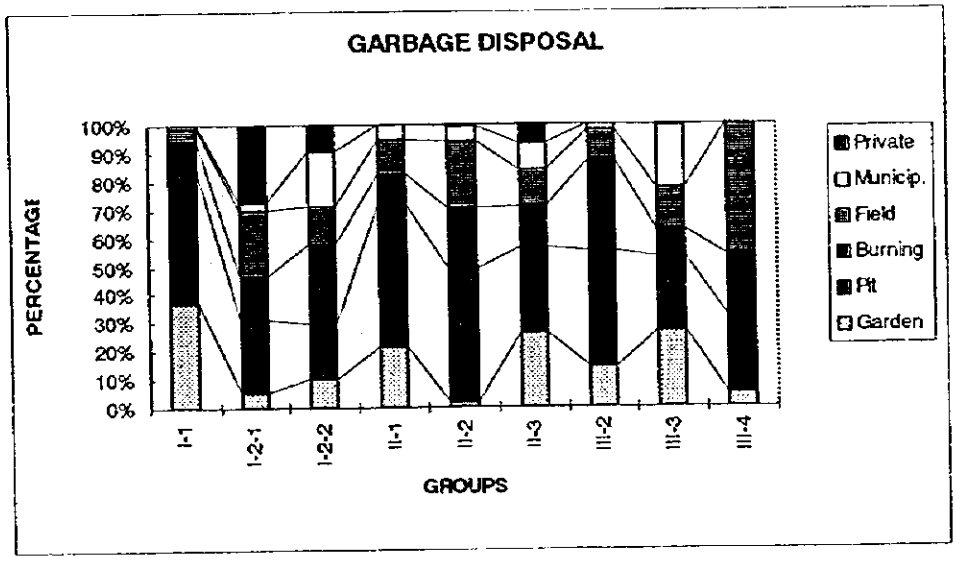
Group	District	Type of Crop: Coffee	Tea	Miraa	Maize and Beans	Other	Not answered	Total
G I.1	Kisii	20.0	18.6	0.0	44.3	2.9	14.3	100
G I.2.1	Nairobi	0.0	0.0	0.0	1.0	4.0	95.0	100
G I.2.2	Mombasa	-	-	-	-	-	100.0	100
G II.1	Kericho	2.8	16.9	0.0	39.4	15.5	25.4	100
G II.2	Murang'a/Nyandarua	12.7	2.8	0.4	34.5	14.1	35.6	100
G II.3	Siaya/Machakos Uasin-Gishu	0.0	0.0	0.0	37.7	14.5	47.8	100
G III.2	Kilifi/Marakwet	0.0	5.3	0.0	56.0	38.7	49.7	100
G III.3	Taita/Kitui/Narok	0.0	0.0	0.0	32.4	2.3	65.3	100
G III.4	Wajir/Turkana	0.0	0.0	0.0	0.0	0.7	99.3	100
	Rural	10.9	8.0	0.2	55.2	22.8	2.6	100
	Urban	0.8	0.1	0.0	5.0	3.6	90.5	100

10. Percentage Distribution of Household by Type of Animals Kept and District Group

Group	District	Type of Animals: Dairy Cows	Zebu Cattle	Goats	Camel and Donkeys	Other	Not Answered	Total
G I.1	Kisii	44.3	0.0	24.3	1.4	7.1	22.9	100
G I.2.1	Nairobi	3.0	0.0	0.0	0.0	1.0	96.0	100
G I.2.2	Mombasa	-	-	-	-	-	100.0	100
G II.1	Kericho	42.3	0.0	21.1	9.9	1.4	25.4	100
G II.2	Murang'a/Nyandarua Siaya/Machakos	45.6	6.7	34.9	2.0	10.8	36.6	100
G II.3	Uasin-Gishu	34.8	2.9	30.4	0.0	1.4	30.4	100
G III.2	Kilifi/Marakwet	22.8	0.0	24.8	0.0	8.7	43.6	100
G III.3	Taita/Kitui/Narok	8.5	19.2	18.3	8.0	5.6	40.4	100
G III.4	Wajir/Turkana	0.0	0.7	9.7	2.1	0.0	87.5	100
	Rural	37.3	32.8	38.0	6.1	8.2	0.0	100
	Urban	2.2	0.4	3.2	0.4	1.5	93.0	100

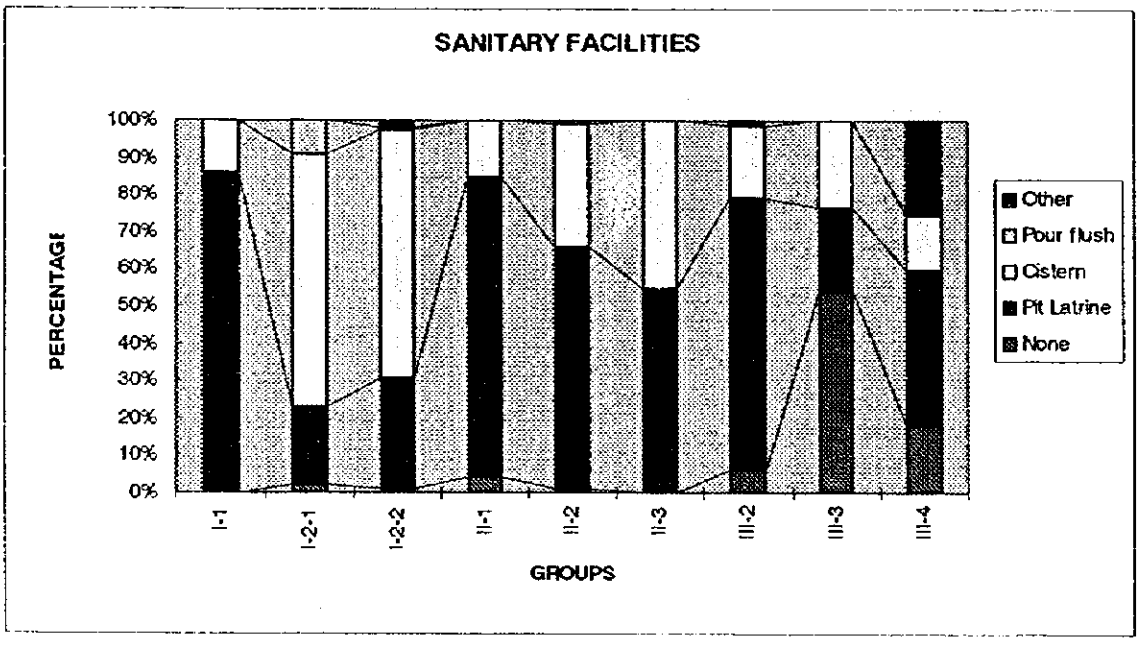
11. Distribution of Households by Type of Refuse Disposal and District Group

Group	District	Type of Refuse Disposal					
		Garden	Rubbish Pit	Burning	Field	Municipal	Private
G I.1	Kisii	41.4	52.9	11.4	5.1	1.3	0
G I.2.1	Nairobi	6.0	26.0	16.0	23.6	2.8	27.4
G I.2.2	Mombasa	11.1	19.7	30.8	13.5	19.0	9.5
G II.1	Kericho	22.5	50.7	11.3	12.2	5.4	0
G II.2	Murang'a/Nyandarua Siaya/Machakos	1.8	35.9	15.1	23.5	5.0	0.9
G II.3	Uasin-Gishu	26.1	30.4	15.9	12.3	9.6	6.8
G III.2	Kilifi/Marakwet	14.8	47.7	36.9	10.5	2.3	0
G III.3	Taita/Kitui/Narok	27.7	27.7	9.9	14.9	22.1	0.5
G III.4	Wajir/Turkana	4.2	29.2	22.9	46.4	0	0
	Rural	37.7	32.8	17.7	12.1	3.3	1.0
	Urban	10.6	33.9	21.0	22.5	10.7	5.4



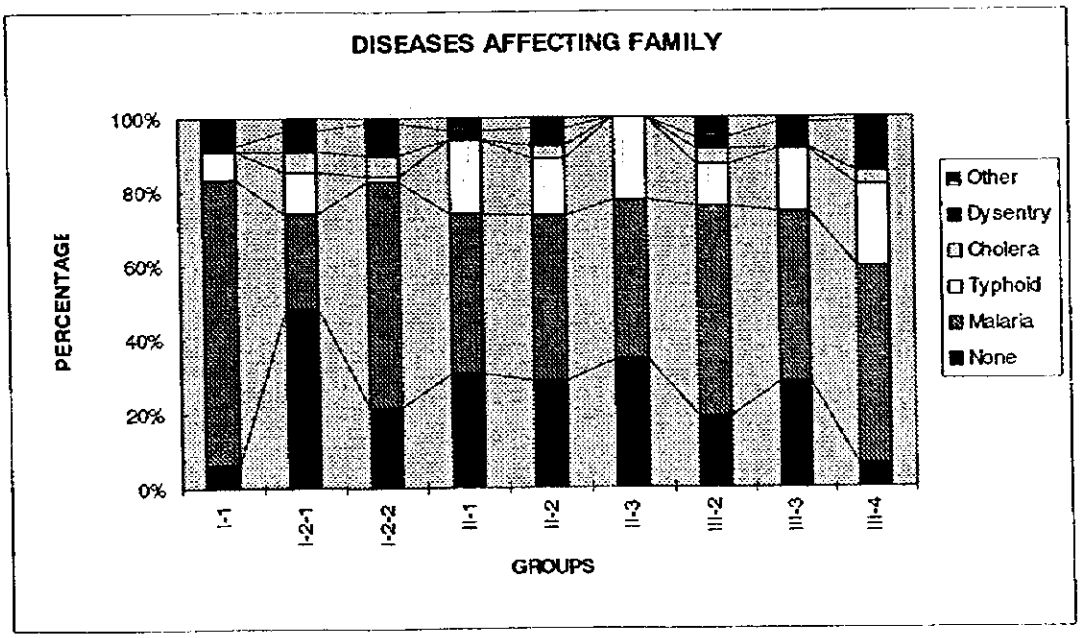
12. Distribution of Households by Type of Sanitation Facilities Available and District Group

Group	Districts	Type of Facility					
		None	Pit-latrine	Cistern	Other	Pour Flash	Total
G I.1	Kisii	0.0	87.1	12.9	0.0	0.0	100
G I.2.1	Nairobi	2.0	21.0	68.0	9.0	0.0	100
G I.2.2	Mombasa	0.9	29.9	66.4	0.9	1.9	100
G II.1	Kericho	4.2	80.3	15.5	0.0	0.0	100
G II.2	Murang'a/Nyandarua Siaya/Machakos	1.1	66.7	31.2	1.0	0.0	100
G II.3	Uasin-Gishu	0.0	55.1	44.9	0.0	0.0	100
G III.2	Kilifi/Marakwet	6.0	73.3	19.3	0.7	0.7	100
G III.3	Taita/Kitui/Narok	9.2	46.6	15.3	0.0	29.0	100
G III.4	Wajir/Turkana	18.2	42.4	139	0.0	25.7	100
	Rural	8.8	77.5	11.3	0.4	2.0	100
	Urban	2.0	46.6	44.2	2.9	4.3	100



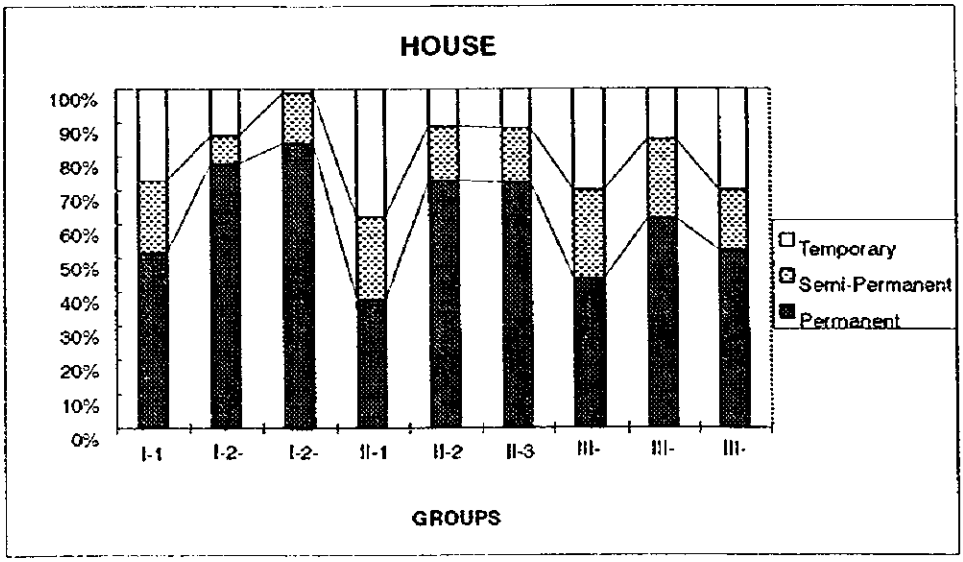
13. Distribution by Types of Water Born (Related) Diseases suffered by households

Group	Districts	Knowledge Yes %	Type of diseases suffered from: None	Malaria	Typhoid	Cholera	Dysentry	Other
G I.1	Kisii	97.1	7.1	85.7	8.6	0.0	1.4	8.6
G I.2.1	Nairobi	98.0	52.0	28.0	12.0	6.0	6.0	4.0
G I.2.2	Mombasa	100.0	25.6	71.8	1.7	6.8	10.3	1.7
G II.1	Kericho	98.6	36.6	50.7	23.9	0.0	2.8	4.2
G II.2	Murang'a/Nyandarua Siaya/Machakos	96.1	34.9	53.5	18.7	4.2	5.3	3.9
G II.3	Uasin-Gishu	87.0	42.0	53.6	27.5	2.9	0.0	0.0
G III.2	Kilifi/Marakwet	100.0	23.5	70.5	14.1	5.4	4.0	6.7
G III.3	Taita/Kitui/Narok	93.4	33.3	54.5	19.7	0.5	8.0	1.9
G III.4	Wajir/Turkana	95.1	10.4	87.5	36.8	5.6	22.9	2.1
	Rural	94.6	26.9	64.2	20.8	2.4	11.7	4.6
	Urban	97.2	31.5	58.7	18.4	4.5	3.8	3.0



14. Distribution of Households by Type of Housing

Group	District	Permanent	Semi- permanent	Temporary	Total
G I.1	Kisii	51.4	21.4	27.2	100
G I.2.1	Nairobi	78.0	8.0	14.0	100
G I.2.2	Mombasa	83.8	15.4	0.8	100
G II.1	Kericho	38.0	24.0	38.0	100
G II.2	Murang'a/Nyandarua Siaya/Machakos	72.9	15.8	11.3	100
G II.3	Uasin-Gishu	72.5	15.9	11.6	100
G III.2	Kilifi/Marakwet	43.5	26.2	30.2	100
G III.3	Taita/Kitui/Narok	61.5	23.5	15.0	100
G III.4	Wajir/Turkana	52.0	18.1	29.7	100
	Rural	44.3	26.0	11.1	100
	Urban	74.5	14.4		100



C. RESULTS OF QUESTIONNAIRE

Q1 Average family Size 4.7

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	>13
Frequency	9	14	10	13	15	17	14	5	2	0	0	0	1
%	9.0	14.0	10.0	13.0	15.0	17.0	14.0	5.0	2.0	0.0	0.0	0.0	1.0

Q2 Average No of students

Kindergarten	1.2	Secondary	1.5
Primary	2	Post Secondary	2

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	6	43	49	6	0
%	5.8	41.3	47.1	5.8	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	8	23	15	12	13	7	4	18
%	8.0	23.0	15.0	12.0	13.0	7.0	4.0	18.0

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	99	0	2	5	13	0	0	0
%	83.2	0.0	1.7	4.2	10.9	0.0	0.0	0.0

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	0	0	0	0	0	0	100
%	0.0	0.0	0.0	0.0	0.0	0.0	100.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	49	41	11	0	0	0	3	0	0	0	0
%	47.1	39.4	10.6	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	1	0	0	0	0	0	0	0	0	0
%	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	5	1	0	0	0	0	0	0	0	0	0
%	83.3	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	97	3
%	97.0	3.0

Q7 Average no of families using standpipe 32.1

Q8 Is drinking water boiled?

	Yes	No
Frequency	76	24
%	76.0	24.0

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	50	48	2	0	0
%	50.0	48.0	2.0	0.0	0.0

Q11 Frequency of water collection

	1	2	3
Frequency	33	11	17
%	54.1	18.0	27.9

Q11 Means of water collection

	B	D	J
Frequency	15	0	39
%	27.8	0.0	72.2

Q12 Shortages during the dry season?

	Yes	No
Frequency	84	16
%	84.0	16.0

Q13 Days per week during season when water available

	1	2	3	4
Frequency	57	21	16	2
%	59.4	21.9	16.7	2.1

Q14 Is water enough for

	Yes	No
i) Washing hands	87	13
%	87.0	13.0
ii) Taking bath	93	7
%	93.0	7.0
iii) Washing clothes	87	13
%	87.0	13.0

		Yes
i)Washing hands, ii)Taking bath		6
	%	6.0
i)Washing hands, ii)Taking bath, iii)Washing clothes		87
	%	87.0

Q15 Do you have storage facilities?

	Yes	No
Frequency	89	11
%	89.0	11.0

Q15 Type of storage

	C	D	T
Frequency	48	9	32
%	53.9	10.1	36.0

Q15 Average volume of storage 0.87m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	21	15	22	19	22
%	21.2	15.2	22.2	19.2	22.2

Q17-1 Satisfied with water services?

	Yes	No
Frequency	44	56
%	44.0	56.0

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	22	22	45	3	0
%	23.9	23.9	43.9	3.3	0.0

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	58	39
%	59.8	40.2

Q18 Land Size

	1	2	3	4
Frequency	1	9	3	2
%	6.7	60.0	20.0	13.3

Q19 Crops grown

	1	2	3	4	5
Frequency	0	0	0	1	4
%	0.0	0.0	0.0	20.0	80.0

Q20 Animals kept

	1	2	3	4	5
Frequency	3	0	0	0	1
%	75.0	0.0	0.0	0.0	25.0

Q20 Average no of cows 7.6

Q20 Average no of goats 0

Q20 Average no of others 101.5

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 **Kg/day**

Q22 Refuse disposal

	1	2	3	4
Frequency	6	26	16	52
%	6.0	26.0	16.0	52.0

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	2	21	68	9	0
%	2.0	21.0	68.0	9.0	0.0

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	9	93
%	8.8	91.2

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	0	0	0	2	0
%	0.0	0.0	0.0	100.0	0.0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	56	18	2	4	6
%	65.1	20.9	2.3	4.7	7.0

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	6	2	4	2	1
%	40.0	13.3	26.7	13.3	6.7

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	5
%	0.0	0.0	0.0	100.0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	14	5	3
%	63.6	22.7	13.6

Q29 Knowledge about water related diseases

	Yes	No
Frequency	98	2
%	98.0	2.0

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	52	28	12	6	6	4
%	48.1	25.9	11.1	5.6	5.6	3.7

Q31 House type

	P	SP	T
Frequency	78	8	14
%	78.0	8.0	14.0

Q31 Electricity

	Yes	No
Frequency	82	18
%	82.0	18.0

Q31 Telephone

	Yes	No
Frequency	33	67
%	33.0	67.0

Q32 Average Distance from leaching pit/drain 77 m

Q1 Average family Size 5.8

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	4	10	7	28	17	17	12	7	5	3	0	3	0	4
%	3.4	8.5	6.0	23.9	14.5	14.5	10.3	6.0	4.3	2.6	0.0	2.6	0.0	3.4

Q2 Average No of students

Kindergarten	1.4	Secondary	1.8
Primary	2.2	Post Secondary	1.4

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	0	68	43	6	0
%	0.0	58.1	36.8	5.1	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	5	15	40	14	12	6	7	18
%	4.3	12.8	34.2	12.0	10.3	5.1	6.0	15.4

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	112	0	3	4	4	0	0	1
%	90.3	0.0	2.4	3.2	3.2	0.0	0.0	0.8

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	0	111	0	0	0	0	0
%	0.0	100.0	0.0	0.0	0.0	0.0	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	70	14	15	0	1	4	13	10	0	0	0
%	55.1	11.0	11.8	0.0	0.8	3.1	10.2	7.9	0.0	0.0	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	0	0	0	0	0	0	0	0	0	0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	4	0	9	0	2	1	6	0	0	0	0
%	18.2	0.0	40.9	0.0	9.1	4.5	27.3	0.0	0.0	0.0	0.0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	95	3
%	96.9	3.1

Q7 Average no of families using standpipe 15.7

Q8 Is drinking water boiled?

	Yes	No
Frequency	103	14
%	88.0	12.0

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	70	54	2	0	0
%	55.6	42.9	1.6	0.0	0.0

Q11 Frequency of water collection

	1	2	3
Frequency	44	9	39
%	47.8	9.8	42.4

Q11 Means of water collection

	B	D	J
Frequency	12	1	34
%	25.5	2.1	72.3

Q12 Shortages during the dry season?

	Yes	No
Frequency	97	20
%	82.9	17.1

Q13 Days per week during season when water available

	1	2	3	4
Frequency	65	19	8	4
%	67.7	19.8	8.3	4.2

Q14 Is water enough for

	Yes	No
i) Washing hands	102	15
%	87.2	12.8
ii) Taking bath	114	3
%	97.4	2.6
iii) Washing clothes	102	15
%	87.2	12.8

		Yes
i)Washing hands, ii)Taking bath		12
	%	10.3
i)Washing hands, ii)Taking bath, iii)Washing clothes		102
	%	87.2

Q15 Do you have storage facilities?

	Yes	No
Frequency	106	11
%	90.6	9.4

Q15 Type of storage

	C	D	T
Frequency	54	12	38
%	51.9	11.5	36.5

Q15 Average volume of storage 6.14m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	13	9	30	25	35
%	11.6	8.0	26.8	22.3	31.3

Q17-1 Satisfied with water services?

	Yes	No
Frequency	26	86
%	23.2	76.8

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	32	24	70	6	4
%	23.5	17.6	51.5	4.4	2.9

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	83	8
%	91.2	8.8

Q18 Land Size

	1	2	3	4
Frequency	3	34	0	0
%	8.1	91.9	0.0	0.0

Q19 Crops grown

	1	2	3	4	5
Frequency	0	0	0	0	0

Q20 Animals kept

	1	2	3	4	5
Frequency	0	0	0	0	0

Q20 Average no of cows 0

Q20 Average no of goats 0

Q20 Average no of others 0

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	13	23	36	53
%	10.4	18.4	28.8	42.4

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	1	32	71	11	2
%	0.9	27.4	60.7	9.4	1.7

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	5	112
%	4.3	95.7

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	0	3	0	0	0
%	0.0	100.0	0.0	0.0	0.0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	27	48	3	0	3
%	33.3	59.3	3.7	0.0	3.7

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	7	14	21	4	2
%	14.6	29.2	43.8	8.3	4.2

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	5
%	0.0	0.0	0.0	100.0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	25	5	6
%	69.4	13.9	16.7

Q29 Knowledge about water related diseases

	Yes	No
Frequency	117	0
%	100.0	0.0

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	30	84	2	8	12	2
%	21.7	60.9	1.4	5.8	8.7	1.4

Q31 House type

	P	SP	T
Frequency	98	18	1
%	83.8	15.4	0.9

Q31 Electricity

	Yes	No
Frequency	105	12
%	89.7	10.3

Q31 Telephone

	Yes	No
Frequency	35	82
%	29.9	70.1

Q32 Average Distance from leaching pit/drain 111 m

Q1 Average family Size 6

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	6	3	8	12	10	14	10	0	3	1	0	1	0	4
%	8.3	4.2	11.1	16.7	13.9	19.4	13.9	0.0	4.2	1.4	0.0	1.4	0.0	5.6

Q2 Average No of students

Kindergarten	1.4	Secondary	1.9
Primary	2.5	Post Secondary	1.7

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	20	28	24	0	0
%	27.8	38.9	33.3	0.0	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	6	24	19	12	3	3	2	1
%	8.6	34.3	27.1	17.1	4.3	4.3	2.9	1.4

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	63	30	4	1	26	4	0	1
%	48.8	23.3	3.1	0.8	20.2	3.1	0.0	0.8

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	60	0	12	0	0	0	0
%	83.3	0.0	16.7	0.0	0.0	0.0	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	23	44	0	0	10	4	1	8	2	1	0
%	24.7	47.3	0.0	0.0	10.8	4.3	1.1	8.6	2.2	1.1	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	22	0	1	4	0	0	2	0	0	0
%	0.0	75.9	0.0	3.4	13.8	0.0	0.0	6.9	0.0	0.0	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	2	11	0	0	1	2	0	1	0	0	0
%	11.8	64.7	0.0	0.0	5.9	11.8	0.0	5.9	0.0	0.0	0.0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	33	32
%	50.8	49.2

Q7 Average no of families using standpipe 6.5

Q8 Is drinking water boiled?

	Yes	No
Frequency	48	24
%	66.7	33.3

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	23	45	4	0	0
%	31.9	62.5	5.6	0.0	0.0

Q11 Frequency of water collection

	1	2	3
Frequency	15	9	45
%	21.7	13.0	65.2

Q11 Means of water collection

	B	D	J
Frequency	6	0	42
%	12.5	0.0	87.5

Q12 Shortages during the dry season?

	Yes	No
Frequency	55	17
%	76.4	23.6

Q13 Days per week during season when water available

	1	2	3	4
Frequency	27	15	10	5
%	47.4	26.3	17.5	8.8

Q14 Is water enough for

	Yes	No
i) Washing hands	62	10
%	86.1	13.9
ii) Taking bath	70	2
%	97.2	2.8
iii) Washing clothes	62	10
%	86.1	13.9

		Yes
i)Washing hands, ii)Taking bath		8
	%	11.1
i)Washing hands, ii)Taking bath, iii)Washing clothes		62
	%	86.1

Q15 Do you have storage facilities?

	Yes	No
Frequency	57	15
%	79.2	20.8

Q15 Type of storage

	C	D	T
Frequency	20	9	32
%	32.8	14.8	52.5

Q15 Average volume of storage 2.81m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	17	15	29	1	2
%	26.6	23.4	45.3	1.6	3.1

Q17-1 Satisfied with water services?

	Yes	No
Frequency	24	47
%	33.8	66.2

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	7	11	31	2	16
%	10.4	16.4	45.3	3.0	23.9

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	45	3
%	93.8	6.3

Q18 Land Size

	1	2	3	4
Frequency	0	10	22	5
%	0.0	27.0	59.5	13.5

Q19 Crops grown

	1	2	3	4	5
Frequency	27	8	0	29	20
%	32.1	9.5	0.0	34.5	23.8

Q20 Animals kept

	1	2	3	4	5
Frequency	28	0	18	0	2
%	58.3	0.0	37.5	0.0	4.2

Q20 Average no of cows 2.5

Q20 Average no of goats 3.3

Q20 Average no of others 3

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	27	23	32	17
%	27.3	23.2	32.3	17.2

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	0	49	23	0	0
%	0.0	68.1	31.9	0.0	0.0

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	0	72
%	0.0	100.0

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	0	0	0	0	0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	7	12	3	0	0
%	31.8	54.5	13.6	0.0	0.0

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	11	0	0	4	0
%	73.3	0.0	0.0	26.7	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	11
%	0.0	0.0	0.0	100.0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	56	1	0
%	98.2	1.8	0.0

Q29 Knowledge about water related diseases

	Yes	No
Frequency	71	1
%	98.6	1.4

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	37	29	6	0	1	5
%	47.4	37.2	7.7	0.0	1.3	6.4

Q31 House type

	P	SP	T
Frequency	66	4	2
%	91.7	5.6	2.8

Q31 Electricity

	Yes	No
Frequency	41	31
%	56.9	43.1

Q31 Telephone

	Yes	No
Frequency	5	67
%	6.9	93.1

Q32 Average Distance from leaching pit/drain 18 m

Q1 Average family Size 4.9

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	7	7	10	13	12	10	3	3	1	4	0	0	0	2
%	9.7	9.7	13.9	18.1	16.7	13.9	4.2	4.2	1.4	5.6	0.0	0.0	0.0	2.8

Q2 Average No of students

Kindergarten	1.3	Secondary	2
Primary	2.4	Post Secondary	1.7

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	18	26	25	0	0
%	26.1	37.7	36.2	0.0	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	9	26	29	5	1	0	1	1
%	12.5	36.1	40.3	6.9	1.4	0.0	1.4	1.4

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	65	18	11	2	16	4	4	0
%	54.2	15.0	9.2	1.7	13.3	3.3	3.3	0.0

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	47	0	19	6	0	0	0
%	65.3	0.0	26.4	8.3	0.0	0.0	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	11	47	7	3	3	7	0	4	2	1	0
%	12.9	55.3	8.2	3.5	3.5	8.2	0.0	4.7	2.4	1.2	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	1	15	0	0	0	1	0	1	0	1	0
%	5.3	78.9	0.0	0.0	0.0	5.3	0.0	5.3	0.0	5.3	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	1	0	0	0	0	1	0	0	0	0	0
%	50.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	42	19
%	68.9	31.1

Q7 Average no of families using standpipe 6.8

Q8 Is drinking water boiled?

	Yes	No
Frequency	53	19
%	73.6	25.4

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	11	56	5	0	0
%	15.3	77.8	6.9	0.0	0.0

Q11 Frequency of water collection

	1	2	3
Frequency	19	11	36
%	28.8	16.7	54.5

Q11 Means of water collection

	B	D	J
Frequency	3	1	40
%	6.8	2.3	90.9

Q12 Shortages during the dry season?

	Yes	No
Frequency	66	2
%	97.1	2.9

Q13 Days per week during season when water available

	1	2	3	4
Frequency	41	8	14	3
%	62.1	12.1	21.2	4.5

Q14 Is water enough for

	Yes	No
i) Washing hands	61	11
%	84.7	15.3
ii) Taking bath	66	6
%	91.7	8.3
iii) Washing clothes	61	11
%	84.7	15.3

		Yes
i)Washing hands, ii)Taking bath		5
	%	6.9
i)Washing hands, ii)Taking bath, iii)Washing clothes		61
	%	84.7

Q15 Do you have storage facilities?

	Yes	No
Frequency	50	22
%	69.4	30.6

Q15 Type of storage

	C	D	T
Frequency	29	8	13
%	58.0	16.0	26.0

Q15 Average volume of storage 3.03m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	12	28	19	5	1
%	18.5	43.1	29.2	7.7	1.5

Q17-1 Satisfied with water services?

	Yes	No
Frequency	27	39
%	40.9	59.1

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	10	3	25	6	12
%	17.9	5.4	44.6	10.7	21.4

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	37	2
%	94.9	5.1

Q18 Land Size

	1	2	3	4
Frequency	0	6	8	12
%	0.0	23.1	30.8	46.2

Q19 Crops grown

	1	2	3	4	5
Frequency	0	0	0	22	13
%	0.0	0.0	0.0	62.9	37.1

Q20 Animals kept

	1	2	3	4	5
Frequency	24	0	16	0	0
%	60.0	0.0	40.0	0.0	0.0

Q20 Average no of cows 6

Q20 Average no of goats 9.5

Q20 Average no of others 7.5

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	18	18	15	21
%	25.0	25.0	20.8	29.2

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	2	48	22	0	0
%	2.8	66.7	30.6	0.0	0.0

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	0	72
%	0.0	100.0

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	2	0	0	0	0
%	100.0	0.0	0.0	0.0	0.0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	0	22	0	0	0
%	0.0	100.0	0.0	0.0	0.0

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	10	4	0	3	0
%	58.8	23.5	0.0	17.6	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	9
%	0.0	0.0	0.0	100.0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	25	22	4
%	49.0	43.1	7.8

Q29 Knowledge about water related diseases

	Yes	No
Frequency	67	5
%	93.1	6.9

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	30	32	18	1	2	3
%	34.9	37.2	20.9	1.2	2.3	3.5

Q31 House type

	P	SP	T
Frequency	47	12	13
%	65.3	16.7	18.1

Q31 Electricity

	Yes	No
Frequency	34	38
%	47.2	52.8

Q31 Telephone

	Yes	No
Frequency	0	72
%	0.0	100.0

Q32 Average Distance from leaching pit/drain 100 m

Q1 Average family Size 8.3

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	2	1	7	13	8	11	9	5	2	5	1	1	1	1
%	3.0	1.5	10.4	19.4	11.9	16.4	13.4	7.5	3.0	7.5	1.5	1.5	1.5	1.5

Q2 Average No of students

Kindergarten	1.7	Secondary	1.5
Primary	3.2	Post Secondary	2

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	26	12	32	5	0
%	34.7	16.0	42.7	6.7	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	16	18	16	15	3	1	0	6
%	21.3	24.0	21.3	20.0	4.0	1.3	0.0	8.0

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	73	0	7	14	9	4	4	0
%	65.8	0.0	6.3	12.6	8.1	3.6	3.6	0.0

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	0	73	0	0	0	0	0
%	0.0	100.0	0.0	0.0	0.0	0.0	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	23	18	33	2	1	6	2	18	9	0	0
%	20.5	16.1	29.5	1.8	0.9	5.4	1.8	16.1	8.0	0.0	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	3	2	0	0	0	2	0	0	0	0	0
%	42.9	28.6	0.0	0.0	0.0	28.6	0.0	0.0	0.0	0.0	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	0	0	0	0	0	0	0	0	0	0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	71	3
%	95.9	4.1

Q7 Average no of families using standpipe 16.9

Q8 Is drinking water boiled?

	Yes	No
Frequency	41	34
%	54.7	45.3

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	23	48	3	0	0
%	31.1	64.9	4.1	0.0	0.0

Q11 Frequency of water collection

	1	2	3
Frequency	25	10	40
%	33.3	13.3	53.3

Q11 Means of water collection

	B	D	J
Frequency	5	0	36
%	12.2	0.0	87.8

Q12 Shortages during the dry season?

	Yes	No
Frequency	38	7
%	84.4	15.6

Q13 Days per week during season when water available

	1	2	3	4
Frequency	45	11	9	3
%	66.2	16.2	13.2	4.4

Q14 Is water enough for

	Yes	No
i) Washing hands	59	16
%	78.7	21.3
ii) Taking bath	71	4
%	94.7	5.3
iii) Washing clothes	59	16
%	78.7	21.3

		Yes
i)Washing hands, ii)Taking bath		12
	%	16.0
i)Washing hands, ii)Taking bath, iii)Washing clothes		58
	%	77.3

Q15 Do you have storage facilities?

	Yes	No
Frequency	50	25
%	66.7	33.3

Q15 Type of storage

	C	D	T
Frequency	39	2	10
%	76.5	3.9	19.6

Q15 Average volume of storage 2.23 m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	1	18	28	19	8
%	1.4	24.3	37.8	25.7	10.8

Q17-1 Satisfied with water services?

	Yes	No
Frequency	21	54
%	28.0	72.0

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	18	12	45	5	2
%	22.0	14.6	54.9	6.1	2.4

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	52	16
%	76.5	23.5

Q18 Land Size

	1	2	3	4
Frequency	1	18	12	14
%	2.2	40.0	26.7	31.1

Q19 Crops grown

	1	2	3	4	5
Frequency	0	0	0	25	18
%	0.0	0.0	0.0	58.1	41.9

Q20 Animals kept

	1	2	3	4	5
Frequency	13	0	23	0	11
%	27.7	0.0	48.9	0.0	23.4

Q20 Average no of cows 4.9

Q20 Average no of goats 8.6

Q20 Average no of others 47.3

Q21 Fish caught

	Omena	Tuna	
Frequency	0	1	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	13	26	37	13
%	14.6	29.2	41.6	14.6

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	8	56	9	1	1
%	10.7	74.7	12.0	1.3	1.3

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	75	0
%	100.0	0.0

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	2	5	0	0	2
%	22.2	55.6	0.0	0.0	22.2

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	0	10	0	0	0
%	0.0	100.0	0.0	0.0	0.0

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	6	1	2	0	0
%	66.7	11.1	22.2	0.0	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	6
%	0.0	0.0	0.0	100.0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	52	2	5
%	88.1	3.4	8.5

Q29 Knowledge about water related diseases

	Yes	No
Frequency	75	0
%	100.0	0.0

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	11	61	12	8	3	2
%	11.3	62.9	12.4	8.2	3.1	2.1

Q31 House type

	P	SP	T
Frequency	26	27	22
%	34.7	36.0	29.3

Q31 Electricity

	Yes	No
Frequency	20	55
%	26.7	73.3

Q31 Telephone

	Yes	No
Frequency	7	68
%	9.3	90.7

Q32 Average Distance from leaching pit/drain 0 m

Q1 Average family Size 5.4

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	2	3	2	9	13	10	9	11	2	6	4	0	0	2
%	2.7	4.1	2.7	12.3	17.8	13.7	12.3	15.1	2.7	8.2	5.5	0.0	0.0	2.7

Q2 Average No of students

Kindergarten	1.3	Secondary	1.6
Primary	2.2	Post Secondary	1.8

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	16	29	26	0	0
%	22.5	40.8	36.6	0.0	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	10	12	14	13	14	4	0	4
%	14.1	16.9	19.7	18.3	19.7	5.6	0.0	5.6

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	72	2	0	0	1	0	0	0
%	96.0	2.7	0.0	0.0	1.3	0.0	0.0	0.0

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	15	31	19	5	0	0	0
%	21.4	44.3	27.1	7.1	0.0	0.0	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	34	28	3	8	0	0	0	0	0	0	0
%	46.6	38.4	4.1	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	1	0	0	0	0	0	0	0	0	0
%	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	1	0	0	0	0	0	0	0	0	0	0
%	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	44	26
%	62.9	37.1

Q7 Average no of families using standpipe 2.7

Q8 Is drinking water boiled?

	Yes	No
Frequency	14	58
%	19.4	80.6

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	33	28	2	2	0
%	50.8	43.1	3.1	3.1	0.0

Q11 Frequency of water collection

	1	2	3
Frequency	1	7	37
%	2.2	15.6	82.2

Q11 Means of water collection

	B	D	J
Frequency	1	0	16
%	5.9	0.0	94.1

Q12 Shortages during the dry season?

	Yes	No
Frequency	49	23
%	68.1	31.9

Q13 Days per week during season when water available

	1	2	3	4
Frequency	18	29	2	1
%	36.0	58.0	4.0	2.0

Q14 Is water enough for

	Yes	No
i) Washing hands	70	2
%	97.2	2.8
ii) Taking bath	71	1
%	98.6	1.4
iii) Washing clothes	70	2
%	97.2	2.8

		Yes
i)Washing hands, ii)Taking bath		1
	%	1.4
i)Washing hands, ii)Taking bath, iii)Washing clothes		70
	%	97.2

Q15 Do you have storage facilities?

	Yes	No
Frequency	19	53
%	26.4	73.6

Q15 Type of storage

	C	D	T
Frequency	0	0	16
%	0.0	0.0	100.0

Q15 Average volume of storage 0.92m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	8	26	13	17	5
%	11.6	37.7	18.8	24.6	7.2

Q17-1 Satisfied with water services?

	Yes	No
Frequency	34	38
%	47.2	52.8

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	32	0	27	0	1
%	53.3	0.0	45.0	0.0	1.7

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	38	34
%	52.8	47.2

Q18 Land Size

	1	2	3	4
Frequency	0	7	7	6
%	0.0	35.0	35.0	30.0

Q19 Crops grown

	1	2	3	4	5
Frequency	0	0	0	20	0
%	0.0	0.0	0.0	100.0	0.0

Q20 Animals kept

	1	2	3	4	5
Frequency	8	7	6	0	1
%	36.4	31.8	27.3	0.0	4.5

Q20 Average no of cows 3.7

Q20 Average no of goats 19.8

Q20 Average no of others 10

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	18	17	5	32
%	25.0	23.6	6.9	44.4

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	2	43	27	0	5
%	2.6	55.8	35.1	0.0	6.5

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	0	72
%	0.0	100.0

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	0	0	0	0	0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	7	19	2	0	31
%	11.9	32.2	3.4	0.0	52.5

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	3	1	15	3	0
%	13.6	4.5	68.2	13.6	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	1	0	0	5
%	16.7	0.0	0.0	83.3

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	42	0	1
%	97.7	0.0	2.3

Q29 Knowledge about water related diseases

	Yes	No
Frequency	63	9
%	87.5	12.5

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	29	34	2	0	1	0
%	43.9	51.5	3.0	0.0	1.5	0.0

Q31 House type

	P	SP	T
Frequency	43	25	4
%	59.7	34.7	5.6

Q31 Electricity

	Yes	No
Frequency	30	42
%	41.7	58.3

Q31 Telephone

	Yes	No
Frequency	8	64
%	11.1	88.9

Q32 Average Distance from leaching pit/drain 0 m

Q1 Average family Size 7.7

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	3	3	7	6	4	7	10	7	5	5	1	3	0	9
%	4.3	4.3	10.0	8.6	5.7	10.0	14.3	10.0	7.1	7.1	1.4	4.3	0.0	12.9

Q2 Average No of students

Kindergarten	1.8	Secondary	1.9
Primary	2.8	Post Secondary	2.2

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	13	25	29	4	0
%	18.3	35.2	40.8	5.6	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	14	16	21	9	3	3	1	3
%	20.0	22.9	30.0	12.9	4.3	4.3	1.4	4.3

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	50	20	14	6	17	0	1	5
%	44.2	17.7	12.4	5.3	15.0	0.0	0.9	4.4

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	40	0	10	0	0	0	0
%	80.0	0.0	20.0	0.0	0.0	0.0	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	11	20	14	1	12	2	3	5	0	1	4
%	15.1	27.4	19.2	1.4	16.4	2.7	4.1	6.8	0.0	1.4	5.5

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	8	0	0	0	4	2	0	0	0	0	0
%	57.1	0.0	0.0	0.0	28.6	14.3	0.0	0.0	0.0	0.0	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	2	0	0	1	2	0	0	0	0	0
%	0.0	40.0	0.0	0.0	20.0	40.0	0.0	0.0	0.0	0.0	0.0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	38	8
%	82.6	17.4

Q7 Average no of families using standpipe 8.1

Q8 Is drinking water boiled?

	Yes	No
Frequency	56	14
%	80.0	20.0

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	11	36	4	4	12
%	16.4	53.7	6.0	6.0	17.9

Q11 Frequency of water collection

	1	2	3
Frequency	41	9	15
%	63.1	13.8	23.1

Q11 Means of water collection

	B	D	J
Frequency	2	1	39
%	4.8	2.4	92.9

Q12 Shortages during the dry season?

	Yes	No
Frequency	53	17
%	75.7	24.3

Q13 Days per week during season when water available

	1	2	3	4
Frequency	31	14	7	1
%	59.5	26.4	13.2	1.9

Q14 Is water enough for

	Yes	No
i) Washing hands	56	14
%	80.0	20.0
ii) Taking bath	68	2
%	97.1	2.9
iii) Washing clothes	56	14
%	80.0	20.0

		Yes
i)Washing hands, ii)Taking bath		12
	%	17.1
i)Washing hands, ii)Taking bath, iii)Washing clothes		56
	%	80.0

Q15 Do you have storage facilities?

	Yes	No
Frequency	41	29
%	58.6	41.4

Q15 Type of storage

	C	D	T
Frequency	19	8	14
%	46.3	19.5	34.1

Q15 Average volume of storage 2.92m^3

Q16 Cost of water per day;month

	1	2	3	4	5
Frequency	6	21	5	14	6
%	11.5	40.4	9.6	26.9	11.5

Q17-1 Satisfied with water services?

	Yes	No
Frequency	10	43
%	18.9	81.1

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	8	10	31	7	9
%	12.3	15.4	47.7	10.8	13.8

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	45	0
%	100.0	0.0

Q18 Land Size

	1	2	3	4
Frequency	1	6	12	13
%	3.1	18.8	37.5	40.6

Q19 Crops grown

	1	2	3	4	5
Frequency	0	0	0	29	18
%	0.0	0.0	0.0	61.7	38.3

Q20 Animals kept

	1	2	3	4	5
Frequency	9	16	20	16	0
%	14.8	26.2	32.8	26.2	0.0

Q20 Average no of cows 8.4

Q20 Average no of goats 16.3

Q20 Average no of others 0

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	26	12	8	21
%	38.8	17.9	11.9	31.3

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	1	56	15	0	0
%	1.4	77.8	20.8	0.0	0.0

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	0	70
%	0.0	100.0

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	1	0	0	0	0
%	100.0	0.0	0.0	0.0	0.0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	1	14	1	0	0
%	6.3	87.5	6.3	0.0	0.0

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	7	1	3	3	0
%	50.0	7.1	21.4	21.4	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	5
%	0.0	0.0	0.0	100.0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	48	10	2
%	80.0	16.7	3.3

Q29 Knowledge about water related diseases

	Yes	No
Frequency	68	2
%	97.1	2.9

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	19	48	7	1	15	2
%	20.7	52.2	7.6	1.1	16.3	2.2

Q31 House type

	P	SP	T
Frequency	54	9	7
%	77.1	12.9	10.0

Q31 Electricity

	Yes	No
Frequency	28	42
%	40.0	60.0

Q31 Telephone

	Yes	No
Frequency	9	61
%	12.9	87.1

Q32 Average Distance from leaching pit/drain 100 m

Q1 Average family Size 5.7

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	3	4	4	13	15	10	8	2	2	6	1	0	1	1
%	4.3	5.7	5.7	18.6	21.4	14.3	11.4	2.9	2.9	8.6	1.4	0.0	1.4	1.4

Q2 Average No of students

Kindergarten	1.4	Secondary	1.7
Primary	3.1	Post Secondary	1.8

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	17	21	31	2	0
%	23.9	29.6	43.7	2.8	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	11	17	19	8	5	1	3	6
%	15.7	24.3	27.1	11.4	7.1	1.4	4.3	8.6

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	63	8	2	2	11	0	2	5
%	67.7	8.6	2.2	2.2	11.8	0.0	2.2	5.4

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	14	19	13	0	1	9	0
%	25.0	33.9	23.2	0.0	1.8	16.1	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	22	16	17	0	10	9	0	7	0	1	1
%	26.5	19.3	20.5	0.0	12.0	10.8	0.0	8.4	0.0	1.2	1.2

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	0	0	0	2	1	0	0	0	0	0
%	0.0	0.0	0.0	0.0	66.7	33.3	0.0	0.0	0.0	0.0	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	3	0	0	0	1	0	0	4	0	1	0
%	33.3	0.0	0.0	0.0	11.1	0.0	0.0	44.4	0.0	11.1	0.0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	36	8
%	81.8	18.2

Q7 Average no of families using standpipe 64.5

Q8 Is drinking water boiled?

	Yes	No
Frequency	49	21
%	70.0	30.0

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	19	27	16	3	1
%	28.8	40.9	24.2	4.5	1.5

Q11 Frequency of water collection

	1	2	3
Frequency	23	12	15
%	46.0	24.0	30.0

Q11 Means of water collection

	B	D	J
Frequency	1	1	29
%	3.2	3.2	93.5

Q12 Shortages during the dry season?

	Yes	No
Frequency	47	23
%	67.1	32.9

Q13 Days per week during season when water available

	1	2	3	4
Frequency	26	10	6	2
%	59.1	22.7	13.6	4.5

Q14 Is water enough for

	Yes	No
i) Washing hands	55	15
%	78.6	21.4
ii) Taking bath	65	5
%	92.9	7.1
iii) Washing clothes	55	15
%	78.6	21.4

		Yes
i)Washing hands, ii)Taking bath		6
	%	8.6
i)Washing hands, ii)Taking bath, iii)Washing clothes		54
	%	77.1

Q15 Do you have storage facilities?

	Yes	No
Frequency	50	20
%	71.4	28.6

Q15 Type of storage

	C	D	T
Frequency	25	4	14
%	58.1	9.3	32.6

Q15 Average volume of storage 2.2 m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	14	11	15	13	18
%	19.7	15.5	21.1	18.3	25.4

Q17-1 Satisfied with water services?

	Yes	No
Frequency	26	44
%	37.1	62.9

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	10	20	21	12	5
%	14.7	29.4	30.9	17.6	7.4

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	36	34
%	51.4	48.6

Q18 Land Size

	1	2	3	4
Frequency	1	5	8	13
%	3.7	18.5	29.6	48.1

Q19 Crops grown

	1	2	3	4	5
Frequency	4	0	0	20	2
%	15.4	0.0	0.0	76.9	7.7

Q20 Animals kept

	1	2	3	4	5
Frequency	10	6	10	2	8
%	27.8	16.7	27.8	5.6	22.2

Q20 Average no of cows 5.8

Q20 Average no of goats 6.3

Q20 Average no of others 14

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	17	26	16	21
%	21.3	32.5	20.0	26.3

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	0	39	29	2	0
%	0.0	55.7	41.4	2.9	0.0

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	0	70
%	0.0	100.0

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	0	0	0	0	0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	19	7	0	0	0
%	73.1	26.9	0.0	0.0	0.0

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	3	1	1	1	0
%	50.0	16.7	16.7	16.7	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	2
%	0.0	0.0	0.0	100.0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	33	3	6
%	78.6	7.1	14.3

Q29 Knowledge about water related diseases

	Yes	No
Frequency	66	4
%	94.3	5.7

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	27	33	7	2	8	7
%	32.1	39.3	8.3	2.4	9.5	8.3

Q31 House type

	P	SP	T
Frequency	52	13	5
%	74.3	18.6	7.1

Q31 Electricity

	Yes	No
Frequency	27	43
%	38.6	61.4

Q31 Telephone

	Yes	No
Frequency	7	63
%	10.0	90.0

Q32 Average Distance from leaching pit/drain 0 m

Q1 Average family Size 8.3

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	1	10	3	4	4	4	6	5	2	12	1	7	1	11
%	1.4	14.1	4.2	5.6	5.6	5.6	8.5	7.0	2.8	16.9	1.4	9.9	1.4	15.5

Q2 Average No of students

Kindergarten	1.5	Secondary	1.9
Primary	2.7	Post Secondary	1.3

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	0	30	12	28	0
%	0.0	42.9	17.1	40.0	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	31	19	12	7	1	0	0	0
%	44.3	27.1	17.1	10.0	1.4	0.0	0.0	0.0

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	9	2	64	2	7	0	0	0
%	10.7	2.4	76.2	2.4	8.3	0.0	0.0	0.0

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	7	0	0	2	0	0	0
%	77.8	0.0	0.0	22.2	0.0	0.0	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	3	6	0	0	2	66	2	4	0	0	0
%	3.6	7.2	0.0	0.0	2.4	79.5	2.4	4.8	0.0	0.0	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	0	0	0	0	0	0	0	0	0	0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	0	0	0	0	0	0	0	0	0	0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	4	4
%	50.0	50.0

Q7 Average no of families using standpipe 7.3

Q8 Is drinking water boiled?

	Yes	No
Frequency	33	37
%	47.1	52.9

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	3	64	4	0	0
%	4.2	90.1	5.6	0.0	0.0

Q11 Frequency of water collection

	1	2	3
Frequency	18	5	46
%	25.1	7.2	66.7

Q11 Means of water collection

	B	D	J
Frequency	14	0	46
%	23.3	0.0	76.7

Q12 Shortages during the dry season?

	Yes	No
Frequency	64	6
%	91.4	8.6

Q13 Days per week during season when water available

	1	2	3	4
Frequency	45	4	8	7
%	70.3	6.3	12.5	10.9

Q14 Is water enough for

	Yes	No
i) Washing hands	68	2
%	97.1	2.9
ii) Taking bath	68	2
%	97.1	2.9
iii) Washing clothes	68	2
%	97.1	2.9

		Yes
i)Washing hands, ii)Taking bath		0
	%	0.0
i)Washing hands, ii)Taking bath, iii)Washing clothes		68
	%	97.1

Q15 Do you have storage facilities?

	Yes	No
Frequency	8	62
%	11.4	88.6

Q15 Type of storage

	C	D	T
Frequency	2	1	5
%	25.0	12.5	62.5

Q15 Average volume of storage 0.52m³

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	6	0	2	1	0
%	66.7	0.0	22.2	11.1	0.0

Q17-1 Satisfied with water services?

	Yes	No
Frequency	0	9
%	0.0	100.0

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	0	7	3	0	1
%	0.0	63.6	27.3	0.0	9.1

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	6	2
%	75.0	25.0

Q18 Land Size

	1	2	3	4
Frequency	10	18	0	0
%	35.7	64.3	0.0	0.0

Q19 Crops grown

	1	2	3	4	5
Frequency	0	0	0	0	0

Q20 Animals kept

	1	2	3	4	5
Frequency	0	1	4	1	0
%	0.0	16.7	66.7	16.7	0.0

Q20 Average no of cows 8.7

Q20 Average no of goats 5

Q20 Average no of others 0

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	5	15	10	42
%	6.9	20.8	13.9	58.3

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	20	9	4	0	38
%	28.2	12.7	5.6	0.0	53.5

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	1	69
%	1.4	98.6

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	0	20	0	0	0
%	0.0	100.0	0.0	0.0	0.0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	0	5	0	0	0
%	0.0	100.0	0.0	0.0	0.0

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	0	3	0	2	0
%	0.0	60.0	0.0	40.0	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	1	7	1
%	11.1	77.8	11.1

Q29 Knowledge about water related diseases

	Yes	No
Frequency	64	5
%	92.8	7.2

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	2	68	27	6	28	2
%	1.5	51.1	20.3	4.5	21.1	1.5

Q31 House type

	P	SP	T
Frequency	34	17	19
%	43.6	24.3	27.1

Q31 Electricity

	Yes	No
Frequency	28	42
%	40.0	60.0

Q31 Telephone

	Yes	No
Frequency	2	68
%	2.9	97.1

Q32 Average Distance from leaching pit/drain 17 m

Q1 Average family Size 7.0

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	2	2	2	9	9	16	10	7	2	4	1	1	0	5
%	2.9	2.9	2.9	12.9	12.9	22.9	14.3	10.0	2.9	5.7	1.4	1.4	0.0	7.1

Q2 Average No of students

Kindergarten	1.3	Secondary	1.5
Primary	2.7	Post Secondary	1.8

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	22	27	17	4	2
%	30.6	37.5	23.6	5.6	2.8

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	23	18	17	5	2	3	2	0
%	32.9	25.7	24.3	7.1	2.9	4.3	2.9	0.0

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	48	13	3	0	18	17	0	0
%	48.5	13.1	3.0	0.0	18.2	17.2	0.0	0.0

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	24	20	0	0	0	0	0
%	54.5	45.5	0.0	0.0	0.0	0.0	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	23	19	35	2	0	3	2	16	9	0	0
%	21.1	17.4	32.1	1.8	0.0	2.8	1.8	14.7	8.3	0.0	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	3	3	0	0	11	1	0	0	6	0	0
%	12.5	12.5	0.0	0.0	45.8	4.2	0.0	0.0	25.0	0.0	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	1	0	0	0	2	0	0	0	2	0	0
%	20.0	0.0	0.0	0.0	40.0	0.0	0.0	0.0	40.0	0.0	0.0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	21	4
%	84.0	16.0

Q7 Average no of families using standpipe 7.1

Q8 Is drinking water boiled?

	Yes	No
Frequency	63	7
%	90.0	10.0

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	21	38	7	2	1
%	30.4	55.1	10.1	2.9	1.4

Q11 Frequency of water collection

	1	2	3
Frequency	13	11	39
%	20.6	17.5	61.9

Q11 Means of water collection

	B	D	J
Frequency	0	0	39
%	0.0	0.0	100.0

Q12 Shortages during the dry season?

	Yes	No
Frequency	40	30
%	57.1	42.9

Q13 Days per week during season when water available

	1	2	3	4
Frequency	29	7	5	1
%	69.0	16.7	11.9	2.4

Q14 Is water enough for

	Yes	No
i) Washing hands	61	9
%	87.1	12.9
ii) Taking bath	66	4
%	94.3	5.7
iii) Washing clothes	61	9
%	87.1	12.9

		Yes
i)Washing hands, ii)Taking bath		5
	%	7.1
i)Washing hands, ii)Taking bath, iii)Washing clothes		61
	%	87.1

Q15 Do you have storage facilities?

	Yes	No
Frequency	33	37
%	47.1	52.9

Q15 Type of storage

	C	D	T
Frequency	18	11	2
%	58.1	35.5	6.5

Q15 Average volume of storage 0.43m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	10	9	8	3	1
%	32.3	29.0	25.8	9.7	3.2

Q17-1 Satisfied with water services?

	Yes	No
Frequency	7	63
%	10.0	90.0

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	11	7	12	0	3
%	33.3	21.2	36.4	0.0	9.1

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	23	47
%	32.9	67.1

Q18 Land Size

	1	2	3	4
Frequency	4	23	14	6
%	8.5	48.9	29.8	12.8

Q19 Crops grown

	1	2	3	4	5
Frequency	14	13	0	31	2
%	23.3	21.7	0.0	51.7	3.3

Q20 Animals kept

	1	2	3	4	5
Frequency	31	0	17	1	5
%	57.4	0.0	31.5	1.9	9.3

Q20 Average no of cows 3.1

Q20 Average no of goats 0

Q20 Average no of others 8.5

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	29	37	8	5
%	36.7	46.8	10.1	6.3

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	0	61	9	0	0
%	0.0	87.1	12.9	0.0	0.0

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	1	69
%	1.4	98.6

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	0	0	0	0	0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	2	4	2	0	1
%	22.2	44.4	22.2	0.0	11.1

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	3	0	3	0	0
%	50.0	0.0	50.0	0.0	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	46	13	2
%	75.4	21.3	3.3

Q29 Knowledge about water related diseases

	Yes	No
Frequency	68	2
%	97.1	2.9

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	5	60	6	0	1	6
%	6.4	76.9	7.7	0.0	1.3	7.7

Q31 House type

	P	SP	T
Frequency	36	15	19
%	51.4	21.4	27.1

Q31 Electricity

	Yes	No
Frequency	20	50
%	28.6	71.4

Q31 Telephone

	Yes	No
Frequency	4	66
%	5.7	94.3

Q32 Average Distance from leaching pit/drain 235 m

Q1 Average family Size 9.1

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	3	0	5	5	4	4	7	8	8	9	0	4	2	10
%	4.3	0.0	7.2	7.2	5.8	5.8	10.1	11.6	11.6	13.0	0.0	5.8	2.9	14.5

Q2 Average No of students

Kindergarten	2.2	Secondary	1.7
Primary	3.4	Post Secondary	1.3

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	24	33	13	3	0
%	32.9	45.2	17.8	4.1	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	11	10	24	16	5	1	1	1
%	15.9	14.5	34.8	23.2	7.2	1.4	1.4	1.4

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	45	12	9	5	11	7	3	2
%	47.9	12.8	9.6	5.3	11.7	7.4	3.2	2.1

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	21	21	0	1	0	0	0
%	48.8	48.8	0.0	2.3	0.0	0.0	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	22	9	5	2	22	1	8	11	9	8	0
%	22.7	9.3	5.2	2.1	22.7	1.0	8.2	11.3	9.3	8.2	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	2	1	0	4	5	0	1	8	10	1
%	0.0	6.3	3.1	0.0	12.5	15.6	0.0	3.1	25.0	31.3	3.1

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	0	0	0	0	5	0	1	5	7	1
%	0.0	0.0	0.0	0.0	0.0	26.3	0.0	5.3	26.3	36.8	5.3

Q6 Status of piped supply

	Metered	Unmetered
Frequency	18	6
%	75.0	25.0

Q7 Average no of families using standpipe 4.7

Q8 Is drinking water boiled?

	Yes	No
Frequency	49	21
%	70.0	30.0

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	10	37	17	5	0
%	14.5	53.6	24.6	7.2	0.0

Q11 Frequency of water collection

	1	2	3
Frequency	17	13	33
%	27.0	20.6	52.4

Q11 Means of water collection

	B	D	J
Frequency	11	2	44
%	19.3	3.5	77.2

Q12 Shortages during the dry season?

	Yes	No
Frequency	58	12
%	82.9	17.1

Q13 Days per week during season when water available

	1	2	3	4
Frequency	42	6	3	1
%	80.8	11.5	5.8	1.9

Q14 Is water enough for

	Yes	No
i) Washing hands	60	10
%	85.7	14.3
ii) Taking bath	64	6
%	91.4	8.6
iii) Washing clothes	60	10
%	85.7	14.3

		Yes
i)Washing hands, ii)Taking bath		4
	%	5.7
i)Washing hands, ii)Taking bath, iii)Washing clothes		60
	%	85.7

Q15 Do you have storage facilities?

	Yes	No
Frequency	40	30
%	57.1	42.9

Q15 Type of storage

	C	D	T
Frequency	14	13	8
%	40.0	37.1	22.9

Q15 Average volume of storage 2.93m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	17	15	22	5	3
%	27.4	24.2	35.5	8.1	4.8

Q17-1 Satisfied with water services?

	Yes	No
Frequency	11	59
%	15.7	84.3

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	30	17	37	4	3
%	33.0	18.7	40.7	4.4	3.3

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	58	11
%	84.1	15.9

Q18 Land Size

	1	2	3	4
Frequency	17	23	7	6
%	32.1	43.4	13.2	11.3

Q19 Crops grown

	1	2	3	4	5
Frequency	0	0	1	27	1
%	0.0	0.0	3.4	93.1	3.4

Q20 Animals kept

	1	2	3	4	5
Frequency	8	4	10	0	12
%	23.5	11.8	29.4	0.0	35.3

Q20 Average no of cows 6.1

Q20 Average no of goats 4.5

Q20 Average no of others 3.7

Q21 Fish caught

	Omena	Tuna	
Frequency	5	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	23	34	11	3
%	32.4	47.9	15.5	4.2

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	1	54	15	1	0
%	1.4	76.1	21.1	1.4	0.0

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	31	39
%	44.3	55.7

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	0	0	0	0	2
%	0.0	0.0	0.0	0.0	100.0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	0	18	4	0	4
%	0.0	69.2	15.4	0.0	15.4

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	8	3	2	5	0
%	44.4	16.7	11.1	27.8	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	3	0	5
%	0.0	37.5	0.0	62.5

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	35	17	2
%	64.8	31.5	3.7

Q29 Knowledge about water related diseases

	Yes	No
Frequency	69	1
%	98.6	1.4

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	5	57	16	9	8	0
%	5.3	60.0	16.8	9.5	8.4	0.0

Q31 House type

	P	SP	T
Frequency	42	16	12
%	60.0	22.9	17.1

Q31 Electricity

	Yes	No
Frequency	19	51
%	27.1	72.9

Q31 Telephone

	Yes	No
Frequency	10	60
%	14.3	85.7

Q32 Average Distance from leaching pit/drain 150 m

Q1 Average family Size 5.7

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	5	5	12	10	5	11	12	3	2	1	3	2	1	2
%	6.8	6.8	16.2	13.5	6.8	14.9	16.2	4.1	2.7	1.4	4.1	2.7	1.4	2.7

Q2 Average No of students

Kindergarten	1.2	Secondary	1.5
Primary	2.3	Post Secondary	1.6

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	14	44	15	1	0
%	18.9	59.5	20.3	1.4	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	16	18	22	12	3	2	0	0
%	21.9	24.7	30.1	16.4	4.1	2.7	0.0	0.0

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	73	32	11	1	9	3	1	0
%	56.2	24.6	8.5	0.8	6.9	2.3	0.8	0.0

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	53	0	0	0	0	0	0
%	100.0	0.0	0.0	0.0	0.0	0.0	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	24	44	11	11	11	4	8	8	0	0	0
%	19.8	36.4	9.1	9.1	9.1	3.3	6.6	6.6	0.0	0.0	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	9	0	0	3	0	0	0	0	1	0
%	0.0	69.2	0.0	0.0	23.1	0.0	0.0	0.0	0.0	7.7	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	0	0	0	0	0	0	0		0	0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	31	36
%	46.3	53.7

Q7 Average no of families using standpipe 7

Q8 Is drinking water boiled?

	Yes	No
Frequency	46	28
%	62.2	37.8

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	24	43	2	2	3
%	32.4	58.1	2.7	2.7	4.1

Q11 Frequency of water collection

	1	2	3
Frequency	14	10	46
%	20.0	14.3	65.7

Q11 Means of water collection

	B	D	J
Frequency	1	0	44
%	2.2	0.0	97.8

Q12 Shortages during the dry season?

	Yes	No
Frequency	59	15
%	79.7	20.3

Q13 Days per week during season when water available

	1	2	3	4
Frequency	43	6	9	4
%	69.4	9.7	14.5	6.5

Q14 Is water enough for

	Yes	No
i) Washing hands	68	6
%	91.9	8.1
ii) Taking bath	74	0
%	100.0	0.0
iii) Washing clothes	68	6
%	91.9	8.1

		Yes
i)Washing hands, ii)Taking bath		6
	%	8.1
i)Washing hands, ii)Taking bath, iii)Washing clothes		68
	%	91.9

Q15 Do you have storage facilities?

	Yes	No
Frequency	47	27
%	63.5	36.5

Q15 Type of storage

	C	D	T
Frequency	26	6	18
%	52.0	12.0	36.0

Q15 Average volume of storage 0.58m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	25	28	11	2	3
%	35.2	40.6	15.9	2.9	4.3

Q17-1 Satisfied with water services?

	Yes	No
Frequency	25	48
%	34.2	65.8

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	26	29	32	4	3
%	27.7	30.9	34.0	4.3	3.2

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	45	7
%	86.5	13.5

Q18 Land Size

	1	2	3	4
Frequency	4	6	5	15
%	13.3	20.0	16.7	50.0

Q19 Crops grown

	1	2	3	4	5
Frequency	0	5	0	17	11
%	0.0	15.2	0.0	51.5	33.3

Q20 Animals kept

	1	2	3	4	5
Frequency	21	0	0	0	0
%	100.0	0.0	0.0	0.0	0.0

Q20 Average no of cows 6.7

Q20 Average no of goats 7.8

Q20 Average no of others 6.3

Q21 Fish caught

	Omena	Tuna	
Frequency		0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	9	45	18	9
%	11.1	55.6	22.2	11.1

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	1	54	20	0	0
%	1.3	72.0	26.7	0.0	0.0

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	3	71
%	4.1	95.9

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	1	0	0	0	0
%	100.0	0.0	0.0	0.0	0.0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	0	21	0	0	0
%	0.0	100.0	0.0	0.0	0.0

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	18	0	0	1	0
%	94.7	0.0	0.0	5.3	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	16
%	0.0	0.0	0.0	100.0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	49	5	1
%	89.1	9.1	1.8

Q29 Knowledge about water related diseases

	Yes	No
Frequency	74	0
%	100.0	0.0

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	24	44	9	0	1	10
%	27.3	50.0	10.2	0.0	1.1	11.4

Q31 House type

	P	SP	T
Frequency	39	12	23
%	52.7	16.2	31.1

Q31 Electricity

	Yes	No
Frequency	48	26
%	64.9	35.1

Q31 Telephone

	Yes	No
Frequency	8	66
%	10.8	89.2

Q32 Average Distance from leaching pit/drain 55 m

Q1 Average family Size 7

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	6	6	10	9	9	4	5	5	2	2	4	3	1	5
%	8.5	8.5	14.1	12.7	12.7	5.6	7.0	7.0	2.8	2.8	5.6	4.2	1.4	7.0

Q2 Average No of students

Kindergarten	1.4	Secondary	2
Primary	3.5	Post Secondary	1.2

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	13	33	26	0	0
%	18.1	45.8	36.1	0.0	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	11	12	20	15	5	1	1	5
%	15.7	17.1	28.6	21.4	7.1	1.4	1.4	7.1

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	71	12	2	0	33	2	2	0
%	59.2	9.8	1.6	0.0	27.0	1.6	1.6	0.0

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	61	0	10	0	0	0	0
%	85.9	0.0	14.1	0.0	0.0	0.0	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	18	24	18	11	0	0	0	0	0	0	0
%	25.4	33.8	25.4	15.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	0	0	0	10	0	0	0	0	7	0
%	0.0	0.0	0.0	0.0	58.8	0.0	0.0	0.0	0.0	41.2	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	8	18	11	7	0	0	0	0	0	0	0
%	18.2	40.9	25.0	15.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	49	9
%	84.5	15.5

Q7 Average no of families using standpipe 13.4

Q8 Is drinking water boiled?

	Yes	No
Frequency	18	53
%	25.4	74.6

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	11	45	14	1	0
%	15.5	63.4	19.7	1.4	0.0

Q11 Frequency of water collection

	1	2	3
Frequency	29	9	38
%	35.2	11.8	50.0

Q11 Means of water collection

	B	D	J
Frequency	41	0	23
%	64.1	0.0	35.9

Q12 Shortages during the dry season?

	Yes	No
Frequency	69	2
%	97.2	2.8

Q13 Days per week during season when water available

	1	2	3	4
Frequency	46	11	9	3
%	66.7	15.9	13.0	4.3

Q14 Is water enough for

	Yes	No
i) Washing hands	63	8
%	88.7	11.3
ii) Taking bath	65	6
%	91.5	8.5
iii) Washing clothes	63	8
%	88.7	11.3

		Yes
i)Washing hands, ii)Taking bath		2
	%	2.8
i)Washing hands, ii)Taking bath, iii)Washing clothes		63
	%	88.7

Q15 Do you have storage facilities?

	Yes	No
Frequency	41	30
%	57.7	42.3

Q15 Type of storage

	C	D	T
Frequency	7	18	46
%	9.9	25.4	64.8

Q15 Average volume of storage 3.5m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	29	9	14	5	13
%	41.4	12.9	20.0	7.1	18.6

Q17-1 Satisfied with water services?

	Yes	No
Frequency	15	56
%	21.1	78.9

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	14	11	33	10	7
%	13.7	14.7	44.0	13.3	9.3

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	55	1
%	98.2	1.8

Q18 Land Size

	1	2	3	4
Frequency	0	8	1	4
%	0.0	61.5	7.7	30.8

Q19 Crops grown

	1	2	3	4	5
Frequency	0	0	0	20	17
%	0.0	0.0	0.0	54.1	45.9

Q20 Animals kept

	1	2	3	4	5
Frequency	1	17	12	1	11
%	2.4	40.5	28.6	2.4	26.2

Q20 Average no of cows 131.5

Q20 Average no of goats 92.2

Q20 Average no of others 27.9

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	15	30	8	21
%	20.3	40.5	10.8	28.4

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	9	48	18	0	0
%	12.0	64.0	24.0	0.0	0.0

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	0	71
%	0.0	100.0

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	2	7	0	0	0
%	22.2	77.8	0.0	0.0	0.0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	0	17	0	0	0
%	0.0	100.0	0.0	0.0	0.0

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	3	3	8	4	0
%	16.7	16.7	44.4	22.2	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	3
%	0.0	0.0	0.0	100.0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	44	9	0
%	83.0	17.0	0.0

Q29 Knowledge about water related diseases

	Yes	No
Frequency	68	3
%	95.8	4.2

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	23	34	32	0	1	1
%	25.3	37.4	35.2	0.0	1.1	1.1

Q31 House type

	P	SP	T
Frequency	34	16	21
%	47.9	22.5	29.6

Q31 Electricity

	Yes	No
Frequency	19	52
%	26.8	73.2

Q31 Telephone

	Yes	No
Frequency	8	63
%	11.3	88.7

Q32 Average Distance from leaching pit/drain 600 m

Q1 Average family Size 7.5

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	2	4	6	7	8	9	9	5	4	4	2	4	3	7
%	2.7	5.4	8.1	9.5	10.8	12.2	12.2	6.8	5.4	5.4	2.7	5.4	4.1	9.5

Q2 Average No of students

Kindergarten	1.4	Secondary	1.6
Primary	2.7	Post Secondary	1.3

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	1	37	27	9	0
%	1.4	50.0	36.5	12.2	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	16	15	27	9	4	2	0	0
%	21.9	20.5	37.0	12.3	5.5	2.7	0.0	0.0

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	69	4	14	2	2	0	0	0
%	75.8	4.4	15.4	2.2	2.2	0.0	0.0	0.0

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	58	0	8	6	0	0	0
%	80.6	0.0	11.1	8.3	0.0	0.0	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	18	46	4	4	13	5	6	0	0	1	0
%	18.6	47.4	4.1	4.1	13.4	5.2	6.2	0.0	0.0	1.0	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	0	0	0	1	1	0	0	0	0	0
%	0.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	0	0	0	0	0	0	0	0	0	0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	38	24
%	61.3	38.7

Q7 Average no of families using standpipe 5.3

Q8 Is drinking water boiled?

	Yes	No
Frequency	34	40
%	45.9	54.1

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	17	50	4	2	0
%	23.3	68.5	5.5	2.7	0.0

Q11 Frequency of water collection

	1	2	3
Frequency	35	7	28
%	50.0	10.0	40.0

Q11 Means of water collection

	B	D	J
Frequency	8	1	42
%	15.7	2.0	82.4

Q12 Shortages during the dry season?

	Yes	No
Frequency	53	21
%	71.6	28.4

Q13 Days per week during season when water available

	1	2	3	4
Frequency	23	15	12	3
%	43.4	28.3	22.6	5.7

Q14 Is water enough for

	Yes	No
i) Washing hands	57	17
%	77.0	23.0
ii) Taking bath	67	7
%	90.5	9.5
iii) Washing clothes	57	17
%	77.0	23.0

		Yes
i)Washing hands, ii)Taking bath		10
	%	13.5
i)Washing hands, ii)Taking bath, iii)Washing clothes		57
	%	77.0

Q15 Do you have storage facilities?

	Yes	No
Frequency	40	34
%	54.1	45.9

Q15 Type of storage

	C	D	T
Frequency	13	16	10
%	33.3	41.0	25.6

Q15 Average volume of storage 0.54m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	21	18	23	4	3
%	30.4	26.1	33.3	5.8	4.3

Q17-1 Satisfied with water services?

	Yes	No
Frequency	10	64
%	13.5	86.5

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	12	6	47	7	4
%	15.8	7.9	61.8	9.2	5.3

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	57	17
%	77.0	23.0

Q18 Land Size

	1	2	3	4
Frequency	7	6	0	0
%	53.8	46.2	0.0	0.0

Q19 Crops grown

	1	2	3	4	5
Frequency	0	0	0	0	1
%	0.0	0.0	0.0	0.0	100.0

Q20 Animals kept

	1	2	3	4	5
Frequency	0	0	11	2	1
%	0.0	0.0	78.6	14.3	7.1

Q20 Average no of cows 0

Q20 Average no of goats 29.6

Q20 Average no of others 5

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	1	27	23	28
%	1.3	34.2	29.1	35.4

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	6	52	16	0	0
%	8.1	70.3	21.6	0.0	0.0

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	1	73
%	1.4	98.6

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	0	4	0	0	0
%	0.0	100.0	0.0	0.0	0.0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	0	13	2	0	0
%	0.0	86.7	13.3	0.0	0.0

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	9	2	2	2	0
%	60.0	13.3	13.3	13.3	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	8
%	0.0	0.0	0.0	100.0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	48	3	0
%	94.1	5.9	0.0

Q29 Knowledge about water related diseases

	Yes	No
Frequency	72	2
%	97.3	2.7

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	13	58	26	2	5	2
%	12.3	54.7	24.5	1.9	4.7	1.9

Q31 House type

	P	SP	T
Frequency	41	9	24
%	55.4	12.2	32.4

Q31 Electricity

	Yes	No
Frequency	15	59
%	20.3	79.7

Q31 Telephone

	Yes	No
Frequency	3	71
%	4.1	95.9

Q32 Average Distance from leaching pit/drain 0 m

Q1 Average family Size 6.4

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	2	4	7	8	10	12	6	4	2	5	4	3	0	7
%	2.7	5.4	9.5	10.8	13.5	16.2	8.1	5.4	2.7	6.8	5.4	4.1	0.0	9.5

Q2 Average No of students

Kindergarten	1.5	Secondary	1.9
Primary	2.5	Post Secondary	1.1

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	17	22	29	1	0
%	24.6	31.9	42.0	1.4	0.0

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	9	9	23	19	4	2	2	1
%	13.0	13.0	33.3	27.5	5.8	2.9	2.9	1.4

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	54	8	22	10	5	4	2	0
%	51.4	7.6	21.0	9.5	4.8	3.8	1.9	0.0

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	22	0	12	6	3	22	0
%	33.8	0.0	18.5	9.2	4.6	33.8	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	32	21	6	4	3	19	2	1	0	1	0
%	36.0	23.6	6.7	4.5	3.4	21.3	2.2	1.1	0.0	1.1	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	3	2	1	0	1	1	1	0	0	0	0
%	33.3	22.2	11.1	0.0	11.1	11.1	11.1	0.0	0.0	0.0	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	0	0	0	0	0	0	0	0	0	0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	31	22
%	58.5	41.5

Q7 Average no of families using standpipe 31.3

Q8 Is drinking water boiled?

	Yes	No
Frequency	53	16
%	76.8	23.2

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	30	33	5	1	0
%	43.5	47.8	7.2	1.4	0.0

Q11 Frequency of water collection

	1	2	3
Frequency	12	4	40
%	21.4	7.1	71.4

Q11 Means of water collection

	B	D	J
Frequency	0	0	38
%	0.0	0.0	100.0

Q12 Shortages during the dry season?

	Yes	No
Frequency	57	12
%	82.6	17.4

Q13 Days per week during season when water available

	1	2	3	4
Frequency	38	12	6	1
%	66.7	21.1	10.5	1.8

Q14 Is water enough for

	Yes	No
i) Washing hands	63	6
%	91.3	8.7
ii) Taking bath	68	1
%	98.6	1.4
iii) Washing clothes	63	6
%	91.3	8.7

		Yes
i)Washing hands, ii)Taking bath		5
	%	7.2
i)Washing hands, ii)Taking bath, iii)Washing clothes		63
	%	91.3

Q15 Do you have storage facilities?

	Yes	No
Frequency	21	48
%	30.4	69.6

Q15 Type of storage

	C	D	T
Frequency	2	1	19
%	9.1	4.5	86.4

Q15 Average volume of storage 1.54m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	16	10	19	5	14
%	25.0	15.6	29.7	7.8	21.9

Q17-1 Satisfied with water services?

	Yes	No
Frequency	24	39
%	38.1	61.9

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	24	9	23	1	5
%	38.7	14.5	37.1	1.6	8.1

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	31	16
%	66.0	34.0

Q18 Land Size

	1	2	3	4
Frequency	12	20	3	6
%	29.3	48.8	7.3	14.6

Q19 Crops grown

	1	2	3	4	5
Frequency	0	0	0	26	10
%	0.0	0.0	0.0	72.2	27.8

Q20 Animals kept

	1	2	3	4	5
Frequency	24	2	21	0	1
%	50.0	4.2	43.8	0.0	2.1

Q20 Average no of cows 10.3

Q20 Average no of goats 14.7

Q20 Average no of others 5.5

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	18	22	11	19
%	25.7	31.4	15.7	27.1

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	0	38	31	0	0
%	0.0	55.1	44.9	0.0	0.0

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	0	69
%	0.0	100.0

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	9	0	0	0	0
%	100.0	0.0	0.0	0.0	0.0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	11	17	12	0	0
%	27.5	42.5	30.0	0.0	0.0

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	7	5	2	4	0
%	38.9	27.8	11.1	22.2	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	7
%	0.0	0.0	0.0	100.0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	35	7	1
%	81.4	16.3	2.3

Q29 Knowledge about water related diseases

	Yes	No
Frequency	60	9
%	87.0	13.0

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	29	37	19	2	0	0
%	33.3	42.5	21.8	2.3	0.0	0.0

Q31 House type

	P	SP	T
Frequency	50	11	8
%	72.5	15.9	11.6

Q31 Electricity

	Yes	No
Frequency	47	22
%	68.1	31.9

Q31 Telephone

	Yes	No
Frequency	21	48
%	30.4	69.6

Q32 Average Distance from leaching pit/drain 95 m

Q1 Average family Size 6.1

No. of occupants	1	2	3	4	5	6	7	8	9	10	11	12	13	>13
Frequency	1	5	8	8	13	11	9	5	2	5	1	1	1	1
%	1.4	7.0	11.3	11.3	18.3	15.5	12.7	7.0	2.8	7.0	1.4	1.4	1.4	1.4

Q2 Average No of students

Kindergarten	1.2	Secondary	1.7
Primary	2.7	Post Secondary	1.1

Q3 Main Occupation of family

Occupation	1	2	3	4	5
Frequency	18	32	18	3	2
%	24.7	43.8	24.7	4.1	2.7

Q4 Family Income

Income Range	1	2	3	4	5	6	7	8
Frequency	21	17	15	8	1	1	2	5
%	30.0	24.3	21.4	11.4	1.4	1.4	2.9	7.1

Q5 Source of water

	1	2	3	4	5	6	7	8
Frequency	53	16	7	0	35	1	0	0
%	47.3	14.3	6.3	0.0	31.3	0.9	0.0	0.0

Q5 Water undertaker for piped water supply

	A	B	C	D	E	F	G
Frequency	16	7	28	0	0	20	0
%	22.5	9.9	39.4	0.0	0.0	28.2	0.0

Q5 Source for domestic use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	10	30	10	4	13	5	0	1	5	3	0
%	12.3	37.0	12.3	4.9	16.0	6.2	0.0	1.2	6.2	3.7	0.0

Q5 Source for Livestock use

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	1	8	0	0	8	4	0	0	2	1	0
%	4.2	33.3	0.0	0.0	33.3	16.7	0.0	0.0	8.3	4.2	0.0

Q5 Source for other uses

	1a	1b	1c	1d	2	3	4	5	6	7	8
Frequency	0	0	0	0	0	0	0	0	0	0	0

Q6 Status of piped supply

	Metered	Unmetered
Frequency	35	15
%	70.0	30.0

Q7 Average no of families using standpipe 11.1

Q8 Is drinking water boiled?

	Yes	No
Frequency	42	39
%	51.9	48.1

Q10 Distance from main water Source

	1	2	3	4	5
Frequency	9	59	3	0	0
%	12.7	83.1	4.2	0.0	0.0

Q11 Frequency of water collection

	1	2	3
Frequency	27	13	31
%	38.0	18.3	43.7

Q11 Means of water collection

	B	D	J
Frequency	4	0	29
%	12.1	0.0	87.9

Q12 Shortages during the dry season?

	Yes	No
Frequency	66	5
%	93.0	7.0

Q13 Days per week during season when water available

	1	2	3	4
Frequency	52	10	5	0
%	77.6	14.9	7.5	0.0

Q14 Is water enough for

	Yes	No
i) Washing hands	68	3
%	95.8	4.2
ii) Taking bath	71	0
%	100.0	0.0
iii) Washing clothes	68	3
%	95.8	4.2

		Yes
i)Washing hands, ii)Taking bath		3
	%	4.2
i)Washing hands, ii)Taking bath, iii)Washing clothes		68
	%	95.8

Q15 Do you have storage facilities?

	Yes	No
Frequency	49	22
%	69.0	31.0

Q15 Type of storage

	C	D	T
Frequency	30	13	6
%	61.2	26.5	12.2

Q15 Average volume of storage 0.28 m^3

Q16 Cost of water per day/month

	1	2	3	4	5
Frequency	10	9	20	9	2
%	20.0	18.0	40.0	18.0	4.0

Q17-1 Satisfied with water services?

	Yes	No
Frequency	40	25
%	61.5	38.5

Q17-2 If no, reasons

	1	2	3	4	5
Frequency	4	12	7	6	6
%	11.4	34.3	20.0	17.1	17.1

Q17-3 Willingness to pay for improved services?

	Yes	No
Frequency	25	1
%	96.2	3.8

Q18 Land Size

	1	2	3	4
Frequency	1	12	5	14
%	3.1	37.5	15.6	43.8

Q19 Crops grown

	1	2	3	4	5
Frequency	2	12	0	28	11
%	3.8	22.6	0.0	52.8	20.8

Q20 Animals kept

	1	2	3	4	5
Frequency	30	0	15	7	1
%	55.6	0.0	28.3	13.2	1.9

Q20 Average no of cows 4.6

Q20 Average no of goats 4.7

Q20 Average no of others 5

Q21 Fish caught

	Omena	Tuna	
Frequency	0	0	

Q21 Average amount of fish caught 0 Kg/day

Q22 Refuse disposal

	1	2	3	4
Frequency	16	36	8	11
%	22.5	50.7	11.3	15.5

Q23 Type of sanitary facilities

	1	2	3	4	5
Frequency	3	57	11	0	0
%	4.2	80.3	15.5	0.0	0.0

Q23a Sanitary facilities requirements affected by culture/customs?

	Yes	No
Frequency	1	70
%	1.4	98.6

Q24 If no latrine, what is the alternative?

	1	2	3	4	5
Frequency	1	2	0	0	0
%	33.3	66.7	0.0	0.0	0.0

Q25 Liquid effluent disposal

	1	2	3	4	5
Frequency	3	3	4	0	0
%	30.0	30.0	40.0	0.0	0.0

Q26 Desludging interval for septic tank

	1	2	3	4	5
Frequency	6	0	1	0	0
%	85.7	0.0	14.3	0.0	0.0

Q27 Reason for not desludging

	1	2	3	4
Frequency	0	0	0	5
%	0.0	0.0	0.0	100.0

Q28 Rise in water level during rainfall in pit latrines

	1	2	3
Frequency	55	5	3
%	87.3	7.9	4.8

Q29 Knowledge about water related diseases

	Yes	No
Frequency	70	1
%	98.6	1.4

Q30 Diseases suffered by family in the preceding year

	1	2	3	4	5	6
Frequency	26	36	17	0	2	3
%	31.0	42.9	20.2	0.0	2.4	3.6

Q31 House type

	P	SP	T
Frequency	27	17	27
%	38.0	23.9	38.0

Q31 Electricity

	Yes	No
Frequency	16	55
%	22.5	77.5

Q31 Telephone

	Yes	No
Frequency	7	64
%	9.9	90.1

Q32 Average Distance from leaching pit/drain 0 m