DFID

Department for International Development
East Africa

CNTR Ref: 99 7763

Four Districts Water, Hygiene and Sanitation Programme, Uganda

Appendices — Volume 2

October 1999

WEDC

Water, Engineering and Development Centre
in association with
Kagga and Partners Ltd, Kampala
Mott MacDonald International, Cambridge

Department for International Development East Africa DFIDEA

4 Districts Water, Hygiene and Sanitation Programme: Uganda
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Appendices - Volume 2

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in Association with:
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Mott MacDonald, Cambridge

Contents List

Appendix 1

Schedule of People Met and Field Work Undertaken

List of People Met

Date	Organisation/Place	People Met
w/c 5 July	DWD - Planning Unit, Luzira	Richard Cong Mugayo Simon
	DWD. Luzira	Ian Arebahona - WES Co-ordinator Kabirizi Arron - Drilling Co-orrdinator
	DWD, Entebbe WRAP Project	James Montgomery Mr Kabateraine Fred Kyserora
	Ministry of Health/Robens Institute	Guy Howard
	Ministry of Finance	Ishmael Mugona - Head of Social Services
	Makerere University - Law Development Centre	Obtaining documentation
	NEMA	Obtaining documentation
12 July	DFID	Piers Vickers - IUD Daniel Davis - Governance Advisor James Grayburn - Economist Ros Cooper - Human Development Andrew Smallwood - Engineering Advisor
		Mike Carter - Trainer, CRDT
13 July to 15 July		Training in DFID Project Cycle Management and Team Building
16 July		Team meeting - planning methodology for fieldwork and arranging meetings in Kampala
19 July		Team meeting - planning methodology for fieldwork and arranging meetings in Kampala
20 July	DWD Rural Water Sector Workshop (Jinja)	
	ActionAid	Moses Mayende - Technical Co-ordinator
	Ministry of Gender and Community Development	Laban Mbulamuko - Project Co-ordinator, Community Development Management
21 July	Irish Aid	Kevin Colgan - Project Officer

Date	Organisation/Place	People Met
	DFID	Bella Bird - Social Development Advisor
	Ministry of Local Government Decentralisation Secretariat	Assumpta Tibamwenda - Community Management Specialist
	Ministry of Health - Environmental Health Division	Dr Okware - Commissioner for Health Services Paul Luyima - Assistant Commissioner
22 July	WaterAid	Monica Kunihira - Co-ordinator, Programme Support Unit
	CARE	Dr Tungwebaze Loma
	ActionAid	Nickson Ogwal - Programme Co-ordinator
	Danish Embassy	Sam Mutono - Programme Officer
	Ministry of Finance, Planning and Economic Development, Directorate of Budgets	Ishmael Magona - Head of Social Services Tim Williamson - Water Desk Officer Ann-Marie Inge - Education Desk Officer
23 July	DWD	Patrick Kahangire - Director Frank Mugisha-Shillingi - Assistant Commissioner for Rural Water
	Makerere University - Faculty of Law	Judy Obitre-Gama
	Mott MacDonald	David Kane
	UNICEF	Bill Fellows
KATAKWI DISTRICT - FIELD WORK		
26 July	Katakwi District Local Government Administration	CAO - Muron Ochakara DWO - Phillip Obaate
27 July	Katakwi District Local Government Administration	DWO - Philip Obaate DCDO - Fred Amudu DEnv O - Jesica Okui DHI - Okia Idholoi ACAO (Usuk) - Ocaloi John plus DVO, DFO, AgricO
	Katakwi District - Political Wing	Stephen Okure - District (LCV) Chairperson

Date	Organisation/Place	People Met
	Katakwi Town	Christine - Owner of shop selling spares for U2 and U3 pumps
	SOCADIDO	Rev Athanasius Mubiru Jacinta Nekesa Victor Male
28 July	Toroma Sub-County Local Government Administration	Okwir Basil - Sub-County Chief John Elado - Chairperson WES Committee
	Toroma Sub-County Local Government Administration	All LCI Village Chairpersons who had been mobilised to meet us!
	Field work in Olupe village	
29 July	Obalanga Sub-County Local Government Administration	Ejulu John - Acting Sub-County Chief Outgoing Sub-County Chief
	CHIPS	Harriet Anyago - Community Development Officer
		LCV Councillor for Obalanga Sub-County
	Field work in Agalibu vilage	
30 July	Katakwi District Local Government Administration	CAO - Muron Ochakara DPO - James Ebitu CFO
	ActionAid Katakwi	Francis Onyait - Field Development Officer
	Netherlands SDDP/KDDP	Mark Versteeg - Acting Programme Co-ordinator
31 July	Asamuk Sub-County Local Government Administration	Sub-County Chief - Esemu Basil - Asamuk Parish LCII Secretary for Defence
	Field work in: Asamuk Centre Village Akoboy Village Ajaki Parish Adodoi Village	
1 Aug	Move to Mbale	
KUMI FIELD WORK		

Date	Organisation/Place	People Met
2 Aug	Kumi District Local Government Administration	CAO- Rose Ochom ACAO (WES) - Simon Akileng Irish Aid Co-ordinator - Godfrey Okello Planning Officer - Ojilong Richard Economist - Ongaba Stephen
	RUWASA	Community Mobilisation Officer - Alice Senkula
3 Aug	Review and planning for field work activities, data analysis	
4 Aug	Kumi District Local Government Administration	DWO (Acting) - Simon Julius Olipot CDO - DVO - DEO - Ailak Benjamin NGO Umbrella organisation - Stephen Ojangole Inspector of Schools - Ochan Daniel Drugs Inspector - Augustine Akamu
5 Aug	Kumi District Local Government Administration	DHI - Christine Apio Personnel Officer - Lucy Francis Amulen
	Mukura Sub-County Local Government Administration	Chief - Chairperson - Ignatius Loyula Okurut
	Field work in: Madoch Village Agogomit Village Okonguro Village Aduli Village Akiet village	
6 Aug	Ongino Sub-County Local Government Administration	Chief - David Omongot LCIII Chairperson - Sub-Accountant - Health Assistant - Patrick Oonyu
	Field work in: Aguya Akum village Kaduka Village Olelia Village Kongura Village Akuro Village Aakum Parish Akide Parish	

Date	Organisation/Place	People Met
9 Aug	Kachumbala Sub-County Local Government Administration	Chief - Okurut David Esiat LCIII Chairperson - Health Assistant - Stanley Ogwang-Onyait Community Development Assistant - John
	Field work in: Kachumbala Parish & Village Kawo Parish, Ongaara Village Amus Parish, Amus villaeg Kwarikwari Parish & Village Omonyono Village Kongungaa Parish, Kongoidi Village	
10 Aug	Kobwin Sub-County Local Government Administration	Chief - Acam Florence Charles Kedi LCII Chief Tilling - George Akunguru
10 Aug	Vision Terudo, Ngora Town	
	Field work in: Oswaara Village Akarukei Village Kodike Parish, Pokor Village Tilling Parish, Tilling Village Atoot Parish	
11 Aug	RUWASA, Mbale	Monitoring Unit - Obtaining documentation
	CARE, Mbale	Marketing Co-ordinator - Andrew Kyambadde
	Mbale School of Hygiene	Paul Oluke
	CARE, Kumi	Andrew Ssawe Omurangi
	SDDP/KDDP, Soroti	Project Co-ordinator - Peter de lang
	Ministry of Finance, Planning and Economic Development, Kampala	Water Desk Officer - Tim Williamson
LIRA FIELD WORK		
12 Aug	Lira District Local Government Administration	DEO - Joan Palolo Economist - Patrick Ogwal
	All Nations Christian Care (ANCC)	Project Co-ordinator - Stephen Ajaki Administration Assistant - Hellen Owoch

Date	Organisation/Place	People Met
13 Aug	Lira District Local Government Administration	CAO - Odwedo Owere W D ACAO- Augustin Atwijukile
	Netherlands LDDP, Lira	LDDP Co-ordinator - Jaap van der Velden
14 Aug	Training field enumerators and facilitators in Lira	
16 Aug	Netherlands SDDP/KDDP, Soroti	SDDP Co-ordinator - Peter de Lang
	Kumi District Local Government Administration	DPO - Ojilong Richard
	Irish Aid, Kumi	Co-ordinator - Godfrey Okello
	Stakeholder Meeting, Kumi District Community Hall	see list of participants
16 Aug	Training field enumerators and facilitators in Lira	
	UNICEF, Kampala	Bill Fellows
	WaterAid, Kampala	Monica Kunihira
	Royal Embassy of the Netherlands	Obtaining documentation
17 Aug	Lira District Local Government Administration	ACAO - Augustin Atwijukile CDO - Pius Okabo Snr CDA - Esther Ruth Adili Snr CDA - Jackson Olea DHI - DMO - Personnel Officer - Peter Okello Snr Statistician - Okello Francis
	Apala Sub-County Local Government Administration	Chief - B Ochien Chairperson LCIII - Sub-accountant - Ngoro Bernard Walter
	Field work in: Obim Parish, Awing Village Abiiting Parish, Ashanting Village Atinkok Village, Awale Village Abia Parish, Abia Village and Akaidebe village	

Date	Organisation/Place	People Met
18 Aug	Muntu Sub-County Local Government Administration	Chief - Oyari Kendon Makmot CDA - Ayo Francis
	Field work in: Naluboyo Parish, Opir B Village Naluboyo Parish, Camurasa Village Alwala Village Amolotar Parish, Amolotar Acon Village and Inomo village	
19 Aug	Amugu Sub-County Local Government Administration	Chief - Ronald Achobi Chairperson LCIII - Charles Alicia Sub-accountant - Patrick Ogwal
	Field work in: Abangontin Parish, Alere village Ajoni Parish, Akisim village Abunga Parish, Agaukato village Omee Parish, Aluga village	
20 Aug	Stakeholder Meeting, Lira District Offices	See list of participants
	Lira District Local Government Administration	Assistant Water Officer - Patrick Ayor
	All Nations Christian Care (ANCC)	Ocen Deleo Moses - Project Co-ordinator
23 Aug	Apac District Local Government Administration	CAO - Faustin Olintingol ACAO - Ojok Victor Acting DMO - Praxeda Erach Acting DHI - Charles Assistant CDO - George Ogwanga Personnel Officer - Omodo Tony Acting District Planner (Statistician) - Pele Enon Alfred CFO - Jomilo Opio Deputy CFO - Loyce Abawo
	ActionAid	Field Development Co-ordinator - George Omolo M&E/Economic Projects - Geoffrey Odaga
24 Aug	Nabieso Sub-County Local Government Administration	Health Assistant - Okello Augustin Sub-accountant - Oduru John

Date	Organisation/Place	People Met
	Field work in: Anwanyi Parish, Teiligo village and Emin A village Acaba Parish, Atumu village Aomga Parish Bung Parish	
	Lira District Private Sector Promotion Centre	
	Lira Municipality Peri-Urban Infrastructure Project	
	Private Sector Participation in Low Cost Water Well Drilling	Drilling Consultant - Peter Ball Research Engineer - Kirsten Danert
	NEMA	Director of Information and Monitoring - Charles Sebukeera
25 Aug	Ibuje Sub-County Local Government Administration	Chief
	Field work in: Alworuceng Parish, Aballa village	Chief
26 Aug	Bala Sub-County Local Government Administration	
	Field work in: Amoladiag Parish, Atiira village	
28 Aug	Chegere Sub-County Local Government Administration	Chief - Geoffrey Awar Ojok Chairperson - Atim Robert HA - Ruma Bini Charles
	Field wok in: Teboke Parish, Agong village, Abolo village and Amunomia Pii village Barodilo Parish - Akademeri village and Akaoidebe village	
30 Aug	Olilim Sub-County Local Government Administration (Lira District)	Chief - Christopher Angonga LC III Chairperson - Patrick Ongom
31 Aug	Stakeholder meeting Apac District	See list of participants

Date	Organisation/Place	People Met
1 Sept	WaterAid	Amsalu Negussie - Country Representative Monica Kunihira - Programme Co-ordinator Piers Vickers - DFID
6 Sept	Drillcon	Leif Marstand Knudsen - Director Bent Hansen - Director
7 Sept	UNICEF	Bill Fellows
	Ministry of Finance	Tim Williamson

Appendix 2

List of Documents and References

Author/ Source	Date	Title
Danida	February 1999	Rural Water Supply and Sanitation Eastern Uganda Project (RUWASA) Phase II Review Report
DFID (as ODA)	July 1996	Manual of Environmental Appraisal
DFID	1997	White Paper on Poverty Eradication
DFID	1999	Uganda Country Strategy Paper
DFIDEA	May 1999	Project Concept Note Uganda 4 Districts Water, Hygiene and Sanitation Report
DFID/ Mouchel	April 1999	DFID Environmental Guide
DHV	1979	Shallow Wells
DWD/DFID/WELL	1998	Uganda Water Sector Scoping Study
DWD/ MWLE	August 1999	National Water Policy
DWD/ MWLE	1999	Water Supply Design Manual (Draft)
DWD/MWLE	Nov 1998	Contract for the Drilling of production Wells in Rukungiri Town
DWD/WES	Feb 1999	WES Programme Plan of Action for January to December 1999
DWD/ Danida/ Wardrop et al	July 1999	Water Sector Reform Rural Water and Sanitation Component, Investment Plan and Strategy 2000-2015 · Draft Final Report. Annex I Proceedings of Regional Workshops Annex II Socio-Economic Analysis · Annex III Detail Costing, Modular Designs and Technical Details
DWD/ Danida/ MM et al	Apr 1997	WRAP Inception Report
DWD/ Danida/ MM et al	Sept 1998	WRAP Report WRA02: Hydroclimatic Studies Report (Draft)
Ministry of Health	Dec 1997	National Sanitation Forum: Final Report
Ministry of Health	Dec 1997	National Accelerated Sanitation Improvement Programme 1998 – 2002
NEMA	Jan 1994	National Environment Policy
NEMA	1997	District State of Environment Report - Apac
NEMA	1997	District State of Environment Report - Kumi
NEMA	1997	District State of Environment Report - Lira
NEMA	1997	District State of Environment Report - Soroti
NEMA	1999?	Guidelines for Environmental Management at Local Government Level
Ministry of Finance	1998	Key Economic Indicators (35th
Ministry of Finance	?????	Poverty Eradication Action Plan, Vol I (Final Draft)
Ministry of Finance	Mar 1999	Uganda Poverty Status Report (Working Draft)
GoU	*?*	*Constitution of Uganda*
GoU	1995?	Chapter 269 of The Public Health Act of 1935, with subsequent amendment notes
GoU	May 1995	The National Environment Statute, 1995
GoU	Dec 1995	The Water Statute, 1995
GoU	1997	The Local Government Act, Act 1, 1997

GoU	Aug 1998	The Water Resources Regulations, 1998
GoU	Aug 1998	The Water (Waste Discharge) Regulations, 1998
GoU	Feb 1999	The Water Supply Regulations
GoU	Feb 1999	The Sewerage Regulations
GoU		*National Interim Water Quality Guidelines*
GoU/ UNICEF	Apr 1995	Country Programme 1995 – 2000: Master Plan of Operations
Univ of Southampton UK/ Nightingale S	1996	Cost Recovery and Willingness to Pay in the Water and Sanitation Sector A Case Study in Uganda (MSc Dissertation)

Appendix 3

Sample Checklists

DISRICT LEVEL

Checklist for meeting with the CAO

1) The management capacities in the key departments in the District and Lower Local Councils. Probe for the staffing levels, qualification and experience of key staff and quality of performance.

2) The effects (positive and negative) of Government Policies on the delivery of water and sanitation services in the District especially to the poor. Probe for the effects of·

   a) the Local Government Act 1997;
   b) the Water Policy;
   c) the Land Act 1998;
   d) the Civil Service Reform, and
   e) other Government policies.

3) Functioning of the different technical and council committees at the District level. Probe for the composition, roles and functioning of the·

   a) District Technical Planning Committee,
   b) District Management Team (where it exists);
   c) WES steering committee;
   d) District Local Government Tender Board,
   e) Council Committee responsible for water and sanitation etc ..

4) Support given by the District to the Sub-counties Probe for

   a) Nature and quantity of trainings conducted,
   b) Procedure and frequency of monitoring and supervision activities;
   c) Other mentoring activities.

5) Support received by the District from the centre and other donors. Probe for

   a) Training and other capacity building activities by central Government and donors like the Irish and Netherlands,
   b) Support in implementation especially procurement and supervision of complex services,
   c) Financial and logistical support;

6) Customary laws affecting accessibility of the poor to water and sanitation facilities and services. Probe for cultural practices and beliefs that may hinder the delivery of water and sanitation services.

7) The key project partners (NGOs, CBOs) in water and sanitation provision in the district and capacity to participate in the project. Probe for their nature, current activities, methodology, effectiveness and relationship with the District.

8) Structural problems in the District and Lower Local Governments demotivating staff and recommendations for combating them.

9) Existing role of the private sector in service delivery, operation and maintenance and constraints in their operation. Probe for

   a) existence and performance of mansons, private hygiene educators, pump mechanics, spare part dealers etc...
   b) mechanism for broadening and strengthening private sector capacity to increase their role in the provision of services.

10) What technical assistance is required to build capacity at Local Government level.

11) What is the most appropriate partnership arrangement between technical assistance, districts and central ministries. Probe for the weaknesses and strength of the arrangement proposed.

12) What are the most appropriate community level structures to manage water supplies. Probe for the practical legal status, relationship to local councils and capacity to manage effectively

13) What are the risks to project success and what are the mitigating measures to reduce the impact of the risks

DISRICT LEVEL

Checklist for meeting with the District Planner

1 Process and progress in the production of the District and Sub-county Three Year Development Plans. Probe for·

a) Training and other preparatory activities for planning;
b) Sequence of activities during the planning process;
c) Procedure for data collection from villages and mechanisms for consolidation into Sub-county and District Plans;
d) Participation and co-ordination between the different sectors,
e) Review the quality of the Development Plans if they exist;
f) Constraints met during the planning process;
g) Support required to supplement the planning process.

2. Incorporation of activities for water and sanitation provision and budget allocation. Probe to find out money allocated and actually released for water and sanitation activities during the previous financial year

3. Capacity building needs and initiatives: Probe for·

a) Mechanisms for identifying, addressing and monitoring improvements;
b) Local resources available for training.
c) Technical assistance required to build capacity at Local Government level

4. What are the most appropriate community level structures to manage water supplies. Probe for the practical legal status, relationship to local councils and capacity to manage effectively

5. Monitoring, technical audits and information sharing. Probe for.

a) Technical audit arrangement for the programme.
b) Indicators for monitoring the capacity and commitment of District administration and community water and sanitation committees to deliver basic water, hygiene and sanitation services.
c) Possible links and information sharing with other related programmes.

6. Existing role of the private sector in service delivery, operation and maintenance and constraints in their operation. Probe for

c) existence and performance of mansons, private hygiene educators, pump mechanics, spare part dealers etc...
d) mechanism for broadening and strengthening private sector capacity to increase their role in the provision of services.

7 What are the risks to project success and what are the mitigating measures to reduce the impact of the risks

Checklist for meeting with the District Personnel Officer

1) Staffing and management capacity: Probe for:

   a) Structure (established positions);
   b) Staff numbers (filled positions);
   c) Skills in all District Departments and Lower Local Councils;
   d) Management capacities in the key departments in the District and Lower Local Councils;
   e) The effect of the Civil Service on staff morale and performance;
   f) Other structural problems in the District and Lower Local Governments demotivating staff and recommendations to avert the situation.

2) Training and capacity building initiatives: Probe for.

   a) Mechanism for identifying, addressing and monitoring improvements arising out of the training and other capacity building initiatives,
   b) Local resources available for training,
   c) Technical assistance required to build capacity at Local Government level

Checklist for meeting with District/Sub-county Chairperson/Executive/Sectoral Committee responsible for WES

1 General discussion on functioning of the Executive, Council and sectoral committees with special emphasis on procedure and constraints.

2. Opinion on the management capacities in the key departments in the District and Lower Local Councils.

3. Structural problems in the District and Lower Local Governments demotivating staff and recommendations to avert the situation.

4. Relationship between the politicians and civil servants and how it affects performance and achievement of goals

5 Partnership arrangement between technical assistance, districts/sub-counties and central ministries.

6 Community level structures to manage water supplies – legal status, relationship to local councils and capacity to manage effectively.

7 Customary laws affecting accessibility of the poor to water and sanitation facilities and services

8 Risks to project success and mitigating measures to reduce the impact of the risks

Checklist for meeting with District Health Officer

Structure and Staffing levels in district

- Which Head of Department does DHI come under?
- How many Health assistants or other staff does DHI have?
- Capacity at sub-counties? And programme?

Equipment

- What transport does the DHI have?
- What transport do assistants have?
- Access to a computer?
- Which problems do they face?

Available data

- What existing data does DHI have on sanitation coverage? (request copy)
- Is this UNICEF MIS data or other?
- Reliability/ confidence in data?
- Coverage by sub-county?
- What data is collected through health post and clinics?
- Are programmes of NGO's monitored? By whom?

Technology

- Types of sanitation technology appropriate and promoted for each sub-county/area?

NGOs/CBOs/committees

- Any organisations involved in water and sanitation activities?
- Types of technology promoted by these players?
- Co-ordination with district?
- Existence of committees, WES committee, health committees? Their roles and responsibilities?

Private sector

- Latrine constructors? Who trained them?
- Pit diggers?

Community contributions

- Capital contributions to the construction of facilities for schools?
- Subsidies for slabs by the government?

Water

- Linkage/co-ordination with District water officer?
- Training of communities linked to water provision?

Institutions

- Provision of sanitation facilities to institutions?
- School sanitation programme

Other

- What would be according to the DHI a good programme to tackle the low latrine coverage? And who are the key partners to work with?
- Reasons for the low coverage?
- Customary laws for the use of latrines?

Checklist for meeting with District Water Officer

Structure and Staffing levels in district

- Which Head of Department does DWO come under?
- How many engineering assistants/other technical staff does DWO have?
- Capacity at sub-counties?

Equipment

- What transport does the DWO have?
- What transport do assistants have?
- What equipment for implementation does district own (e.g. drilling rig)
- Access to a computer?

Available data

- What existing data does DWO have on water coverage? (request copy)
- Is this UNICEF MIS data or other?
- Reliability/ confidence in data?
- Coverage by sub-county?

Technology

- Types of technology appropriate for each sub-county/area?
- Number of boreholes functioning?

NGOs/CBOs

- Any organisations involved in water and sanitation activities?
- Types of technology promoted by these players?
- Co-ordination with district?

Private sector

- Hand pump mechanics? Who trained them?
- Well diggers?
- Outlets for spare parts?
- Any ideas for promotion/innovation/

Community contributions/O&M

- Capital contributions to facilities?
- Consultation during provision of facilities?
- Organisation for O&M?
- Contributions to O&M?
- Training?

Hygiene and Sanitation

- Linkage/co-ordination with Health Inspector?
- Training of communities linked to water provision?

Institutions

- Provision of water facilities to institutions?

Planning

- Capacity and progress with planning/budgeting water provision

PRA CHECKLIST

Transect
Direct observation of geographical, geological features, household size, type of housing, location and type of water sources, latrine types and distribution, hygiene behaviour

Sanitation Ladder
Level of awareness on use of latrines, practices, awareness of sanitation-related diseases, attitudes towards use of latrines, types of latrines common in village, % latrine coverage in village, problems related to latrine construction (collapsing soils, hard rock, etc.), proposed solutions, preferences for latrine types, ways in which needs of vulnerable groups can be met

Focus Group Discussion (small group) on Sanitation
Methods of disposal of faeces of small children, when, where, who responsible. Constraints encountered in completing latrines, (beyond rotting logs and lack of slabs). WTP for slabs, and affordability. Availability of slabs. Identify perceived benefits of having a latrine (e.g. reduction in treatment costs)

Social Map
Infrastructure:
houses, paths, drainage, school, church, health centre, clinic
How long community established in the village
Neighbouring/bordering villages
Environmental:
location of latrines, shambas, disposal wastewater
Water sources:
existing water sources, (functioning, non-functioning), incl. boreholes, shallow wells, hand-dug wells (community/NGO) springs etc. Distance to water sources, distance to fuel
If new waterpoint installed, which other villages likely to use it
If they do, how will community handle this
What problems might occur

Water Preference Ranking
Availability of water in different sources in village
list of household activities related to water, distances, quality and usage of water, reliability and seasonal variations per source, purposes for which water collected, preferences for sources in relation to purpose
WTP issues: how much will they pay for capital investment, O&M of a new waterpoint
Consumption patterns (per capita per day)

Transect (2)
Visit households indicated on Social Map for one-to-one discussions on e.g. livelihood issues, hygiene practices

Institutions
Local institutions, official and unofficial, (schools, health centres), traditional institutions, NGOs, CBOs, cooperatives, informal gatherings, credit societies, women's groups, youth clubs

Seasonal Calendar
Annual rainfall, water availability, harvest times, labour demand according to gender, food shortages and diseases affecting people, animals, crops, social and religious events and ceremonies
Incomes after harvest when crops sold (equivalent cash)
Drought related incidences (Karamajong incursions)

Gender
Mobility Chart
Division of labour, time expenditure of men and women, children on daily activities, eg home maintenance, water collection, cooking, fuel collection
Economic activities, eg land preparation, planting, weeding, harvesting, livestock rearing, social activities

Resources/Control Profile
Differences in access to resources (esp. cash) in the community by men and women, different levels of control of these resources by men/women.

Livelihood issues
Livestock
Size of herd (average) per homestead; ideal size of herd
Govt. cattle restocking activities in the past
Other NGO support for cattle re-stocking

Poverty issues
Identify households without cattle in the village
Coping strategies
Food security - any specific govt. (or other) programmes in area
Income generating activities esp. for women ongoing

Some of the issues to be considered when inspecting point sources or when meeting members of LCIs

Identification:
County
Sub-county
Village
Name of person you are speaking to
Position he/she holds in the village or on WATSAN committee

Specific for Water Points:
Are there many people collecting water – count how many
Are there many people waiting around the source?
Check the yield of the source
Find out if the source is seasonal or they use it throughout the year
If it is seasonal, find out the other sources they use in the dry season
Find out how far away those at the source have been walking to get to the source
Find out how much time they normally have to wait at the source in the morning and evening
If it is a HP try pumping – is the HP O.K or what is the problem?

O&M arrangements:
Is the person you are speaking to aware that there is a committee managing the source?
How many members are on the committee
Does the committee meet and if so has he/she ever attended the committee meetings
As far as the person you're interviewing remembers, has the source ever been maintained?
What was involved – did the community contribute some money, how much?
How was the committee formed and how can a new committee be formed in case the current one fails to deliver?
Are the water users happy with the performance of the committee?
Do you think the source is properly cleaned - observe
Find out when the committee las cleaned the source
If they have a caretaker, is he/she paid and how much

LCI
Population size
Number of Households
Any baseline survey conducted on the village?
Water and sanitation coverage
Any active CBO and NGO
What are theNGO/CBOs doing in the village?

Latrine
Find out there are local people available who can dig latrine pits and find out how much it costs per foot
Write down some of the names of people available at the village or Sub-county who normally dig pit latrines
Are local materials readily available
Why have people failed to build latrines
What proposal can the LC make to enhance latrine cosntruction

And many others

Structured observations at water sources

Type and condition of water source

Type of water source	borehole/protected well/unprotected well/protected spring/unprotected - spring/river-pond-lake/valley/dam/rainwater/other
Type of pump	ut2/ut3/nera/tara/other
Is there a cattle through near the water source?	Yes/no
Is the water source fenced?	Yes/no
Condition of the pump?	Good/fair/broken/none
Other information of interest	

Activities at the water source (ones that you have seen while at the water source)

Fetching water	yes/no
Washing containers	yes/no
Washing clothes	yes/no
Bathing-washing yourself	yes/no
Watering animals	yes/no
Other, specify,	

Water source hygiene

Do you see any animal faeces at/near the water source?	Yes/no
Do you see any waste at/near the water source?	Yes/no
Do you see any human faeces at/near the water source?	Yes/no
How is the drainage of the wastewater?	Poor/fair/good
Is there any stagnant water at/near the water source?	Yes/no

Users of water and water collection

Person 1

Who have you seen collecting water?	Women/men/children
What utensils, if any, are used to collect water? (specify)	clean or not
What kind of containers are used to transport the water with?	Jerrycans/open buckets/other
Are these containers cleaned before use?	Yes/no

Person 2

Who have you seen collecting water?	Women/men/children
What utensils, if any, are used to collect water? (specify)	
What kind of containers are used to transport the water with?	Jerrycans/open buckets/other
Are these containers cleaned before use?	Yes/no

Person 3

Who have you seen collecting water?	Women/men/children
What utensils, if any, are used to collect water? (specify)	
What kind of containers are used to transport the water with?	Jerrycans/open buckets/other
Are these containers cleaned before use?	Yes/no

Other remarks

School sanitation checklist

Questions for Head Master

Number of pupils? Total Boys Girls
Is thtere a teacher responsible for Health issues? Yes/no
Role of the health teacher

Is there a School health committee? Yes/no
Role of the school health committee

Do they have health parades each morning? Yes/no
What is been thought on health and hygiene at school?

Number of stances for Teachers Boys Girls
Number of urinals for boys
Existence of hand washing facilities yes/no distance
If no latrines available. are their plans for them to be build in the near future? Yes/no
By whom? Government/NGO/community contribution

Prevalent diseases and if this has any consequences for the enrollment of pupils?

Visit to the latrines

Any signs of the use of the latrine? Yes/no
Type of latrine

Cleanliness of the latrine? Poor/Fair/good
Signs of burning grasses in the latrine yes/no
Condition of the latrine Poor/Fair/good
Maintenance of the latrine Poor/Fair/good
Signs of cleaning agents in the latrines? Yes/no
If yes what kind of agents
Who is responsible for the cleaning of the latrines? Pupils/teachers/others
Handwashing facility nearby the latrine yes/no

Drinking water

Is there a safe water source near (less than 0.5 km away) the school? Yes/no
If no, how far is a safe source from the school?
Is there safe drinking water available in the classrooms? Yes/no
How is it stored?
And how is drawn?

Household visits-structured observations

Water

Kind of pot the water is stored in?	For drinking water	covered: yes/no
	For other water	
	All water stored in same pot	yes/no

Cleaning of the pot in which drinking water is stored? Seen/not seen

Method of drawing of drinking water out of the pot?

Is there any special utensil for drawing water out of the pot? Yes/no

Is this utensil used for drinking? Not been able to observe yes/no

Latrines

Is there a latrine? Yes/no

If latrine is there, any signs of the use of the latrine? Yes/no

Type of latrine

Cleanliness of the latrine? Poor/Fair/good

Signs of burning grasses in the latrine yes/no

Condition of the latrine Poor/Fair/good

Maintenance of the latrine Poor/Fair/good

Signs of cleaning agents in the latrines? Yes/no

If yes what kind of agents

Handwashing facility nearby the latrine yes/no

Disposal if faeces of small children?

Food hygiene

Where is the food stored? Granaries/huts/other

How is the food stored? Open/covered/in bags

How is cooked food stored? Not seen any/covered/without cover

Handwashing practices

Seen anybody washing their hands during the household visit? Yes/no

Handwashing before and while preparing food? Not seen/no/yes

Handwashing before eating and or feeding? Not seen/no/yes

Use of soap or ashes? Not seen/no/yes

Environmental health

Has the compound signs of:	Animal faeces	yes/no
	Human faeces	yes/no
	Vegetable waste	yes/no
	Being swept every day	yes/no
	Presence of small livestock	yes/no
	Presence of livestock	yes/no

Is there a waste pit? Yes/no

Is waste being thrown in the gardens around the household? Yes/no

Is there a bathing shelter? Yes/no

How is the drainage? Poor/fair/good

Is there any stagnant water visible? Yes/no

Appendix 4

District and Sub-county Institutional Profiles

Katakwi District and Sub-county Institutional Profiles

Overview

Katakwi District is glossily understaffed according to the established structure inherited from Soroti District. It has reviewed and developed a structure commensurate with the District needs and capacities and submitted it to the District Executive, Ministry of Public Service and Ministry of Local Government for further review and approval. The District realised a need to have a structure that is effective, and with a manageable wage bill. To-date out of about 55 million received as the conditional grant from the central Government about 43 million is used to cover the wage bill. This scenario leaves no money for development.

District Level

In **Management** out of 139 established positions, 118 are filled. The staff in place include the CAO who is overloaded with work due to the devolution of functions to the District Local Government and especially because there is no Deputy CAO. The District has three instead of five ACAOs who are based in the three counties supervising, and mentoring sub-counties. The District feels that the ACAOs would be more useful if they were based at the District Headquarters to supplement the overloaded management with schedules of duties incorporating responsibilities and functions for the different units in addition to roles in the counties.

One person holding a Bachelor of Arts in Social Worker and Social Administration with a wide range of short courses solely executes the **Personnel function**. Given the heavy work load with new job demands, the Personnel Officer need more training in order to be able to identify training needs, address them, monitor acquisition and adoption of skills and conduct performance appraisals among others. There is also a need to recruit the Secretary for the **District Service Commission** to guide the newly established D.S.C.

In **Internal Audit** out of the six established positions 3 are filled including 2 audit assistants and a copy typist. The District carried out interviews to recruit the Senior Internal Auditor. Notwithstanding the above, the established positions are few such that even if they are filled they cannot effectively handle the internal audit function. A lot of funds are flowing to the district including UPE, health and donor funding yet they are also required to audit and support Sub-accountants in the Sub-counties.
The Internal Audit Department is not in position to inform the **Public Accounts and District Council** to make informed decisions for financial control. Perhaps donors should help the District to outsource Internal Auditors to assist in the quarterly internal audits and report to council.

The District has no substantive **Chief Finance Officer**. The books of accounts are handled by Sub-accountants leading to poor vote book control, delay in the production of final accounts for 1997/98 financial year as per provided format among others. The District is in the process of soliciting assistance from the MoLG and plans to recruit a Finance Officer to deputise the CFO and control the revenue and budget aspects. Sub-accountants are also to be recruited to maintain the books of accounts. The new staff will need training to be oriented to the Local Government accounting procedures and financial regulations.

The **Planning Unit** has only one person the Planner/Economist but the District has interviewed and will soon appoint a Population Officer. The Planner has met a lot of challenges in the process of generating needs from the Sub-counties and sectoral heads to be incorporated in the District Development Plan. The responsible heads need to be

further oriented to the Local Government planning procedures. The problem is aggravated by the non-functionality of the **District Technical Planning Committee**.

Out of the 162 positions established in **the Production Department** 49 are filled. The few staff in the Department are experienced and well-qualified. For instance the District Agriculture Officer holds a Masters Degree.

Technical Services Department has 9 positions filled out of the 23 established. There is no District Engineer. However, the District has recruited Diploma Holders as supervisors of works, **acting Water Officer**, Building Inspectors and three Roads Supervisors. Posts for two assistants (in charge of boreholes and spring protection) to help the Water Officer have been advertised and are expected to liase with CDAs at the Sub-county level in the execution of the Water function.

Education and Sports have 11 positions filled out of the 16 established. The Department is managed by an experienced and well-qualified DEO. Whereas the teachers are not included on the current structure they are a potential to be tapped for hygiene education and sanitation campaigns especially in schools.

Health has 190 positions established and only 79 are filled. There is only one Doctor in the District. Most of the staff below him are in acting positions. The ongoing establishment of the health Sub-districts at the county level implies that the District has to recruit a Doctor and Medical Assistant in every county. The District has 3 Health Inspectors in charge of counties and 1 DHI.

The **Community Based Service Department** is understaffed. At the District level there is no Community Based Services Co-ordinator. A Community Development Officer and a Probation and Welfare Officer man the Department.

The District has in place a **Management Committee for WES** composed of heads of departments implementing water and sanitation activities (CAO, ACAO-WES, DHI, DWO, CDO). This committee is functional and fills in the gap created by the non-functionality of the DTPC. The committee reports to the **District Steering Committee WES**, which was formed under the UNICEF funded WATSAN/WES programme and to Council. The Steering Committee is responsible for policy and overseeing WES project implementation activities. It is supposed to be meeting quarterly but it does not meet regularly.

The District has four **council sectoral committees** thus: Finance and Planning, Works and General Purpose, Health, Education and Children Affairs and Production and Environment. Whereas these committees are in place they need a lot of strengthening. The technical wing should synthesise issues and submit reports to make them make informed decisions.

Sub-county Level

All Sub-counties in the District have Sub-county Chiefs. However, most of the Sub-county Chiefs were recruited before decentralisation and were basically charged to keep law and order and to collect revenue. With increasing roles in planning, budgeting, co-ordination due to decentralisation most of the Sub-county Chiefs cannot spearhead development in their Sub-counties including the supervision of extension staff who are in most cases more qualified than the Sub-county Chiefs.

The District lacks resources to train them and some of them are not trainable. The option of retiring those that are not trainable is difficult because the District lack resources to pay their retrenchment package. The situation is made worse because the District inherited a

salary debt of about 70 million from Soroti District. Perhaps the District should gradually replace the Sub-county Chiefs with those more qualified and positioned to handle the increasing functions.

Most of the Sub-counties have Sub-accountants but they do not properly maintain the books of accounts and they have not put in place an LPO and stores control system. Special arrangements have to be put in place to build their capacity because for now they receive ad hoc and lukewarm support from the poorly staffed Internal Audit Section.

Out of the 14 established positions for Health Assistants, the District has only filled 5. This is one of the reasons that may explain the low demand and coverage of sanitation facilities.

The Water and Sanitation Committees formed under UNICEF's WES programme are at large not performing their responsibilities to supplement the non-existent, poorly facilitated and demotivated health personnel. Despite the fact that UNICEF provided each WES committee with three bicycles, there is no vote allocated for there maintenance. The WES committee is further demotivated because there are no allowances allocated to it by the Sub-county Council. Moreover, many of the members of the WES committees were elected to the councils and no longer give precedence to the execution of the roles of the committee. For instance in Toroma and Obalang Sub-counties, the WES committees last met in December 1998 and 1997 respectively.

Two instead of 14 Social Workers are in place. Notwithstanding the understaffing, the staff are a potential for mobilisation for water and sanitation activities and participation in the training of water source committees. There is also a potential to use the same staff in facilitating a participatory planning process.

The District has Assistant Agriculture Officers in all most all sub-counties and recruited three agriculture graduates and strategically deployed them to Sub-counties that are models for agriculture mordenisation. For now they are responsible for the three counties. The people in the production department are a potential to be used in facilitating the planning process at the Sub-county level.

All the 78 Parish Chiefs are in place. They are not likely to effectively handle the increasing role in planning, supervision of projects and guiding the local councillors most of whom are of low education standards because there was no minimum standard set during local council elections.

The above not withstanding, the Parish and Village councils remain a key channel for project activities in the villages especially where other structures like the Water User Groups and Parish Development Committees have only existed and performed duties during the existence of donor support.

Apac District and Sub-county Institutional Profile

Overview

The District is reasonably staffed with most of the established positions filled. The **District Service Commission** has recently recruited a number of staff, advertised and short listed candidates for a number of others as explained below.

District Level

In the **Management Department**, there is an experienced CAO at a level of Under Secretary, Deputy CAO and 4 ACAOs. However, two out of the four ACAOs are newly recruited need to be inducted, given a wide range of training and orientation to the local government procedures. The post of the Senior Administrative Officer (ACAO) special duties is not filled.

In the **Personnel Department** there is no Principal Personnel Officer and the Senior Personnel Officer is acting. He holds a bachelor's degree, a certificate in human resource management and training in records management. The two Personnel Officers are not in place but their positions have been advertised. The Records Officer is also not in place. However, in place are the Senior Personnel Assistant Grade 11 and Senior Records Assistant Grade 11. Some of the staff in place need to be given a wide range of human resource management skills to be able to cope up with the challenges of the Department especially training needs assessment, record management and performance appraisals.

The Senior Economist/**District Planner** is on interdiction. The Population Officer and Statistician are in place. The Statistician is newly recruited and need induction and training. The District has advertised for the position of the Urban Officer.

The **Internal Audit** section is only staffed with a Seniors Internal Auditor and one instead of four Internal Auditors in charge of schools and administration. Nevertheless, the District has advertised and short-listed for the positions of the Principal Internal Auditor and Internal Auditors in charge of schools and administration. No attempt has been made to recrui the two Assistant Internal Auditors.

Apart from the Principal Finance Officer, and Finance Officers in charge of procurement and budget all positions in the **Finance Department** are filled. The District has also advertised for the positions of the Principal Finance Officer.

The **Engineering Department** is the most understaffed in the District. All the established positions of heads of departments are not filled. In the **Water Department** there is substantially one position of Assistant District Water Officer filled. The District has no Water Officer but they have advertised for the position. There is need to fill all the established positions and recruit of Water Assistants in charge of Sub-counties before the implementation of the programme.

Apart from the District Community Development Manager and Assistant Probation and Social Welfare Officer all the established positions in the **Community Based Services Department** are filled. In the Education Department, the majority of positions are filled.

The District Director of **Health Services** is on interdiction. There is a **Principal Health Inspector**, Senior Assistant Health Educator, four Health Inspectors and District Health Educator.

Out of the 38 positions established in the Agriculture Department 27 are filled. All the technical positions in the Veterinary and Fisheries Department are filled. The District Entomologist died and his position has not yet been advertised. The District Commercial Officer, Trade and Marketing Officer and Co-operatives Officer positions are not filled. The District has also advertised for the position of the Production Manager to head the **Production Directorate.**

The District has a **District Management Team** for WES, which plans and reviews WES activities and compiles reports. The DMT is composed of staff directly responsible for implementing WES activities and is supposed to be meeting monthly. The DMT was supposed to report to the District Steering Committee for WES but it is no longer functional because the Centre stopped paying for their allowances. The PMT currently report to three council sectoral committees thus Health, Works and Finance and Administration. This is because the Works committee handles water issues, Health Committee handles sanitation and Finance and Administration Committee handles community mobilisation.

The challenge is that the different sectoral committees may not accord the same priority to the planned activities yet their integration is a major determinant for effective implementation. The funds for the components of the same activity are also requisitioned for separately and may not be released at the same time stalling implementation. There is need for the PMT to report to the DTPC, which should report to the council.

The **District Local Government Tender Board (DLGTB)** is functioning. It is composed of five members who sit whenever there is need. The tender board has the following challenges:

- The Heads of Departments do not send requistions in a co-ordinated way necessitating it to meet more often than prescribed;
- Sometimes the technical staff do not have the capacity to prepare render documents;
- The decisions of the tender board are some times politically influenced ignoring the advice of the technical evaluation committee.

The DLGTB and staff need a lot of training regarding contracting and contract management.

The District Council is very active and makes relevant deliberations. When there is need it means more than the required four times in a year. The Executive meets monthly.

Sub-county Level

Out of the 20 Sub-counties in the District 15 have substantive **Sub-county Chiefs**. The other five Sub-county Chiefs retired recently due to old age and their positions have been advertised and candidates most of them Diploma holders short listed. The District is processing their benefits to be approved by the Office of the Auditor General. The Sub-county Chiefs who occupy the positions do not have the basic qualifications and a number of them were recruited as Parish Chiefs. The ACAOs try to give them support.

They are 104 out of the established 108 positions of the **Parish Chiefs** filled. The Parish Chiefs were reported capable of executing their roles if they collaborate with the Parish Counsellors.

All the 20 established positions of **Accounts Assistants** Grade 1 in charge of Sub-counties are filled. The majority of them has low basic qualifications and sometimes fails to produce final accounts and maintain books of accounts. The Sub-counties have no LPO and stores control systems. The District has also appointed 20 Personnel Assistants in charge of Sub-counties to assist the Sub-accountants.

Out of the 20 established positions of **Assistant Agriculture Officers** 18 are filled. All the 10 and 8 established positions of Assistant Animal Husbandry Officers in charge of extension and Fisheries Assistant respectively have been filled. They however, handle more than one Sub-county.

In place are 20 **Assistant Community Development Officers** in charge of Sub-counties but nine of them are newly recruited and need induction and training. This is especially because some of them do not have prior training and experience in community development related disciplines. The District plans to send three CDAs per year to UMI for training. Nevertheless, the staff in the department can be used for social mobilisation in the programme.

In place are 8 **Health Assistants** to man the twenty sub-counties leaving a very big establishment gap. It is recommended that before the implementation of the programme, 12 Health Assistants be recruited to fill the gap.

Despite the presence of staff, the Sub-county TPCs are not functional.

At the Parish level, the communities have identified and the District trained Community Health Workers who work with the LCs as volunteers to spread sanitation messages and monitor behaviour changes.

Lira District and Sub-county Institutional Profile

Overview

The District is well staffed with most of the established positions filled. The **District Service Commission** has confirmed people in the positions and is in the process of filling the few vacant ones.

District Level

In the **Management Department**, apart from one Assistant Chief Administrative Officer all the established technical positions are filled. The CAO holds a Masters degree and all ACAOs have post graduate qualifications with a wide range of short training courses. It is however recommended to have an additional ACAO to supplement the CAO and DCAO in the execution of the management function at the district headquarters. The District has an Urban and Information Officer and News Reporter.

All the established positions in **Internal Audit** are filled. They include a Principal Internal Auditor, Senior Internal Auditor and five Internal Auditors based in the Counties. The Auditors are facilitated with motorcycles and carry out quarterly internal audits. However, the PAC and Council do not use the internal audit reports in making sure that the district resources are well utilised and accounted for. The Principal Internal Auditor is newly recruited and need orientation.

In the **Personnel Department** there is a Senior Personnel Officer with a Masters Degree and is going to be promoted to a Principal Personnel Officer. There are two Personnel Officers, three Personnel Assistants and fifteen Records Assistants. The Department lacks one Principal Personnel Officer. Some of the staff in place need to be given a wide range of human resource management skills to be able to cope up with the challenges of the Department.

In the **Planning Unit** apart from the Population Officer who died, all other established positions are filled. They include the Senior Economist, Statistician and Assistant Statistician. Apart from the CFO who is acting, all the positions in the **Finance Department** are filled.

A substantive **District Engineer** is in place with one Engineering Assistant Grade 1. The Engineering Assistant Grade 11 and the two roads Inspectors positions are not filled.

In **Water Department** there are two positions filled out of the three established. The Water Officer died recently. The District maintained the crew of five people. The three staff on the establishment are not enough to manage the department because the private sector that was anticipated to participate in the implementation is not developed. The District is in the process of reviewing the structure and recruit four Engineering Assistants each one being in charge of a County.

Apart from the District Youth Organiser, all the established positions in the **Gender and Community Services Department** are filled. In Place is a Community Development Officer, Probation and Assistant Welfare Officer and Assistant Rehabilitation Officer.

The District Director of **Health Services** is acting and there is only one Medical Officer instead of five to man the health sub-districts. There is a big establishment gap in the health department because some of the health units are managed by nursing aides. There is a **District Health Inspector** and District Health Educator.

All positions in the **Education, Production and Marketing Departments** at the District are filled. The schools can be used as an entry point for sanitation and hygiene improvement in the communities.

It was noted that some of the **council committees** do not know their roles and sometimes interfere with management responsibilities. There is need for role clarification. The **DTPC**, which would have guided the council, is not functional and advice to council is given on departmental basis.

The **District Local Government Tender Board (DLGTB)** is functioning. It is however required to sit more times than provided for to cater for the uncertain donor released resources. Some of the Heads of Departments cannot prepare tender documents and render tender evaluation difficult and subjective. The DLGTB needs a lot of training.

The District has a **District Management Team** for WES composed of the Water Officer, DDHS, District Planner, CDO, DHI, DHE and DEO. It plans, supervises and reviews programme implementation and it is functional. The District Management Team reports to various sectoral committees making co-ordination of activities difficult.

Sub-county Level

Out of the 24 Sub-counties in the District 20 have substantive Sub-county Chiefs. Whereas about half of them are Diploma holders they find it difficult to cope with the newly devolved functions and need a lot of support and training. They are 137 out of the established 155 positions of the Parish Chiefs.

Out of 24 established positions of Accounts Assistants Grade 1 22 are filled and 20 out of the 24 established positions of Accounts Assistants Grade 11 are in place. The majority of them has low basic qualifications and sometimes fails to produce final accounts and maintain books of accounts. The Sub-counties have no LPO and stores control systems.

In place are 8 Senior Community Development Assistants in charge of Sub-counties. The staff in the department can be used for social mobilisation in the programme. All sub-counties have health supervisors. They are 7 Veterinary Officers, 5 Agriculture Officers and 4 Fisheries Officers.

Despite the presence of staff, the Sub-county TPCs are not functional.

The Agriculture Officers, Health Assistants and Sub-county Chief have motorcycles and other staff have personal bicycles.

Kumi District and Sub-county Institutional Profile

Overview

Kumi District is in the process of reviewing the staff structure. Heads of Departments have reviewed their staffing levels and needs and made proposals leading to the production of the new staff structure. The new structure will be presented to the District Council for approval.

District Level

The **Management Department** has 18 positions filled out of 27 established. There is a CAO and three ACAOs in charge of counties but one of them is on suspension. The ACAOs have 2-3 years experience and need more orientation to the Local Government administrative procedures. The position of the DCAO is not filled.

There is no Senior Personnel Officer. The Personnel Officer, assisted by a Personnel Assistant mans the **Personnel function** including being the secretary to the District Service Commission.

In the **Finance Department**16 positions out of the18 established are filled. Most of the staff occupying the positions in the department lack the basic qualifications and have attained seniority because of experience. They have attended short training courses but need more exposure to be able to cope up with the demands of the new financial and accounting regulations.

The **Planning Unit** has filled 2 out of the 5 established positions including a Statistician/Planner and an Economist. The Post of the Population Officer was advertised and the District will hold interview soon to fill it. Filling the post of the Population Officer will greatly boost the capacity of the Planning Unit to handle the planning function. Whereas the staff in place are qualified and have the basic planning skills, they need further training to orient them to changes in the planning processes. The Unit is co-ordinating the production of the District and Sub-county Development Plans.

Out of the 158 positions that are established in the **Production Department** 124 are filled. There are only five Assistant Veterinary Officers. Most of the staff in the Department, on top of their routine duties also carries out tasks for people on a private basis for payment.

In the **Works Department** Out of 21 positions established, 19 are filled
The District Engineer is in place but newly recruited. The Department lacks works supervisors for roads and buildings.

In the **Water Department** out of 53 established positions, 38 are filled.
The District has just recruited the District Water Officer. Two Engineering Assistants are in place with one of them newly recruited. Other staff are in place but need a lot of training to enable them for instance to prepare tender documents that will be used by the District Local Government Tender Board in he evaluation and award of tenders to the private sector.

Education and Sports is well staffed with 20 people who are experienced out of the 26 in the establishment. Whereas most of the persons are elderly, they are trainable and will be an important entry point for school sanitation.

The **Directorate for Health Services** has 107 staff out of the 217 in the establishment. The District Medical Officer is in place but do not have the qualifications required to make him a Director of Health Services. There is also need to recruit more Doctors to man the health Sub-districts but the District has no capacity to pay them. The Substantive **District Health Inspector** is on Suspension but there is a person acting in the position.

For **Community Based Services Deparetment**16 out of 27 established positions are filled. An Assistant Community Development Officer holding a Diploma currently heads the Department. Also in place are a District Probation and Welfare Officer who is a degree holder and two people in the section holding Diplomas.

Sub-county level

There is only one Sub-county without a substantively appointed **Sub-county Chief**. Whereas the Sub-county Chiefs are in place, many of them lack the basic skills for the position.

The Majority of **Sub-accountants** lack the basic financial and accounting qualifications and most of them are just being introduced to accounting and financial management. A lot of support and on the job training is required to enable them perform their duties.

Most of the **Agriculture Assistants,** who are in place, hold Diplomas and have a lot of experience. They are a potential that should be built on during the implementation of the programme.

All sub-counties have **residential pump mechanics**. There is however a proposal to equip the local private firms or individuals with the skills to repair boreholes, protect springs and be paid by the communities for efficiency and sustainability purposes.

All Sub-counties have **Health Assistants** but half of them are newly recruited and need further training especially in participatory approaches.

They are 12 **Social Workers** posted in the Sub-counties but they have not been trained and oriented to handle all components of social development including youth affairs, culture, gender, community development, probation and social welfare. Only two of the Social Workers hold Diplomas others just attained certificates. Most of them are trainable.

All Sub-county **Technical Planning Committees** have started to function at least during the process of producing the Sub-county development plans. Given the fact that they are doing the exercise for the first time, they need continued support to maintain the functionality.

Most of the Sub-counties have three **council committees** thus: Education and Sports, Health and Environment (handling water and sanitation) and Technical Services. The committees are supposed to meet four times a year to make proposals to council for approval. However, due to limited funds the frequency of meetings is not regular.

Most of the protected water sources have **Water User Committees** charged with the responsibility of O&M. However, a number of the committees are not performing their duties and there are cases where the funds collected for water source maintenance were misappropriated. The WUCs are not paying attention to hygiene and sanitation issues.

Appendix 5

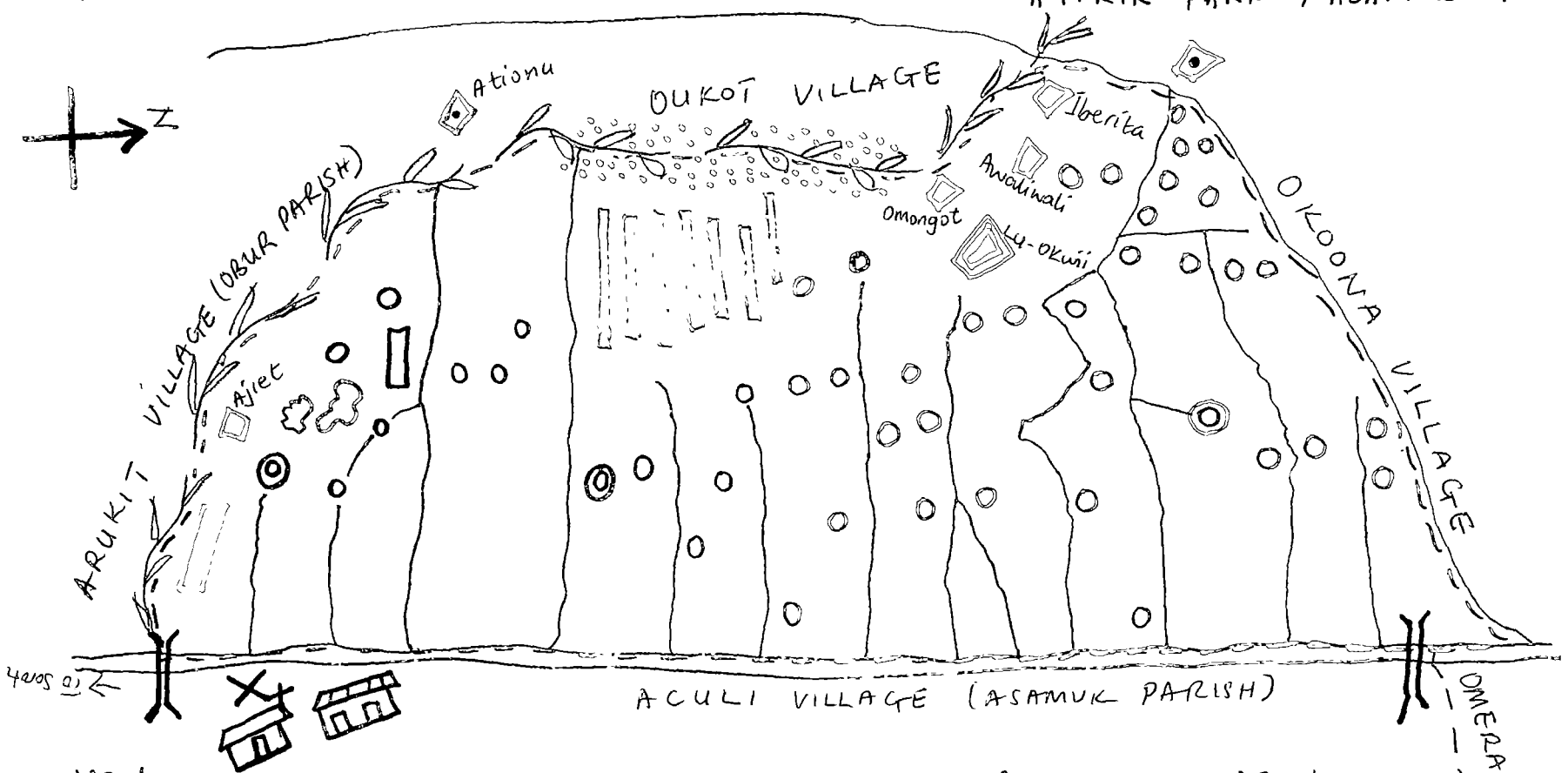
Not Used

Appendix 6

Community Profiles

31/07/1999

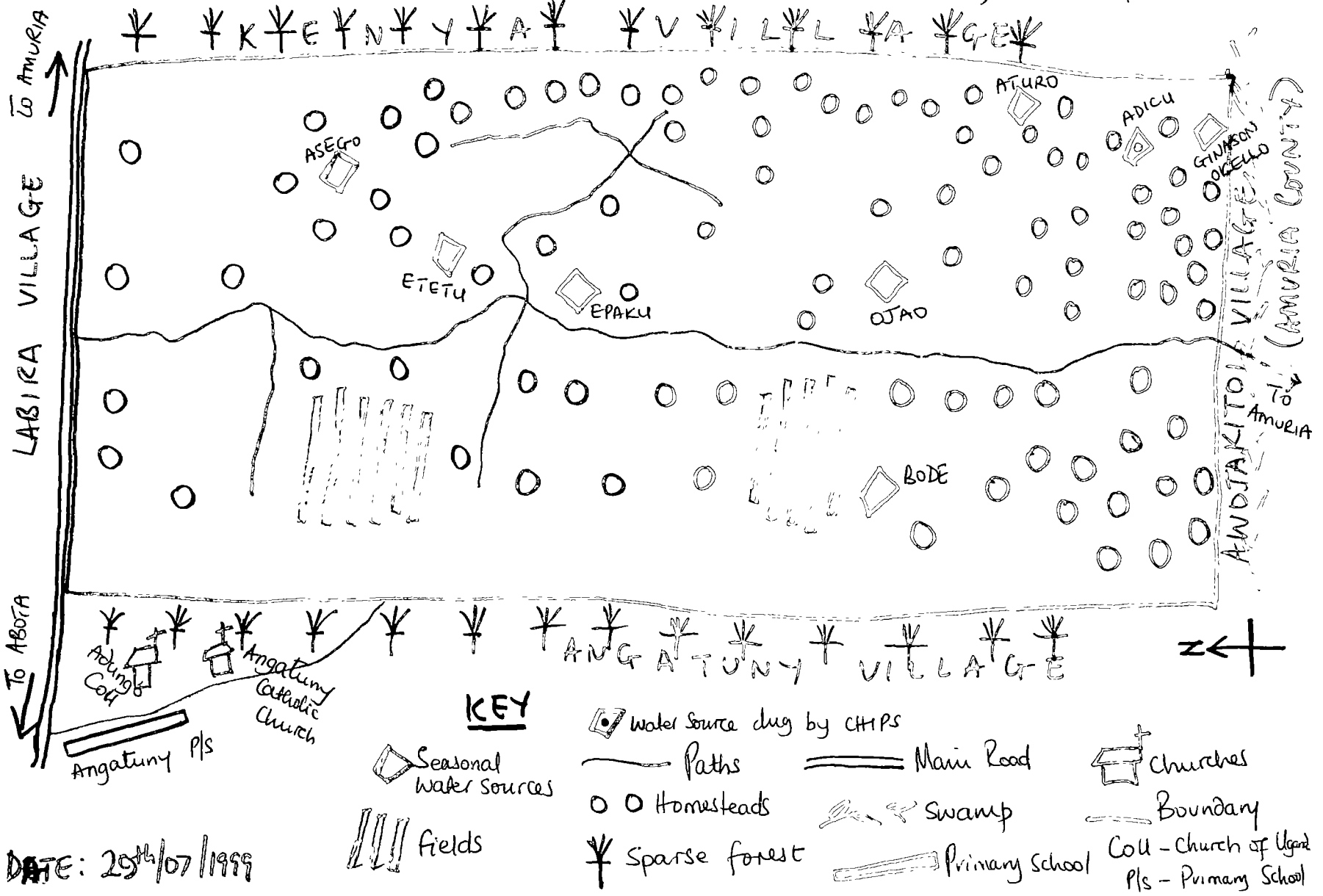
COMMUNITY MAP OF MORUPUS VILLAGE, ATIRIR PARISH, ASAMUK S/C.



KEY:

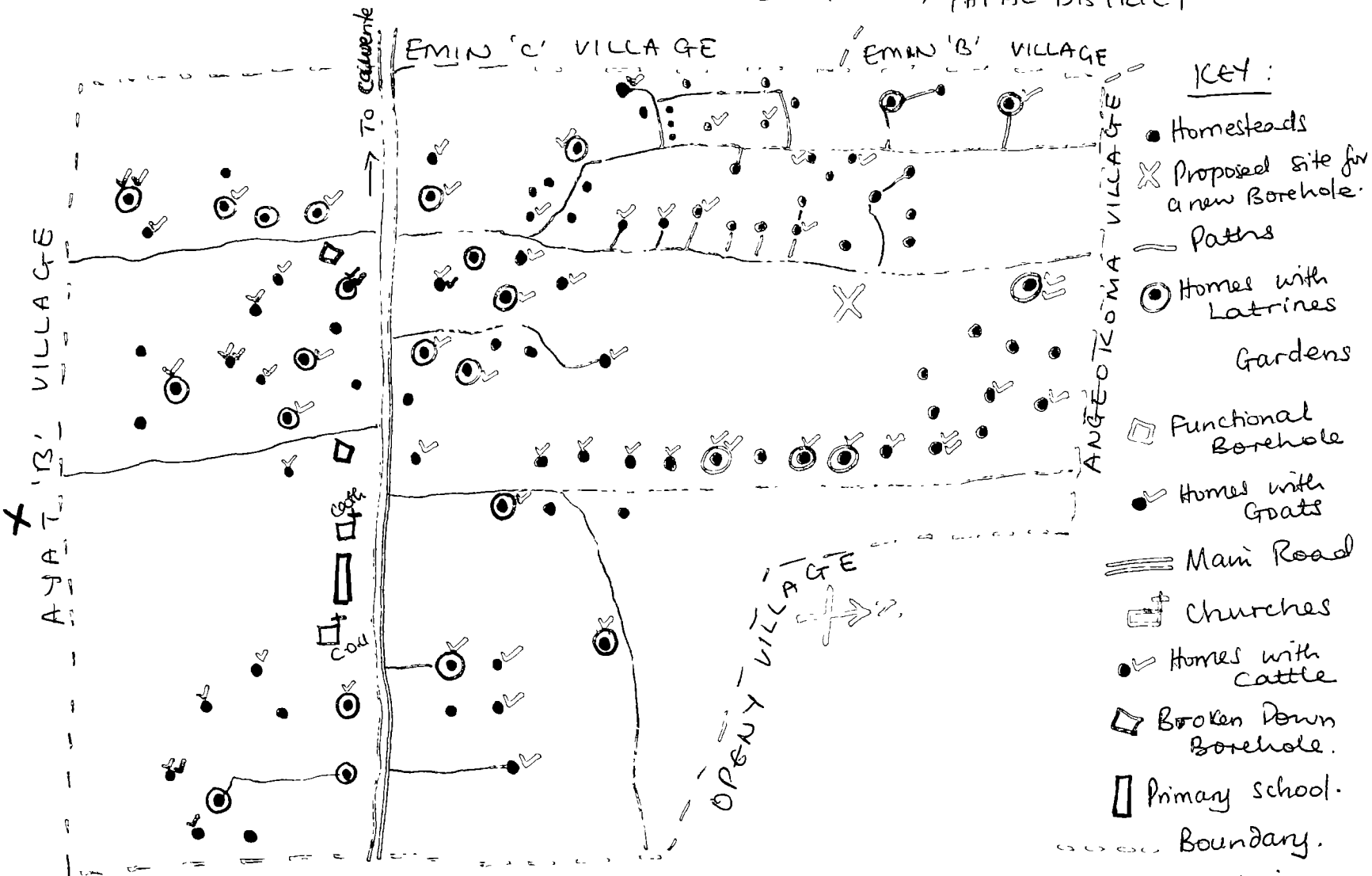
- Major Road
- Homesteads
- Rocks
- Paths
- Swamp
- OKwalo Catholic Church
- Fish Pond
- Boundary
- Fields of Crops
- Protected Spring by Watsan (dry)
- Small Bridges
- Morupus Bar
- Hand-dug well with Pump (4WHPM)
- Borehole
- Okwalo Primary school
- Dry Hand-dug well
- Homesteads with VIP latrines
- Seasonal Water Sources
- Area of Kamnojong Settlement during dry season.

COMMUNITY MAP OF AGALIBU VILLAGE, OBALANG SUB-COUNTY, OBALANG PARISH

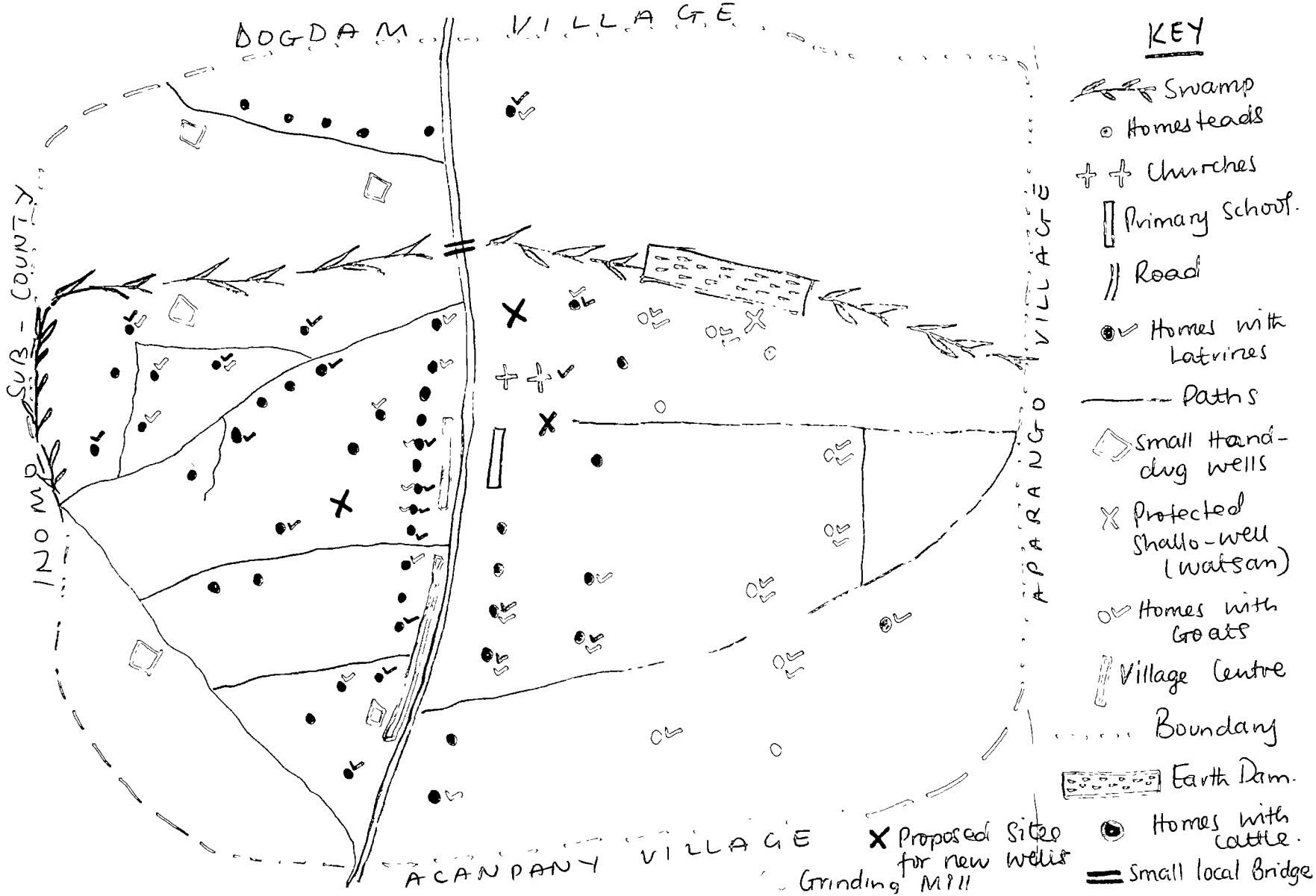


DATE: 29th/07/1999

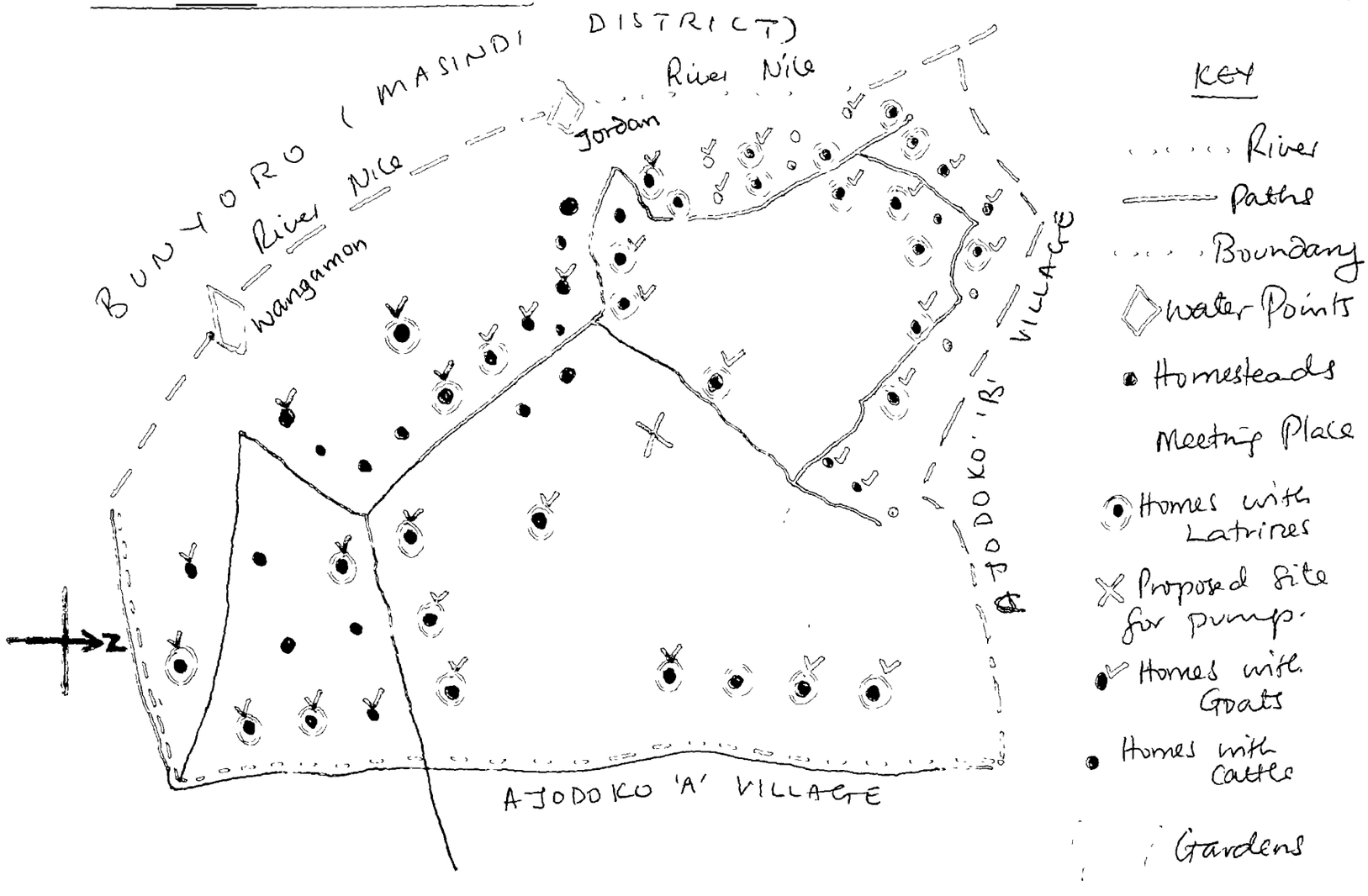
COMMUNITY MAP OF EMIN 'A' VILLAGE, NABIESO S/COUNTY, APAC DISTRICT



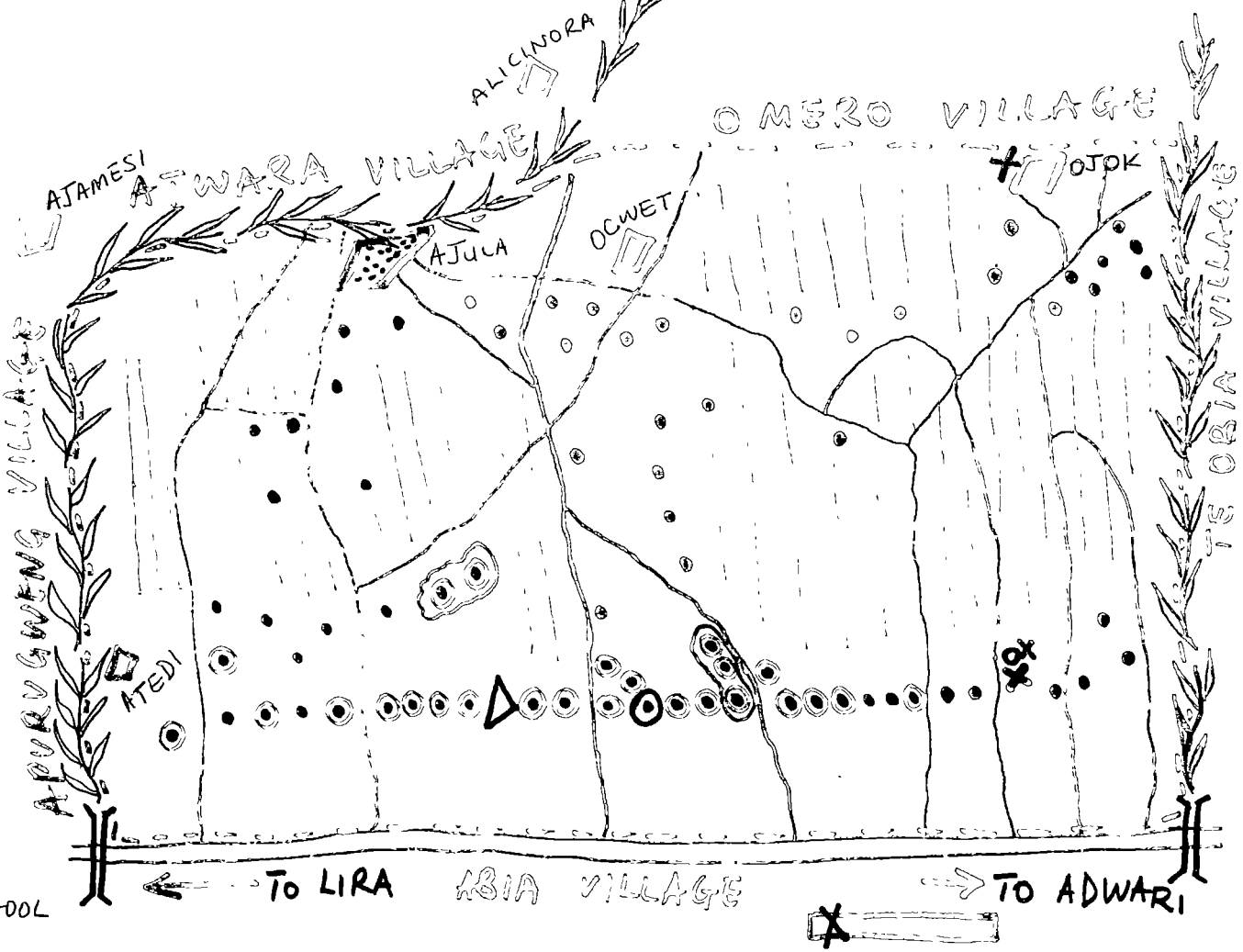
COMMUNITY MAP OF AMOLADIANG PARISH, ATIIRA VILLAGE, BALA S/COUNTY - APAC



COMMUNITY MAP OF ABALIA VILLAGE, ALWOROCENG PARISH, IBUJE S/C, APAC DISTRICT.



COMMUNITY MAP OF AKAI DEBE VILLAGE, ABIA PARISH, APALA SUB-COUNTY, LIRA DISTRICT.

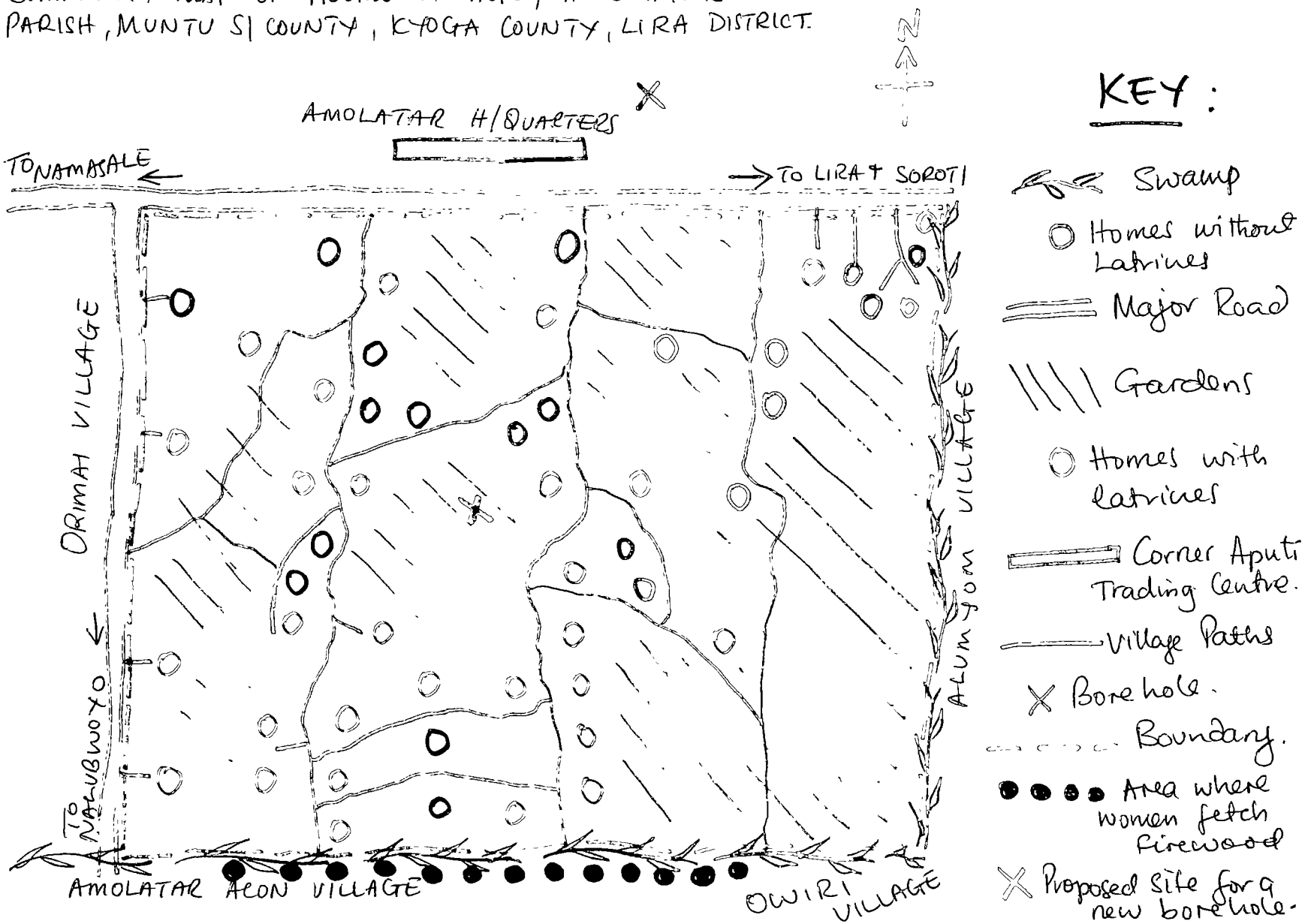


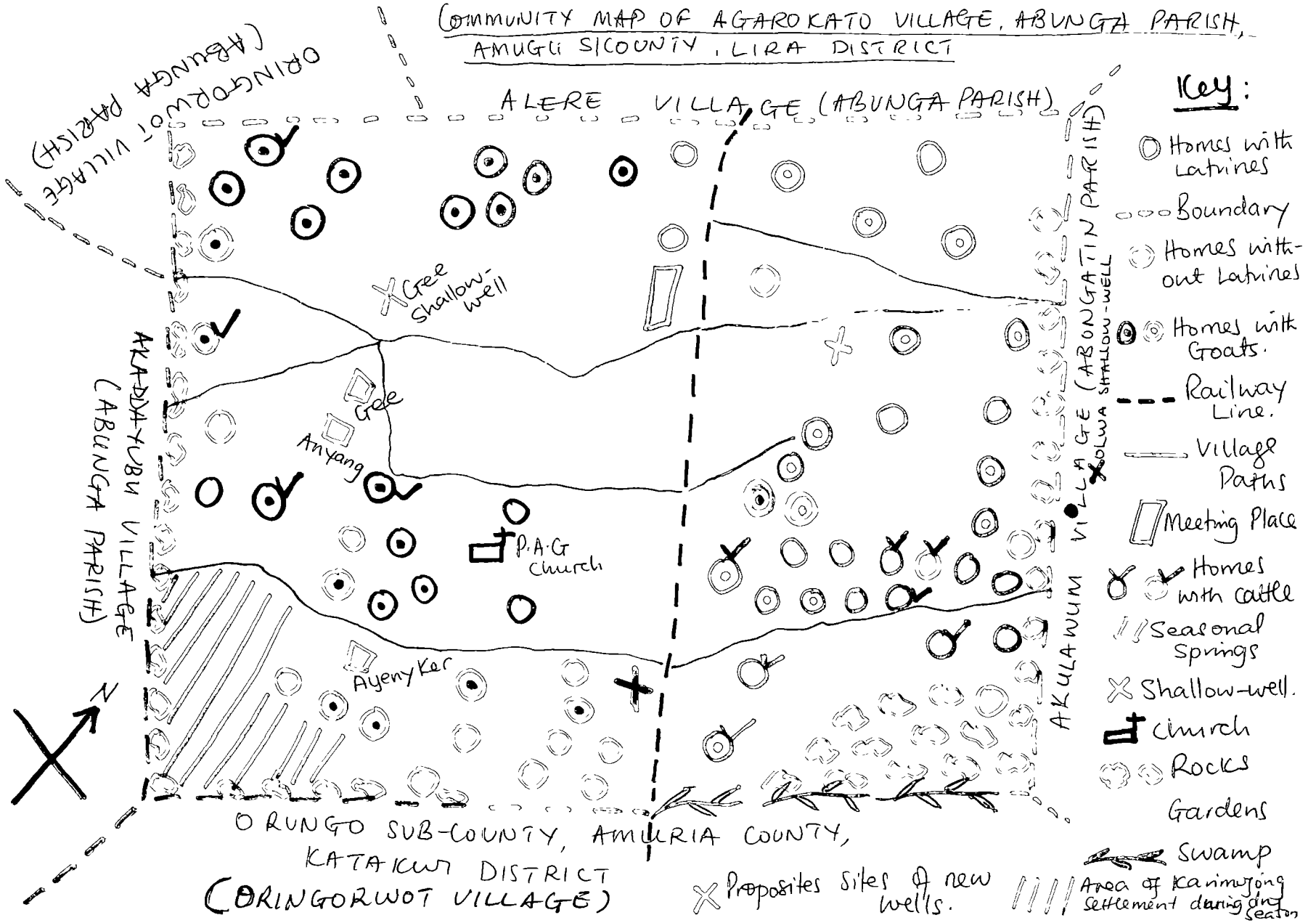
KEY:

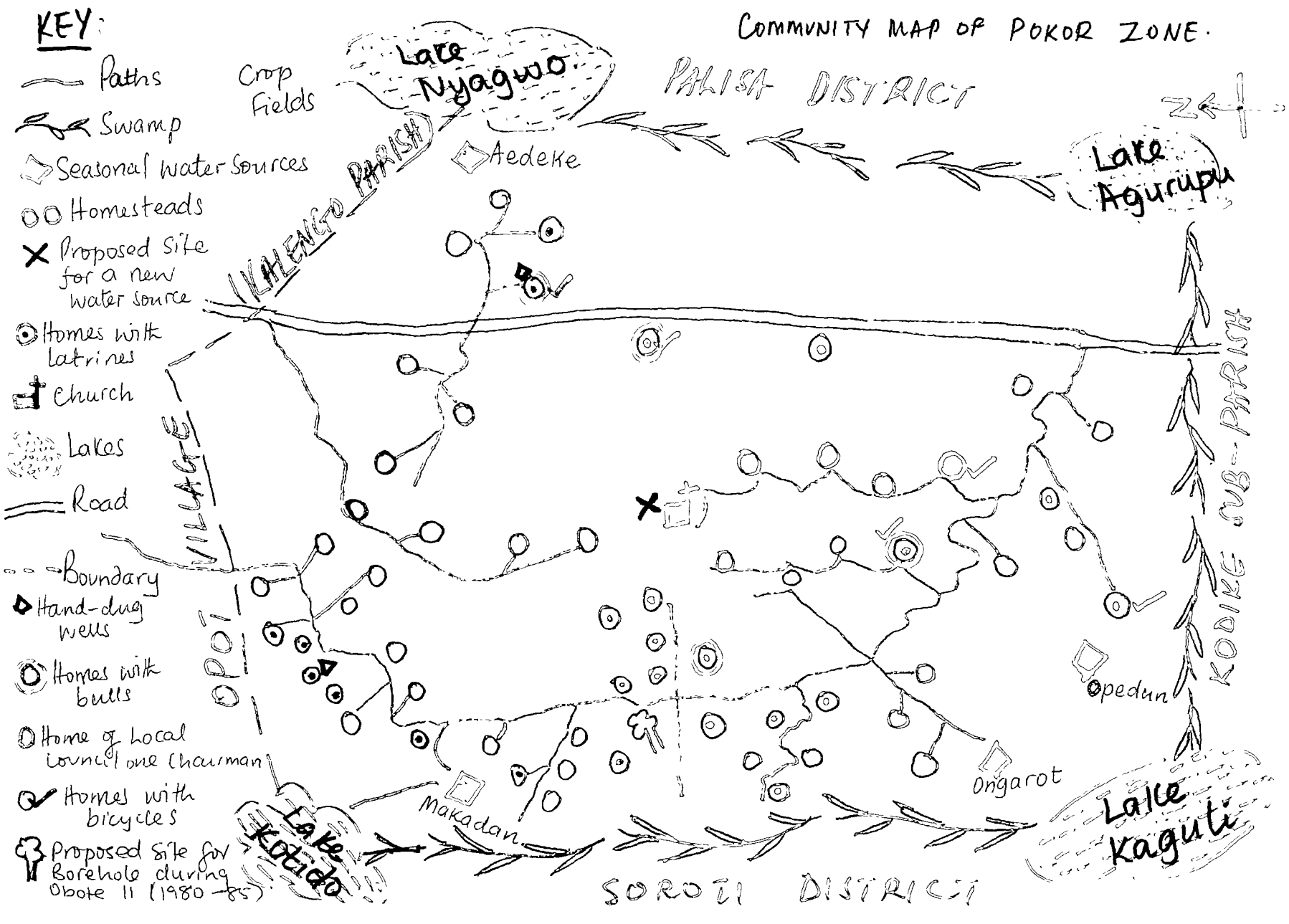
- SWAMP
- CROP FIELDS
- UNPROTECTED SPRINGS
- MAIN ROAD
- HOMESTEADS
- Paths
- COTTON/PRODUCE STORE
- HOMES WITH TRADITIONAL LATRINES
- BOUNDARY
- HOME WITH VIP LATRINE
- HOMES SHARING ONE LATRINE
- HOMES WITH LATRINES BUT OWNERS ABSENT FROM VILLAGE
- ABIA SUB-DISPENSARY
- PROTECTED SPRING (BY WATSAN)
- ABIA PRIMARY SCHOOL
- Small Briages
- Broken Down Borehole

- PROPOSED SITE FOR A NEW BOREHOLE
- PROPOSED SITE FOR A SHALLOW-WELL
- VIP LATRINE AT SUB-DISPENSARY
- PROPOSED SITE FOR A PROTECTED SPRING

COMMUNITY MAP OF INOMO VILLAGE, AMOLATAR PARISH, MUNTU SI COUNTY, KYOGA COUNTY, LIRA DISTRICT.




COMMUNITY MAP OF AGAROKATO VILLAGE, ABUNGA PARISH, AMUGLI S/COUNTY, LIRA DISTRICT
ALERE VILLAGE (ABUNGA PARISH)
ORINGOROWOT VILLAGE (ABUNGA PARISH)
AKADDAKUBU VILLAGE (ABUNGA PARISH)
AKULAWUM VILLAGE (ABONGATIN PARISH)
Gee Shallow-well
Gee
Anyang
P.A.G Church
Ayeny Ker
Solwa shallow-well
ORUNGO SUB-COUNTY, AMURIA COUNTY, KATAKWI DISTRICT (ORINGORWOT VILLAGE)
Key:
Homes with Latrines
Boundary
Homes without Latrines
Homes with Goats.
Railway Line.
Village Paths
Meeting Place
Homes with cattle
Seasonal Springs
Shallow-well.
Church
Rocks
Gardens
Swamp
Proposites sites of new wells.
Area of Kanimujong settlement during dry season


KEY:
Paths
Swamp
Seasonal water sources
Homesteads
Proposed site for a new water source
Homes with latrines
Church
Lakes
Road
Boundary
Hand-dug wells
Homes with bulls
Home of Local council one Chairman
Homes with bicycles
Proposed site for Borehole during Obote II (1980-85)
COMMUNITY MAP OF POKOR ZONE.
Crop Fields
Lake Nyagwo
PALISA DISTRICT
KHENGO PARISH
Aedeke
Lake Agurupu
VILLAGE
KODIKE SUB-PARISH
POKOR
Opedun
Ongarot
Makadan
Lake Kotido
Lake Kaguti
SOROTI DISTRICT

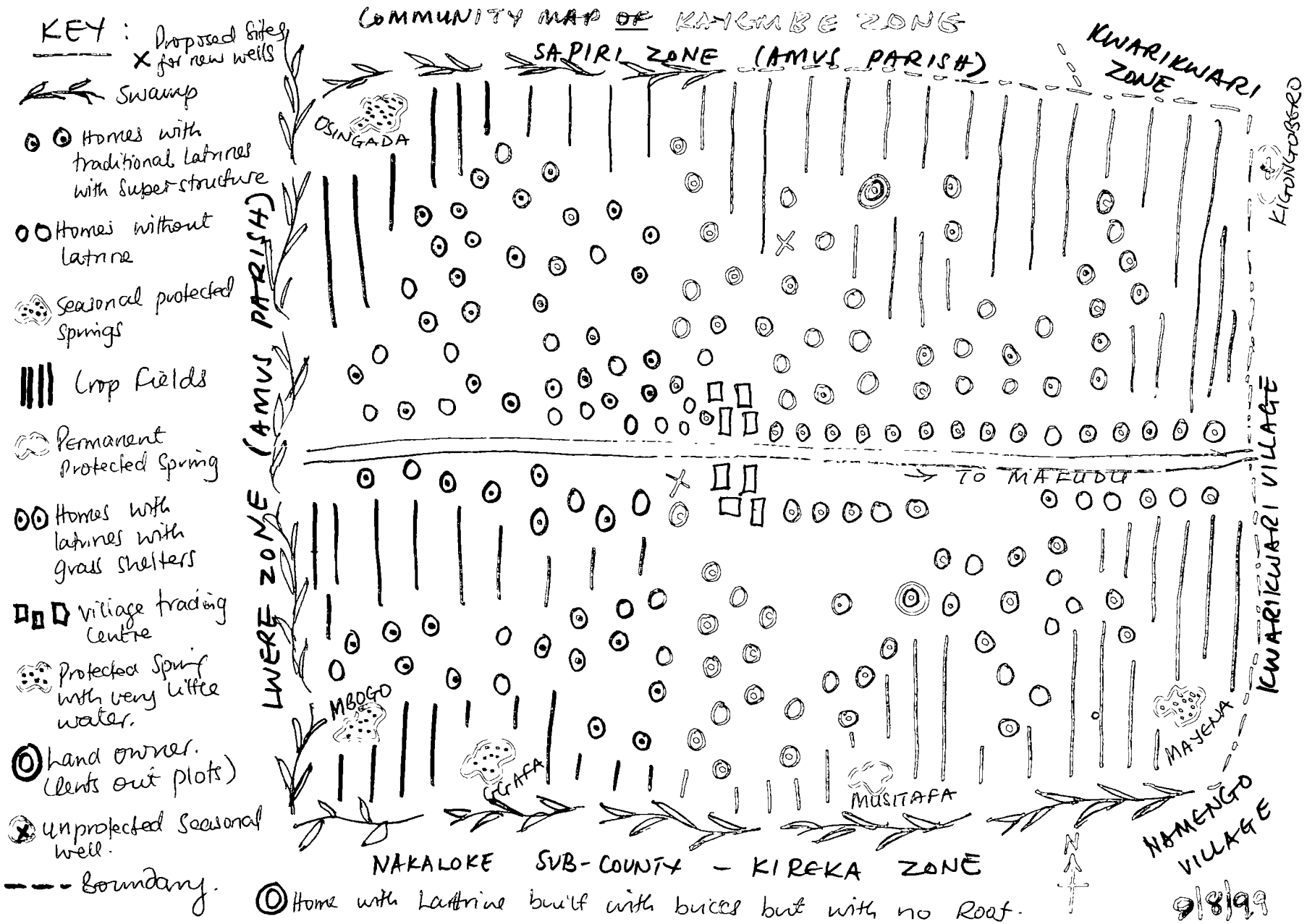
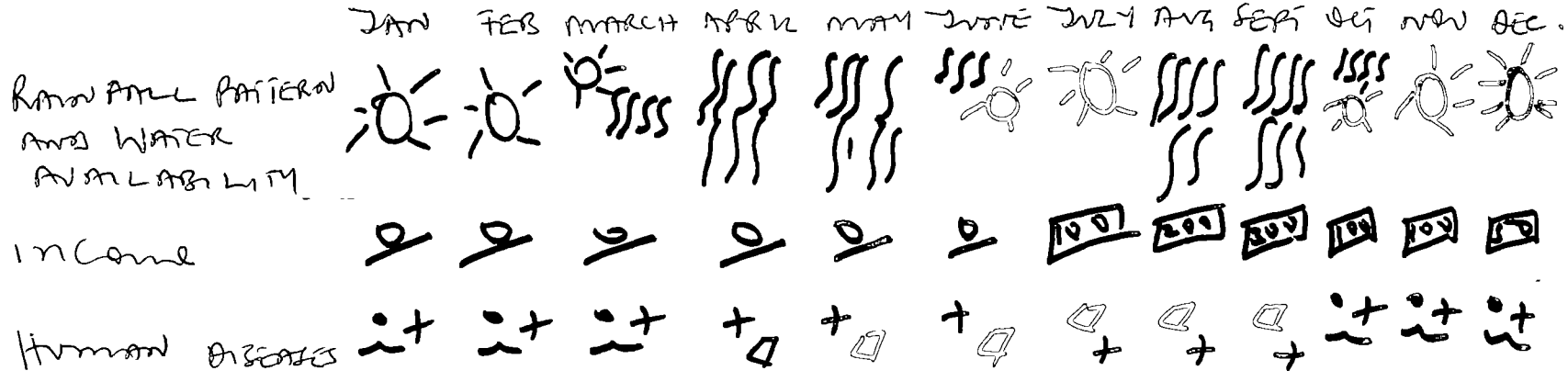
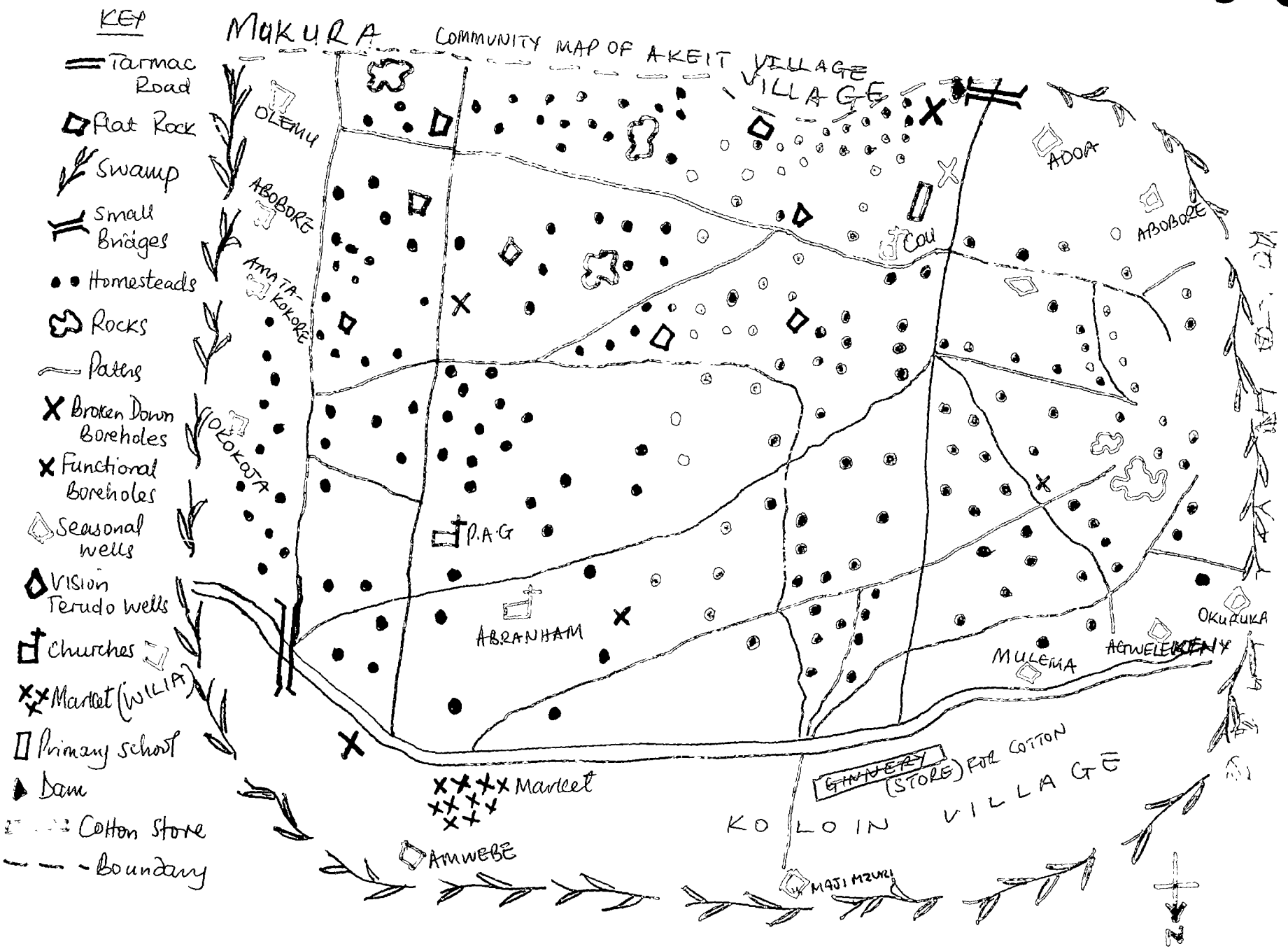

KEY :
Proposed Sites for new wells
Swamp
Homes with traditional Latrines with Super-structure
Homes without latrine
Seasonal protected Springs
Crop Fields
Permanent Protected Spring
Homes with latrines with grass shelters
Village trading Centre
Protected Spring with very little water.
Land owner. (lents out plots)
Unprotected Seasonal well.
Boundary.
COMMUNITY MAP OF KANGABE ZONE
SAPIRI ZONE (AMUS PARISH)
KWARIKWARI ZONE
KIGONGOSORO
OSINGADA
LWERE ZONE (AMUS PARISH)
TO MAFUDU
KWARIKWARI VILLAGE
MBOGO
MAJENA
MUSITAFA
NAMENGO VILLAGE
NAKALOKE SUB-COUNTY - KIREKA ZONE
Home with Latrine built with bricks but with no Roof.
9/8/99

DIAGRAM 9 SEASONAL CALENDAR, AMWA VILLAGE - KACHUMBALA S/C

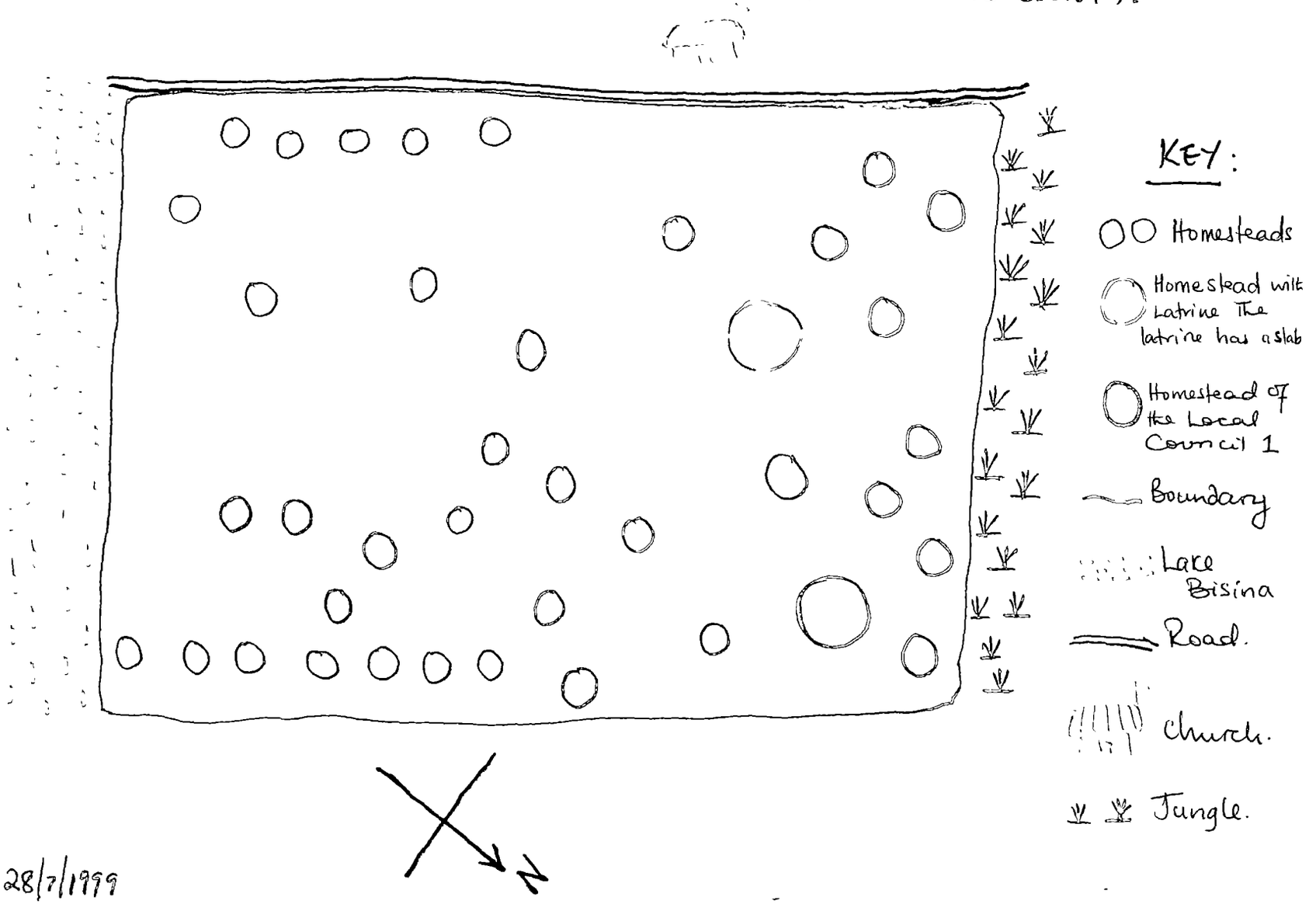


KEY

- ∫∫∫∫ - RAIN
- ☼ - DRY
- o - NO MONEY
- 100 - INCOME
- □ - DIARRHOEA.
- • - MEASLES
- ~ - COUGH
- \+ - MALARIA


KEY
Tarmac Road
Flat Rock
Swamp
Small Bridges
Homesteads
Rocks
Paths
Broken Down Boreholes
Functional Boreholes
Seasonal wells
Vision Terudo wells
Churches
Market (WILIA)
Primary school
Dam
Cotton Store
Boundary
MAKURA COMMUNITY MAP OF AKEIT VILLAGE
VILLAGE
OLEMU
ABOBORE
AMATA-KOKORE
OLOKOTA
P.A.G
ABRAHAM
Market
AMWEBE
ADOA
ABOBORE
COU
OKURUKA
MULEMA
AGWELEKENY
GINNERY (STORE) FOR COTTON
KOLOIN VILLAGE
MAJI MZURI
N

COMMUNITY MAP OF OLUPE VILLAGE, TORORA PARISH, TORORA SUB-COUNTY.



Date: 28/7/1999

Katakwi District Community Profile

Community Profile: Olupu Village, Toroma Parish, Toroma Sub-County, Usuk County

Local leaders present at meeting: LC1 Chairman

The village was located 3 km from the lake, and was very poor.
In terms of infrastructure, the nearest school was 8 km away, the nearest health centre 7 km, and the clinic was also 7 km. The village had a total population of 234, with 39 households.
The village was poorly served with regard to water supply, having no access to a protected supply, and used lake water (3 km) for all purposes. The same source was was also used by cattle and some fishing was also carried out.

Water use patterns
Lake water is used for all purposes, cooking, drinking, bathing, washing and brewing. The least polluted water has to be obtained by hiring a boat (Ushs.300 return) from the deepest part of the lake. To pay for water from the deeper parts of the lake, women use money earned from beer-brewing Women mentioned the problem of having to wade deep into the lake to get cleaner water and the humiliation of having to undress to do this. One problem asociated with children collecting water was the fact that they could not go into the deeper levels where the water is less polluted.
Women do all the water collection, assisted by children, and face dangers such as crocodiles and snakes

Some men help women in water collection, by collecting drinking water from the borehole using bicycles. Some (fisher)men also bathe at the lake to save women from having to carry water. Distance to collect wood for fuel is so far that husbands also help their wives in this. Men determine how household expenditure is made. Although women generally own small ruminants, they are obliged to obtain their husband's permission before selling these.

Households indicated that they were willing to contribute amounts varying from Ushs. 500 to 1000 to the capital cost of constructing a new water source.

Potential areas of conflict between users
The community map indicates that 3 or 4 villages adjoin this village, and therefore so siting of any protected source would be of interest to this cluster of villages, without a protected water supply of their own. Potential conflicts could arise where water management issues were not clarified.

Sanitation
Existing practices were found to be:
i) children defecate in compound
ii) defecate in the bush without burying faece
iii) defecate in the bush and burying faeces

Use of the bush is common, and is easier in the wet season, when crops are near the home, but more difficult in the dry season, when people have to walk further for privacy.
Latrine coverage was found to be very low at 2.5%. Only one latrine was in use in the village, constructed in 1984 by a comparatively well off householder

Awareness level
Awareness levels of the effects of poor sanitation were high, and households visited were requesting slabs. Constraints mentioned by households included logs rotting but as it was unlikely that logs had ever been used, this was more a programmed response, rather than the result of actual experience.

Adults quoted the lack of a latrine being due to the fact that they never had one in the household when they were growing up. This may be a more genuine reason than the physical constraints quoted. The majority of the villagers were aware of the inconvenience and diseases related to poor faecal disposal.
Regarding individual willingness to pay for a slab, amounts ranged between Ushs. 500-5000. In terms of actual construction of latrines, villagers indicated that local materials were available such as grass for the thatched superstructure, and poles. Skills for construction available in village (construction of grananes, kitchens)

Institutional Analysis

The village members were facilitated to identify the key institutions and individuals operating in the village, discuss their activities and using circles indicate their importance and relationships.

Some key institutions were found missing in this community and included among others the water user committee because there is no protected source in the village and people use lake water, no women and youth groups. Community members also revealed that they do not know the names of the NGOs operating in the village because the are not told.

The key institutions and individuals identified and discussed were

Parish credit Committee: There is a parish credit committee formed by KDDP. It manages the credit scheme under the programme through the provision of oxen and goats to women.

The Health Unit: This is located in Toroma about 5 Kms away from the village. The people reported the health unit to be important because they get most of the treatment from it. It is related to the church because churchmen encourage people to get treatment from the health unit

Community Health Workers: The people reported the presence of CHWs in the community but could not mention who trained them The CHW sensitise the community members of good health practices. They are closely related to the health unit because they get information from there and also submit reports

Traditional Birth attendants: There are women who used to assist people during the process of delivering. The staff at the health unit trained these TBAs and they are very important in handling emergency cases.

Seasonal Calendar

The village uses the twelve months in a normal calendar year and do not have particular local names for the months. The seasonal calendar that was drawn summarised rainfall patterns, water availability, human diseases, crop sequence (from planting to harvesting) and social events and ceremonies.

Rainfall patterns:
- In January, February, June and December the village experiences a dry and windy climate.
- In March and November the village experiences a mix of dry and rain days.
- In April, May, July, August, September and October the village has plenty of rain.

Water availability
The rainfall pattern is closely related to the water availability. However, it was reported that plenty of rain sometimes pollutes the water sources as a result of surface wash-off.

Katakwi District Community Profile

Human diseases

- In January, February, November and December, the most common disease affecting the people is eye infections as a result of the dry period and blowing wind. Other diseases reported in the period are malaria and measles.
- In March, April, May, July, August, September and October, the common diseases are cough, diarrhoea as a result of water pollution by rain wash-off. Other diseases are malaria as a result of increased mosquito bleeding in the growing bush and birrhazia.
- In June communities reported swelling of the chicks due to lack of food (famine period)

Crop sequence (from planting to harvesting)

- In January and February the communities reported land clearing and no harvesting.
- In March harvesting of little cassava was reported.
- In April and May the communities reported planting of sorghum, millet, simsim, and G. nuts. Planting coincides with the rain season.
- In June, which is a dry period, efforts are put on weeding.
- In July communities start to harvest millet, sorghum and maize.
- In August all crops are harvested
- In September, the second crop is planted especially heaping of potatoes and planting of cassava.
- October is weeding
- November and December, which is a dry period communities reported slicing and drying of potatoes and cassava.

Social events and ceremonies

The major social events reported in the village were last funeral rites and weddings. These were reported to be conducted in the dry months especially November, December and January.

Community Profile: Agalibu Village, Obalang Parish, Obalang Sub-County

Local leaders present at meeting: LC1 Chairman

The village itself is poor, and is located 4 km from a lake.

In terms of infrastructure, a feeder road enables reasonable access to markets (km) but in the village itself there is no clinic, market, church, health centre, school. (nearest school 3 km). The village is large, however, with 96 homesteads. The nearest clinic is at the Sub-county town, 3 km. distant The population of the village is 576, with a total of 96 households.
Widows and female headed households do not pay tax, and therefore tend to be ignored when the total number of households is being recorded, for instance for the community map. This underrepresentation has implications for the provision of water supply, and other services.

There are no protected sources in the village, and a total of 8 unprotected and seasonal water sources. The Sub-county omitted to provide Agalibu with a borehole, although the neigbouring villages were supplied. CHIPS attempted to fill this gap, but after hitting hard rock, abandoned the attempt.

Water use patterns

A borehole located at a school 3 km. distant is the source used by some for drinking water. However access to this source is mainly limited to those with bicycles and those who are able to walk the distance. The elderly, and handicapped make use of the unprotected sources in the village. Another sources is a hand-dug well attempted by CHIPS, subsequently abandoned after hard rock was encountered. The community contributed Ushs.50,000 for this well, but as the money was not refunded, they are very disillusioned by the experience.

Some men are prepared during the dry season to collect drinking water from the borehole, using bicycles. This is is limited to those men who are prepared to assist their wives, on the basis that they already have a heavy workload. This is often younger men, who generally did not pay a high brideprice as many of the older generation have done. The attitude of older men is that since they paid bridepnce, they have then 'bought' their wives' services as a water collector for life.

Potential areas of conflict between users
Bordering villages use this village to access the borehole at the school. If a new installation is installed in this village, it will also become the nearest source for these neighbouring village, and potential confllict may arise unless water management principles are established.
An actual form of conflict is the regular visits of the pastoralist tribes of the Karamajong who arrive during November and use the same sources as the villagers up to March. As these tribes are armed, villagers prefer to avoid confrontation, but experience considerable distress and unrest during this period.

With regard to contributions for any new water supply, households were prepared to contribute unskilled labour, food, and cash. For the shallow well construction started by CHIPS, contributions ranged from Ushs. 500 (women) and Ushs. 1000 (men). Towards construction

Sanitation
Existing practices were found to be·
i) children defecate in compound
ii)defecate in the bush without burying faeces
iii)defecate in the bush and burying faeces

Awareness level
High levels of awareness were found, although these were not supported by actual practice. Latrine coverage was found to be very low at 6%. The types of latrines found were traditional ones, with a mud/wattle superstructure, and a roof. One latrine with a slab was found.
The main constraints cited by villagers in constructing latrines were those of collapsing soil, lack of tools (pickaxes), and hard rock. Although the majority of households did not not have a latrine, they expressed a preference for a traditional pit latrine with a Sanplat.

Institutions

The village members identified the key institutions and individuals operating in the village, discussed their activities and used circles (Venn diagrams) to indicate their importance and relationships. Obalang community identified and discussed nine key institutions operating in the village as follows:

Katakwi District Development Programme (KDDP): KDDP through the Parish Credit Committees gave out loans for use in purchasing of hoes and oxen to a few community members.

Parish Credit Committee: The Parish Credit Committee was formed under KDDP to participate in the delivery and recovery of loans. The communities reported that it does not closely relate to the village LCs. However, the noted that KDDP works through the Sub-county which is a realisation that they work through the established Government structure.

Sub-county Local Government: They reported that they Sub-county Local Government is the major channel of development projects and messages to their village. It is in the centre and collaborates with all other development players in the village. The NGOs go through the local government in order to come to people.

Traditional birth attendants: The traditional birth attendants assist women to deliver. The sub-county identified them but have not yet trained them. The Health Unit promised them gloves. These are key actors and can be used as channel of spreading sanitation messages.

The health unit: The health unit, which is located about 3 kms from the village handles complicated delivery cases and general illness. Health unit staff sensitises people on a wide range of issues including sanitation.

CHIPS: The only activity reported to have been done by CHIPS in the village is an attempt to construct a hand dug well which was not completed. The communities seem to have been disappointed and incomplete interventions may set a bad precedence for those to come in the future

Local council 1: LC 1 was reported as the major information conduit between the village, sub-county local Government and NGOs

SOCADIDO: The organisation gave goats, seeds of G.nuts, millet and sorghum to a few women in the women's group

Women Group: There is a women's group that was used to distribute seeds from SOCADIDO.

The community members reported that

- There was Entandkwa credit scheme in the area but phased out;
- The borehole they use for drinking water is not in the village and were not conversant of its operation;
- There is a youth group in formation but has not received any form of training.

Seasonal Calendar

Agalibu village use the twelve months in a normal calendar year and do not have particular local names for the months. The seasonal calendar that was drawn summarised rainfall patterns and water availability, human diseases, crop sequence (from planting to harvesting), social events and ceremonies and Karimojong movements in the area. Karamajong incursions take place during periods of drought, typically from November to March.

Rainfall patterns and water availability

Rainfall patterns and water availability were closely linked because rainfall was reported as the major determinant of water availability.

- In January, February, March, June, November and December the village experiences a dry and windy climate.
- In September the village receives some rain and spells of dry periods.
- In April, May, July, August, and October the village recives plenty of rain.

Human diseases

- Measles were reported to be rampant through out the year.
- In January, February, March, June, September, November and December, the most common disease affecting the people are 'the cough' and eye infections as a result of the dry period, wind and dust.
- April, July, and October, the common diseases are diarrhoea as a result of water source contamination by rain wash-off. Other diseases are malaria as a result of increased mosquito bleeding in the growing bush and cold weather and sleeping sickness because the tse tse flies bleed in a wet period.
- In May communities reported skin diseases and wounds due to damage from the growing bush.

Crop sequence (from planting to harvesting)

- In January, February and March the communities reported land clearing and no harvesting.
- In April and May the communities reported planting of sorghum, millet, simsim, and G. nuts. Planting coincides with the rain season.
- In June, which is a dry period, efforts are put on weeding.
- In July and August communities start to harvest millet, sorghum and maize and planting the second crop especially cow peas.
- In September, the communities weed the second crop and harvest cow peas planted in July
- October and November is harvest period including slicing and drying of potatoes and cassava.
- In December, which is a dry period the community reported harvesting of sorghum.

Social events and ceremonies
The major social events reported in the village were last funeral rites and weddings. These were reported to be conducted in the dry months especially November, December and January because there is little farming work due to the dry period. The period also coincides with the X-mas and end of year celebrations

COMMUNITY PROFILE: ***Morupus Village, Atirir Parish, Asamuk Sub-County, Amuria County***

Local leaders present at meeting: LC1 Chairman, Secretary LC1, Chairperson Water Committee (F)

The village is moderately well off. In terms of infrastructure, the village is poorly served, there being no feeder roads, no clinic, market, church, health centre, or school either in or near the village. The population of the village was 282, with a total of 47 households During 1985, many villagers left as a result of Karamajong raids.

Water use patterns
There are no protected sources in the village itself, and although there is a functioning borehole in the neighbouring village of Aculi, only a few homes close by make use of it. There are no springs within the village, and the nearest spring protected by UNICEF has dried up. There is one hand-dug well, installed by the NGO YWAM. YWAM trained 2 volunteers (1 man, 1 woman) to promote hygiene in the village, including boiling water, improving general hygiene and maintaining water sources, and improve sanitation. This has resulted in a high level of awareness. This source is not properly protected as the well needs re-lining, and the design of the pump is a curious treadle contraption, not sited directly over the well, and water drawn is prone to contamination due to the leaking connecting pipe. In the dry season, the pit has to be deepened as the water level drops. This source is shared by 3 other neighbouring villages, Oukot, Okoona and Aculi. In acute periods of drought, villagers come from Omerai, some 2 km distant, to fetch water.
Women are responsible for fetching water, although during the dry season, a few men assist their wives, using bicycles. The general feeling among older men is that since they have paid 25 cows for their wife, she is under obligation to fetch water. This attitude is changing among younger men, however.
Control of income in the household. although women generally keep the money in the household, the final decision on its disposal is taken by the man.

While a water committee is said to exist, comprising 'uppers' from the village (retired officials, LC1 chairman, etc.) it is not functioning.
In addition there is a total of 4 other hand-dug unprotected seasonal wells.
The community is eager to upgrade the well to a pump or borehole, and to contribute local materials.

Katakwi District Community Profile

Potential conflict

There is a potentially a conflict developing in the community, since YWAM require to be paid Ushs 116,000 and the community has to date only collected Ushs.9,000. There is a general feeling in the village that this is too high a charge for a pump that is in imminent danger of breaking down.

Neighbouring villagers collecting water from the pump are not contributing to its maintenace or the capital cost. If a new installation is installed in this village, it will also become the nearest source for these neighbouring villages, and water management issues arise.

Annual Karamajong incursions from November to March result in much disruption and resentment from the villagers, who regard the (armed) Karamajong as highly dangerous as well as the source of all diseases in the village.

WTP: for any facility, community contribution would take the form of unskilled labour, local matenals.

Sanitation

Existing practices were found to be:

i) children defecate in compound

ii)defecate in the bush without burying faeces

iii)defecate in the bush and burying faeces

Latrine coverage was found to be 34%. This comparatively high level of coverage can be ascribed to the activities of YWAM. Those without latrines use the bush. Children defecate in the compound, (compounds were seen to be clean, so this is disposed of by the mother.)

Constraints to latrine construction cited by households included lack of poles for covering pits, lack of tools (pickaxes), and hard rock

Awareness level

Awareness levels were found to be high, and villagers were able to indicate the linkes between poor sanitation and disease. The main types of latrine present in the village were traditional pit latrines withouth a superstructure and without a roof.

Households were not happy with the existing sanitation situation in village and expressed a preference for improved latrines, with a superstructure and a roof. The view generally held was that there was no point in building a latrine with a slab on a shallow pit. (A shallow pit had been advised by YWAM for pit construction.)

Apac District Community Profiles

Community Profile: Emin 'A' Village, Anwango Parish, Nabyeso Sub-County, County

Local leaders present at meeting: General Secretary LC2, Information Secretary LC1

The village was located 5 km. from the lake and is relatively well off.
In terms of infrastructure, the village had two churches, while the nearest school was 1 km, the nearest health centre 7 km, the market was 7 km. The population of the village was 648, with a total of 108 households.
The main water sources were one functioning borehole, 'Teiligo', 1 km distant, and a non-function borehole at Anwang Primary school 1 km distant

Water use patterns
Drinking water is collected from the borehole at Teiligo, and when this breaks down, water is collected from the lake, some 5 km. distant. On average consumption is 10 lpcpd.While goats are watered at the borehole, cattle are watered at the lake A new borehole is currently being drilled by Swedish International, but this seems unlikely to be successful due to the geological problems. Initial siting was at the Primary School, but an appropriate site could not be identified The new site is more community friendly. Men assist women in collecting water if they own a bicycle. In general, men retain control over the household income.

Water Committee
A Water Committee exists, comprising 15 members, 5 of which are women. Its tasks are to collect money for repairs, locate the pump mechanic in cases of breakdown, and buying spare parts. Each household contributes Ushs.1000 for O+M. Individuals in the community were willing to pay Ushs 1000 for construction, while poorer members, such as the elderly and handicapped would pay Ushs. 500.

Potential areas of conflict between users
Currently the supply from the borehole is inadequate for the population of three villages which use it and conflict often arises as a result of queuing.
In the event that a new borehole was installed in the village, it would also serve neighbouring villages, and contributions would have to be agreed to avoid problems.

Sanitation
Existing practices were found to be:
i) children defecate in compound
ii) defecate in the bush without burying faeces
iii) defecate in the bush and burying faeces
The most common latrine types found were traditional, with mud/wattle superstructure and roof. Latrine coverage was 24%. Latrines are dug to a depth of 10 feet for those who cannot afford the cost and to a depth of 25 feet for those who can afford it.
ActionAid has been casting slabs for the school, and parents have contributed Ushs.7,500 as a contribution towards labour costs for construction of pit latrines there.

Awareness level
Awareness level was high on the links between poor sanitation and disease, but practices did not comply with this awareness.

Regarding willingness to pay for latrine slabs, the amount of Ushs 500 was quoted by by some villagers.

Apac District Community Profiles

Community Profile: Abalia Village, Alworoceng Parish, Ibuje Sub-County, County

Local leaders present at meeting: LC1 Women Secretary (F), Parish Chief, Defence Secretary LC1, Vice Chairman Youth LC1, LC1 Chairman.

The village was located 2.5km. from the lake and is moderately well off.
In terms of infrastructure, there are three paths through the village, the nearest school is 2 km distant, the health centre is 13 km. distant, and the nearest church is next to the school. The population of the village was 366, with a total of 61 households.

The only water source was the lake 2.5 km. distant.

Water use patterns
Consumption was on average 22 lpcpd. Women and children are the main collectors of water in this villages, and men do not asssist. However, many more women were seen to be using bicycles themselves to collect water than was the case in the other three Districts.

Gender
Men are usually in control of the household resources, and although women keep any cash, its expenditure is decided by the husband.

Potential areas of conflict between users
In the event that a new waterpoint was installed in this village, neighbouring villages would also make use of it and would be required to make a contribution to avoid conflict.

Regarding community willingness to contribute to the capital cost of a new water source, they were prepared to contribute local materials, as well as accommodation for skilled labour, and Ushs 2000 in cash. The community would consider a system of cross-subsidy for the elderly and handicapped.

Sanitation
Existing practices were found to be.
i) children defecate in compound
ii) defecate in the bush without burying faeces
iii) defecate in the bush and burying faeces

Latrine coverage was 51 %. The most common latrine types were grass thatched, with a roof, but without a slab, pipe or cover.

Awareness level
Awareness levels on the link between poor sanitation and disease was found to be high. This was probably due to the strict enforcement of a bye-law on having a latrine. Households found without a latrine are regularly fined Ushs. 5000. This is the only form of 'sensitisation' being adopted.
For slabs, community willingness to pay levels were around Ushs. Slabs were previously available at a price of Ushs.6000 at the sub-county HQ. The price has now increased to Ushs.15000. Transport of the slabs from the point of manufacture is considered to be one of the main constraints in latrine construction.

Village Institutions
Okomoimaki Farmers Group
The group has a committee of 4 members. The profits made from the sale of members' crops is divided between the members. Membership is Ushs. 4000.

Apitpedaa Womens Group
Membership fee is Ushs.3000. Members pay Ushs.1300 weekly

Akiiba Drinking Group
There are 15-18 members, and the membership fee is Ushs.4000. There is a committee of 4 members.

NGOs/CBOs
ActionAid, the international NGO, will be involved in the construction of 4 class rooms starting 1999. Contributions from the community take the form of water, sand, and food for the workers.

Community Profile: Atiira Village, Amoladiang Parish, Bala Sub-county Kole County

Local leaders present at meeting: LC1 Vice Chairman, Secretary LC1, Finance Secretary LC1, Secretary for Production LC1 (F)

The village was located 5 km. from the lake and is moderately well off.
In terms of infrastructure, there are 6 paths and one main road through the village, there are two churches in the village, the nearest school is 2 km distant, the health centre is over 5 km. distant, and the market is 15 km. away. The population of the village was , with a total of households

The water sources available to the village were 4 traditional wells (small hand dug wells dug by women in the swamps), one borehole which was not functioning, one protected shallow well, which was functioning and an earth dam, constructed in 1948.

Water use patterns
Women collect water from the swamps during the wet season, digging 1 metre deep holes. At the start of the wet season these fill up with dirty surface run-off, and this has to be drained off before the source recharges. Recharge time is approx. 10 minutes. This water is perceived to be cleaner than that of the earth dam, which was constructed in 1948 for human consumption, but has become polluted and is now generally used for cattle, bathing, swimming and fishing
Average consumption was 13-15 lpcpd Men generally do not assist with water collection.
There was an active Water Committee, with a total of 7 members, three of which were women. The main positions however, such as Chairperson, Treasurer and Secretary, were filled by men, such as the LC1 Chairman, and Head Teacher of the Primary School. Women were only selected to fulfil the quota insisted on by WES and had no decision making functions.

Gender
Although women keep the cash its expenditure is the husband's decision.

Water/hygiene awareness
A high level of awareness of the links between safe water and the need for good hygiene behaviour was found, evidenced by the fact that women preferred to use the small wells rather than the earth dam which is considered polluted. Generally homes were kept clean, compounds were well swept, and dish racks were in use. The implications of an improved safe water supply were known to villagers, who commented that they would spend less on visits to health centres

Households were prepared to contribute local materials and accommodation for masons, as well as a cash contribution of Ushs. 300 per household for the capital cost of a new water supply, while for O+M a flat rate of Ushs. 500 was proposed. A system of cross-subsidy was considered, whereby elderly people would pay less, Ushs.100 or not pay anything at all. Widows could be exempted from paying.
This would be agreed by consensus in a village meeting.
For the shallow well (DWD/WATSAN) constructed in 1997, a total of Ushs.18000 was collected for a repair which took one month to effect. There is a pump mechanic at the sub-county HQ, trained by UNICEF WES. The labour charge of the pump mechanic is negotiated (approx. Ushs. 5000 depending on the type of work involved.)

Sanitation
Existing practices were found to be the following:

i) children defecate in compound (compounds were observed to be clean, so this is disposed of in one way or the other
ii) defecate in the bush without burying faeces
iii) defecate in the bush and burying faeces (majority of villagers)

The most common latrine types found were traditional pit latrines, with a superstructure of mud/wattle, and a roof. Latrine coverage was 44%.

Awareness level
Awareness level was found to be high. When shown the picture of latrine with no roof, no walls, this was regarded as being unacceptable for this community, and villagers commented that such latrines did not exist in the village. Anthills are said to be used as pits but there was no corroborating evidence for this. Sub county extension staff visit fairly regularly, and have imposed fines of Ushs 5,000 when households are found to be without a latrine If after 3 months they have not constructed one, then they are fined again. Bye-laws are regularly enforced, and latrines are known as 'bye-laws' This accounts for the relatively high latrine coverage. However, these latrines are generally not used by the owners, but reserved for visitors, and are built only to avoid paying fines

With regard to paying for slabs, households indicated that they were willing to pay Ushs.2,500 per slab. From the better off in the village, this rose to Ushs. 5000.

Village level institutions

WATSAN Committee
A committee was formed comprising 7 members. Its task was to decide on the level of contributions villagers should pay for O+M (Ushs 300), and keep the surroundings of the well clean

Catholic Women Group
A membership fee of Ushs 2000 is charged, and at the end of the year there is a division among the group of the funds held.

Atura Digging Group
Members cooperate by helping to dig each member's shamba in turn.

Community Profile: Amunomia Village, Teboke Parish, Chegere Sub-County, County

Local leaders present at meeting: LC1 Chairman, Chairman LC2 and Chairman LC3.

The village was and was poor.

In terms of infrastructure, there are 4 feeder roads and 1 major road passes through the village. The nearest clinic is 4 km. distant, and the nearest school is 2 km. The village is 15 km. from the Sub-county Headquarters. The population of the village is 462, with a total of 77 households.

Water use pattern
Water is collected from the borehole, 2 km. away, being the main protected source for the village, but there is generally much queuing as it is used by three other villages as well and conflicts break out frequently. Unprotected sources which are also used are three hand dug wells, for all household purposes. Average consumption is 12 lpcpd. *Water Committee:* There is

an active water committee for the borehole, comprising 9 members, but meetings are only held in the event of a breakdown of the pump at the borehole. Contributions from the community range from Ushs.500-1000. The caretaker lives close by the borehole. *t*

Sanitation
Existing practices were found to be:
i) children defecate in compound
ii) defecate in the bush without burying faeces
iii) defecate in the bush and burying faeces

Latrine coverage was found to be 38%. Common latrines found were traditional pit latrines with logs only, without any superstructure, as well as traditional pit latrines, with a superstructure of grass, and logs over the pit, but no roof

Awareness level
Awareness on the link between poor sanitation and disease was found to be high, but practices did not comply with this awareness.
Latrine slabs had been provided by CPAR at a price of Ushs.5000, but only two households had purchased any. The price has now been increased to Ushs 15000 in line with the government policy on no subsidies.

Village level Institutions
The P.A G is active in this village, and as a consequence the majority of the villagers are 'saved' This also means that there is no Drinking Group in this village

Women Farmer Group
This group is no longer very active

Lira District Community Profiles

Community Profile: Agarakato Village, Amugu Sub-County

Local leaders present at meeting: LC1 Chairman, Defense Secretary LC1, General Secretary, LC1, Secretary for Mass Mobilisation LC1, Secretary for Women, LC1, Secretary for Youth, LC1, 2 elders.

Socio-economic conditions
This is a poor village, but it has received support from the NGO All Nations. In terms of infrastructure, the nearest school was 2 km away, the health centre 3 km. The population of the village was 468, a total of 78 households.

The village has one shallow well installed by All Nations, which was onginally a protected source but has become infected with red worms and provides only a seasonal yield. Other sources are three seasonal unprotected springs.
A survey was conducted by All Nations NGO for borehole drilling but was unable to find a suitable site.

Water use patterns
Women prefer to use the three seasonal springs in the village, to the shallow well installed by All Nations, since the water appears to be clearer and tastes better. The shallow well yield is poor, the water turbid and it dries up completely during the dry season. There are various problems associated with this well, and due to its siting, is polluted by a ditch close by. Dissatisfaction results in this so-called protected source being little used. The NGO All Nations has not monitored problems arising, and although provided some advice at the time of installation has not returned to provide further support

In the event of any new water supply being installed, households were prepared to contribute local materials for construction and food for the labourers. There would be one contribution rate for all, whether male or female, rich or poor. However, the very poor, and old are usually excused from contributions. Consumption was on average 2 lpcpd.

Potential areas of conflict between users
Any new waterpoint sited in this village would also serve three neighbouring villages, and community management arrangements would have to take this into account to avoid potential conflicts over contributions, caretaker arrangements, etc.
The regular incursions by Karamajong during the dry season (December-April) cause much disruption, including theft of grain, crops, loss of pastures, and contamination of the water source by pastoralists' cattle.

Sanitation
Existing practices were found to be
i) children defecate in compound
ii) defecate in the bush without burying faeces
iii) defecate in the bush and burying faeces

Latrine coverage was 57%. The most common types of latrines found were traditional pit latrines, with superstructure made of grass, and logs over the pit, some with and some without a roof.

Awareness level
Awareness levels on the links between poor sanitation and disease was found to be high. Households were willing to contribute up to Ushs. 3000 for a slab. A system of cross-subsidy for those who cannot afford would be adopted in this village and a request was made for assistance in producing slabs.One person was trained in slab casting by All Nations.
While there are diggers in the village, most people dig their own pits. The charge is Ushs. 2000 per 2 feet.

Constraints noted in latrine construction by villagers included lack of tools (pickaxes) lack of transport for rocks to use as covers for pits This is particularly the casen since cattle rustling reduced the number of oxen in the village, making transport very difficult and costly

Community Profile: ***Akaidebe Village, Abia Parish, Apala Sub-County***

Local leaders present at meeting: LC1 Chairman

The village was moderately well off, and well served by access roads. In terms of infrastructure, the main Lira-Adwan road passes through the village. A primary school is located in the neighbouring village of Abia, a Health Centre is located within the village. The population of the village was 450, with a total of 75 households.

There is only one borehole for the whole Parish, which comprises 21 villages. There are four springs in the village at a distance of between 0.5-1 5 km.of which two are protected and two unprotected

Water use patterns
Water is collected from all springs for drinking, cooking, washing and bathing. Cattle are watered at the bridges. Households contribute Ushs.1000 annually towards repair of the borehole (located at the school) and this is organised by the head teacher of Abia Primary school. Although a water committee was formed, comprising 13 members, this does not function. A caretaker was selected by the LC1 chairman to mobilise villagers to keep the spring clean. Fines of Ushs 500 are applied, to those who do not participate in this work, but the caretaker is said to 'drink' the money he collects in this way. Water collected from the borehole during the rainy season is considered to be turbid, and water is then collected from the protected spring.
There is one pump mechanic for the whole sub-county, who is now employed by Red Cross at the Health Unit at Apala Trading Centre.
Water was regarded as a first priority by the village, due to problems of water related diseases. Average consumption is 11-13 lpcpd.

Potential areas of conflict between users
Two neighbouring villages would benefit from the protection of the two springs, and conflicts were not anticipated, as long as the other villagers contributed in the form of local materials.

WTP: Local materials and unskilled labour

Sanitation
Existing practices were found to be:
i) children defecate in compound
ii) defecate in the bush without burying faeces
iii) defecate in the bush and burying faeces

These practices however are decreasing due to the lack of bush in the surrounding area, and the increasing population density.

Latrine coverage was found to be 29%. The most common latrine types found were traditional pit latrines with a superstructure of grass, using logs to cover the pit, some with a roof and some without. These are considered the easiest type of latrine to construct for temporary use as they are often put up as temporary structures for events such as funerals. This accounts for the concentration of latrines found in a linear pattern along the trading centre, (see community map) and only one is actually located at a homestead in the village itself.

Lira District Community Profiles

Awareness level
Awareness was found to be high regarding the relation between diseases and poor sanitation. Red Cross has been working in the area on hygiene and sanitation

Community Profile: ***Inomo Village, Amolatar Parish, Muntu Sub-County, Kyoga County***

Local leaders present at meeting: LC1 Chairman LC1 Vice Chairman, LC1 Agriculture, Head of Onomo Clan, General Secretary LC2, Elder, Secretary for Mass Mobilisation LC1

The village is poor, although easily accessed by main roads. The nearest school is 1.5 km. distant, and the nearest Health Unit is 2 km. away. The population of the village is 306 with a total of 51 households.

Criteria for selection: CDA, DHI and HA have all been visiting village regularly.

The water source for the village is a borehole located 1.5 km. away in the primary school DWD plans to drill a borehole in the village were interrupted by war in 1986.

Water use patterns
Water is collected from the borehole 1.5 km distant, and is used for all household purposes. There are complaints about the queuing involved at this source as it serves a large population of five neighbouring villages. During the rainy season, women collect water from the swamps for cooking, washing and other household purposes. Some households with tin roofs collect rain water during the rainy season.
Average consumption is 12 lpcpd

Potential conflict
In the event that a new water supply was installed, households would be prepared to contribute Ushs. 2000 as well as food for labourers and local materials. Neighbouring villages would be required to make contributions to avoid conflict.

Sanitation
Existing practices were found to be:
i) children defecate in compound
ii) defecate in the bush without burying faeces
iii) defecate in the bush and burying faeces

Latrine coverage was found to be 59%. The most common latrine types found were pits with logs only, without any superstructure, traditional pit latrines with a superstructure of grass, using logs to cover the pit, some with a roof and some without.

Awareness levels
Awareness levels on the links between poor sanitation and disease were found to be high. This is probably due to the frequent visits of the DHI who'sensitises' villagers on hygiene and sanitation and monitors pit latrine construction. The village is close to the Sub-county HQ.
During the process of social mapping, villagers plotting the homes initially excluded those without latrines. The LC1 Chairman present pointed this out and these were subsequently included. This indicated the prevailing fear among villagers about giving accurate details about latrine coverage, due to the practice of bye-laws and fines applied as penalties.
Constraints noted in latrine construction by households were insufficient water for mud block making for the latrine superstructure Due to the frequent visits of Sub-County staff, and the pressure to construct latrines, a number of 'fake' latrines are constructed which have no pits, but which are sufficient to avoid a fine being imposed. Affordability for pit digging was also noted, in

relation to the cost of digging, amounting to Ushs. 2000 per foot. For a pit minimum 15 feet deep, this is beyond the reach of most villagers, but particularly disadvantaged are widowed and elderly people. Households were prepared to pay Ushs. 500 for a slab, but most villagers were unaware of the production costs of the slabs.

Kumi District Community Profiles

Community Profile: Akiet Village, Mukura Sub-County, Ngora County

Local leaders present at meeting: LC2 Secretary for Defense, LC1 Mass Mobiliser; LC1 Environment, LC1 Chairman

The village was moderately well off. In terms of infrastructure, two main murram roads and one tarmac road transect the village/sub-parish, and there is one primary school, and three churches in the village. There was no health centre, the nearest being at the Sub-County, 4 km distant, the market was 2 km away. The population of the village was1320, with a total of 264 households, although the village in fact constitutes the sub-parish.

There are a total of 9 seasonal wells used by the village, one of which has dried up and 5 hand-dug wells installed by the NGO Vision Terudo One borehole is functioning, while two are not. There is also a valley dam which has silted up.

Water use patterns

Although there is one functioning borehole in the village, and awareness of the health risks attached to drinking from unprotected sources, many (elderly and disabled especially) collect water from polluted sources, such as the Maji Mzun, a pond approximately 1 km distant. Cattle also are watered at this pond (often by children). Distance to the borehole seems to be the main reason for use of such sources, which overrules awareness of health risks. Average consumption was between 8-11 lpcpd.

The community sends regular demands to the District for an improved water supply by the village but there has been no response. The community identified the locations for 3 boreholes for the sub-parish, 1.5 km distant from each other, centrally situated in the sub-parish. (See community map). By comparison, the rehabilitation of wells carried out by Vision Terodo appears to be an inappropriate intervention, in only rehabilitating existing wells in individual's homes, these being clustered in one part of the village only, leaving the remaining households unserved.

Water preferences

Type of source	Name	Purpose
Protected hand-dug wells	Vision Terodo	drinking, cooking, washing
Seasonal pond	Kuruka	bathing, washing clothes, watering animals
Seasonal pond	Maji mzuri	drinking, bathing, washing clothes
Borehole (F)	Akeit School	drinking
	Agwelikor	bathing, washing, watering animals
Seasonal pond	Amwebe	drinking, cooking, bathing
	Olumu	cooking, drinking
Seasonal well	Adia	drinking, washing clothes (dry season only)
	Mulema	bathing, washing
	Okokoj	drinking, cooking, bathing
	Abobore	drinking, washing

In the view of the villagers, the community was easily able to afford contributions, but emphasised that 'byelaws need to be introduced to deal with contributions'

Sanitation

Existing practices were found to be:

i) children defecate in compound
ii) defecate in the bush without burying faeces
iii) defecate in the bush and burying faeces

The most common type of latrine found was the traditional pit latrine, with a superstructure of mud/wattle, and a roof. The latrine coverage was found to be 29%. :

Awareness level
A high level of awareness was found, which was attributed to the efforts of the Parish chief at mobilisation at the time of the cholera epidemic, and various campaigns in the past Households were prepared to pay Ushs 2,000 for a slab. (This could have been influenced by RUWASA promotional activities in nearby Mbale where subsidised Sanplats had been offered at Ushs. 2,500) Skills in the construction of latrines were available in the village as were materials, such as grass for thatch, and poles.
Constraints cited by villagers in constructing latrines included hard rock, unavailability of affordable slabs, sanplats, termites, and cultural beliefs (latrines never used in the past) as well as collapsing soils.

Village level institutions

Akeit community identified seven institutions operating in their village. These include

Vision Terudo which is an NGO. The activities it carries out in the village are: school construction, giving out loans for bulls and goats, hand-outs in form of sorghum, G, nut seeds, hand hoes, axes, basins and blankets and water source protection. Vision Terudo is also involved in AIDS counselling and health care training The NGO works through the LCs to mobilise people and materials for school construction and water source protection.

Local council 1: The LC 1 executive encourages people to dig latrines and carries out health care training in the households. It mobilises people for road clearance, village meetings and encourages parents to take children to school. They keep law and order and attend seminars organised by the District and sub-county. The LC particularly mobilised communities to contribute materials for the construction of Akeit primary school.

Women's Groups: The women group in the village received loans from Vision Terudo and is almost dying out because it does no longer receive support from the organisation.

Burial groups: The community members organised themselves into burial groups. The burial groups contribute money and food stuffs during burial ceremonies.

Churches: Whereas there is no church building located in the village, the churches were taken to be the most important institution to the people in the village. The members reported that they take them to be very important because they spread the word of God. The church also distributed hoes to the community members as a loan. There is an indication that the church could be a good channel for community mobilisation. It is however important to take into consideration the different denominations.

The sub-county Local Government: The sub-county is not very active in the village and communities allayed fears that if support is channelled through the sub-county it may never reach them. They reported that every year they inform the sub-county that their need is water but they have never received any response.

The Parish Chief: The Parish Chief is responsible for collecting tax, mobilisation for road maintenance and sanitation improvement. He participates in resolving conflicts and hearing of cases together with the LCs

Kumi District Community Profiles

Community Profile: Aguya-Akum Village, Akide Parish, Ongino Sub-County, Kumi County

Local leaders present at meeting: LC1 Chairman

The village was located 10 km from Kumi town, and was poor. In terms of infrastructure, the village was poorly served, the nearest school was 4.5 km away, nearest health centre 9 km The village had a population of 539, with a total of 79 households.

The only water sources was Lake Bisina, some 2 km. away.

Water use patterns
Lake water is used for all purposes throughout the year. During the rainy season, the swamp in the middle of the village is also used for distilling, washing clothes, and watering animals There is no custom of hiring/using boats to collect water from the deeper (therefore less polluted) areas of the lake, as in Olupe Village. Average consumption was 8-9 lpcpd.
A few men assist women with water collection, but only those who own bicycles. Approximately 20% of the households own a bicycle of which perhaps half are willing to assist women in water collection.
Women retain control of their own earnings, and generally are responsible for household purchases. The main items purchased are salt, soap, jerrycans, household needs, as well as visits to health centre. Main sources of income are sale of food crops (cassava), brewing, and charcoal burning. Women are mainly responsible for taking children to the health centre. Typical costs are : Ushs.300 for a 'book', Ushs.300 for a syringe, so expenditure is seldom less than Ushs. 600. Typical high expenditure times are in April, May and August, with May the highest, when women may go 3-4 times to the health centre, incurring costs in excess of Ushs.2,800

With regard to contributions households are prepared to make towards construction of any new source, this ranged from Ushs. 500-1000 per household, and they were willing to provide local materials as well as unskilled labour.

Sanitation
Existing practices were found to be.
i) children defecate in compound
ii) defecate in the bush without burying faeces
iii) defecate in the bush and burying faeces

Latrine coverage was found to be 2.5%.

Awareness levels
A high level of awareness between poor sanitation and disease was found, although practices did not reflect the leve of awareness. Six households attempted to dig pit latrines, but met hard rock. Constraints cited by the community in building latrines included lack of tools, (pickaxes) and collapsing soils. Villagers indicated they could form groups for pit latrine digging Disillusionment however with the whole business of pit latrine construction characterises the general attitude towards sanitation and consequent low latrine coverage.

Households indicated that they were prepared to pay between Ushs. 500-1000 for a slab, and that materials were available for constructing the latrine superstructure, such as grass for thatch, and poles.

Livelihood issues
Although cattle are regarded as a main source of income and wealth in the District, villagers were generally reluctant to admit to owning any. In this village only 20% of the households declared themselves owners of cattle. This was a sensitive item of discussion, as many villagers thought that information on cattle ownership would be used in some way against them. The Protestant Church ran a cattle re-stocking scheme in the village, and reportedly 4 villagers had the opportunity to take part in this scheme in 1997 No food security programme was operating in the village.

Poverty issues
Ownership of 8+ cattle is an indicator of wealth in this village.
Ownership of 2 bulls is an indicator of being reasonably well off
Owning no cattle is an indicator of poverty
Youth, living with their parents are often considered poor as they have no land
Having cash is not considered to be a good idea, and is not considered as an indicator of wealth.It is spent too easily, and 'can be easily misspent' There was no knowledge of banking or any bank in the area.

Village level institutions

The institutions operating in the village are:

Burial groups: The burial groups collect food and contribute money for use during burial ceremonies. They purchase burial materials, saucepans, cups and plates

Drinking Group: The men in the village reported to have started a drinking group They contribute money, which they use to buy local brew on Sundays. The balance is given to one member for use on individual problems on a rotational basis. The drinking group sometimes collects money for burial ceremonies and other community functions.

Local council 1: The local council communicates on behalf of the community with the NGOs and other development players coming to the village. They mobilise people and materials to construct schools. The LC settles disputes and they are overall leaders of the village.

The Clan: The village has a clan head who also participates in resolving conflicts especially those related to the families. He presides over marriage, burial and other ceremonies in the village.

Seasonal Calendar

Rainfall patterns and water availability: The people in Aguya village use lake water and changes in relation to the rainfall patterns. During the rain season, the lake floods and during the dry season it extends making people to walk a stretch of mad before drawing the water.

- In January, February, June, November and December the village is dry and windy.
- In March, July, September and October the village experiences rainy and dry periods.
- In April, May and August the village receives plenty of rainfall.

Crop sequence:

- In January, February and March the people in the village are clearing land in preparation for planting. They mainly clear the land using hand hoes and pangas because few households (about 10) have oxen and ploughs.
- In April and May the people are planting mainly millet, sorghum, G.nuts, Cassava and heap potatoes.
- In June and July the main activity in the crop sequence is weeding of crops especially cassava and potatoes.

- August marks the beginning of the harvest penod. An average household can harvest half a sack of sorghum, 1-2 bags of G. nuts and 2 sacks of cassava. They sell sorghum in small tins each costing Shillings 350/= and they are about 60 tins in a bag. Therefore a bag of sorghum costs about 20,000/=. A basin of G.nuts costs shillings 2,500/= and they are about 6 basins in a sack which implies that a sack of G. nuts cost about 15,000/=.
- Another source of income to the community members is the sell of labour to the well to do during the planting seasons.

Human Diseases:

- In January, February, October, November and December the commonest diseases are eye infections, cough and measles due to windy climate
- In March, Apnl, May, August and September the commonest disease is malaria because mosquitoes start to bleed in stagnant water. Other diseases are diarrhoea and cough due to the contamination of water sources.
- During June, and July the commonest diseases are flue and measles.

Major ceremonies:

The major ceremonies are carried out during December and January. They include last funeral rites, X-mas celebrations and visiting of friends and relatives.

Community Profile: Amus Village, Parish, Kachumbala Sub-County, Bukedea County

Local leaders present at meeting: LC1 Chairman

The village was moderately well off. In terms of infrastructure, the nearest school was 3 km distant, the nearest health centre is at Mbale Sub-County or Kachumbala,7 km distant. The population of the village was 850, with a total of 170 households. A total of 7 tribes live together in this village ('cell'), being Baganda, Bagisu, Basoga, Bateso, Basamya, Banyole, Bagwere with the majority being Moslem.

The village was served by 6 protected springs (3 protected by DWD 96). These were i) Mustafa and ii) Osingada, the second with very low yield in both the wet and dry season. The remaining three sources were Mayena, Ggafa and Mbogo. Each source has a (male) caretaker.

Socio-economic issues

A retired official of the Uganda Cooperative Alliance rents out much of the land in this sub-parish to villagers. He sets conditions which limit tenants to growing only fast-growing crops such as beans and maize, so that tenants can be evicted within a short time-span.

Water use patterns

Water is collected mainly from Mustafa, about 1.5 km. distant, access being down a very steep valley, particularly difficult in the rainy season. Although it is supposed to be cleaned 2 or 3 times a month, this was not evident from observation.

Women are entirely responsible for collecting water and very few men assist their wives in this. The few that do use a bicycle.

Men retain control of all earnings in the household, and women have no control over any resources, even the usual small ruminants, chickens, etc. Fuel collection is a problem for women, who have to walk 4-5 km to buy bundles of firewood at Ushs.200-500.

Potential areas of conflict between users
Villagers from 3 neighbouring villages also collect water from the springs. If a new supply is installed, the neighbouring villages of Sapiri Zone, Kwankwan Zone, Namengo Zone and Kireka Zone will also use it. No conflict are anticipated over this.
Conflict within the village has ensued however, as a result of the (male) caretakers trying to get the women to keep the source clean, and the women have refused. Their solution is to appoint a female caretaker. This is unlikely to happen unless some level of encouragement is provided.

Sanitation
Existing practices were found to be:
i) children defecate in compound
ii) defecate in the bush without burying faece
iii) defecate in the bush and burying faeces

Latrine coverage was 62%.
The most common types of latrines found were
i) pit with logs only, without any superstructure
ii) traditional pit latrine, without any superstructure, with logs over the pit
iii) traditional pit latrine, with a superstructure of mud/wattle and a roof

Awareness level
Awareness levels on the links between poor sanitation and disease was found to be high. There is generally a positive attitude towards latrine use, which partly accounts for the high level of coverage The LC1 is particularly active, and has been involved in a range of mobilising actities

Livelihoods
Cattle were not kept in this village due to the geo-physical conditions and high density population. There was a high proportion of small businesses in the trading centre in the centre of the village. From January to June most men migrate out and hire out their labour, in Mbale and beyond Women remain in the village and involved in domestic and household activities, child care, etc.

Food security issues:
Soil fertility is gradually declining in this area, due to the high density population, and pressure from the landlord to grow fast-growing crops. The banana plantations were hit by disease a few years ago, and as a result, a different species is now being used, which is smaller, and produces less, resulting in reduced incomes for growers.

Village level institutions

Uganda National Farmers Association (UNFA): The organisation supplies seeds of beans and maize to the women group. When a person receives 10 kgs pays 13 kgs in return. However this season the crops did not yield because the farmers did not follow the farming instructions and were not given pesticides.

Amusi burial group: This offers support in form of food stuffs, and money during burial ceremonies. The communities reported that they take this group as being more important than UNFA because the results are feasible It is a good form of community mobilisation and contributions.

Uganda Women's Efforts to Save Orphans (UWESO): The organisation started operation in the village in February It trains community members on identifying income generating activities, project management and savings. People are not yet sure of its benefits to the village.

Ayuda Farmers Group: The major objective is to mobilise the youth to overcome poverty through identification and implementation of projects like brick making. The group was started by

the youth in the village on their own initiative with each member paying 2000/= as membership fees. The current members are 15. The group is relatively big because the youth have already put in place gardens and banked some money. There is likelihood that in future this group may get linked to UNFA.

Local Council 1: The LC was reported to be very vital in community mobilisation. It co-ordinates all projects in the area and is regarded to be the most important institution in the village.

UCOBAC: This deals in adult education. It only started in 1999 and community members especially women said that they are very eager to learn how to read and write.

Aikwada women's group: It is a club of 40 women engaged in farming and singing. UNFA channelled its support through the group.

Bangoma farmers group: The members are involved in farming, savings and credit. The group operates in Mbale, Kumi and Pallisa District and started operation in Amus in 1998.

Agric farmers association: It is involved in agriculture activities especially growing of beans, matooke and maize

The village used to have a water committee, which collapsed during insurgency. Currently there is no systematic mechanism of looking after the spring, which was protected in 1986

Seasonal calendar

Rainfall pattern and water availability:

- In January, February, November and December the village experiences a dry period
- In March, June and October the village has a mixture of rain and dry periods.
- During April, May, August and September the village receives a lot of rain

Income

The people reported to be having very little income between January and June. There is no harvest and the only income earned is through sell of labour by the men in neighbouring communities. The income earned is basically used to buy food from the trading centres because during the period there is no food harvested. The community members start to earn money in July and get their peak in September. Average harvest per household are two bags sold at Shillings 20,000/= each.

Human Diseases:

- In January, February, March, October, November and December the commonest diseases are measles, malana and cough
- In April, May, June, July, August and September the commonest diseases are malaria and diarrhoea due to mosquitoes and water contamination.

Community Profile: Pokore Village, Kodike Parish, Kobwin Sub-County, Ngora County

Local leaders present at meeting: LC1 Chairman, Secretary Youth

CDA indicated that this village had a Water User Committee that was functioning well. This turned out not to be the case.

The village was moderately well off. In terms of infrastructure, the village is easily accessed, as a major road passes through it to the lake. There is a P.A.G. church in the village, but no school, and the nearest health centre is Opot Clinic 4 km. away.
Neighbouring villages are Opot and Kodike. The population is 200, with a total of 40 households..

There are two hand-dug wells and 4 open water sources, which are seasonal, and 4 lakes surround the village.

Water use patterns
Drinking water is collected from the borehole in the neighbouring village of Kodike 2 km distant. Households that cannot go that far collect drinking water from seasonal unprotected sources. When these seasonal sources dry up, the only remaining source is the lake This is also where cattle are watered.
Households were prepared to make contributions towards the capital cost of any new installation in the form of locally available materials
Some men were seen to help women in water collection, by collecting drinking water from the borehole. This is done however only when the husband owns a bicycle. They would not contemplate collecting water by foot.

Potential areas of conflict between users:
If a new borehole was installed, neighbouring villagers from Opot would also be likely to use it. However, it was thought that these would mainly be men, collecting drinking water with bicycles. Conflicts over this were not anticipated.

Sanitation
Existing practices were found to be:
i) children defecate in compound

The latrine coverage was found to be 60 %. This comparatively high rate of coverage may be attributed to a previous cholera outbreak in the area and consequent enforcement of bye-laws. The latrines were located quite close together.

Village level institutions

Local Council 1: It is involved in settling cases and disputes for example related to land. It is the link between the village and higher local councils. The LC mobilises the community to clear roads, construct schools, latrines and bath shelters. It used to conduct sanitation sensitisation and home visits. They collect data about the village and communicate to higher authorities.

Water User Committee (WUC): There is a water committee composed of nine members. The committee collects money from the communities to buy spare parts for the repairing the borehole. Normally the communities contribute between 100 and 200/= and the spare parts are bought from Kumi town. The WUC also ensures that the surroundings of the borehole are clean. The WUC also selected a caretaker. He works as a volunteer and supervises the way the borehole is used. The people do not know the amount of money, which the WUC has but they are more concerned about the functioning of the borehole.

Obongosio Women's Group: This is a group of seven women. Each one of them contributes 3000/= every after two weeks which they give to one person to brew local beer on a rotational basis. The profits made by each individual are used to cater for family needs. The group was reported to be very important because it helps the families to raise money for clothing, sickness, food and hire of ploughs. It is closely related to the LC.

Aleya Group: This is a group of 5 women and 5 men. They plant and weed for each other collectively (communal farming). The group members between them have 3 oxen and a plough,

which they use collectively. It was not taken to be very important because it has just started and covers a few people.

Pentecostal Assemblies of God (PAG): They advise people not to drink and is not linked to the women's group because they sell beer The people believing in PAG increase in the village day by day.

Sub-county Local Government: The sub-county built a dispensary in the nearby village and people no longer travel to Ngora, which is about 15 kms away for treatment. The Sub-county also graded the road passing through the village It also sensitises people on development. However, the HA is no longer visiting the village regularly as he used to do. The sub-county also released the 25% allocation to the village totalling to 250,000/= which the village allocated to the construction of the school as a supplement from the community contributions. The sub-county was reported important because everything coming to the village goes through the sub-county.

Appendix 7

Sample Household Survey Questionnaire

Uganda 4 Districts - Household Questionnaire

Reference No

Location and date of survey

District:.....

County.....

Sub-County:.....

Village:.....

Date:.....

Opening statement

My name is .....and I am working for the UK Department for International Development which is planning to a water, hygiene and sanitation project in this district. This village has been chosen at random to carry out a survey of the existing situation and problems related to water and sanitation on households. Your household has also been chosen at random. The information will be used to be build up a picture of the current situation in the district and will be used to help design a project which will meet the needs and demands of residents throughout the district.

I would like to ask you some questions about the water and sanitation situation in your household. This will take less than half an hour. Your answers will be completely confidential and will not be made available to any authority. You do not have to answer any questions which you do not like.

	Is the respondent female or male?	***Female***	1
		Male	2

GENERAL QUESTIONS

1.	Are you the head of this household?	***Yes***	1
		No	2
2.	How many people are living in your household?	***Enter number:***	

WATER SUPPLY QUESTIONS

3.	Do you have to use different water sources in the wet and dry season?	***Same***	1
		Different	2

WET SEASON - (explain to respondent that the following questions are for water collection in the wet season)

4.	Where do you normally collect your drinking water from?	***Borehole***	1
		Protected well	2
		Unprotected well	3
		Protected spring	4
		Unprotected spring	5
		River/pond/lake	6
		Valley dam	7
		Rainwater	8
		Other	9
5.	Do you collect all your water from this source?	***Yes***	1
		No	2
	If "No"		
6.	where do you normally collect your other domestic water from (e.g. for washing)?	***Borehole***	1
		Protected well	2
		Unprotected well	3
		Protected spring	4
		Unprotected spring	5
		River/pond/lake	6
		Valley dam	7
		Rainwater	8
		Other	9
7.	Who normally collects the water?	***Man***	1
		Woman	2
		Girl children	3
		Boy children	4
		Vendor brings it	5
8.	If you get water from a vendor:		
	How much does the vendor charge	***per trip***	
	or	***per jerrycan***	
9.	How often and how many jerrycans do you buy from the vendor?		**number jerrycans**
		Daily	
		Weekly	
		Monthly	
		Occasionally	

10. How many (20 litre) jerrycans do you **fetch** to your house each day?	***Enter number:***	
12. How far is it from your house to the source where you fetch water in the wet season?	***Enter distance (km):***	
13. How much time do you spend fetching water in the wet season (total in one day)?	***Less than ½ hour***	1
	½ hour to 1 hour	2
	1 hour to 1 ½ hours	3
	1 ½ hours to 2 hours	4
	2 to 3 hours	5
	3 to 4 hours	6
	More than 4 hours	7
14. How do you transport the water to your home?	***On foot***	1
	With a bicycle	2

DRY SEASON (explain to respondent that the following questions are for water collection in the dry season)

15. Where do you normally collect your drinking water from in the dry season?	***Borehole***	1
	Protected well	2
	Unprotected well	3
	Protected spring	4
	Unprotected spring	5
	River/pond/lake	6
	Valley dam	7
	Rainwater	8
	Other	9
16. Do you collect all your water from this water from this source?	***Yes***	1
	No	2
If "No"		
17. where do you normally collect your other domestic water from (e.g. for washing)?	***Borehole***	1
	Protected well	2
	Unprotected well	3
	Protected spring	4
	Unprotected spring	5
	River/pond/lake	6
	Valley dam	7
	Rainwater	8
	Other	9

18.	Who normally collects the water?	***Man***	1
		Woman	2
		Girl children	3
		Boy children	4
		Vendor brings it	5
19.	If vendor brings water sometimes:		
	How much does the vendor charge	***per trip***	
	or	***per jerrycan***	
20.	How often and how many jerrycans do you buy from the vendor?		**Number jerrycans**
		Daily	
		Weekly	
		Monthly	
		Occasionally	
21.	How many (20 litre) jerrycans do you **fetch** to your house each day?	***Enter number:***	
22	How far is it from your house to the main source where you fetch water in the dry season?	***Enter distance (km):***	
23.	How much time do you spend fetching water in the dry season (total in one day)?	***Less than ½ hour***	1
		½ hour to 1 hour	2
		1 hour to 1 ½ hours	3
		1 ½ hours to 2 hours	4
		2 to 3 hours	5
		3 to 4 hours	6
		More than 4 hours	7
24.	How do you transport the water to your home?	***On foot***	1
		With a bicycle	2

GENERAL WATER SUPPLY QUESTIONS - WET & DRY SEASON

25.	Are you satisfied with your water source(s)?	***Yes***	1
		No	2
26.	If "No" what are the problems?	***Too far***	1
		Bad taste	2
		Unsafe	3
		Unreliable	4
		Long wait	5

27.	Do you have to pay any money per jerrycan?	***No***	1
		Yes	2
28.	If "Yes" How Much?	***Enter cost/jerry***	
29.	How many jerrycans do you buy each day?	***Enter Nr jerrycans***	
30.	Do you pay any money towards maintenance of the source?	***No***	1
		Yes	2
31.	If "Yes" ask how much and on what basis?	***Weekly (enter cost)***	
		Monthly (enter cost)	
		Occasional	
		When breaks down	
32.	Who do you pay the money to?	***Treasurer WUC***	1
		LCI Chairperson	2
		Other	3
33	Do you catch any rainwater from your roof?	***Yes***	1
		No	2

IMPROVEMENTS TO WATER SOURCE

34.	Do you feel there is a need for an improved water source in your village?	***Yes***	1
		No	2
35.	How could the water situation be improved in your village?	***Improve/rehabilitate existing source***	1
		New protected spring	2
		New shallow well	3
		New borehole	4
		Rainwater catchment in home	5
36.	How much would your household be prepared to contribute at the start towards construction of a new source like this?	***Initial payment (enter sum)***	
37.	How much would your household be prepared to contribute to maintenance each month?	***Maintenance per month (enter sum)***	

SANITATION & ENVIRONMENTAL HEALTH

38.	What type of sanitation facilities does your household use?	***Bush/open***	1
		Traditional pit latrine (no slab)	2
		Pit latrine with slab or sanplat	3
		Pit latrine with slab & ventilation pipe	4
39.	Who uses the latrine?	***Man***	1
		Woman	2
		Children	3
40.	What age do your children start using it?	***Enter Age:***	
	Do you have a special hand-washing facility near the latrine?	***Yes***	1
		No	2
41.	Do you have any soap for hand-washing at the moment?	***Yes***	1
		No	2
42.	Are you satisfied with your present latrine facilities?	***Yes***	1
		No	2
43.	If "No" What is wrong with your latrine ?	***Smells***	1
		No privacy	2
		Difficult to maintain	3
		Dangerous	4
		Unhealthy	5
44.	Where do you bathe?	***At water source***	1
		Bathing shelter at home	2
		Other	3
45.	Where do you throw away household waste?	***Bush***	1
		Waste pit	2
		In the garden	3
46.	Do you have a drying rack for your plates?	***Yes***	1
		No	2

HOUSEHOLD EXPENDITURE

47. Does your household own any of the following:	***Radio***	1
	Bicycle	2
	Foam mattress	3
	Thermos	4
	Ironing machine	5
	Blankets	6
	Plough	7
	Oxen (number)	
	Cows (number)	
	Goats (number)	
	Poultry (number)	
48. Approximately how much **cash** do you estimate your household spends in **one week?**	***0 - 100***	1
	100 - 200	2
	200 - 500	3
	500 - 1,000	4
	1,000 - 2,000	5
	2,000 - 5,000	6
	5,000 - 10,000	7
	More than 10,000	8
Thank you!! Any questions??		

Appendix 8

Analysis of Household Survey Data

HOUSEHOLD SURVEY RESULTS
APAC, KATAKWI, KUMI AND LIRA DISTRICTS
JULY - AUGUST, 1999

1. Respondent's Sex:

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Female	56	64.4	5	50	31	55.4	33	52.4	125	57.9
Male	31	35.6	5	50	25	44.6	30	47.6	91	42.1
Total	87	100	10	100	56	100	63	100	216	100

2. Female Household Heads

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Female Households	50	57.5	4	40	18	32.1	28	44	100	46.3
Total	87	100	10	100	56	100	63	100	216	100

3. Average Household Size

Description	Apac	Katakwi	Kumi	Lira	Average
Mean	7.43	7.60	8.00	8.85	8.00

WATER SUPPLY QUESTIONS

4. People using different sources in wet and dry seasons

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Same Sources	70	80.5	2	20	26	46.4	45	71.4	143	66.2
Different Sources	17	19.5	6	60	30	53.6	18	28.6	71	65.7
Total	87	100	10	100	56	100	63	100	216	100

5. Sources of drinking water in wet season

Facilities	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Boreholes	48	55.2	06	60.0	34	60.7	15	23.8	103	47.7
Protected Wells	-	-	01	10.0	01	1.8	02	3.2	04	1.9
Unprotected Wells	03	3.4	03	30.0	01	1.8	14	22.2	21	9.7
Protected Springs	-	-	-	-	13	23.2	16	25.4	29	13.4
Unprot. Springs	15	17.2	01	10.0	06	10.7	13	20.6	35	16.2
River/Pond/Lake	20	23.0	-	-	08	14.3	04	6.3	32	14.8
Valley Dam	04	4.6	-	-	-	-	03	4.8	07	3.2
Rainwater	03	3.4	-	-	-	-	02	3.2	05	2.3
Other	-	-	-	-	01	1.8	-	-	-	-
Sample size	87	100	10	100	56	100	63	100	216	100

6. People using other sources for domestic (non-drinking) water

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Same source	47	54	8	80	19	33.9	43	68.3	117	54
Different source	40	46	2	20	37	66.1	20	31.7	99	46

7. Sources for domestic (non-drinking) water in wet season

Facilities	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Boreholes	-	-	6	60	04	7.1	01	1.6	11	5
Protected Wells	-	-	1	10	01	1.8	-	-	02	1
Unprotected Wells	13	15.0	3	30	31	55.4	03	4.8	50	46
Protected Springs	-	-	-	-	04	7.1	02	3.2	06	3
Unprotected Springs	04	4.6	1	10	03	5.4	06	9.5	14	6
River/Pond/Lake	16	18.3	-	-	02	3.8	09	14.3	27	13
Valley Dam	04	4.6	-	-	-	-	01	1.6	05	2
Rainwater	03	3.4	-	-	01	1.8	04	6.3	08	4
Other	-	-	-	-	01	1.8	-	-	01	1

8. Sources for drinking water in dry season

Facilities	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	
Boreholes	56	64.4	07	70.0	31	55.4	32	50 1	126	
Protected Wells	-	-	-	-	01	1.8	00	0.0	01	
Unprotected Wells	04	4.6	-	-	19	34.0	13	20.1	36	
Protected Springs	01	1.1	-	-	02	3.6	14	22.2	17	
Unprot. Springs	12	13.8	02	20.0	05	8.9	14	22.2	33	
River/Pond/Lake	20	23.0	-	-	02	3.8	02	3.2	24	
Valley Dam	04	4.6	-	-	-	-	02	3 2	06	
Rainwater	01	1.1	-	-	-	-	01	1.6	02	
Other	-	-	-	-	-	-	-	-	-	

(note: some people use more than one source for drinking water)

9. People using other sources for domestic (non-drinking) water in dry season

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Same source	47	54.7	8	80	23	41	47	75	125	58
Different source	39	45.3	2	20	33	59	16	25	90	42

10. Sources for other domestic (non-drinking) water in dry season

Facilities	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Boreholes	-	-	Na	Na	09	16.1	01	1.6	10	4.6
Protected Wells	-	-	Na	Na	-	-	-	-	-	-
Unprotected Wells	12	13.8	Na	Na	22	25.3	03	4.8	37	17.1
Protected Springs	-	-	Na	Na	-	-	-	-	-	-
Unprot. Springs	04	4.6	Na	Na	02	3.6	03	4.8	09	4.2
River/Pond/Lake	16	18.4	Na	Na	04	7.1	06	9.5	26	12.0
Valley Dam	04	4.6	Na	Na	01	1.8	03	4.8	08	3.7
Rainwater	03	3.4	Na	Na	00	0.0	02	3.2	05	2 3
Other	-	-	Na	Na	-	-	-	-	-	-

11. Rainwater harvesting facilities in the household

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Yes	25	29	n/a	n/a	25	44.6	23	37	73	35
No	62	61	n/a	n/a	31	55.4	40	63	133	65

12. Responsibility for collecting water

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr	%	Nr.	%	Nr	%	Nr.	
Man	1	1	-	-	16	29	03	5	20	
Woman	78	90	7	70	54	96	56	89	195	
Girl Children	38	44	5	50	33	59	33	52	109	
Boy Children	20	23	3	30	16	29	11	17	50	
Vendor Brings it	00	0	2	20	12	21	01	2	15	

13. Number of jerrycans fetched to household each day

Description	Apac		Katakwi		Kumi		Lira		Ave.	
Season	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry
Av Nr. of Jerycans	7.4	8.0	5.5	6.1	6.5	7.7	7.1	7.1	6.6	7.2
Av household size	7.4	7.4	7.6	7.6	8.0	8.0	8.9	8.9	8.0	8.0
Av consumption (l/c/d)	20.0	21.6	14.5	16.1	16.3	19.3	16	16	16.5	18.0

14. Distance from home to source (one way)

Description	Apac	Katakwi	Kumi	Lira	Ave.
Wet: Average (km)	1.3	Na	1.5	1.3	1.4
Wet: Max (km)	3.0	Na	3.0	3.0	3 0
Dry. Average (km)	1.3	Na	1.9	1.4	1.5
Dry: maximum (km)	3.0	Na	5.0	3.0	3.7

15. Total time spent collecting water in the wet season

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
< 0.5 hrs	03	3.4	-	-	-	-	09	14.3	12	5.6
0.5 – 1 hrs	08	9.2	06	60	13	23.2	20	31.7	47	21.8
1.0 – 1.5 hrs	15	17.2	-	-	14	25.0	15	23.8	44	20.4
1.5 – 2.0 hrs	27	31.0	03	30	14	25.0	12	19	56	25.9
2.0 – 3.0 hrs	23	26.4	-	-	08	14.3	07	11.1	38	17.6
3 0 – 4 0 hrs	09	10.3	-	-	05	8.9	-	-	14	6.5
> 4.0 hrs	02	2.3	-	-	01	1.8	-	-	03	1.4

16. Total time spent collecting water in the dry season

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
< 0.5 hrs	03	3.4	-	-	-	-	09	18.4	12	6.3
0.5 – 1 hrs	08	9.2	01	10	13	23.2	20	40.1	31	16.1
1.0 – 1.5 hrs	16	18.4	-	-	14	25.0	12	24.5	42	21.9
1.5 – 2.0 hrs	27	31.0	07	70	14	25.0	06	12.2	47	24.5
2.0 – 3.0 hrs	21	24.1	-	-	08	14.2	02	4.1	31	16.1
3.0 – 4.0 hrs	09	10.3	-	-	05	8.9	-	-	14	7.3
> 4.0 hrs	02	2.3	-	-	01	1.8	-	-	03	1.6

17. Mode of transporting water in wet season

Description	Apac		Katakwi		Kumi		Lira		Ave.	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Foot Only	55	63	6	80	43	77	50	79	154	71
Bicycle only	12	14	-	-	1	2	6	10	19	9
Both Foot and Bicycle	19	22	2	20	11	20	7	11	39	18

18 **Mode of transporting water in dry season**

Description	Apac		Katakwi		Kumi		Lira		Ave.	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Foot Only	56	64	4	40	40	71	46	73	146	68
Bicycle only	12	14	1	10	1	2	4	6	18	8
Both Foot and Bicycle		21	3	30	12	21	6	10	39	18

19. Satisfaction with water source

Description	Apac		Katakwi.		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr	%
Satisfied	13	14.9	3	30	6	10.7	9	18.4	31	14
Unsatisfied	71	81.6	6	60	50	89.3	53	79.6	180	83

20. Problems with source – wet season

Description	BHs		P/wells		U/wells		P/sp		Un/sp		V dam	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Too far	51	24	1	.5	17	8	5	2	11	5	6	3
Bad taste	14	7	1	.5	6	3	0	0	5	2	5	2
Unsafe	58	27	2	1	31	14	6	3	16	7	6	3
Unreliable	22	10	2	1	5	2	5	2	7	3	4	2
Long wait	52	24	2	1	21	10	6	3	6	3	0	0

21. Payments for water on a per jerrycan basis

Description	Apac		Katakwi.		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Do not pay per jerrycan	86	100	5	50	50	89	62	98	192	94
Pay per jerrycan	0	0	2	20	6	11	1	2	9	4
Av payment per jerycan	0	0	200	-	93	-	100	-	98	-
Maximum (shs)	0	0	200	-	100	-	100	-	100	-

22. Payments towards maintenance of sources

(Boreholes and protected spring respondents only)

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Contribute	56	98	6	86	31	66	18	39	111	71
Do not contribute	1	2	1	14	16	34	28	61	46	29

23. Average actual payments towards borehole maintenance

Description	Apac	Katakwi.	Kumi	Lira	Average
Weekly (Ushs)	0	0	350	0	350
Monthly (Ushs)	264	200	325	736	381
Occasionally (Ushs)	0	0	0	0	0
Breakdown (Ushs)	632	480	465	0	394

24. Average actual payments towards spring maintenance

Description	Apac	Katakwi.	Kumi	Lira	Average
Weekly	-	-	350	0	350
Monthly	-	-	350	736	543
Occasionally	-	-	0	0	0
Breakdown	-	-	465	0	465

25. Responsibility for collecting maintenance payments

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
WSC treasurer	0	0	Na	Na	27	48.2	1	2	28	30
LCI	8	9.1	Na	Na	2	3.6	19	38.8	29	31
Other (Caretaker)	37	42.5	Na	Na	0	0	0	0	31	39

26. Number of people wanting an improved source

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Yes	87	100	7	70	51	91.1	61	96.8	206	95.4
No	0	0	0	0	5	8.9	2	3.2	7	3.2

27. Preferred New Source

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr	%
Borehole rehabilitation	23	26.4	1	14.3	0	0	16	25.4	40	18.5
New Protected Spring	8	9.2	0	0	9	16.1	8	12.7	23	10.6
New Shallow well	11	12.6	1	14.3	3	5.4	4	6.3	19	8.8
New Borehole	83	95.4	5	71.4	47	83.9	50	79.4	183	84 7
Rainwater harvesting in home	1	1.1	0	0	0	0	0	0	1	0 5

(Note: some people gave more than one option as a preference)

28. Willingness to Pay: Contributions to Capital Costs

Description	Apac	Katakwi	Kumi	Lira	Ave.
Boreholes: Average (Ushs)	2,157	1,000	1,439	1,528	1,531
Boreholes: Max (Ushs)	10,000	5,000	10,000	10,000	8,750
Springs. Average (Ushs)	1,288	500	1,533	486	952
Springs: Max (Ushs)	5,000	1,000	7,000	1,000	3,500

29. Willingness to Pay: Contributions to Maintenance Costs (monthly)

Description	Apac	Katakwi	Kumi	Lira	Ave.
Boreholes: Average (Ushs)	551	200	327	432	377.5
Boreholes: Max (Ushs)	5,000	1,000	1,000	5,000	750
Springs: Average (Ushs)	325	100	255	364	261
Springs: Max (Ushs)	500	500	500	1,000	625

SANITATION AND ENVIRONMENTAL HEALTH

28. Type of sanitation facilities used

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Bush	15	17	5	50	25	49	22	35	67	32
Traditional Latrine	60	69	4	40	22	26	36	58	122	58
Latrine with Slab/SanPlat	11	13	1	10	4	5	3	5	19	9
VIP latrine	1	1	-	-	-	-	1	2	2	1
Total	87	100	10	100	51	100	62	100	210	100

28. Age children starts using latrine

Description	Apac	Katakwi	Kumi	Lira	Ave.
Age: Average	5.2	N/A	5.3	4.6	5.0
Maximum	8	N/A	9	7	8

29. Satisfied with Latrine

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Yes	17	20	0	0	3	5	14	22	34	16
No	67	77	6	60	51	91	39	62	164	76

30. Problems with latrine by type

Description	Bush		Traditional		Slab		VIP	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Smells	03	1.5	45	23.4	11	5.7	0	0
No Privacy	26	13.5	17	8.9	0	0	0	0
Difficult to maintain	3	1.5	38	19.8	10	5.2	0	0
Dangerous	28	14.6	24	12.5	0	0	0	0
Unhealthy	15	7.8	19	9.9	1	0.5	0	0

31. Hand washing and soap facilities in household

Description	Apac		Katakwi		Kumi		Lira	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Hand washing facilities and soap	6	7	1	10	n/a	n/a	6	12.2
Hand washing facilities no soap	31	36	0	0	n/a	n/a	3	6.1
Soap no hand washing facility	3	3	0	0	n/a	n/a	8	16.3
Neither	47	54	9	90	n/a	n/a	24	49

(Note: data analysis for Kumi not completed)

32. Drying rack in household

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Yes	34	39	4	40	26	46	11	23	75	37
No	53	61	6	60	30	54	37	77	126	63

33. Location of bathing

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
At water source	5	5.8	Na	Na	3	5.4	5	8.3	13	6
Bathing shelter	74	84.9	Na	Na	44	78.6	40	70.8	158	77
Other	8	9.3	Na	Na	9	16.1	18	20.8	35	17

34. Disposal of household waste

Description	Apac		Katakwi		Kumi		Lira		Total	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Bush	50	58	6	60	15	27	30	42	101	48
Waste pit	36	42	2	20	18	33	17	35	73	35
Garden	0	0	1	10	22	40	15	23	38	18

35. Income/expenditure Vs Material goods

Expenditure Groups	Nr	%	Blanket		Mattress		Bicycle		Oxen		Radio		Plough		Cow	
			Nr	%	Nr.	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
0 – 100	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100 – 200	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200 – 500	12	5	4	33	4	33	2	17	3	25	2	17	1	8	0	0
500 – 1000	24	11	5	21	5	21	5	21	5	21	0	0	2	8	9	29
1000 – 2000	31	14	20	65	20	65	13	42	7	23	5	16	7	23	9	29
2000 – 5000	70	32	40	57	40	57	36	51	9	13	26	37	7	10	13	19
5000 – 10000	48	22	24	50	24	50	31	65	9	19	23	50	10	21	15	31
> 10,000	27	13	13	48	13	48	26	96	15	56	17	63	12	44	18	67
Total	212	100	106	49	106	49	113	52	48	22	73	34	39	18	55	25

36. Expenditure Vs Sanitation

Exp Groups	Nr in Group	Bush		Traditional		Slab		VIP	
		Nr.	%	Nr	%	Nr.	%	Nr.	%
0 – 10	0	-	-	-	-	-	-	-	-
100 – 200	0	-	-	-	-	-	-	-	-
200 – 500	12	4	33	3	25	0	0	0	0
500 – 1000	24	10	42	6	25	0	0	0	0
1000 – 2000	31	17	55	21	67	1	3	0	0
2000 – 5000	70	11	16	36	51	6	9	0	0
5000 – 10000	48	5	10	28	58	4	8	0	0
> 10,000	27	3	11	16	59	6	22	2	7
Total	212	46	21	110	51	17	8	2	1

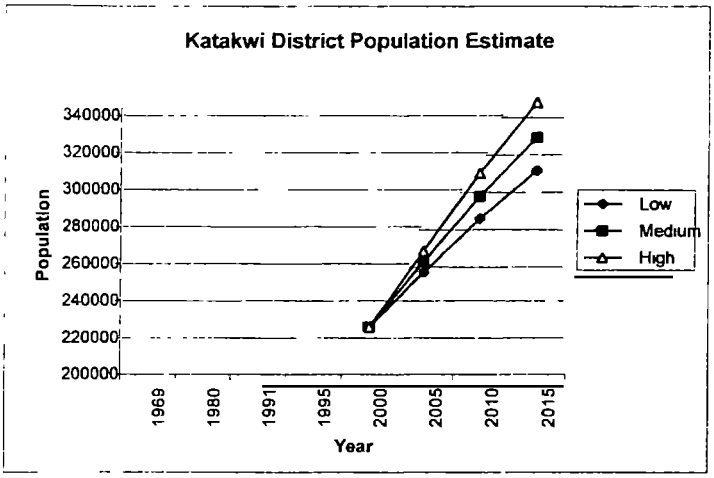
Appendix 9

Population Projections and Demand Forecasts

Katakwi District Rural Population and Water Needs Projections

Population Forecast

	Growth Rate			Total Rural Population			National Rural		District		WARDROP	
	Low	Medium	High	Low	Medium	High	R. Popn.	Growth	R. Popn.	Growth	R. Popn.	Growth
1969							8,900,459					
								2 5%				
1980							11,697,892					
								2 2%				
1991							14,782,083				144,593	
								3 3%				
1995							16,682,000					
								2 5%				7 0%
2000				225,850	225,850	225,850	18,646,000				265,206	
	2 6%	3 1%	3 5%					2 0%				4 2%
2005				256,893	262,708	268,629	20,255,000				325,206	
	2 2%	2 5%	2 9%					2 1%				4 2%
2010				285,956	297,943	310,380	22,037,000				398,780	
	1 7%	2 0%	2 3%					0 7%				4 2%
2015				311,474	329,414	348,312	23,869,000				489,000	



Rural Domestic Water Needs Projection

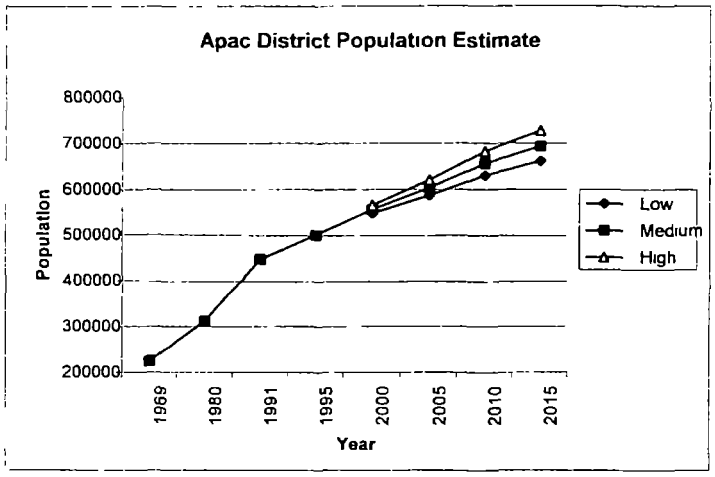
	Per Capita[1]	Total Popn Needs (m3/d)			% Pop Served	Covered Popn Needs (m3/d)		
		Low	Medium	High		Low	Medium	High
1995	20	0	0	0	35%	0	0	0
2000	20	4,517	4,517	4,517	40%	1,807	1,807	1,807
2005	20	5,138	5,254	5,373	55%	2,826	2,890	2,955
2010	20	5,719	5,959	6,208	60%	3,431	3,575	3,725
2015	20	6,229	6,588	6,966	70%	4,361	4,612	4,876

1 It has been assumed that per capita water consumption will remain the same for the forseeable future

Apac District Rural Population and Water Needs Projections

Population Forecast

	Growth Rate			Total Rural Population			National Rural		District		WARDROP	
	Low	Medium	High	Low	Medium	High	R. Popn	Growth	R. Popn.	Growth	R Popn.	Growth
1969					224,411		8,900,459		224,411			
		3 0%						2 5%		3 0%		
1980					311,617		11,697,892		311,617			
		3 4%						2.2%		3 4%		
1991					448,721		14,782,083		448,721		448,721	
		2 8%						3 3%				
1995					501,583		16,682,000					
	1 8%	2 1%	2 4%					2 5%				2 5%
2000				548,171	556,740	565,416	18,646,000				560,185	
	1 4%	1 6%	1 9%					2 0%				1 7%
2005				587,038	603,408	620,186	20,255,000				609,055	
	1 4%	1 7%	1 9%					2 1%				1 7%
2010				630,308	655,998	682,662	22,037,000				662,190	
	0 9%	1 1%	1 3%					0 7%				1 7%
2015				660,647	693,270	727,416	23,869,000				719,960	



Rural Domestic Water Needs Projection

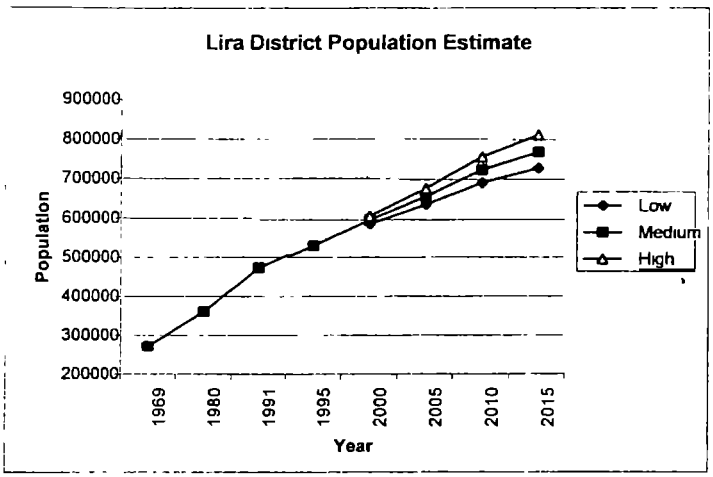
	Per Capita[1]	Total Popn Needs (m3/d)			% Pop Served	Covered Popn Needs (m3/d)		
		Low	Medium	High		Low	Medium	High
1995	20	10,032	10,032	10,032	35%	3,511	3,511	3,511
2000	20	11,308	11,135	11,308	40%	4,385	4,454	4,523
2005	20	11,741	12,068	12,404	55%	6,457	6,637	6,822
2010	20	12,606	13,120	13,653	60%	7,564	7,872	8,192
2015	20	13,213	13,865	14,548	70%	9,249	9,706	10,184

1 It has been assumed that per capita water consumption will remain the same for the forseeable future

Lira District Rural Population and Water Needs Projections

Population Forecast

	Growth Rate			Total Rural Population			National Rural		District		WARDROP	
	Low	Medium	High	Low	Medium	High	R Popn	Growth	R Popn.	Growth	R Popn.	Growth
1969					271,562		8,900,459		271,562			
		2 6%						2 5%		2 6%		
1980					361,130		11,697,892		361,130			
		2 5%						2 2%		2 5%		
1991					473,397		14,782,083		473,397		473,397	
		3 1%						3 3%				
1995					534,430		16,682,000					
	2 0%	2 3%	2 7%					2 5%				3 0%
2000				589,388	599,539	609,829	18,646,000				615,429	
	1 6%	1 9%	2 1%					2 0%				2 2%
2005				637,555	657,505	678,014	20,255,000				684,755	
	1 7%	2 0%	2 2%					2 1%				2 2%
2010				692,245	724,250	757,630	22,037,000				761,890	
	1 0%	1 2%	1 4%					0 7%				2.2%
2015				728,489	769,022	811,687	23,869,000				847,714	



Rural Domestic Water Needs Projection

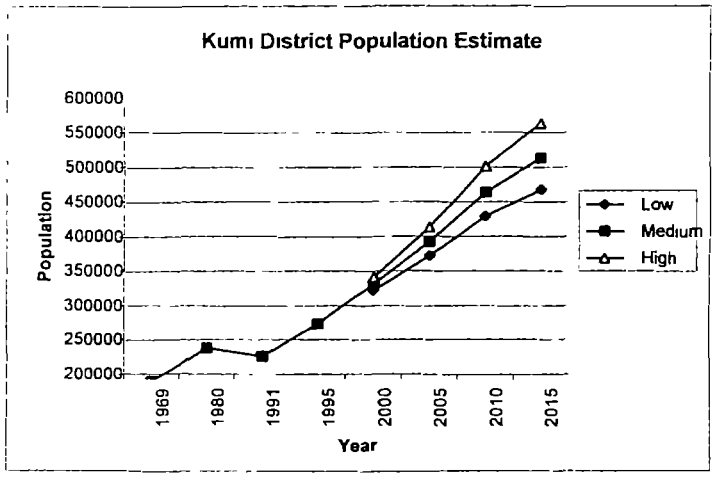
	Per Capita[1]	Total Popn. Needs (m3/d)			% Pop Served	Covered Popn. Needs (m3/d)		
		Low	Medium	High		Low	Medium	High
1995	20	10,689	10,689	10,689	35%	3,741	3,741	3,741
2000	20	12,197	11,991	12,197	40%	4,715	4,796	4,879
2005	20	12,751	13,150	13,560	55%	7,013	7,233	7,458
2010	20	13,845	14,485	15,153	60%	8,307	8,691	9,092
2015	20	14,570	15,380	16,234	70%	10,199	10,766	11,364

1 It has been assumed that per capita water consumption will remain the same for the forseeable future

Kumi District Rural Population and Water Needs Projections

Population Forecast

	Growth Rate			Total Rural Population			National Rural		District		WARDROP	
	Low	Medium	High	Low	Medium	High	R Popn	Growth	R Popn	Growth	R. Popn	Growth
1969					189,193		8,900,459		189,193			
		2 1%						2 5%		2 1%		
1980					237,906		11,697,892		237,906			
		-0 5%						2 2%		-0 5%		
1991					224,945		14,782,083		224,945		224,945	
		5 0%						3 3%				
1995					273,561		16,682,000					
	3 3%	3 9%	4 5%					2 5%				4 8%
2000				322,370	331,663	341,170	18,646,000				343,862	
	2 9%	3 4%	3 9%					2 0%				3 8%
2005				371,589	391,846	413,091	20,255,000				414,513	
	2 9%	3 4%	3 9%					2 1%				3 8%
2010				428,977	463,778	501,198	22,037,000				499,680	
	1 7%	2 1%	2 4%					0 7%				3 8%
2015				467,725	513,366	563,207	23,869,000				602,346	



Rural Domestic Water Needs Projection

	Per Capita[1]	Total Popn Needs (m3/d)			% Pop Served	Covered Popn. Needs (m3/d)		
		Low	Medium	High		Low	Medium	High
1995	20	5,471	5,471	5,471	35%	1,915	1,915	1,915
2000	20	6,823	6,633	6,823	40%	2,579	2,653	2,729
2005	20	7,432	7,837	8,262	55%	4,087	4,310	4,544
2010	20	8,580	9,276	10,024	60%	5,148	5,565	6,014
2015	20	9,354	10,267	11,264	70%	6,548	7,187	7,885

1 It has been assumed that per capita water consumption will remain the same for the forseeable future

Comparison of National and District Estimated Population Growth Rates - Source: The 1991 Population and Housing Census

Year	National				Apac				Kumi				Katakwi				Lira			
	Rural	Urban	Total	% Rural	Rural	Urban	Total	% Rural	Rural	Urban	Total	% Rural	Rural	Urban	Total	% Rural	Rural	Urban	Total	% Rural
1969	8900459	469094	9369553	95 0%	224411	1002	225413	99 6%	189193	1522	190715	99 2%					271562	7340	278902	97 4%
1980	11697892	916646	12614538	92 7%	311617	1716	313333	99 5%	237906	1633	239539	99 3%					361130	9122	370252	97 5%
1991	14782083	1889622	16671705	88 7%	448721	5783	454504	98 7%	224945	11749	236694	95 0%					473397	27568	500965	94 5%
1995	16802993	2459607	19262600	87 2%	501583	7817	509400	98 5%	273581	18939	292500	93 5%					534430	37670	572100	93 4%
2000	18983369	3227031	22210400	85 5%	556740	10560	567300	98 1%	331663	30137	361800	91 7%	225850	4140	229990	98 2%	599539	51561	651100	92 1%
2005	20969818	4070082	25039900	83 7%	603408	13492	616900	97 8%	391846	44254	436100	89 9%	262708	5706	268415	97 9%	657505	66895	724400	90 8%
2010	23275429	5090071	28365500	82 1%	655998	16902	672900	97 5%	463778	62822	526600	88 1%	297943	7485	305428	97 5%	724250	85250	809500	89 5%
2015	24096562	5874538	29971100	80 4%	693270	20230	713500	97 2%	513366	81334	594700	86 3%	329414	9400	338814	97 2%	769022	102978	872000	88 2%
Annual Change in Proportion of Rural Population																				
1969 - 1980				-0 22%				-0 01%				0 01%				n/a				0 02%
1980 - 1991				-0 41%				-0 07%				-0 40%				-0 07%				-0 29%
Annual Population Growth Rate																				
1969 - 1980	2 52%	6 28%	2 74%	-0 22%	3 03%	5 01%	3 04%	-0 01%	2 10%	0 64%	2 09%	0 01%					2 63%	2 00%	2 61%	0 02%
1980 - 1991	2 15%	6 80%	2 57%	-0 41%	3 37%	11 68%	3 44%	-0 07%	-0 51%	19 65%	-0 11%	-0 40%					2 49%	10 58%	2 79%	-0 29%
1991 - 1995	3.26%	6 81%	3 68%	-0 41%	2 82%	7 83%	2 89%	-0 07%	5 01%	12 68%	5 43%	-0 40%					3 08%	8 12%	3 38%	-0 29%
1995 - 2000	2.47%	5 58%	2 89%	-0 41%	2 11%	6 20%	2 18%	-0 07%	3 93%	9 74%	4 34%	-0 40%					2 33%	6 48%	2 62%	-0 29%
2000 - 2005	2 01%	4 75%	2 43%	-0 41%	1 62%	5 02%	1 69%	-0 07%	3 39%	7 99%	3 81%	-0 40%	3 07%	6.63%	3 14%	-0 07%	1 86%	5 35%	2 16%	-0 29%
2005 - 2010	2 11%	4 57%	2 53%	-0 41%	1 69%	4 61%	1 75%	-0 07%	3 43%	7 26%	3 84%	-0 40%	2 55%	5 58%	2 62%	-0 07%	1 95%	4 97%	2 25%	-0 29%
2010 - 2015	0 70%	2 91%	1 11%	-0 41%	1 11%	3 86%	1 18%	-0 07%	2 05%	5 30%	2 46%	-0 40%	2 03%	4 66%	2 10%	-0 07%	1 21%	3 85%	1 50%	-0 29%

Source of data for Katakwi Katakwi District Profile (April 1999)

Uganda Mid - Year Population Projections ('000) - Source: Key Economic Indicators (36th Issue: January 1999)

Year	Rural Population	Growth	Growth	Urban Population	Growth	Growth	Total Population	Growth	Growth			
1991												
1992	15421			2101			17522					
1993	15850	2 78%	2 78%	2253	7 23%	7 23%	18102	3 31%	3 31%			
1994	16270	2 65%	2 65%	2412	7 06%	7 06%	18682	3 20%	3 20%			
1995	16682	2 53%	2 53%	2580	6 97%	6 97%	19263	3 11%	3 11%	2 65%		
1996	17090	2 45%	2 45%	2758	6 90%	6 90%	19848	3 04%	3 04%			
1997	17493	2 36%	2 36%	2945	6 78%	6 78%	20438	2 97%	2 97%			
1998	17887	2 25%	2 25%	3142	6 69%	6 69%	21029	2 89%	2 89%			
1999	18271	2 15%	2 15%	3348	6 56%	6.56%	21620	2 81%	2 81%			
2000	18646	2.05%	2 05%	3565	6 48%	6 48%	22210	2 73%	2 73%	2 25%		
2001	18999	1 89%	1 89%	3789	6 28%	6 28%	22788	2 60%	2 60%			
2002	19329	1 74%	1 74%	4022	6 15%	6 15%	23351	2 47%	2 47%			
2003	19649	1 66%	1 66%	4265	6 04%	6 04%	23914	2 41%	2 41%			
2004	19957	1 57%	1 57%	4520	5 98%	5 98%	24477	2 35%	2 35%			
2005	20255	1 49%	1 49%	4785	5 86%	5 86%	25040	2 30%	2 30%	1 67%		
2006	20583	1 62%	1 62%	5073	6 02%	6 02%	25656	2 46%	2 46%		6 06%	2 43%
2007	20947	1 77%	1 77%	5386	6 17%	6 17%	25333	-1 26%	-1 26%			
2008	21298	1 68%	1 68%	5713	6 07%	6 07%	27011	6 62%	6 62%			
2009	21634	1 58%	1 58%	6054	5 97%	5 97%	27688	2 51%	2 51%			
2010	22037	1 86%	1 86%	6328	4 53%	4 53%	28366	2 45%	2 45%	1 70%		
2011	22324	1 30%	1 30%	6799	7 44%	7 44%	29123	2 67%	2 67%			
2012	22745	1 89%	1 89%	7226	6 28%	6 28%	29971	2 91%	2 91%			
2013	23147	1 77%	1 77%	7673	6 19%	6 19%	30820	2 83%	2 83%			
2014	23531	1 66%	1 66%	8137	6 05%	6 05%	31668	2 75%	2 75%			
2015	23869	1 44%	1 44%	8648	6 28%	6 28%	32517	2 68%	2 68%	1 61%	6 13%	2 72%

Appendix 10

Water Quality Testing Results

Summary of Water Quality Testing Results

Date	District	County	Sub-county	Village	Source	Installed by	Colour	Turbidity NTU	pH	Conductivity	Faecal Coliforms/100ml
05-Aug-99	Kumi	Ngora	Mukura	Madoch	Unprotected spring	Community work	Milky	45	6 5	80	0
05-Aug-99	Kumi	Ngora	Mukura	Agogomit	Borehole	UNICEF	Clear	<5	7 6	480	0
05-Aug-99	Kumi	Ngora	Mukura	Agogomit	Unprotected well	-	Milky	100	6 1	70	18
05-Aug-99	Kumi	Ngora	Mukura	Okonguro	Borehole	UNICEF	Clear	<5	6 8	480	0
05-Aug-99	-	-	-	-	Control - Bottled water	-	Clear	<5	7 3	160	0
06-Aug-99	Kumi	Kumi	Ongino	Olelia	Borehole	UNICEF	Rusty	27	7 0	270	-
06-Aug-99	Kumi	Kumi	Ongino	Kongura	Borehole (deep)	ACAV	Clear	<5	7 1	480	-
06-Aug-99	Kumi	Kumi	Ongino	Kodokul	Borehole	UNICEF	Clear	<5	6 9	500	-
09-Aug-99	Kumi	Bukedea	Kachumbala	Kachumbala	Borehole	Irish Aid	Clear	<5	6.1	170	-
09-Aug-99	Kumi	Bukedea	Kachumbala	Ongaara	Unprotected spring	-	Clear	<5	5 9	50	test failed
09-Aug-99	Kumi	Bukedea	Kachumbala	Omonyono	Unprotected spring	-	Milky	11	5 7	70	114
09-Aug-99	Kumi	Bukedea	Kachumbala	Kongoidi	Protected spring	CARE	Milky	15	5.8	60	20
09-Aug-99	Kumi	Bukedea	Kachumbala	Kongoidi	Home sample 1	(CARE)	Brown	n/k	6.1	70	77
09-Aug-99	Kumi	Bukedea	Kachumbala	Kongoidi	Home sample 2	(CARE)	Clear	n/k	6 4	70	9
10-Aug-99	Kumi	Ngora	Kobwin	Oswaara	Borehole	UNICEF	Clear	<5	7 0	470	0
10-Aug-99	Kumi	Ngora	Kobwin	Tilling	Hand dug well	Private home	Clear	<5	6 7	300	800
10-Aug-99	Kumi	Ngora	Kobwin	Tilling	Protected spring	CARE/KDDP?	Milky	30	6 3	80	68
10-Aug-99	-	-	-	-	Control - Tap water	-	Clear	<5	8.1	230	0
17-Aug-99	Lira	Moroto	Apala	Awing	Protected spring	UNICEF	Clear	<5	5 9	100	34
17-Aug-99	Lira	Moroto	Apala	Erii	Protected spring	Red Cross	Milky	18	5 8	80	-
17-Aug-99	Lira	Moroto	Apala	Awali	Shallow well with pump	ANCC	Clear	<5	6 2	220	-
17-Aug-99	Lira	Moroto	Apala	Ashanting	Unprotected spring	-	Clear	6	6.5	180	7
17-Aug-99	Lira	Moroto	Apala	?	Stream/swamp	-	Cloudy	5 5	7 3	130	54
18-Aug-99	Lira	Kyoga	Muntu	Amolotar Acon	Borehole	UNICEF	Clear	<5	7.4	480	0
18-Aug-99	Lira	Kyoga	Muntu	Amolotar Acon	Home sample	(UNICEF)	Clear	<5	7 7	450	770
24-Aug-99	Apac	Kwania	Nableso	Atumu	Borehole	UNICEF	Clear	<5	7 0	470	-
24-Aug-99	Apac	Kwania	Nableso	Emin A	Borehole	UNICEF	Clear	<5	7 2	510	-
24-Aug-99	Apac	Kwania	Nableso	Acokoala	Valley dam/infiltration	ActionAid	Brown	800	7 7	70	21
24-Aug-99	Apac	Kwania	Nableso	Bung Parish	Shallow well with pump	UNICEF	Clear	<5	7 3	1440	-
28-Aug-99	Apac	Maruzi	Chagere	Akaoidebe	Hand dug water hole	Community	Cloudy	27	6 0	130	>2000
28-Aug-99	Apac	Maruzi	Chagere	Abolo	Hand dug water hole	Community	Clear	8	6 5	160	>2000
28-Aug-99	Apac	Maruzi	Chagere	Amunomia Pii	Borehole	UNICEF	Clear	<5	6 4	110	0
30-Aug-99	Lira	Otuke	Olilim	Apungere	Unprotected spring	-	Cloudy	7	6.2	24	
30-Aug-99	Lira	Otuke	Olilim	Aluga P School	Borehole	UNICEF	Clear	<5	7 6	0	

Appendix 11

Water Resources Data

Appendix 11 - Water Resources Data

Contents

Table 11.1 Rainfall at Serere

Directorate of Water Development
Annual summary of daily data - Rainfall

Station number : 8833004 Name : Serere Agric. Station

Basin number : 0 Latitude : 0: 0. 0 Longitude : 0: 0: 0 Altitude . .0

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
1947	-	62.0	106.0	290.0	135.0	59.0	121.0	92.0	136.0	20.0	2.0	65.0	-
1948	8 0	63.0	47.0	182.0	364.0	92.0	234.0	192.0	114.0	128.0	58.0	.0	1482.0
1949	-	64.0	6.0	182.0	136.0	82.0	108.0	182.0	146.0	92.0	51.0	188.0	-
1950	16.0	21.0	161.0	177 0	156.0	57.0	151.0	161.0	139.0	81.0	6.0	19.0	1145.0
1951	21 0	30.0	114.0	199.0	193.0	99 0	156.0	71 0	133.0	202.0	150.0	139.0	1507.0
1952	3.0	60.0	178.0	220 0	189.0	55.0	136.0	271 0	158.0	105.0	61.0	.0	1436.0
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	47.0	72.0	92.0	218.0	179.0	92.0	97.0	124.0	95.0	111.0	50.0	97.0	1274.0
1959	24.0	45.0	170.0	194 0	138.0	89.0	108.0	74.0	159.0	175.0	231.0	6.0	1413.0
1960	-	-	-	-	-	-	-	-	-	-	-	-	-
1961	5.0	18.0	127.0	159.0	139.0	170.0	183.0	260.0	205.0	131.0	265.0	160.0	1822.0
1962	27.0	.0	222.0	162.0	218.0	121.0	65.0	159.0	145.0	194.0	172.0	25.0	1510.0
1963	85.0	182.0	118.0	326.0	151.0	83.0	75.0	286.0	123.0	103.0	234.0	42.0	1808.0
1964	18.0	87.0	96.0	224.0	216.0	85.0	166.0	84.0	185.0	206.0	42.0	63.0	1472.0
1965	1.0	30.0	135.0	116.0	156.0	85.0	79.0	118.0	55.0	230.0	134.0	88.0	1227.0
1966	64.0	147.0	145.0	358.0	112.0	101.0	92.0	102.0	177.0	289.0	71.0	12.0	1670.0
1967	3.0	14.0	93.0	220.0	109.0	175.0	138.0	140.0	85.0	192.0	148.0	16.0	1333.0
1968	1.0	109.0	94.0	349.0	189.0	97.0	135.0	99.0	91.0	227.0	77.0	93.0	1561.0
1969	52.0	115.0	80.0	116.0	223.0	53.0	125.0	56.0	70.0	191.0	141.0	98.0	1320.0
1970	53.0	35.0	151.0	175.0	252.0	55.0	91.0	280.0	113.0	93.0	94.0	66.0	1458.0
1971	6.0	8.0	35.0	223.0	202.0	62.0	99.0	199.0	169.0	82.0	131.0	10.0	1226.0
1972	38.0	82.0	80.0	127.0	177.0	103.0	74.0	131.0	220.0	271.0	291.0	105.0	1699.0
1973	23.0	44 0	19.0	150.0	166.0	130.0	48.0	127.0	215.0	125.0	127.0	7.0	1181.0
1974	58.0	31.0	88.0	134.0	177.0	81.0	253.0	156.0	136.0	103.0	49.0	1.0	1267.0
1975	12.0	10.0	143.0	220.0	147.0	164.0	138.0	227.0	266.0	97.0	55.0	59.0	1538.0
1976	54 0	79.0	62.0	178 0	174.0	72.0	149.0	248.0	64 0	127.0	119.0	45.0	1371.0

Table 11.1 Rainfall at Serere

Directorate of Water Development
Annual summary of daily data - Rainfall

Station number : 8833004 Name : Serere Agric. Station

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
1977	91.0	54.0	118.0	229.0	160.0	73.0	105.0	132.0	98.0	114.0	367.0	120.0	1661.0
1978	13.0	149.0	257.0	216.0	166.0	118.0	59.0	125.0	102.0	116.0	69.0	43.0	1433.0
1979	117.0	81.0	20.0	135.0	69.0	193.0	93.0	104.0	95.0	55.0	123.0	27.0	1112.0
1980	32.0	67.0	75.0	180.0	113.0	109.0	88.0	187.0	103.0	143.0	83.0	8.0	1189.0
1981	47.0	24.0	261.0	263.0	91.0	69.0	144.0	186.0	70.0	111.0	84.0	40.0	1390.0
1982	51.0	30.0	71.0	193.0	174.0	121.0	105.0	127.0	-	223.0	170.0	19.0	-
1983	-	37.0	54.0	187.0	224.0	82.0	46.0	-	203.0	209.0	51.0	17.0	-
1984	.0	26.0	15.0	220.0	186.0	100.0	46.0	225.0	90.0	136.0	170.0	48.0	1262.0
1985	26.0	1.0	165.0	230.0	184.0	-	170.0	114.9	87.0	78.0	148.0	27.0	-
1986	3.0	-	-	242.0	87.0	50.0	27.0	84.0	161.0	50.0	63.0	37.0	-
1987	16.0	18.0	20.0	63.0	-	-	-	-	-	-	-	-	-
Mean	31.5	55.7	106.4	201.6	169.2	96.3	114.8	155.2	133.6	141.5	120.2	52.6	1378.7
Median	23.0	44.0	94.0	194.0	166.0	89.0	105.0	132.0	133.0	125.0	94.0	40.0	
Maximum	117.0	182.0	261.0	358.0	364.0	193.0	253.0	286.0	266.0	289.0	367.0	188.0	
Minimum	.0	.0	6.0	63.0	69.0	50.0	27.0	56.0	55.0	20.0	2.0	.0	
St. dev.	29.4	44.2	65.3	63.5	54.2	36.8	50.9	65.2	51.3	54.8	82.6	48.5	
CV	.93	.79	.61	.32	.32	.38	.44	.42	.38	.46	.69	.92	

Total monthly rainfall in millimetres

Data flags

Missing - flag "-" Original - no flag set Estimate - flag "e"

Printed on 9/ 7/1999

Table 11.2 Rainfall at Lira Ngette Experimental Station

Directorate of Water Development
Annual summary of daily data - Rainfall

Station number : S732002 Name : Lira Ngetta Exp.

Basin number : 6 Latitude : 0: 0: 0 Longitude : 0: 0: 0 Altitude : .0

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
1947	-	29.0	249.0	246.0	231.0	90.0	291.0	252.0	247.0	75.0	1.0	57.0	-
1948	4.0	25.0	61.0	112.0	240.0	192.0	173.0	204.0	236.0	203.0	113.0	.0	1563.0
1949	.0	32.0	15.0	82.0	242.0	162.0	257.0	273.0	319.0	153.0	35.0	85.0	1655.0
1950	30.0	11.0	45.0	221.0	165.0	71.0	147.0	209.0	209.0	141.0	4.0	3.0	1256.0
1951	51.0	41.0	131.0	173.0	143.0	133.0	81.0	134.0	128.0	221.0	158.0	141.0	1535.0
1952	1.0	40.0	157.0	167.0	145.0	85.0	138.0	118.0	173.0	222.0	82.0	.0	1328.0
1953	65.0	8.0	19.0	174.0	94.0	141.0	154.0	187.0	52.0	228.0	103.0	5.0	1230.0
1954	7.0	28.0	25.0	136.0	199.0	214.0	107.0	180.0	134.0	204.0	20.0	44.0	1298.0
1955	71.0	34.0	23.0	105.0	203.0	145.0	173.0	192.0	293.0	203.0	76.0	65.0	1583.0
1956	23.0	66.0	111.0	250.0	126.0	82.0	129.0	256.0	153.0	157.0	30.0	43.0	1426.0
1957	40.0	23.0	42.0	208.0	258.0	74.0	100.0	183.0	95.0	58.0	80.0	56.0	1217.0
1958	76.0	35.0	68.0	206.0	167.0	140.0	196.0	195.0	149.0	138.0	23.0	92.0	1485.0
1959	21.0	16.0	194.0	100.0	278.0	47.0	83.0	226.0	252.0	194.0	91.0	8.0	1510.0
1960	86.5	54.0	91.0	188.0	268.0	80.0	102.0	266.0	133.0	140.0	88.0	21.0	1517.0
1961	.0	24.0	64.0	165.0	138.0	203.0	179.0	312.0	205.0	120.0	172.0	117.0	1699.0
1962	45.0	5.0	130.0	93.0	238.0	134.0	119.0	176.0	289.0	95.0	91.0	22.0	1437.0
1963	81.0	81.0	129.0	304.0	285.0	104.0	83.0	190.0	208.0	185.0	201.0	79.0	1930.0
1964	5.0	22.0	40.0	239.0	237.0	75.0	62.0	375.0	310.0	172.0	104.0	89.0	1530.0
1965	.0	7.0	101.0	160.0	155.0	52.0	87.0	130.0	142.0	297.0	171.0	71.0	1373.0
1966	14.0	133.0	87.0	287.0	114.0	154.0	117.0	195.0	162.0	142.0	36.0	7.0	1448.0
1967	.0	26.0	71.0	137.0	255.0	137.0	116.0	204.0	187.0	250.0	137.0	17.0	1537.0
1968	.0	114.0	140.0	87.0	163.0	108.0	106.0	100.0	141.0	154.0	36.0	87.0	1236.0
1969	60.0	133.0	91.0	25.0	119.0	175.0	52.0	185.0	73.0	134.0	100.0	42.0	1189.0
1970	54.0	44.0	164.0	189.0	227.0	52.0	215.0	251.0	125.0	186.0	55.0	1.0	1563.0
1971	2.0	2.0	26.0	134.0	238.0	61.0	109.0	166.0	211.0	203.0	98.0	32.0	1282.0
1972	11.0	43.0	89.0	196.0	118.0	123.0	136.0	83.0	177.0	180.0	178.0	32.0	1366.0
1973	7.0	24.0	13.0	105.0	227.0	208.0	75.0	123.0	194.0	80.0	91.0	10.0	1157.0
1974	18.0	36.0	151.0	162.0	231.0	88.0	179.0	163.0	100.0	251.0	62.0	13.0	1454.0
1975	.0	66.0	136.0	124.0	244.0	274.0	221.0	201.0	252.0	191.0	17.0	20.0	1746.0
1976	15.0	16.0	72.0	108.0	372.0	110.0	238.0	149.0	45.0	57.0	115.0	23.0	1320.0

Table 11.2 Rainfall at Lira Ngette Experimental Station

Directorate of Water Development
Annual summary of daily data - Rainfall

Station number : S732002 Name : Lira Ngetta Exp.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
1977	46.0	32.0	53.0	176.0	240.0	92.0	208.0	145.0	155.0	247.0	178.0	16.0	1588.0
1978	19.0	156.0	102.0	116.0	182.0	182.0	176.0	317.0	175.0	206.0	108.0	57.0	1796.0
1979	76.0	91.0	-	139.0	45.0	188.0	134.0	62.0	229.0	48.0	48.0	23.0	-
1980	5.0	40.0	82.0	143.0	197.0	-	80.0	283.0	128.0	-	44.0	94.0	-
1981	19.0	22.0	171.0	202.0	98.0	-	153.0	222.0	161.0	60.0	107.0	7.0	-
1982	26.0	21.0	97.0	229.0	261.0	209.0	51.0	116.0	119.0	-	103.0	120.0	-
1983	6.0	45.0	51.0	163.0	235.0	151.0	100.0	276.0	192.0	186.0	115.0	-	-
1984	.0	30.0	43.0	214.0	134.0	89.0	315.0	101.0	149.0	65.0	117.0	18.0	1275.0
1985	51.0	3.0	151.0	227.0	190.0	139.0	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	143.0	131.0	160.0	49.0	94.0	-
1990	-	125.0	103.0	195.0	156.0	102.0	118.0	22.0	132.0	156.0	60.0	43.0	-
1991	73.0	16.0	34.0	148.0	285.0	56.0	139.0	232.0	4.0	163.0	73.0	35.0	1258.0
1992	1.0	9.0	65.0	145.0	186.0	140.0	170.0	217.0	145.0	203.0	92.0	84.0	1457.0
1993	-	9.0	69.0	106.0	205.0	189.0	60.0	151.0	308.0	137.0	53.0	15.0	-
1994	6.0	.0	132.0	98.0	180.0	166.0	256.0	236.0	133.0	111.0	363.0	99.0	1780.0
1995	.0	34.0	81.0	111.0	130.0	264.0	339.0	117.0	128.0	196.0	213.0	110.0	1715.0
Mean	26.3	40.9	90.2	162.1	196.3	132.1	148.3	184.8	170.7	162.7	95.4	46.1	1456.1
Median	15.0	29.0	82.0	162.0	199.0	134.0	134.0	187.0	155.0	163.0	91.0	34.0	
Maximum	86.0	156.0	249.0	304.0	372.0	274.0	339.0	317.0	319.0	297.0	363.0	141.0	
Minimum	.0	.0	13.0	25.0	43.0	47.0	51.0	22.0	4.0	48.0	1.0	.0	
St. dev.	28.1	38.3	52.9	58.3	64.4	57.2	70.4	65.2	71.1	58.9	66.2	36.2	
CV	1.06	94	.59	.36	.33	.43	.48	.35	.42	.36	.69	.83	

Total monthly rainfall in millimetres

Data flags

Missing - flag "-" Original - no flag set Estimate - flag "e"

Printed on 9/ 7/1999

Table 11.3 Rainfall at Masindi

Directorate of Water Development
Annual summary of daily data - Rainfall

Station number : S831003 Name : Masindi R/F Station

Basin number : 5 Latitude : 0: 0: 0 Longitude : 0: 0: 0 Altitude : .0

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
1926	15.0	62.0	34.0	111.0	95.0	64.0	155.0	143.0	144.0	111.0	125.0	4.0	1063.0
1927	42.0	62.0	136.0	174.0	107.0	80.0	112.0	124.0	121.0	48.0	98.0	60.0	1164.0
1928	29.0	12.0	86.0	122.0	202.0	76.0	130.0	98.0	93.0	126.0	102.0	23.0	1099.0
1929	18.0	34.0	122.0	132.0	139.0	49.0	113.0	126.0	127.0	93.0	107.0	103.0	1165.0
1930	41.0	93.0	111.0	287.0	80.0	91.0	93.0	111.0	123.0	201.0	171.0	19.0	1421.0
1931	11.0	61.0	227.0	115.0	176.0	62.0	242.0	175.0	113.0	96.0	63.0	70.0	1411.0
1932	.0	51.0	272.0	-	-	-	-	-	-	-	-	-	-
1933	80.0	162.0	83.0	143.0	127.0	132.0	167.0	14.0	148.0	169.0	54.0	46.0	1325.0
1934	1.0	4.0	119.0	209.0	138.0	78.0	189.0	201.0	60.0	110.0	152.0	-	-
1935	.0	44.0	158.0	184.0	156.0	212.0	40.0	91.0	129.0	114.0	102.0	123.0	1353.0
1936	77.0	182.0	105.0	110.0	122.0	106.0	126.0	166.0	151.0	96.0	41.0	81.0	1363.0
1937	5.0	125.0	192.0	162.0	227.0	114.0	118.0	46.0	161.0	155.0	191.0	37.0	1533.0
1938	1.0	43.0	31.0	73.0	91.0	80.0	192.0	111.0	125.0	187.0	68.0	44.0	1046.0
1939	19.0	112.0	92.0	174.0	93.0	79.0	108.0	115.0	127.0	138.0	73.0	20.0	1150.0
1940	84.0	126.0	128.0	224.0	171.0	73.0	96.0	161.0	63.0	118.0	165.0	23.0	1432.0
1941	36.0	56.0	72.0	186.0	246.0	242.0	44.0	127.0	105.0	115.0	133.0	75.0	1437.0
1942	72.0	46.0	214.0	196.0	119.0	74.0	35.0	135.0	150.0	110.0	47.0	53.0	1251.0
1943	5.0	52.0	110.0	119.0	100.0	267.0	37.0	105.0	127.0	119.0	7.0	49.0	1097.0
1944	26.0	24.0	77.0	133.0	87.0	96.0	41.0	238.0	140.0	169.0	176.0	38.0	1245.0
1945	37.0	.0	119.0	99.0	285.0	45.0	138.0	162.0	248.0	50.0	196.0	14.0	1393.0
1946	.0	9.0	12.0	81.0	125.0	133.0	153.0	159.0	158.0	228.0	119.0	17.0	1194.0
1947	-	33.0	67.0	234.0	144.0	67.0	194.0	117.0	114.0	42.0	50.0	87.0	-
1948	4.0	28.0	74.0	154.0	93.0	111.0	193.0	106.0	119.0	129.0	107.0	.0	1118.0
1949	12.0	46.0	19.0	187.0	106.0	33.0	146.0	153.0	136.0	102.0	53.0	40.0	1033.0
1950	27.0	9.0	146.0	183.0	176.0	91.0	182.0	174.0	204.0	139.0	4.0	1.0	1336.0
1951	13.0	-	87.0	60.0	209.0	67.0	131.0	175.0	64.0	220.0	313.0	82.0	-
1952	23.0	61.0	77.0	-	-	-	-	-	-	-	-	-	-
1953	-	52.0	125.0	160.0	118.0	168.0	98.0	170.0	105.0	154.0	86.0	27.0	-
1954	25.0	32.0	162.0	119.0	210.0	60.0	143.0	128.0	232.0	199.0	28.0	82.0	1420.0
1955	103.0	39.0	57.0	105.0	49.0	157.0	71.0	147.0	140.0	117.0	90.0	92.0	1167.0

Table 11.3 Rainfall at Masindi

Directorate of Water Development
Annual summary of daily data - Rainfall

Station number : 8831003 Name : Masindi R/F Station

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
1956	76.0	36.0	95.0	144.0	108 0	57.0	53.0	127 0	123.0	135.0	59.0	67.0	1080.0
1957	55.0	3.0	-	-	-	-	94.0	99.0	156.0	71.0	115.0	-	-
1958	35.0	22.0	91.0	119 0	119.0	40.0	148.0	224.0	96.0	112.0	46.0	101.0	1153.0
1959	32.0	23.0	120 0	187.0	115.0	105.0	78.0	172 0	187.0	97.0	142.0	3.0	1261 0
1960	74.0	137.0	141.0	190.0	86.0	88.0	83.0	146 0	188.0	105.0	30.0	-	-
1961	21.0	77.0	158.0	117.0	66.0	85.0	172.0	74.0	219.0	216.0	347 0	77.0	1629.0
1962	30.0	3 0	140.0	172.0	292.0	84.0	74.0	285.0	171.0	161.0	136.0	87.0	1635.0
1963	91.0	114.0	138.0	259.0	126.0	76.0	58.0	70.0	47.0	115.0	263.0	132.0	1489.0
1964	11.0	66.0	230.0	175.0	110.0	45.0	148.0	186.0	199.0	119.0	69.0	87.0	1445.0
1965	29.0	10.0	142.0	105.0	106.0	97.0	97.0	161 0	135.0	202.0	165.0	69.0	1318.0
1966	46.0	78.0	70.0	304.0	64.0	79.0	78.0	104 0	190.0	105.0	86.0	30.0	1234.0
1967	.0	4.0	38.0	161.0	131.0	112.0	76.0	89.0	107.0	202.0	224.0	42.0	1186.0
1968	8.0	66.0	73.0	200.0	93.0	83.0	94.0	97.0	66.0	188.0	120.0	135.0	1223.0
1969	123.0	95.0	114.0	91.0	201.0	99.0	93.0	78 0	83.0	265.0	143.0	70.0	1455.0
1970	85.0	21.0	244.0	177.0	208.0	27.0	144.0	117.0	214.0	145.0	69.0	3.0	1454.0
1971	49.0	5.0	63.0	227.0	216.0	111.0	150.0	243.0	140.0	151.0	86.0	2.0	1443.0
1972	90 0	93.0	121.0	220.0	201.0	64.0	94.0	140.0	303.0	177.0	226.0	14.0	1733.0
1973	26.0	38.0	47.0	227.0	153.0	62.0	53.0	158.0	218.0	200.0	144.0	13.0	1339.0
1974	27.0	50.0	155.0	96.0	225.0	113.0	155.0	118.0	149.0	100.0	65.0	21.0	1274.0
1975	20.0	64.0	82.0	164.0	133.0	69.0	113.0	204.0	185.0	172.0	40.0	10.0	1256.0
1976	21.0	90.0	87.0	216.0	123.0	94.0	77.0	99.0	98.0	60.0	153.0	58.0	1176.0
1977	50.0	6.0	127.0	226.0	167.0	85.0	79.0	160.0	160.0	-	-	-	-
1978	11.0	122.0	104.0	224.0	119.0	113.0	65.0	149.0	182.0	316.0	192.0	109.0	1706.0
1979	40.0	187.0	61.0	120.0	163.0	105.0	77.0	90.0	219 0	101.0	-	51.0	-
1980	7.0	44 0	123.0	276.0	110.0	69.0	64.0	116 0	128.0	129.0	125.0	39.0	1230.0
1981	26.0	34.0	223.0	148.0	104.0	42.0	230.0	281.0	166.0	83.0	-	17 0	-
1982	-	79.0	53.0	175.0	101.0	78.0	54.0	124.0	-	230.0	174.0	59.0	-
1983	3.0	8.0	63.0	126.0	64.0	87.0	117.0	135.0	199.0	177.0	25.0	10 0	1014.0
1984	7.0	25.0	53.0	181.0	90.0	50.0	163.0	265.0	59.0	100.0	170.0	29.0	1192.0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 11.3 Rainfall at Masindi

Directorate of Water Development
Annual summary of daily data - Rainfall

Station number : S831003 Name : Masindi R/F Station

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
1986	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	29.0	67.0	70.0	80.0	187.0	65.0	50.0	155.0	-	-	211.0	82.0	-
1988	17.0	11.0	115.0	241.0	-	21.0	91.0	322.0	220.0	263.0	81.0	43.0	-
1989	3.0	30.0	134.0	98.0	133.0	98.0	163.0	63.0	140.0	196.0	210.0	-	-
1990	25.0	46.0	124.0	193.0	101.0	92.0	35.0	108 0	153.0	243.0	48.0	242.0	1410.0
1991	45.0	37.0	116.0	92.0	185.0	79.0	140.0	137.0	102.0	163.0	144.0	24.0	1264 0
1992	28.0	.0	68.0	151.0	104.0	112.0	159.0	164.0	192.0	149 0	93.0	82.0	1302.0
1993	24.0	113.0	105.0	86.0	307.0	133.0	67 0	167.0	151.0	81.0	131.0	36.0	1401.0
1994	38.0	1.0	72 0	138.0	194 0	99.0	94.0	188.0	112.0	154.0	201.0	20.0	1311.0
1995	6.0	14.0	113.0	274.0	167.0	86.0	169.0	152.0	246.0	219.0	120.0	65.0	1631.0
Mean	32.4	53.4	110.4	163.3	143.2	90.8	112.7	144.6	147.4	146.2	120.2	53.1	1317.7
Median	26.0	44.0	110.0	162.0	125.0	84.0	98.0	137.0	140.0	135.0	115.0	44.0	
Maximum	123.0	187.0	272.0	304.0	307.0	267.0	242.0	322.0	303.0	316.0	347.0	242.0	
Minimum	.0	.0	12.0	60.0	49.0	21.0	35.0	14.0	47.0	42.0	4.0	.0	
Std dev.	28.6	44.8	54.0	57 1	57.4	44.0	50.2	56.4	52.1	57.2	71.0	42.8	
CV	.88	.84	.49	.35	.40	.48	.45	.39	.35	.39	.59	.81	

Total monthly rainfall in millimetres

Data flags

Missing - flag "-" Original - no flag set Estimate - flag "e"

Printed on 9/ 7/1999

Table 11.4 Rainfall at Soroti Meteorological Station

Directorate of Water Development
Annual summary of daily data - Rainfall

Station number : 8833006 Name : Soroti Met. station

Basin number : 2 Latitude : 0: 0: 0 Longitude : 0: 0: 0 Altitude : .0

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
1947	-	79.0	86.0	322.0	182.0	113.0	110.0	67.0	244.0	47.0	.0	80.0	-
1948	16.0	40.0	18.0	126.0	132.0	192.0	171.0	331 0	91.0	193.0	38.0	.0	1348.0
1949	.0	9.0	8.0	90.0	172.0	78.0	-	71.0	195.0	71.0	35 0	81.0	-
1950	34.0	1.0	128.0	138.0	117.0	115.0	119.0	150.0	118.0	90.0	.0	3.0	1013 0
1951	22.0	23.0	34.0	145.0	216.0	149.0	105.0	239.0	120.0	231.0	157.0	131 0	1572.0
1952	2 0	16.0	68.0	199.0	131.0	148.0	88.0	217.0	183.0	131.0	83.0	.0	1266 0
1953	56.0	.0	11.0	235.0	133.0	133.0	77.0	246.0	72.0	171.0	74.0	57.0	1265.0
1954	2.0	12.0	36.0	143.0	168.0	210.0	130.0	140.0	166.0	75.0	5.0	45.0	1132.0
1955	2.0	57.0	12.0	237.0	107.0	47.0	90.0	237.0	227.0	64.0	129.0	64.0	1273.0
1956	18.0	20.0	25.0	266.0	293.0	169.0	90.0	181.0	116.0	190.0	72.0	.0	1440.0
1957	69.0	14.0	34.0	213.0	107.0	112.0	57 0	131.0	.0	63.0	51.0	.0	851.0
1958	.0	.0	134.0	219.0	158.0	160.0	122.0	-	-	-	-	-	-
1959	-	-	-	-	-	96.0	222.0	141.0	158.0	350.0	90.0	60.0	-
1960	28.0	60.0	137.0	125.0	296.0	72.0	23.0	226.0	251.0	111.0	62.0	12.0	1403.0
1961	.0	33.0	58.0	162.0	120.0	116.0	248.0	291.0	158.0	148.0	164.0	147.0	1645.0
1962	36.0	1.0	125.0	132.0	262.0	81.0	92.0	257.0	247.0	139.0	43.0	83.0	1498.0
1963	43.0	66.0	108.0	229.0	182.0	75.0	153.0	124.0	40.0	100.0	174.0	70.0	1364.0
1964	3.0	60.0	53.0	159.0	175.0	98.0	40.0	145.0	90.0	131.0	27.0	68.0	1049.0
1965	5.0	22.0	148.0	206.0	119.0	31.0	145.0	94.0	101.0	150.0	92.0	32.0	1145.0
1966	8.0	55.0	116.0	276.0	97.0	104.0	153.0	129.0	180.0	188.0	31.0	.0	1337.0
1967	24.0	7.0	99.0	186.0	393.0	64.0	171.0	153.0	250.0	129.0	206.0	2.0	1684.0
1968	2.0	104.0	233.0	218.0	232.0	190.0	129.0	81.0	122.0	183.0	27.0	39.0	1560.0
1969	29.0	166.0	54.0	63.0	137.0	147.0	153.0	73.0	173.0	211.0	84.0	19.0	1309.0
1970	41.0	20.0	195.0	100.0	162.0	50.0	187.0	271.0	179.0	116.0	41.0	1.0	1363.0
1971	73.0	6.0	8.0	220.0	366.0	97.0	88.0	151.0	139.0	178.0	31.0	7.0	1364.0
1972	8.0	33.0	29.0	142.0	171.0	175.0	108.0	85.0	79.0	236.0	70.0	89.0	1225.0
1973	40.0	67 0	6.0	119.0	104.0	163.0	104.0	156.0	124 0	197.0	125.0	1.0	1206.0
1974	17.0	20.0	122.0	94.0	171.0	126.0	261.0	55.0	95.0	164.0	39.0	8.0	1172.0
1975	2.0	20.0	188.0	204.0	361.0	184.0	199.0	336.0	217.0	96.0	24.0	15.0	1846.0
1976	14.0	33.0	50.0	126.0	350.0	128.0	184.0	323.0	129.0	130.0	124.0	49.0	1620.0

Table 11.4 Rainfall at Soroti Meteorological Station

Directorate of Water Development
Annual summary of daily data - Rainfall

Station number : 8833006 Name : Soroti Met. station

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
1977	40.0	35.0	136.0	217.0	158.0	148.0	118.0	221.0	51.0	207.0	154 0	38.0	1523 0
1978	49.0	158.0	238 0	170.0	176.0	151.0	312.0	197.0	43.0	140.0	73.0	19 0	1726.0
1979	54.0	80 0	36.0	-	-	-	36.0	113.0	159.0	-	-	-	-
1980	15.0	53.0	98.0	98.0	162.0	82.0	-	-	-	85.0	-	31.0	-
1981	-	33.0	-	234.0	103.0	72.0	143.0	350.0	170.0	83.0	40.0	12.0	-
1982	44.0	18.0	94.0	218.0	182 0	172.0	186.0	-	103.0	163.0	175.0	-	-
1983	7.0	11.0	64.0	246.0	196.0	-	-	-	249.0	156.0	53.0	28.0	-
1984	13.0	3.0	41.0	145.0	174.0	133.0	164 0	165.0	162.0	61.0	83.0	31.0	1175.0
1985	21.0	6.0	94.0	267.0	314.0	142 0	151.0	106.0	54.0	94.0	195.0	40.0	1474.0
1986	42.0	-	115.0	229.0	105.0	88.0	80.0	108.0	91.0	109.0	47.0	41.0	-
1987	10.0	29.0	155 0	176.0	231.0	129.0	10.0	118.0	86.0	42.0	89.0	14.0	1089.0
1988	66.0	61.0	47.0	271.0	153.0	88.0	130.0	285.0	213.0	194.0	37.0	3 0	1548.0
1989	.0	14.0	139.0	158.0	154.0	33.0	130.0	152.0	122.0	202.0	79.0	-	-
1990	63.0	168.0	136.0	213 9	120.0	39.0	107.0	162.0	152.0	209.0	70.0	80.0	1519.0
1991	56.0	58.0	79.0	182.0	430.0	123.0	98.0	275.0	246.0	140.0	82.0	7.0	1776.0
1992	6.0	8.0	40.0	171.0	141.0	187.0	77.0	117.0	107.0	184.0	123.0	84.0	1245.0
1993	26.0	29.0	13.0	125.0	161.0	224.0	42.0	112.0	78.0	146.0	127.0	29.0	1112.0
1994	6.0	.0	126.0	140.0	146.0	178.0	108.0	171.0	140.0	155 0	182.0	20.0	1372.0
1995	.0	37.0	139.0	246.0	118.0	74.0	182.0	89.0	106.0	255.0	103.0	53.0	1402.0
Mean	24.2	39.3	87.1	183.0	188.0	121.0	128.1	174.3	140.3	144.6	82.8	37.6	1350.3
Median	17.0	29.0	86.0	182.0	162.0	123.0	119.0	152.0	129.0	146.0	73.0	31.0	
Maximum	73.0	168.0	238.0	322.0	430.0	224.0	312.0	350.0	251.0	255.0	206.0	147.0	
Minimum	.0	.0	6.0	63.0	97.0	31.0	10.0	55.0	.0	42.0	.0	.0	
St. dev.	21.9	41.3	60.7	58.3	84.4	49.0	62.0	81.0	63.8	56.2	54.5	35.9	
CV	.91	1.05	.70	.32	.45	.41	.48	.46	.45	.39	.66	.96	

Total monthly rainfall in millimetres

Data flags

Missing - flag "-" Original - no flag set Estimate - flag "e"

Printed on 9/ 7/1999

Table 11.5 Streamflow Records and analyses: R. Tochi II at Gulu-Atura Road

Directorate of Water Development
Annual summary of daily data - Flow

Station number : S3312 Name : R. Tochi II at Gulu-Atura Road.

Basin number : 3 Latitude : 2:14: 0 Longitude : 32:20: 0 Altitude : 1027.9
Area : 2188.1

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean
1990	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	19.61	26.65	15.02	17.75	12.43	-
1995	-	-	-	-	-	8.32	18.86	14.13	13.61	14.25	23 44	16.66	-
1996	-	-	-	9.29	12.20	25.44	17.41	29.83	40.54	36.02	30.59	15.10	-
1997	-	-	2.54	6.12	8.28	6.53	6.24	10.71	4.32	5.92	22.70	24.59	-
1998	9.65	4.20	-	2.93	7.57	9.44	6.19	18.81	15.46	11.29	23.58	6.43	-
1999	2.64	1.74	1.75	2.15	-	-	-	-	-	-	-	-	-
Mean	6.14	2.97	2.14	5.12	9.35	12.43	12.18	18.62	20.12	16.50	23.61	15.04	12.05
Median	2.64	1.74	1.75	2.93	8.28	8.32	6.24	18.81	15.46	14.25	23.44	15.10	
Maximum	9.65	4.20	2.54	9.29	12.20	25.44	18.86	29.83	40.54	36.02	30.59	24.59	
Minimum	2.64	1.74	1.75	2.15	7.57	6.53	6.19	10.71	4.32	5.92	17.75	6.43	
St. dev.	4.96	1.74	.56	3.27	2.49	8.75	6.91	7.23	13.91	11.48	4.58	6.61	
CV	.81	.59	.26	.64	.27	.70	.57	.39	.69	.70	.19	.44	

Mean monthly flow in cubic metres per second

Data flags

Missing - flag "-" Original - no flag set Estimate - flag "e"

Printed on 8/ 7/1999

Table 11.5 Streamflow Records and analyses: R. Tochi II at Gulu-Atura Road

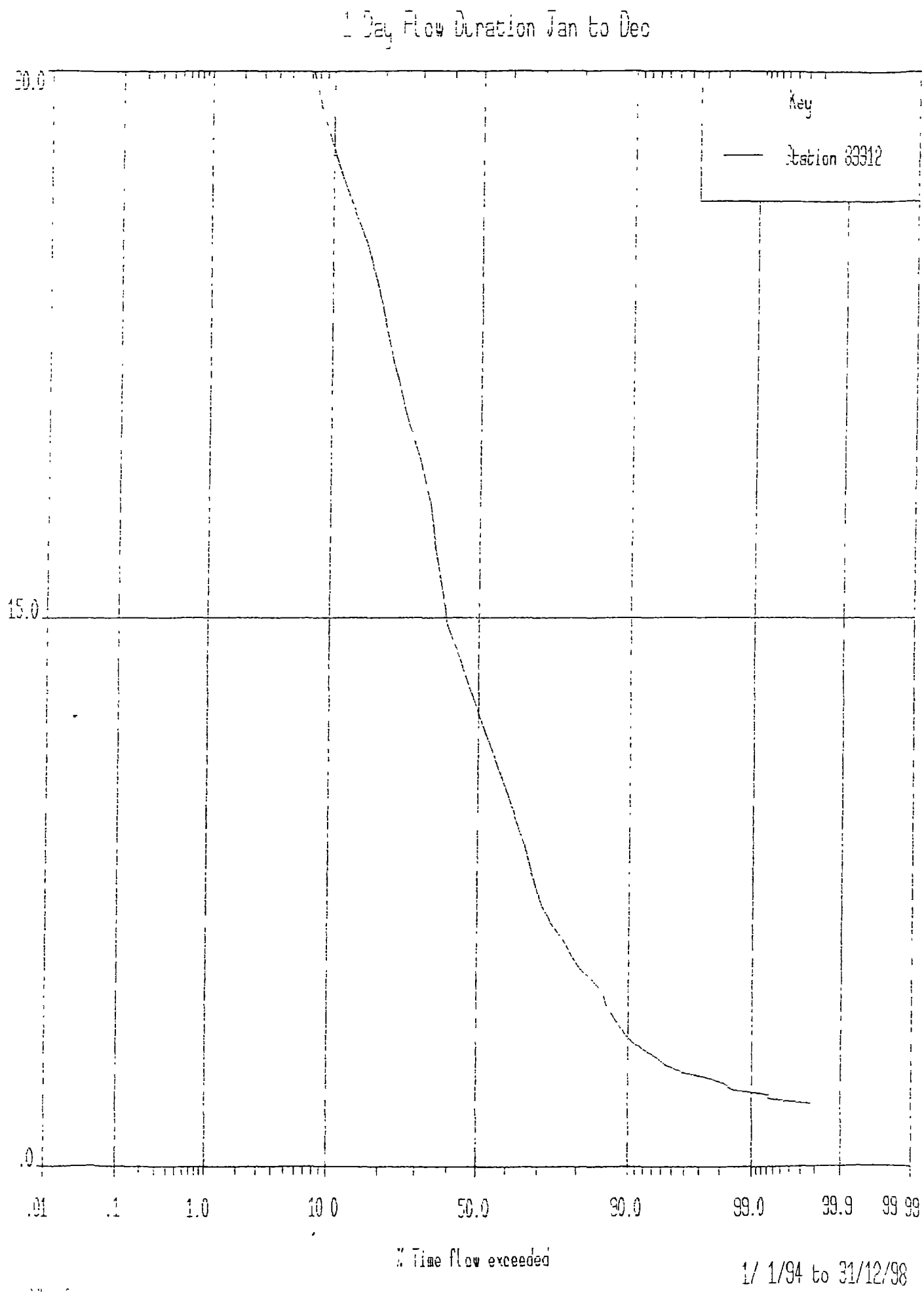


Table 11.5 Streamflow Records and analyses: R. Tochi II at Gulu-Atura Road

Directorate of Water Development
BASEFLOW INDEX CALCULATION

Station number : 83312 Name : R. Tochi II at Gulu-Atura Road.

Period of analysis from 1 Jan 1994 to 31 Dec 1999

BFI calculated over whole period

Number of days in period = 2191
Number of days with data = 1447
Number of days for BFI = 1133

Total volume (mm / year) = 216.28
Baseflow volume (mm / year) = 203.78

BFI = .942

BFI in each hydrological year

Year start	Days	Data days	BFI days	Total (mm)	Baseflow (mm)	BFI
Jan 1994	365	151	111	85.63	82.26	.961
Jan 1995	365	223	173	112.90	100.62	.891
Jan 1996	366	277	199	224.05	216.23	.965
Jan 1997	365	328	306	118.32	107.74	.911
Jan 1998	365	357	309	127.04	115.78	.911
Jan 1999	365	111	35	2.95	2.93	.991

Table 11.6 Streamflow Records and analyses: R. Akokorio at Soroti – Katakwi Road

Directorate of Water Development
Annual summary of daily data - Flow

Station number : 82345 Name : R. Akokorio at Soroti-Katakwi Rd

Basin number : 2 Latitude : 1:51:50 Longitude : 33:51:15 Altitude : 1042.4
Area : 1400.9

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean
1969	-	-	-	-	-	-	.000	004	021	.002	.000	.000	-
1970	.000	.000	.000	.000	.033	.066	.001	13.426	32.901	3.333	.932	.012	4.213
1971	.000	.000	.000	.000	.000	.115	1.537	3.060	3.649	5.144	1.906	.094	1.301
1972	.000	.000	.000	.000	.000	.000	.505	2.273	.303	.005	.051	.047	.269
1973	.000	.000	.000	.000	.000	-	-	.050	2.253	3.347	-	.005	-
1974	.000	.000	.000	.000	.000	-	-	1.113	.969	.366	.007	.000	-
1975	.000	.000	000	.000	.000	.592	2.120	-	86.692	-	-	-	-
1976	-	-	-	-	-	-	-	-	-	-	-	-	-
1977	-	-	-	-	-	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	2.589	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	.231	4.290	17.244	12.793	7.979	2.168	-	-
1997	-	-	.002	.059	.000	.000	.000	.000	.000	.000	.000	-	-
1998	.000	.000	.000	.000	.000	.000	.000	.005	.000	.000	.000	.000	.000

Table 11.6 Streamflow Records and analyses: R. Akokorio at Soroti – Katakwi Road

Directorate of Water Development
Annual summary of daily data - Flow

Station number : 82345 Name : R. Akokorio at Soroti-Katakwi Rd

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean
1999	.000	.000	.000	.000	-	-	-	-	-	-	-	-	-
Mean	.000	.000	.000	.007	004	.143	1.057	4.131	13.958	2.276	.633	.023	1.847
Median	.000	.000	.000	.000	.000	.066	.001	1 113	.969	.366	.007	.005	
Maximum	.000	.000	.002	.059	.033	.592	4.290	17.244	86.692	7.979	2.168	.094	
Minimum	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
St. dev.	.000	.000	001	.020	012	.215	1.539	6.518	27.554	2.738	.926	.036	
CV	.00	.00	3.00	3.00	2.83	1.50.	1.46	1.58	1.97	1.20	1.46	1.58	

Mean monthly flow in cubic metres per second

Data flags

Missing - flag "-" Original - no flag set Estimate - flag "e"

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Table 11.6 Streamflow Records and analyses: R. Akokorio at Soroti – Katakwi Road

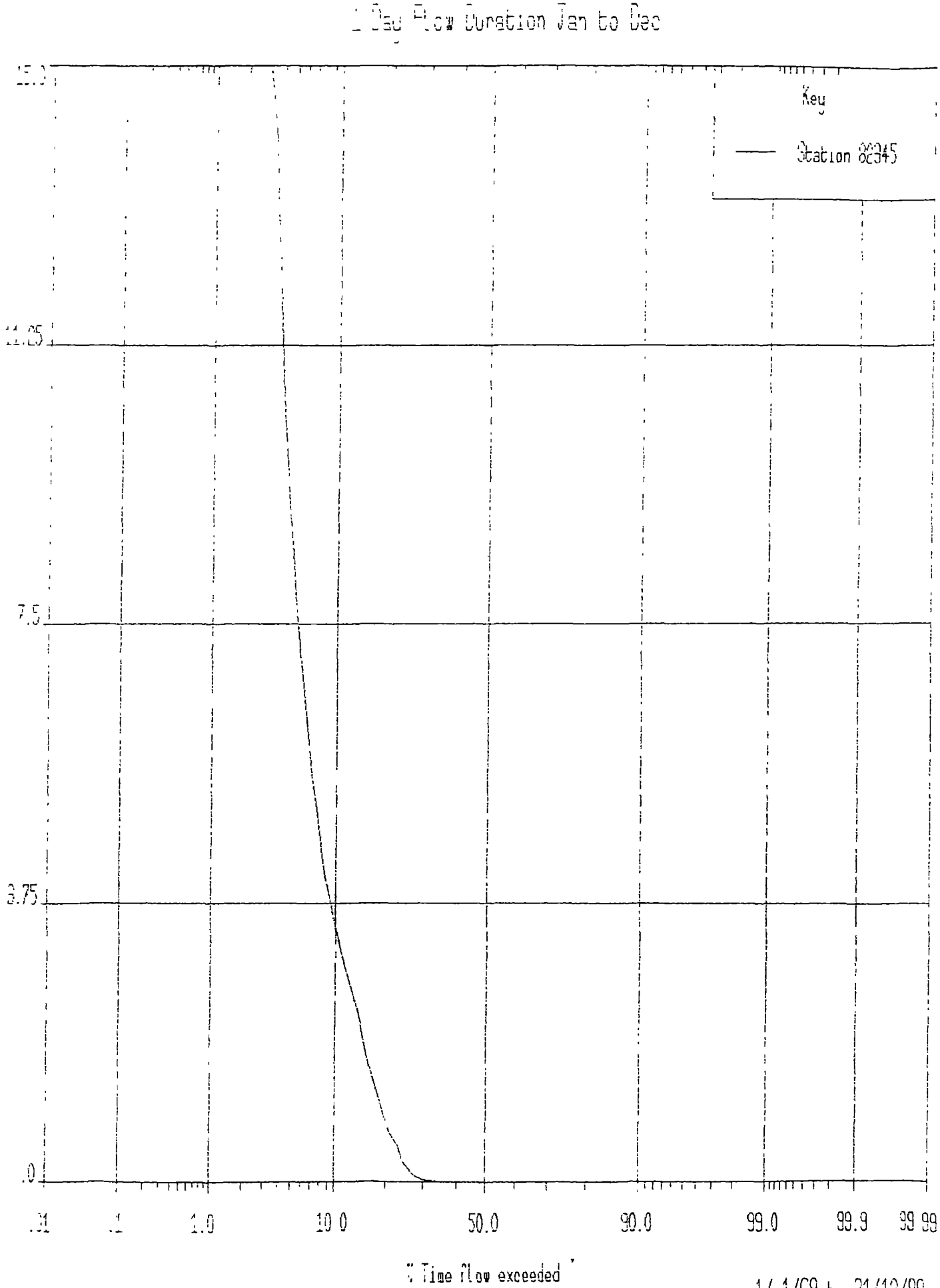
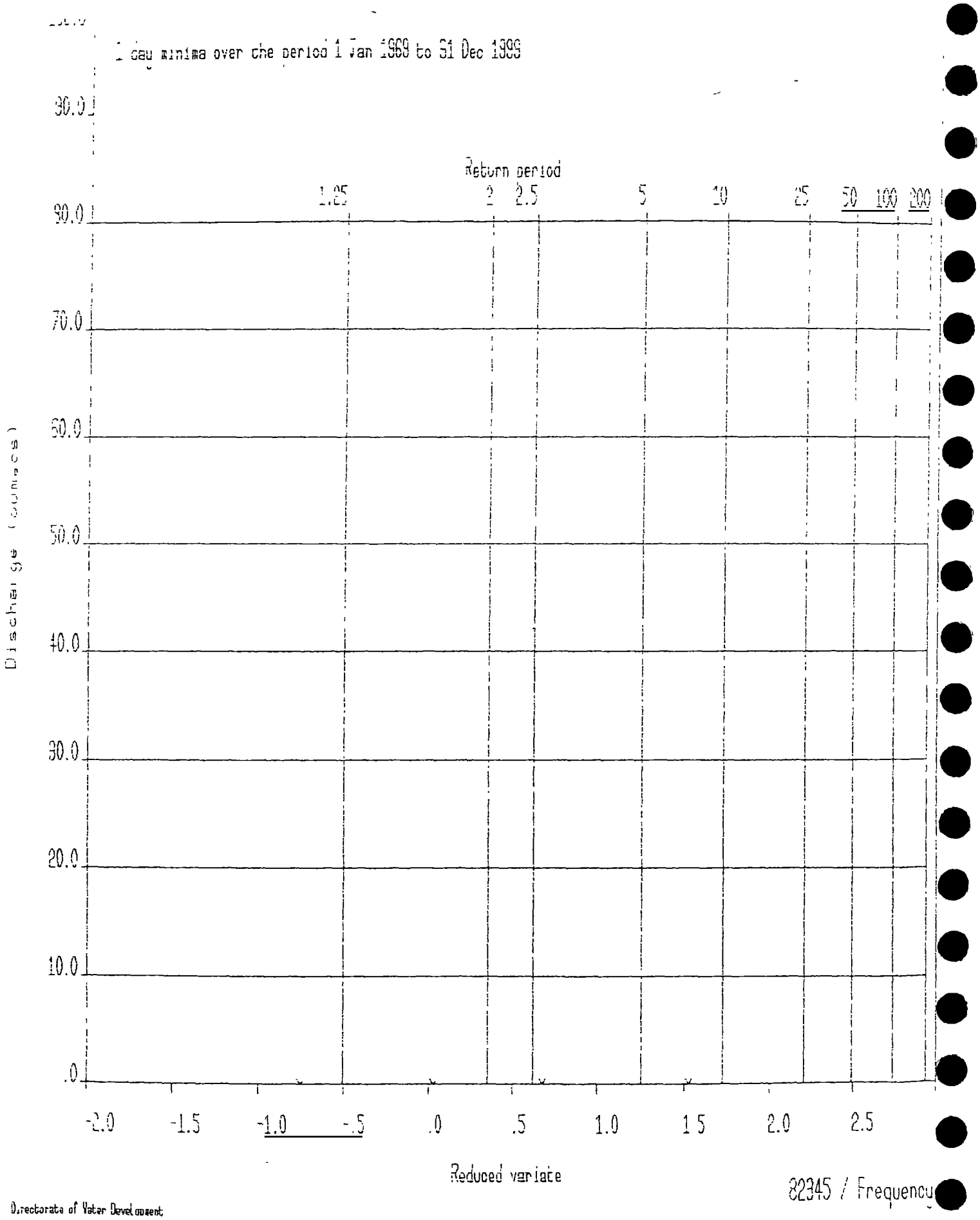


Table 11.6 Streamflow Records and analyses: R. Akokorio at Soroti – Katakwi Road



Directorate of Water Development

Table 11.6 Streamflow Records and analyses: R. Akokorio at Soroti – Katakwi Road

Station number : 82345 Name : R. Akokorio at Soroti-Katakwi Rd

Period of analysis from 1 Jan 1969 to 31 Dec 1999

BFI calculated over whole period

Number of days in period = 11322
Number of days with data = 3131
Number of days for BFI = 2865

Total volume (mm / year) = 29.66
Baseflow volume (mm / year) = 30.15

BFI = 1.017

BFI in each hydrological year

Year start	Days	Data days	BFI days	Total (mm)	Baseflow (mm)	BFI
Jan 1969	365	180	175	.05	.00	.000
Jan 1970	365	365	365	94.85	78.57	.828
Jan 1971	365	365	365	29.29	22.42	.765
Jan 1972	366	366	366	6.07	1.94	.319
Jan 1973	365	274	223	5.92	3.89	.657
Jan 1974	365	304	267	2.92	2.46	.844
Jan 1975	365	265	219	8.91	7.82	.877
Jan 1976	366	0	0			
Jan 1977	365	0	0			
Jan 1978	365	0	0			
Jan 1979	365	0	0			
Jan 1980	366	0	0			
Jan 1981	365	0	0			
Jan 1982	365	0	0			
Jan 1983	365	0	0			
Jan 1984	366	0	0			
Jan 1985	365	0	0			
Jan 1986	365	0	0			
Jan 1987	365	0	0			
Jan 1988	366	0	0			
Jan 1989	365	0	0			
Jan 1990	365	0	0			
Jan 1991	365	0	0			
Jan 1992	366	0	0			
Jan 1993	365	0	0			
Jan 1994	365	31	0			
Jan 1995	365	0	0			
Jan 1996	366	207	187	84.54	58.11	.687
Jan 1997	365	289	232	.11	.00	.000
Jan 1998	365	365	360	.01	.00	.109
Jan 1999	365	120	106			

Table 11.7 Streamflow Records and analyses: R. Kapiri at Kumi-Soroti Road

Directorate of Water Development
Annual summary of daily data - Flow

Station number : S2327 Name : R. Kapiri at Kumi - Soroti Road.

Basin number : 2 Latitude : 1:40: 0 Longitude : 33:46: 0 Altitude : .0
Area . 14123.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean
1994	-	-	-	-	-	-	45.456	155.052	234.888	189.688	188.952	173.705	-
1995	137.337	117.225	99.493	92.880	99.110	94.406	105.566	142.238	142.828	146.025	154.673	148.911	123.466
1996	-	-	-	-	-	-	-	-	-	-	-	-	-
1997	311.055	210.292	164.665	149.407	153.392	138.931	134.290	138.292	131.402	125.190	160.904	-	-
1998	44.711	46.950	44.103	37.999	38.528	40.298	42.014	71.026	115 014	133.011	144.499e	120.898	73.348
1999	94.183	61.151	49.157	44.568	47.601	-	-	-	-	-	-	-	-
Mean	146.822	108.905	89.354	81.213	84.658	91 212	81.832	126.652	156.033	148.479	162.257	147.838	118.803
Median	94.183	61 151	49.157	44.568	47.601	94.406	45.456	138.292	131.402	133.011	154.673	148.911	
Maximum	311.055	210.292	164.665	149.407	153.392	138.931	134.290	155.052	234.888	189.688	188.952	173.705	
Minimum	44.711	46.950	44.103	37.999	38.528	40.298	42.014	71.026	115.014	125.190	144.499	120.898	
St. dev.	115.845	74.089	56.089	51.630	53.023	49.394	45.548	37.768	53.795	28.786	19.038	26.420	
CV	.79	.68	.63	.64	.63	.54	.56	.30	.34	.19	.12	.18	

Mean monthly flow in cubic metres per second

Data flags

Missing - flag "-" Original - no flag set Estimate - flag "e"

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Table 11.7 Streamflow Records and analyses: R. Kapiri at Kumi-Soroti Road

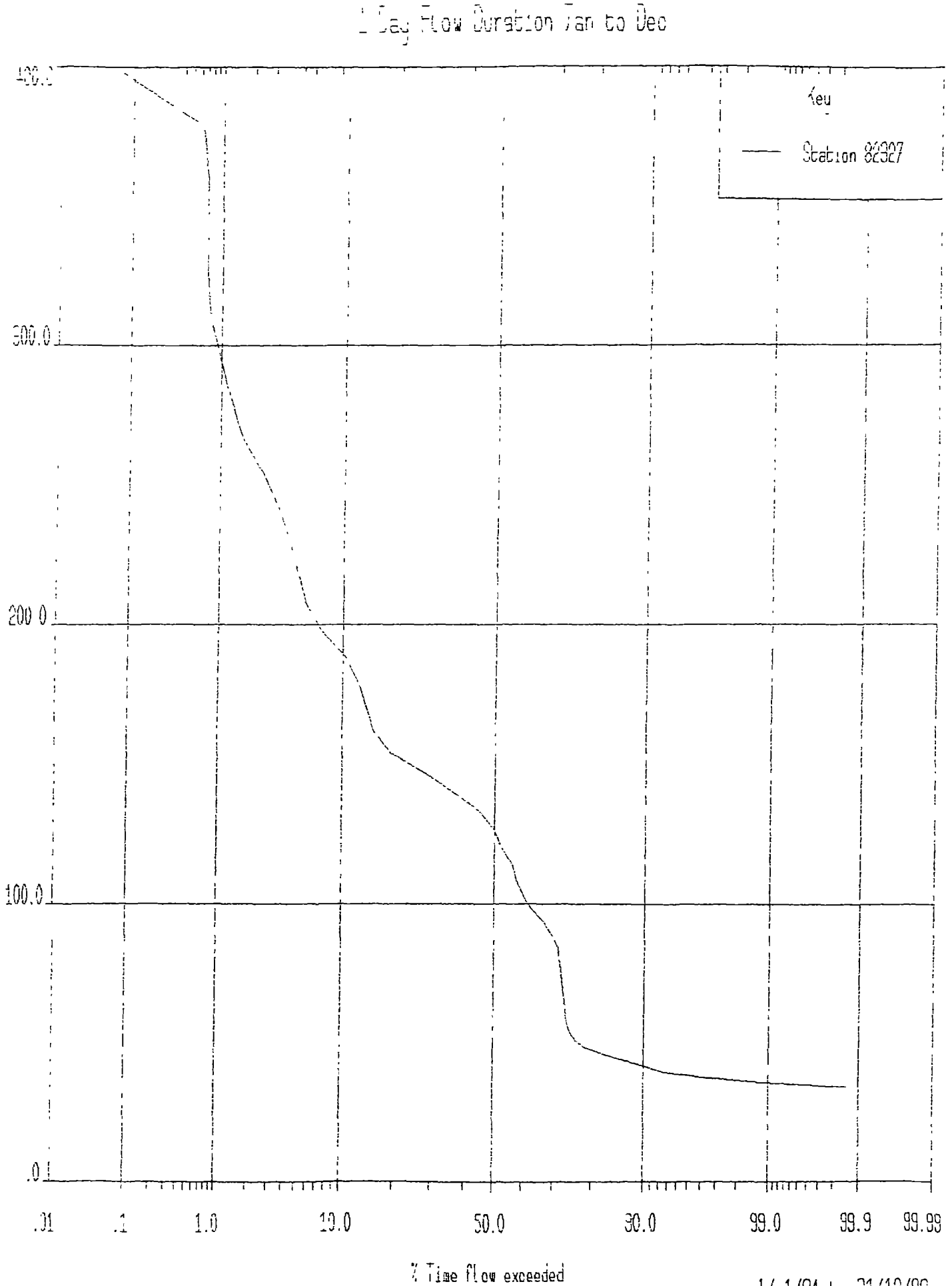

Table 11.7 Streamflow Records and analyses: R. Kapiri at Kumi-Soroti Road

Directorate of Water Development
BASEFLOW INDEX CALCULATION

Station number : S2327 Name : R. Kapiri at Kumi - Soroti Road.

Period of analysis from 1 Jan 1994 to 31 Dec 1999

BFI calculated over whole period

Number of days in period = 2191
Number of days with data = 1413
Number of days for BFI = 1325

Total volume (mm / year) = 257.18
Baseflow volume (mm / year) = 255.43

BFI = .993

BFI in each hydrological year

Year start	Days	Data days	BFI days	Total (mm)	Baseflow (mm)	BFI
Jan 1994	365	199	194	186.97	184.80	.988
Jan 1995	365	365	352	263.80	259.67	.984
Jan 1996	366	0	0			
Jan 1997	365	333	288	270.18	268.27	.993
Jan 1998	365	365	346	158.74	155.79	.981
Jan 1999	365	151	145	53.28	52.58	.987

Table 11.8 Streamflow Records and analyses: R. Enget at Bata-Dokolo Road

Directorate of Water Development
Annual summary of daily data - Flow

Station number : 82320 Name : R. Enget at Bata - Dokolo Road.

[illegible] number 2 Latitude : 2. 0: 0 Longitude : 3[illegible]. 6 Altitude . 1076.6
Area : 05.2

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean
1970	-	-	-	-	-	-	-	-	-	-	.218	.058	-
[illegible]	.037	.025	.009	.718	.613	.207	.352	436	.828	1.161	.376	110	.408
[illegible]2	.042	.059	.130	.086	.410	.604	.633	.464	.220	.684	.909	191	.370
1973	.122	.046	029	.010	.119	381	.159	906	1.730	.375	.336	.113	.360
[illegible]74	.114	075	.059	.504	.143	.214	.328	.181	.545	561	.179	.119	.251
[illegible]5	.105	.086	.038	.018	.418	.377	.498	506	.715	1.003	.216	.235	.354
1976	.039	.031	.184	.157	1.291	.207	.806	.760	.363	.194	231	.195	.381
[illegible]77	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]8	.156	.328	.375	.346	.736	748	1.231	.992	1 047	1 365	.791	.428	715
1979	.327	.619	.244	.729	.386	-	406	.590	.410	.317	.255	-	-
[illegible]80	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]83	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]84	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]86	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]87	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]89	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]90	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]91	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]92	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]93	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]95	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]96	.129	.144	.165	.349	.492	.588	960	1.098	1.166	.742	.628	.415	.532
1997	.222	.110	.060	.791	.786	500	.515	.384	.188	.536	.806	.627	.462
[illegible]98	.558	.452	.317	-	-	-	-	-	-	-	-	-	-
[illegible]99	.412	.289	.364	464	.713	-	-	-	-	-	-	-	-
Mean	.194	.197	.158	379	.555	.436	.589	.632	.721	.694	.450	.248	.439
Median	.122	.110	.104	.349	.492	.381	.498	.506	.545	.561	.336	.19[illegible]	
[illegible]ximum	.558	.619	.375	.791	1.291	.748	1.231	1.098	1.730	1.365	.909	.627	
Minimum	.037	.025	.009	.010	.119	.207	.159	.181	.188	.194	.179	.058	
St. dev.	.160	.186	.134	.289	.330	.210	.326	.296	.486	.380	.278	.183	
	82	.94	.85	.76	.59	.48	.55	.47	.67	.55	.62	.74	

Mean monthly flow in cubic metres per second

Table 11.8 Streamflow Records and analyses: R. Enget at Bata-Dokolo Road

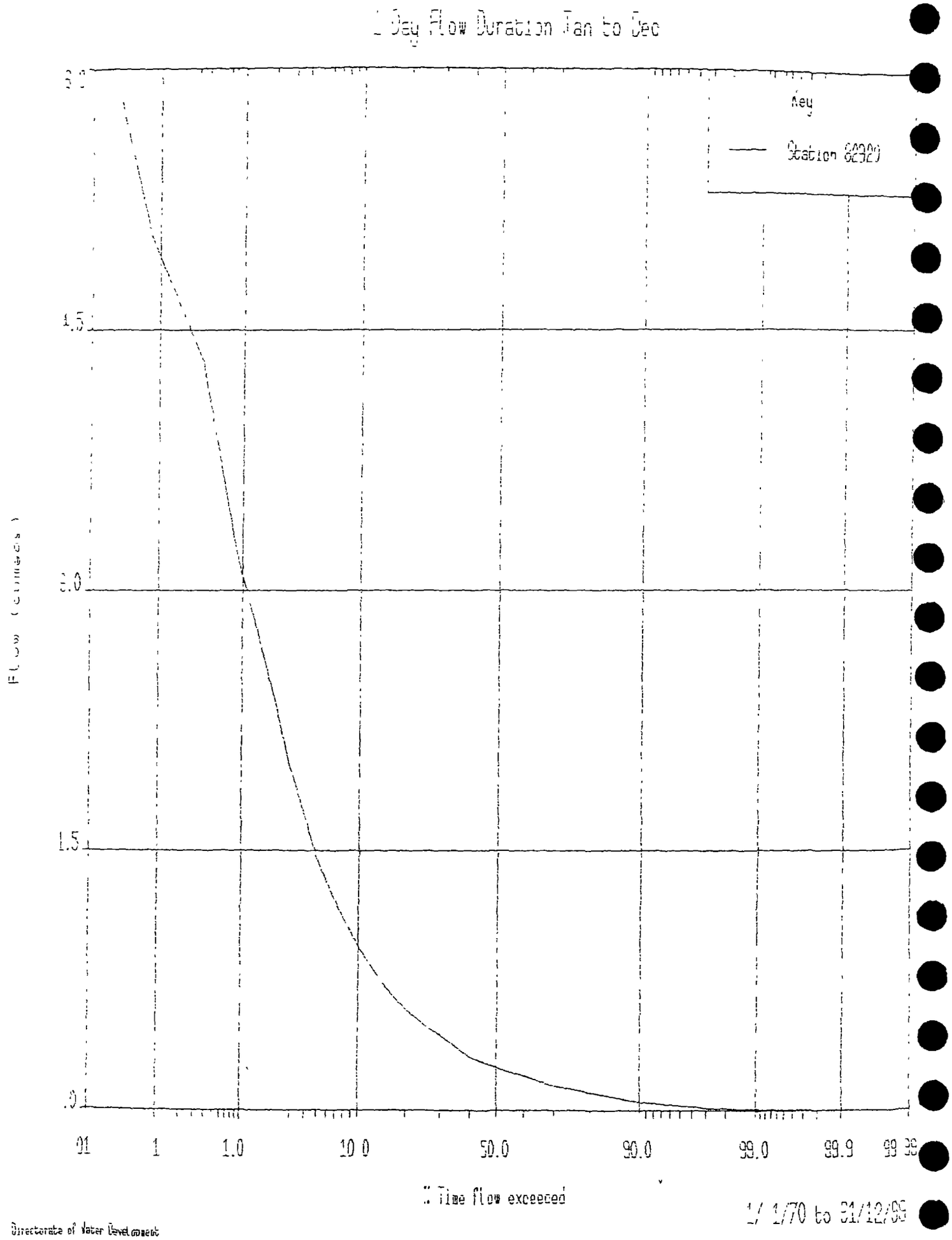

Table 11.8 Streamflow Records and analyses: R. Enget at Bata-Dokolo Road

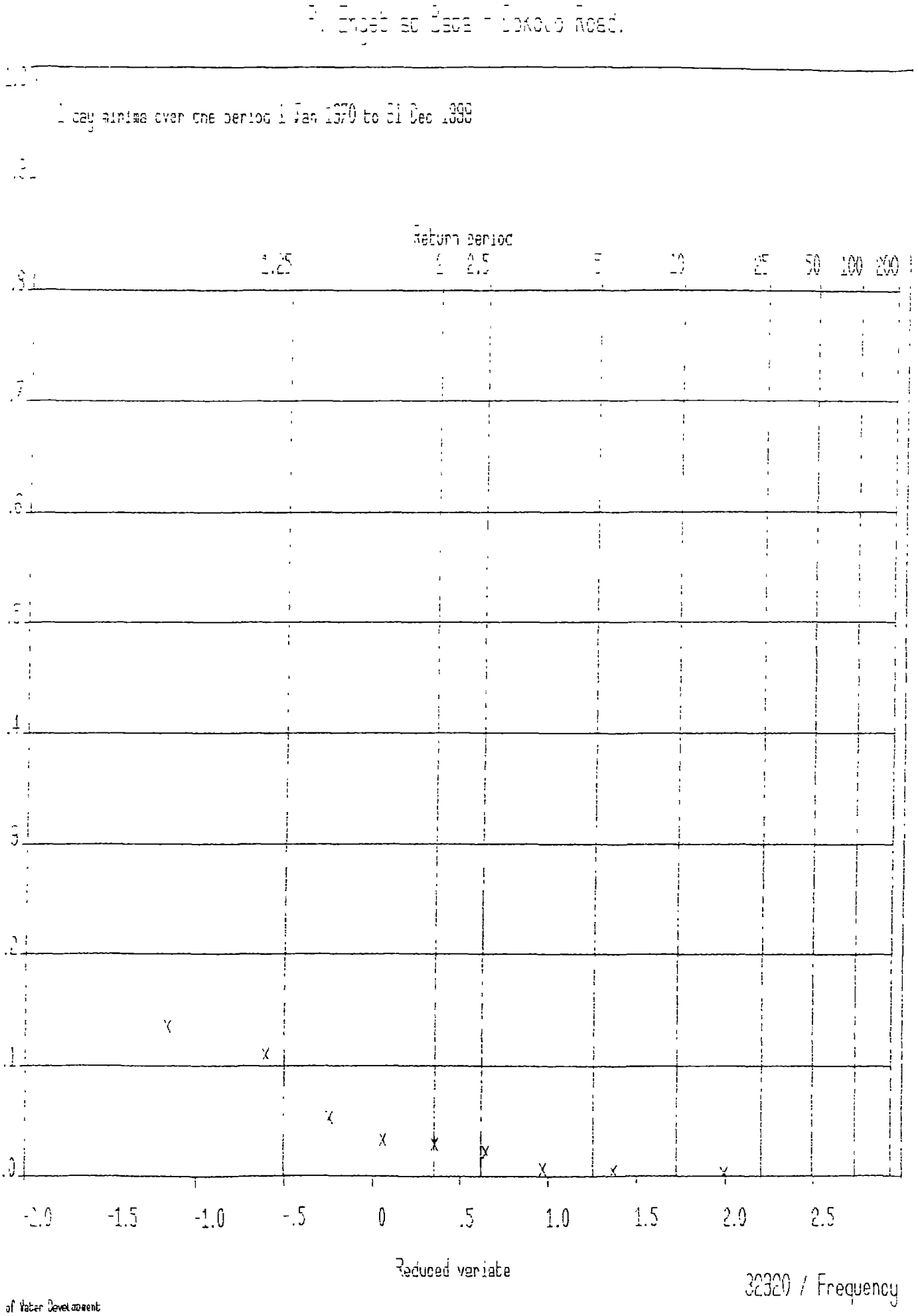

Table 11.8 Streamflow Records and analyses: R. Enget at Bata-Dokolo Road

Station number : 82320 Name : R. Enget at Bata - Dokolo Road.

Period of analysis from 1 Jan 1970 to 31 Dec 1999

BFI calculated over whole period

Number of days in period = 10957
Number of days with data = 4047
Number of days for BFI = 3876

Total volume (mm / year) = 127.08
Baseflow volume (mm / year) = 59.68

BFI = .470

BFI in each hydrological year

Year start	Days	Data days	BFI days	Total (mm)	Baseflow (mm)	BFI
Jan 1970	365	70	59	6.56	3.67	.560
Jan 1971	365	365	365	122.28	29.40	.240
Jan 1972	366	366	366	111.25	31.79	.286
Jan 1973	365	365	365	108.05	33.10	.306
Jan 1974	365	365	365	75.36	30.80	.409
Jan 1975	365	365	365	106.05	35.79	.337
Jan 1976	366	366	354	112.95	40.01	.354
Jan 1977	365	0	0			
Jan 1978	365	364	322	189.87	92.75	.489
Jan 1979	365	329	300	106.34	59.37	.558
Jan 1980	366	0	0			
Jan 1981	365	0	0			
Jan 1982	365	0	0			
Jan 1983	365	0	0			
Jan 1984	366	0	0			
Jan 1985	365	0	0			
Jan 1986	365	0	0			
Jan 1987	365	0	0			
Jan 1988	366	0	0			
Jan 1989	365	0	0			
Jan 1990	365	0	0			
Jan 1991	365	0	0			
Jan 1992	366	0	0			
Jan 1993	365	0	0			
Jan 1994	365	0	0			
Jan 1995	365	0	0			
Jan 1996	366	364	318	141.31	94.43	.668
Jan 1997	365	365	360	137.78	82.28	.597
Jan 1998	365	212	201	80.63	60.26	.747
Jan 1999	365	151	136	50.17	38.40	.765

Table 11.9 Indicative Water Analyses - Uganda Lakes and Rivers - 1999

Source Name	LAB SR	Total Coliforms	E coli	DO	Temp	CO_2	TSS (105°C)	TSS (500°C)	Turbidity	TDS	EC	PH	Total Alkalinity	Total Hardness	Ca	Mg
		No/100ml	No/100ml	mg/l	°C	mg/l	mg/l	mg/l	NTU	mg/l	uS/cm	units	mg/l	mg/l	mg/l	mg/l
R Nkusi	E0285	2100	250	3 8	22 0	40	15	ND	90 00	80	60	6 5	NR	26	4 8	3 4
L Albert	E0286	74	9	6 4	27 0	0	5 0	ND	1 94	370	610	9 0	274	135	10	26 0
Soroti W/W (intake)	E0287	3050	<10	ND	ND	ND	3 0	1 7	1 02	195	230	7 7	135	80	14	11 2
Soroti W/W (Reservior)	E0288	>200	1	ND	ND	NR	<1 0	NR	0.56	180	235	7.7	125	82	14	11 7
Soroti STW (Effluent)	E0289	$1\ 24X10^7$	$7\ 5X10^4$	ND	ND	NR	135	18	30 90	NR	730	7 7	NR	NR	NR	NR
Soroti STW (influent)	E0290	NR	NR	ND	ND	NR	290	49	60 80	NR	1130	7 1	NR	NR	NR	NR
R Mpologoma	E0291	1150	26	ND	ND	ND	2 0	<1 0	9 40	105	125	7 2	68	51	10	6 3
R Lwakhakha	E0301	28900	1750	9 4	19	ND	47	33	22 30	<81	70	7 7	37	32	6 4	3 9
Palisa W/W	E0302	8	0			ND	<1 0	NR	0 09	330	7	6 7	135	135	31 2	14 1
Victoria Nile	E0306	4290	10	5	25	ND	5 0	0 7	2 22	<81	100	7 8	43	25	3 6	3 9
Nkokonjeru GW site	E0307	1	0	5 5	23	ND	1 0	0 7	2 25	120	110	6 1	46	32	5 2	4 6
Nakivubo Channel - Kampala	E0320	$7.8x10^5$	$1.37x10^5$	1 23	22 7	NR	21	15	7 00	170	440	6 9	135	99	23 6	9 7
Masindi W/W (Intake)	E0323	305	125	5 92	24 4	35	6 0	2 0	25 00	81	110	6 6	57	43	5 2	7 3
Nyaruzinga/Bushenyi W/W(intake)	E0326	2650	57	1 56	17 1	ND	13	5 0	6 06	91	48	5 9	15	20	2.0	3 6
Nyaruzinga/Bushenyi W/W(Treated Water)	E0327	>200	18	7.5	18 3	NR	7 0	2 0	6 54	125	135	4 4	3	11	1 6	1 7
R Rukoki	E0328	200	0	10 07	16 2	10	47	33	15 40	34	49	7 0	13	19	4 8	1 7
R Sebwe	E0329	4150	67	9 9	16 9	10	168	140	56 10	33	47	7 8	17	15	3 2	1 7
R Nyamwamba	E0330	8300	2400	10 42	15 8	10	12	6.5	5 21	30	43	7 9	12	ND	ND	ND
Nakayiba stream - Masaka	E0349	>40100	11200	6 17	25 3	20	34	25	10 00	73	105	6 9	31	13	2 8	1 5
Kyokumpi	E0350	7380	100	0 25	20 1	50	7 0	4 5	60 00	72	100	6.1	25	16	2 4	2 4
Bukola	E0351	>40100	>40100	9 2	22.1	30	50	37	210	120	110	7 0	40	14	2 8	1 7
Ruharo	E0352	20050	1500	6.18	19.7	15	110	98	10 00	120	140	7 2	29	40	7 6	5 1
Kakoba	E0353	20050	550	6 83	20 5	10	135	120	340	120	145	8.0	30	42	8 4	5 1
R Tochi [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	4.0	1 0	5 63	100	89	7 8	67	24	4 0	3 4
R Moroto	E0406	1920	67	5 74	25 4	ND	6 0	4 0	12 80	81	69	7 1	31	30	5 6	3 9
Arua W/W (intake)	E0407	33040	3560	7.63	23.8	ND	26	21	ND	<81	84	7 4	40	32	5 6	4 4
Kabong Ground Water Site	E0409	ND	ND	3 36	24 9	50	2 0	NR	1 56	1155	2050	6 9	690	360	68	46 2

Source: WRMD Laboratory, Entebbe

Table 11.9 Indicative Water Analyses - Uganda Lakes and Rivers - 1999

Source Name	LAB SR	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	NO_2	NH_4	PO_4	TP	TN	BOD	COD
		mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l as N	mg/l as N	mg/l as N	mg/l as P	mg/l as P	mg/l as N	mg/l	mg/l
R Nkusi	E0285	7 0	2 0	NR	NR	4	22	0 03	0 005	NR	0 08	0 18	1 60	ND	ND
L Albert	E0286	90	51 0	34 8	263 3	25	19	0 03	0 003	NR	<0 08	0 14	0 80	ND	23 00
Soroti W/W (intake)	E0287	21	6 1	NR	164 6	5	7	0 09	<0 002	<0 07	<0 08	0 14	0 30	ND	46 00
Soroti W/W (Reservior)	E0288	20	6 2	NR	152 4	6	9	0 08	<0 002	<0 07	<0 08	NR	NR	NR	NR
Soroti STW (Effluent)	E0289	NR	NR	NR	NR	49	24	0 08	0 025	30 97	3 68	8.10	76 00	ND	108 00
Soroti STW (Influent)	E0290	NR	NR	NR	NR	92	21	<0 02	0 024	ND	9 42	11.50	62 00	ND	>160
R Mpologoma	E0291	12	2 5	NR	82 9	5	10	<0 02	<0 002	<0 07	0 14	0 23	0 20	ND	36 00
R Lwakhakha	E0301	6	1 6	NR	45 1	7	8	<0 02	0 005	<0 07	0 12	0 20	5 7	ND	22.00
Pallisa W/W	E0302	50	6 7	NR	164 6	52	13	0 86	<0 002	NR	0 15	NR	NR	NR	NR
Victoria Nile	E0306	10	3.4	NR	52 4	5	1	0 13	<0 002	NR	<0 08	ND	1 5	ND	34 00
Nkokonjeru GW site	E0307	ND	ND	NR	56 1	2	2	0 71	<0 002	NR	0 09	NR	NR	NR	NR
Nakivubo Channel - Kampala	E0320	20	19.0	NR	164 6	39	9	<0 02	0 004	5 84	1 35	1 41	11 4	ND	55
Masindi W/W (intake)	E0323	13	1 4	NR	69 5	6	5	<0 02	0 002	NR	<0 08	ND	ND	ND	42
Nyaruzinga/Bushenyi W/W(intake)	E0326	3	<0 1	NR	18 3	5	15	<0 02	0 006	ND	<0 08	ND	ND	ND	95
Nyaruzinga/Bushenyi W/W(Treated Water)	E0327	3	0 1	NR	3 7	5	51	<0 02	<0 002	ND	<0 08	ND	ND	ND	79
R. Rukoki	E0328	4	1 3	NR	15.8	3	12	0 77	<0 002	ND	<0 08	0 15	ND	ND	47
R Sebwe	E0329	7	1 6	NR	20 7	6	9	0 32	0.013	ND	0 10	0 27	1 7	ND	44
R Nyamwamba	E0330	3	1.0	NR	14 6	6	12	1 17	<0 002	ND	<0 08	0 12	0 8	ND	ND
Nakayiba stream - Masaka	E0349	9	5 4	NR	37 8	7	12	1 41	0 177	NR	0 35	0 38	7 3	ND	31
Kyokumpi	E0350	17	4 8	NR	30.5	5	14	0 03	<0 002	ND	<0 08	0 09	7 5	ND	37
Bukola	E0351	9	6 7	NR	48 8	7	13	0 10	0 011	ND	0 90	0 55	8 6	ND	39
Ruharo	E0352	12	3.1	NR	35 4	20	17	<0 02	0 170	ND	0.19	0 17	5 0	ND	62
Kakoba	E0353	13	3 3	NR	36.6	20	17	<0 02	0 028	ND	0 24	0 19	6 4	ND	76
R. Tochi at Lira-Kamdini Road	E0405	[illegible]	[illegible]	NR	[illegible]	<3	12	<0.02	<0.002	ND	<0.08	ND	[illegible]	ND	36.00
R Moroto	E0406	10	2 3	NR	37 8	<3	12	<0 02	0 004	ND	<0 08	ND	2 4	ND	22 00
Arua W/W (intake)	E0407	7	1 2	NR	48 8	4	3	0 02	0 004	ND	<0 08	ND	ND	ND	24 00
Kabong Ground Water Site	E0409	420	2 0	NR	841 1	115	59	27.7	<0 002	NR	<0 08	NR	NR	NR	NR

Table 11.10 Apac District: Early Boreholes in Kwania County

	County	Id_project	Completion	TD (m)	Pump type	Q test (l/s)	SWL (m)	Lithology from	Lithology to		Description
1	ADUKU	CD 135	23-Apr-42	45 75	Handpump	1 63	20	28	46	18	Decomposed granite
2	ADUKU	CD 1714	16-Jan-57	56 1	Handpump	0 8	13	53	56	3	Dark hard rock
3	ADUKU	CD 1720	30-Jan-57	58 6	Handpump	0 93	24	37	59	21	Dark rock
4	ADUKU	CD 2358	05-Sep-59	69 6	Handpump	8.78	7	58	70	12	Black medium hard rock
5	ADUKU	CD 3063	18-Mar-63	128 4	Handpump	2 2	8	57	128	71	Grey rock
6	ADUKU	CD 3104	13-May-63	99 43	Handpump	4 99	11	29	99	70	Grey soft rock
7	ADUKU	CD 3332	24-Jun-64	86 9	Handpump	3 6	12	55	87	32	White grey rock
8	ADUKU	CD 3866	21-Mar-67	90	Handpump	1 63	13	81	90	9	Grey black rock
9	ADUKU	CD 682	17-Aug-50	55 21	Handpump	0 95	22	53	55	2	Dark rock
10	ADUKU	CD 687	31-Aug-50	51 2	Handpump	1	17	45	51	6	Hard grey rock
11	ADUKU	CD 693	18-Sep-50	58	Handpump	2	10	43	58	15	Grey rock
12	ADUKU	CD 698	24-Oct-50	87 54	Handpump	0 64	35	50	88	37	Dark rock
13	ADUKU	CD 995	23-May-53	65 6	Handpump	0 8	19	10	66	56	Grey rock
14	ADUKU	CD1686	26-Nov-56	89 67	Handpump	2 59	23	66	90	24	Dark Rock
15	ADUKU	CD2373	25-Sep-59	89 37	Handpump	0 87	15	80	89	9	Grey Medium Hard Rock
16	ADUKU	CD2929	17-May-62	62 53	Handpump	5 54	5	21	63	41	Grey Rock
17	ADUKU	GS 1722	25-Sep-73	87	Handpump	4 1	11	61	87	26	Grey hard rock
18	ADUKU	GS 67	28-Sep-34	42 7	Handpump	0.77	11	40	43	3	Hard rock
19	ADUKU	WDD 0224	21-Sep-94	62	Handpump	0 72	11	44	62	18	Granite
20	ADUKU	WDD 0226	26-Sep-84	61 96	Handpump	5 4	26	38	62	24	Rather hard formation
21	ADUKU	WDD 0227	27-Sep-84	61 56	Handpump	3 6	18	24	62	38	Granite
22	ADUKU	WDD 0239	01-Nov-84	49 62	Handpump	3 6	15	31	50	18	Black soft granite
23	ADUKU	WDD 0317	27-Nov-84	80 23	Handpump	5 4	15	68	80	12	Hard granite
24	ADUKU	WDD 0327	09-Jan-85	68	Handpump	0 9	14	30	68	38	Black and grey granite
25	ADUKU	WDD 0331		80 3	Handpump	1	6	62	80	18	Weathered quartz
26	ADUKU	WDD 0339	29-Nov-84	68 1	Handpump	2 8	9	56	68	12	Granite quartz
27	ADUKU	WDD 0340	05-Dec-84	62 5	Handpump	0 9	9	32	63	31	Granite Quartz
28	ADUKU	WDD 0347	17-Dec-84	54 87	Handpump	1 2	10	43	55	12	Weathered quartz and schist
29	ADUKU	WDD 0391	19-Jan-85	74 1	Handpump	1 2	6	8	74	66	Brownish granite
30	ADUKU	WDD0225	29-Sep-84	110 7	Handpump	0 792	15	86	111	24	Schist Rock
31	ADUKU	WDD0237	03-Nov-84	56 86	Handpump	1 8	29	31	57	25	Hard Rock
32	ADUKU	WDD0316	05-Dec-84	61 95	Handpump	1 8	29	31	62	31	Hard Black Granite
	Average for sub-county			71 1		2 3	15 2	45 3		25 8	
33	CAWENTE	CD 1751	02-Apr-57	96 08	Handpump	3 27	32	35	96	61	Grey medium hard rock
34	CAWENTE	CD 1771	03-Jun-57	152 8	Handpump	0 4	31	134	153	19	Grey medium hard rock
35	CAWENTE	CD 711	08-Nov-50	58	Handpump	3 8	12	53	58	5	Grey hard rock
36	CAWENTE	CD 717	27-Nov-50	69 5	Handpump	1 5	35	54	70	16	Dark grey hard rock
37	CAWENTE	CD2444	10-Feb-60	101 87	Handpump	2 18	30	0	2	2	Black Soil
38	CAWENTE	CD2444	10-Feb-60	101 87	Handpump	2 18	30	93	102	9	Grey Medium Hard Rock
39	CAWENTE	CD3439	20-Jan-65	106 45	Handpump	5 21	43	77	106	30	Black Grey Rock + grey Rock
40	CAWENTE	GS1256	18-Feb-71	45 75		0 999	18	19	46	27	Granite
41	CAWENTE	WDD 0229	02-Oct-84	91 5	Handpump	0 39	11	20	92	72	Granite
42	CAWENTE	WDD 0323	08-Dec-84	62 2	Handpump	1 08	33	54	62	8	Fine grey granite
43	CAWENTE	WDD 0324	11-Dec-84	80 3	Handpump	0 4	19	41	80	39	Light grey granite(hard)
44	CAWENTE	WDD 0325	14-Dec-84	86 3	Handpump	0 43	16	44	86	42	Grey granite
45	CAWENTE	WDD 0330	17-Jan-85	104 6	Handpump	0 28	14	86	105	18	Grey granite
46	CAWENTE	WDD 0341	03-Dec-84	103 6	Handpump	1	37	73	104	30	Weathered quartz and granite
47	CAWENTE	WDD 0344	08-Dec-84	62	Handpump	1 8	17	56	62	6	Quatzite
48	CAWENTE	WDD 5226	31-Jan-92	57	Handpump	0 7	21	39	57	18	Fractured granite
	Average for sub-county			68 4		2.2	15 9	41 4		27 0	
49	INOMO	CD 124	04-Mar-42	114	Handpump	6 1	41	27	114	87	Granite
50	INOMO	CD 1736	18-Feb-57	71 4	Handpump	0 7	49	31	71	41	Grey rock
51	INOMO	CD 1777	23-Apr-57	61	Handpump	1 82	30	58	61	3	Grey rock
52	INOMO	CD 2167	06-Nov-58	61	Handpump	1 63	37	24	61	37	Grey rock
53	INOMO	CD 2177	29-Nov-58	68 63	Handpump	0 66	41	17	69	52	Grey hard rock
54	INOMO	CD 3360	17-Sep-64	152.5	Handpump	0 36	43	50	153	102	Black hard rock and grey rock
55	INOMO	CD 3435	14-Dec-64	70 76	Handpump	3 72	27	67	71	3	White rock
56	INOMO	CD 3877	06-Apr-67	102 8	Handpump	4 72	27	94	103	9	Black white rock
57	INOMO	CD3651	12-Feb-66	43	Handpump	5 902	35	34	43	9	Brown White Rock
58	INOMO	CD729	14-Feb-51	67 71	Handpump	0 64	34	49	68	18	Grey Granite
59	INOMO	WDD 0228	28-Sep-84	67 86	Handpump	6	11	37	68	31	Schist rock
60	INOMO	WDD 0230	05-Oct-84		Handpump	0 9	21	32	92	61	Schist rock
61	INOMO	WDD 0231	06-Oct-84	86 23	Handpump	0 72	80	62	86	24	Hard rock
62	INOMO	WDD 0312	10-Nov-84	86 13	Handpump	3 5	27	73	86	14	Hard granite
63	INOMO	WDD 0322	06-Nov-84	92 46	Handpump	1 68	23	39	92	54	Hard rock
64	INOMO	WDD 0334	10-Nov-84	62	Handpump	1	12	50	62	12	White granite
65	INOMO	WDD 0336	21-Nov-84	92 5	Handpump	2 5	33	62	93	31	Mica schist
66	INOMO	WDD 0348	17-Dec-84	68 1	Handpump	1	29	56	68	12	Fine schist

Table 11.10 Apac District: Early Boreholes in Kwania County

	County	Id_project	Completion	TD (m)	Pump type	Q test (l/s)	SWL (m)	Lithology from	Lithology to	Description
	Average for sub-county			80 5		2 4	33 3	47 9		33 3
67	NAMBIESO	CD 1031	08-Sep-53	69 5	Handpump	2 6	9	27	70	43 White and grey rock
68	NAMBIESO	CD 1691	06-Dec-56	100 35	Handpump	0 999	25	26	100	75 Grey soft rock
69	NAMBIESO	CD 2683	01-Mar-61	136 6	Handpump	0 4	17	11	137	125 Grey rock
70	NAMBIESO	CD 3431	29-Nov-64	61 61	Handpump	3 86	20	52	62	9 Brown black white rock
71	NAMBIESO	CD 3472	29-Mar-65	152 2	Handpump	0 634	28	69	153	83 Black white and white black rock
72	NAMBIESO	CD 3840	30-Jan-67	93 6	Handpump	3 2	24	85	94	9 Black white brown rock
73	NAMBIESO	CD 3882	18-Apr-67	120 2	Handpump	1 22	43	111	120	9 Black white rock and white rock
74	NAMBIESO	CD2460	25-Feb-60	73 51	Handpump	1 09	39	64	74	9 Black Medium Hard Rock
75	NAMBIESO	WDD 0232	10-Oct-84	80 3	Handpump	3 6	10	61	80	19 Grey hard granite
76	NAMBIESO	WDD 0234	16-Oct-84	67 8	Handpump	3	7	60	68	8 Dark grey granite
77	NAMBIESO	WDD 0235	18-Oct-84	61 85	Handpump	0 9	4	44	62	18 Hard grey rock
78	NAMBIESO	WDD 0236	20-Oct-84	49 53	Handpump	3 6	7	25	50	24 Soft rock
79	NAMBIESO	WDD 0297	02-Nov-84	49 8	Handpump	1 6	8	44	50	6 Quartz
80	NAMBIESO	WDD 0298	30-Oct-84	62	Handpump	1 8	7	50	62	12 Mica schist
81	NAMBIESO	WDD 0299	01-Nov-84	80 3	Handpump	1.3	23	50	80	31 Weathered quartz
82	NAMBIESO	WDD0374	05-Nov-84	80 3	Handpump	1 4	24	68	80	12 Weathered quartz and fine granite
	Average for sub-county			83 7		1 9	19 0	54 7		30 0
	Average for district			78 4		2 1	21 7	49 1		28 3
	Median			70 2		1 6	19.3	49 4		21 4
	Mode			80 3		3 6	19 5	55 9		18 3
	Max			152 8		8 8	80 0	133 6		125 3
	Min			42 7		0 3	4 0	0 0		2 1

Table 11.11 Apac District: Early Boreholes in Maruzi County

	Cname	Sub-County	ID project	Completion	TD (m)	Pump type	Q test (l/s)	SWL (m)	Lithology from (m)	Lithology to (m)	Description
1	MARUZI	AKOKORO	CD 1911	08-Jan-58	167.8	Handpump	0 5	19	165	168	3 Dark and grey rock
2	MARUZI	AKOKORO	CD 1866	01-Feb-58	110 0	Handpump	10 0	37	21	110	89 Dark soft rock
3	MARUZI	AKOKORO	CD 2092	21-Aug-58	161.4		0 1	47	15	161	146 Grey rock
4	MARUZI	AKOKORO	CD 2127	05-Oct-58	122.0		0 0	88	40	122	82 Grey hard rock
5	MARUZI	AKOKORO	CD 2191	17-Dec-58	79.3	Handpump	9 1	47	56	79	23 Grey medium hard rock
6	MARUZI	AKOKORO	CD 2849	19-Jun-62	105.5	Handpump	1 6	36	63	106	43 Grey rock
7	MARUZI	AKOKORO	CD 3117	25-Jun-63	119 9	Handpump	3 1	38	46	120	74 Grey rock
8	MARUZI	AKOKORO	CD 900	11-Sep-52	61 9	Handpump	4 0	37	43	62	19 Hard rock (grey)
9	MARUZI	AKOKORO	CD 920	25-Nov-52	75 6	Handpump	1 5	36	25	76	51 Grey and brown rock
10	MARUZI	AKOKORO	CD 938	12-Jan-53	74 7	Handpump	1 6	45	34	75	40 Grey and brown rock
11	MARUZI	AKOKORO	CD 954	30-Jan-53	67 4	Handpump	0 6	50	47	67	20 Hard rock (brown and grey)
12	MARUZI	AKOKORO	CD 965	31-Mar-53	57 0	Handpump	0 7	30	20	57	37 Hard rock (white and grey)
13	MARUZI	AKOKORO	CD 980	21-May-53	73 2	Handpump	0 7	36	5	73	68 Hard yellow green and brown rock
14	MARUZI	AKOKORO	GS 1264	06-Feb-71	93 9	Handpump	2.7	27	46	84	48 Medium hard black rock
15	MARUZI	AKOKORO	GS834	08-Oct-67	61 0	Handpump	1 4	37	49	61	12 Rock
16	MARUZI	AKOKORO	WDD 0145	05-Jul-84	86 5	Handpump	0 8	9	55	87	32 Grey hard granite and black rock
17	MARUZI	AKOKORO	WDD 0150	19-Jul-84	80 3	Handpump	0 6	24	44	80	36 Dark grey granite and grey granite
18	MARUZI	AKOKORO	WDD 0153	27-Jul-84	74 1	Handpump	0 6	16	62	74	12 Dark grey and hard grey granite
19	MARUZI	AKOKORO	WDD 0154	30-Jul-84	74 3	Handpump	5 2	17	54	74	20 Black rock
20	MARUZI	AKOKORO	WDD 0155	31-Jul-84	86 5	Handpump	3 0	32	73	87	14 Black rock
21	MARUZI	AKOKORO	WDD 0157	22-Aug-84	80 8	Handpump	13 5	35	63	81	18 Dark grey rock
22	MARUZI	AKOKORO	WDD 0486	26-Jul-85	61 0		7 5	8	31	61	31 Black soft rock
	Average for sub-county				**89.7**		**3 1**	**34.5**			**41.7**
23	MARUZI	APAC	CD 140	21-Mar-48	45 8	Handpump	2 5	20	32	46	14 Broken granite and quartz
24	MARUZI	APAC	CD 1795	29-May-57	89 1	Handpump	1 1	27	83	89	6 Dark hard rock
25	MARUZI	APAC	CD 1815	13-Jun-57	57 0	Handpump	1 9	18	55	57	2 Grey hard rock
26	MARUZI	APAC	CD 1819	15-Jul-57	152.5	Handpump	0 4	29	83	153	70 Dark grey soft rock
27	MARUZI	APAC	CD 3258	06-Mar-64	126 6	Handpump	1 1	27	118	127	9 Dark grey rock and grey white rock
28	MARUZI	APAC	CD 3345	18-Jul-64	105 2	Handpump	1 5	27	97	105	9 Black white rock
29	MARUZI	APAC	CD 3860	28-Feb-67	108 3	Handpump	6 1	38	100	108	8 Grey black rock
30	MARUZI	APAC	CD 662	31-May-52	93 3		2 0	45	50	93	43 Grey black, white and brown rock
31	MARUZI	APAC	CD 959	23-Feb-53	80 0	Handpump	0 9	38	39	60	21 Grey and brown rock
32	MARUZI	APAC	CD2330	01-Aug-59	105 2	Handpump	6 4	31	25	105	81 Grey Medium Hard Rock
33	MARUZI	APAC	CD2636	09-Nov-60	78 1	Handpump	8 6	4	70	78	9 Grey Rock
34	MARUZI	APAC	CD78	04-Mar-41	43 8	Handpump	1 8	7	35	42	8 Schist
35	MARUZI	APAC	WDD 0059	29-May-84	56 0	Handpump	0 5	21	24	58	32 Grey granite
36	MARUZI	APAC	WDD 0135	01-Aug-84	81 5	Handpump	2.5	28	69	82	13 Coarse quartzite and mica schist
37	MARUZI	APAC	WDD 0137	20-Aug-84	81 3	Handpump	0 4	9	63	81	18 Coarse granite and weathered quartzite
38	MARUZI	APAC	WDD 0140	31-Aug-84	75 2	Handpump	2 5	17	69	75	6 Quartz and slashed schist
39	MARUZI	APAC	WDD 0223	19-Sep-84	104 5	Handpump	1 5	44	98	105	8 Hard granite
40	MARUZI	APAC	WDD0052	15-May-84	90 0		0 3	12	19	90	71 Hard Granite
41	MARUZI	APAC	WDD0053	20-May-84	58 0	Handpump	1 1	25	32	58	26 Grey Granite
42	MARUZI	APAC	WDD0076	17-May-84	73 4	Handpump	1 4	8	67	73	6 Coarse Grain Black and White Granite
43	MARUZI	APAC	WDD0124	18-Jun-84	92.0	Handpump	1.2	20	88	92	6 Fine Grain
44	MARUZI	APAC	WDD0138	27-Aug-84	69 1	Handpump	2.5	18	45	69	24 Quartzite + Coarse Granite
45	MARUZI	APAC TOWN CO	CD 3635	06-Mar-66	106 8		5 0	14	50	107	56 Hard rock
46	MARUZI	APAC TOWN CO	CD3675	11-May-66	122.0		5 0	14	118	122	4 Hard Gneiss
47	MARUZI	APAC TOWN CO	CD3798	20-Jun-66	122.9		11 7	20	62	123	61 Hard Rock
48	MARUZI	APAC TOWN CO	GD1943	21-Oct-75	62.2	Handpump	4 5	13	24	62	38 Black Rock Mixed with Mica
49	MARUZI	APAC TOWN CO	WDD 0057	25-May-84	62 0	Handpump	0 9	63	54	62	8 Whitish rock
50	MARUZI	APAC TOWN CO	WDD 0075	12-May-84	104.2	Handpump	1 2	10	43	104	62 Granite(black fine and coarse)
51	MARUZI	APAC TOWN CO	WDD 0077	18-May-84	87 4	Handpump	1 4	18	0	2	2 Top soil and murram
52	MARUZI	APAC TOWN CO	WDD 0077	18-May-84	87 4	Handpump	1 4	18	69	87	18 Weathered
53	MARUZI	APAC TOWN CO	WDD 0142	18-Jun-84	61 4	Handpump	4 0	10	40	61	21 Hard black rock containing water
54	MARUZI	APAC TOWN CO	WDD 0143	20-Jun-84	86 4	Handpump	7 2	16	68	86	18 Dark grey rock and grey rock
	Average for sub-county				**86.2**		**2.8**	**22.1**			**24 6**
55	MARUZI	CEGERE	CD 1004	26-Jun-53	76 6	Handpump	2.0	19	75	77	2 Grey rock (hard)
56	MARUZI	CEGERE	CD 1011	15-Jul-53	67 1	Handpump	1 5	11	31	67	36 Grey rock
57	MARUZI	CEGERE	CD 1015	01-Aug-53	68 3	Handpump	8.2	9	51	68	17 Grey and black rock
58	MARUZI	CEGERE	CD 1021	18-Aug-53	79 0	Handpump	13.6	18	58	79	21 Grey and white rock
59	MARUZI	CEGERE	CD 1847	29-Jul-57	83.3	Handpump	2.6	22	34	83	50 Dark coarse soft rock
60	MARUZI	CEGERE	CD 1876	02-Oct-57	103 7	Handpump	1 0	29	0	1	1 Top soil
61	MARUZI	CEGERE	CD 1876	02-Oct-57	103 7	Handpump	1 0	29	40	104	64 Grey rock
62	MARUZI	CEGERE	CD 2080	26-Jun-58	115.9	Handpump	10 9	24	24	116	92 Black soft rock
63	MARUZI	CEGERE	CD 2310	04-Jul-59	126.3	Handpump	1.1	23	26	126	100 Grey rock
64	MARUZI	CEGERE	CD 2858	03-Feb-62	105 0	Handpump	3 3	15	84	105	21 Grey soft rock
65	MARUZI	CEGERE	CD 3710	07-Jun-66	140 3	Handpump	3 6	34	131	140	9 Grey white rock and grey rock
66	MARUZI	CEGERE	CD 873	26-Jun-52	87.2	Handpump	5 5	28	84	87	3 Grey and white rock
67	MARUZI	CEGERE	CD3415	14-Nov-64	122 0	Handpump	1 1	43	104	122	18 White Grey Brown Rock + Grey White Rock
68	MARUZI	CEGERE	GS 1692	28-Aug-73	110 4	Handpump	1 5	21	59	79	21 Grey hard rock and soft grey rock
69	MARUZI	CEGERE	GS 1968	25-Nov-82	131 0	Handpump	8.2	14	94	131	37 Black soft rock
70	MARUZI	CEGERE	GS1600	28-Jul-73	79.3	Handpump	1 5	18	58	79	21 Black Hard Rock
71	MARUZI	CEGERE	WDD 0282	11-Sep-84	62.0	Handpump	1 0	12	44	62	18 Quartz
72	MARUZI	CEGERE	WDD 0283	14-Sep-84	62 0		1 0	14	50	62	12 Weathered quartz and coarse granite
73	MARUZI	CEGERE	WDD 0284	17-Sep-84	80 3	Handpump	0 4	25	62	80	18 Quartzite and fine schist
74	MARUZI	CEGERE	WDD 0285	22-Sep-84	111 8	Handpump	0 5	27	100	112	12 Quartz and weathered quartz
75	MARUZI	CEGERE	WDD 0286	25-Sep-84	80.3	Handpump	0 4	8	68	80	12 Coarse granite mixed with weathered quartz
76	MARUZI	CEGERE	WDD 0288	29-Sep-84	62.0	Handpump	1 5	8	50	62	12 Weathered quartzite
77	MARUZI	CEGERE	WDD 0289	19-Sep-84	73 2	Handpump	1 3	22	55	73	18 Weathered rock
	Average for sub-county				**92.6**		**3.2**	**20 5**			**26.8**
78	MARUZI	IBUJE	CD 1855	14-Aug-57	114 4	Handpump	0 9	33	39	114	76 Dark soft rock
79	MARUZI	IBUJE	CD 1880	18-Oct-57	51 2	Handpump	0 7	18	21	51	30 Dark grey rock
80	MARUZI	IBUJE	CD 1902	29-Oct-57	103.7	Handpump	3 6	48	64	104	40 Black soft rock
81	MARUZI	IBUJE	CD 1952	23-Jan-58	111 9	Handpump	7 3	30	61	112	51 Dark blue soft rock
82	MARUZI	IBUJE	CD 2063	01-Jun-58	85 7	Handpump	1 8	34	48	86	38 Dark rock
83	MARUZI	IBUJE	CD 2077	11 Jun-58	122.0	Handpump	2.3	42	58	122	64 Black soft rock
84	MARUZI	IBUJE	CD 2748	03-Jun-61	56 7	Handpump	4 7	9	48	57	9 Brown and white rock
85	MARUZI	IBUJE	CD 3115	30-May-63	103 1	Handpump	3 3	34	30	103	73 Grey soft rock

Table 11.11 Apac District: Early Boreholes in Maruzi County

86	MARUZI	IBUJE	CD 852	30-Apr-52	53 4	Handpump	1 5	20	27	53	27	White,yellow and grey rock
87	MARUZI	IBUJE	CD 883	16-Jul-52	93 0	Handpump	6 0	36	67	93	26	Grey and white colour rock
88	MARUZI	IBUJE	CD 890	18-Aug-52	83 3	Handpump	1.5	30	28	83	58	Hard grey rock
89	MARUZI	IBUJE	CD3391	22-Oct-64	101 3	Handpump	0 8	18	80	101	21	Grey Rock
90	MARUZI	IBUJE	WDD 0123	07-Jun-84	89 1	Handpump	1,0	25	51	69	18	Hard granite
91	MARUZI	IBUJE	WDD 0128	07-Jun-84	81 3	Handpump	20 0	35	63	81	18	Schist and quartz
92	MARUZI	IBUJE	WDD 0129	11-Jul-84	81 4	Handpump	30 0	9	51	81	31	Medium hard granite
93	MARUZI	IBUJE	WDD 0147	11-Jul-84	62.0	Handpump	6 6	8	25	62	37	Dark black rock
94	MARUZI	IBUJE	WDD 0148	16-Jul-84	80 3	Handpump	4 6	28	0	4	4	Murrum
95	MARUZI	IBUJE	WDD 0148	16-Jul-84	80 3	Handpump	4 8	28	66	80	14	Brownish sedimentary rock
96	MARUZI	IBUJE	WDD 0151	23-Jul-84	92.6	Handpump	21 5	28	56	93	36	Dark black soft rock
97	MARUZI	IBUJE	WDD 0152	25-Jul-84	80 4	Handpump	15 0	25	71	80	9	Grey granite
98	MARUZI	IBUJE	WDD 4700	08-Dec-91	100 0	Handpump	4 0	9	76	100	24	Flakes of dark rock impregnated with quartzites
	Average for sub-county				86.1		6 6	25.8			33.5	
	Average for district				88.6		3.8	25.3			30 9	
	Median				83 3		1.8	24 4			21.4	
	Mode				80 3		1 5	18 3			18.3	
	Max				167.8		30.0	97 6			149 1	
	Min				43.6		0.0	4.3			1.2	
	Standard deviation				24 6		4.8	13.9			26.1	

Table 11.12 Apac District: Early Boreholes in Kole County

	County	Village	Completion	TD (m)	PumpType	Lithology from (m)	Lithology to (m)		Description	Q test (l/s)	SWL (m)
1	ABOKE	ABOKE	11-Nov-56	81	Handpump	58 6	80 8	22 2	Grey hard rock	3 3	16 5
2	ABOKE	ABOKE	11-Jun-58	182	Handpump	178 12	182.44	4 32	Grey rock and white hard rock	3.82	11 59
3	ABOKE	ABOKE	08-Sep-66	95	Handpump	56 12	94 55	38 43	White grey black rock	0.73	13 73
4	ABOKE	ABOKE	27-Jun-53	51	Handpump	40 57	50 63	10 06	Grey rock	3 27	8 85
5	ABOKE	ACANDY	17-Jan-62	79	Handpump	18 3	79	60 7	Grey rock	0.82	8 24
6	ABOKE	ACULBA	07-Oct-54	93	Handpump	25 62	92 72	67 1	Grey rock	1 86	7 63
7	ABOKE	AMUKO	12-Dec-62	110	Handpump	102 18	109 5	7 32	Grey soft rock	2.63	17 08
8	ABOKE	OGWAN	25-Oct-66	68	Handpump	40 87	68 32	27 45	White grey black rock	2.18	7 32
9	ABOKE	OPETA	05-Jul-58	92	Handpump	29	91 5	62 5	Grey rock	2.7	15
	Average for county			**94.4**				**33 3**		**2.4**	**11 8**
10	AKALO	ADYANG	26-Jun-54	70	Handpump	18	70.15	52.15	Grey rock (medium hard)	0 94	8 54
11	AKALO	ADYEDA	09-Jun-54	102	Handpump	32	102	70	Grey, hard rock	7 4	2.7
	Average for county			**86.1**				**61.1**		**4.2**	**5.6**
12	AYER		09-Aug-62	136	Handpump	62.5	136	73 5	Grey rock	3 2	69 5
13	AYER	AYER	16-Jul-60	94	Handpump	72.59	94 2	21 61	Grey rock	3 13	10 07
14	AYER	AYER	31-Dec-61	71	Handpump	35 38	71 37	35 99	Grey Hard Rock	2 86	5 19
15	AYER	AYER	18-Sep-66	124	Handpump	117 12	124 44	7 32	Black White Rock	2 72	7 02
16	AYER	AYER T	16-Jul-60	94	Handpump	72 59	94 25	21 66	Grey rock	3 13	10 07
	Average for county		**22821.4**	**104 1**				**32.0**		**3.0**	**20.4**
17	BALLA		17-Feb-55	87	Handpump	51 2	87 2	36	Grey medium hard rock	1 4	36 6
18	BALLA		30-Apr-71	46	Handpump	15 3	45 8	30 5	Hard grey rock	4 2	6 1
19	BALLA	ABERDY	09-Dec-61	48	Handpump	4 58	47 68	43 1	Grey Hard Rock	4 77	1 53
20	BALLA	ABILONI	24-Apr-65	89	Handpump	55 21	88 76	33 55	Black White Rock	0 63	19 52
21	BALLA	ALEMA	25-Nov-66	88	Handpump	61 61	88 45	26 84	Black White Rock + White Grey Brown Rock	0 62	12.81
22	BALLA	BALLA	03-Apr-41	35	Handpump	30 5	35 38	4 88	Granite	4 8	14 03
23	BALLA	BALLA	13-Jul-62	106	Handpump	86 9	105 8	18 9	Grey soft rock	1 09	11
24	BALLA	OMOLA	18-Jan-61	175		35 1	174 8	139 7	Grey soft rock	0 23	40 6
	Average for county			**84.2**			**84 2**	**41 7**		**2.2**	**17 8**
	Average for district			**92.6**			**92.3**	**38.6**		**2.7**	**14 8**
	Median			**90 1**			**88 8**	**32.7**		**2.8**	**10.5**
	Mode			**#N/A**			**#N/A**	**7.3**		**3.1**	**10 1**
	Max			**182.4**			**182.4**	**73 5**		**7.4**	**69 5**
	Min			**35.4**			**35.4**	**4 3**		**0 6**	**1 5**
	Standard deviation			**30 1**			**31 9**	**21 1**		**1 6**	**13.3**

Table 11.13 Apac District: Early Boreholes in Oyam County

	Sub-County	Village	Completion	TD (m)	PumpType	Lithology from (m)	Lithology to (m)	'Bottom' thickness	Description	Q test (l/s)	SWL (m)
1	ABER	ABER-KAMDININ T C	07-Mar-43	44 23	Handpump	19	44	25	Gneiss or Granite	1 8	14 6
2	ABER	ADEBE	18-Mar-58	95 46	Handpump	73	95	22	Dark Grey Rock + Dark Rock	2 7	30 5
3	ABER	ADYEGI	07-Jan-54	66 19	Handpump	21	66	45	Grey rock	3 3	9 2
4	ABER	ADYEGI	25-Oct-73	73 2	Handpump	46	73	27	White Hard Rock	4 0	19 2
5	ABER	ALYEC JUK	13-Oct-84	92	Handpump	62	92	30	Wethered quartz	1 4	12.2
6	ABER	AMINOMIR	31-Mar-43	38 13	Handpump	21	20	0	Gneiss or granite	3.9	9 2
7	ABER	ATURA	05-Feb-92	111	Handpump	54	111	57	Granite impregnated with quartz	3 0	12.0
8	ABER	ATURA TDC	19-May-58	57 04	Handpump	44	57	13	Grey Hard Rock	1 6	11 0
9	ABER	OGWALAGOA	17-Feb-62	86 32	Handpump	40	86	47	Grey Rock	6.3	18 9
10	ABER	ONGICA	23-Jan-64	97	Handpump	88	97	9	White grey rock	1.0	8 0
11	ABER	PUCIKA	05-Dec-53	70 4	Handpump	39	70	32	Medium hard grey rock	3.2	5 8
12	ABER	WIRAO	29-Jun-54	101 57	Handpump	30	102	72	Grey rock	3 1	31 4
	Average for county			**77 7**			**76.2**	**31 6**		**2.9**	**15.2**
13	ACHABA	ACET	22-Mar-71	64 7	Handpump	26	65	39	Granite	2.5	9.2
14	ACHABA	ADYANG	07-Oct-66	127 49	Handpump	118	127	9	Black Tock	5 5	12.2
15	ACHABA	ANYEKE	23-Aug-53	114 38		19	114	96	Grey hard rock	0.2	18.9
16	ACHABA	ANYEKE	29-Sep-56	106	Handpump	97	106	9	Black madium hard rock	4 1	8 8
17	ACHABA	ANYEKE	29-Sep-56	116 3		107	116	10	Black medium hard rock	4 1	9 7
18	ACHABA	DOGAPIO	14-Feb-67	137 3		76	137	61	Grey white black rock	0 0	109 8
19	ACHABA	DOGAPIO	02-Dec-67	61	Handpump	18	61	43	Rock	3.2	7 6
20	ACHABA	LELA-ATENG	26-Apr-62	104 31	Handpump	95	104	9	Grey Soft Rock	4 4	21 7
21	ACHABA	OBANGANGEO	23-Apr-54	87 23	Handpump	8	87	79	Grey soft rock	1 7	20 7
	Average for county			**102.1**			**102.1**	**39 4**		**2.9**	**24 3**
22	ICHEME	ALONI	29-Jan-59	128 1	Handpump	7	128	121	Grey rock	0 7	15 9
23	ICHEME	AMUKUGUNGU	12-Dec-62	119 7		112	120	8	Grey soft rock	2.6	18 7
24	ICHEME	AWIO	25-Sep-66	52 77	Handpump	44	53	9	Grey White Rock + White Brown Rock	2.2	7 3
25	ICHEME	ICEME	28-Jul-60	50 94	Handpump	36	51	15	Grey Rock	6 8	7 6
26	ICHEME	ICHEME	13-Jan-65	119 26		99	110	11	White Black Rock + BlackWhite Hard Rock	5 8	11 9
27	ICHEME	OKIC	08-Apr-59	183		16	183	167	Grey Rock	0 1	20 4
	Average for county			**109 0**			**107 5**	**55 2**		**3.0**	**13.6**
28	LORO	ABOLONENENO	21-Dec-91	84	Handpump	27	84	57	Granite rock	1.2	21 0
29	LORO	ABOLONENO	04-Sep-81	67 71		63	68	5	White hard rock	4 9	25 3
30	LORO	ADIGO	31-Jan-54	67 4	Handpump	18	67	50	Grey rock	2.0	8.2
31	LORO	ADIGO	02-Mar-67	76 6	Handpump	68	76	8	Brown black white rock	5 4	12.2
32	LORO	ADYEBA	06-Apr-84	84 25	Handpump	47	84	37	Coarse grain granite	1 0	15.2
33	LORO	ADYEDA FARM	05-Mar-65	152.5	Handpump	145	153	8	White rock	2.2	32.0
34	LORO	ADYEDA FARM	29-Jan-82	54 9	Handpump	50	55	5	White hard rock	4 5	22.9
35	LORO	AGULURUDE	06-Apr-61	81 44	Handpump	80	81	2	Grey and White Rock	4 2	6 4
36	LORO	ATOP	14-Feb-64	104	Handpump	95	104	9	Grey-white rock	1 5	19 5
37	LORO	LORO	12-Jun-41	25 32	Handpump	23	25	2	Hard Schist	2 4	5 8
38	LORO	LORO	31-Jul-68	79 3	Handpump	69	79	11	Softer rock	1 4	30 5
39	LORO	LORO	10-Nov-81	47.3	Handpump	15	47	32	Hard rock only	8.2	9.2
40	LORO	LORO	10-Feb-82	64 05	Handpump	31	64	34	Hard going bu not very	2.5	7 6
41	LORO	LORO	31-Mar-84	61 5	Handpump	31	62	31	Coarse granite	5 0	7 6
42	LORO	LORO	03-Apr-84	62	Handpump	42	62	20	Granite rich with black mineral	0 5	13 8
43	LORO	LORO	12-Apr-84	55	Handpump	37	55	18	Coarse grain granite	6 0	7 0
44	LORO	LORO C V SCHOOL	09-Apr-63	120.5	Handpump	111	120	9	Dark grey rock	0 4	9.2
45	LORO	LORO FARM	12-Mar-65	153 7	Handpump			0		0 7	36 6
46	LORO	ODIKE	17-Apr-84	67 1	Handpump	55	67	12	Coarse grain granite	1 3	23 0
47	LORO	OMOLO	19-Dec-42	109 8	Handpump	75	110	35	Gneiss + Granite	0 2	45 8
	Average for county			**80 9**			**77 1**	**19.2**		**2.8**	**17 9**
48	MINAKULU	AKUKINGA	18-Sep-60	66 8	Handpump	55	67	12	Grey dark rock	8 0	6 0
49	MINAKULU	MINAKULU TDC	10-Apr-43	30 5	Handpump	19	31	12	Gneiss and granite	6 8	9 5
50	MINAKULU	MINAKULU TDC	05-Oct-53	53 68	Handpump	17	54	37	Grey rock	4.2	13 7
51	MINAKULU	PAMWA T T C	18-Mar-43	39 65	Handpump	22	40	18	Gneiss or granite	2.1	8.2
52	MINAKULU	PANY-JOK	15-Feb-65	85 71	Handpump	77	86	9	Grey Rock	0 6	23 8
	Average for county			**55.3**			**55 3**	**17.3**		**4.3**	**12.4**
53	NGAI	ABOKOIRAO	29-Aug-64	58 3	Handpump	50	58	9	Brown Rock	1 1	11 9
54	NGAI	AJERIJERI	28-Apr-59	88 5	Handpump	26	89	63	Grey rock	3.3	6 1
55	NGAI	NGAI	20-Feb-63	160 4	Handpump	24	160	138	Grey rock	0 4	7 0
56	NGAI	NGAI TDC	23-Mar-62	64 66	Handpump	56	65	9	Dark Grey Rock	4 4	6 4
	Average for county			**93.0**			**93.0**	**54.1**		**2.3**	**7 9**
57	OTWAL		29-Dec-58	108 8	Handpump	8	109	101	Grey rock	0 8	14 6
58	OTWAL	ACOKARA	16-Aug-66	95 16	Handpump	60	95	35	White Black Rock	4 7	15 0
59	OTWAL	AYAMOKUTA	18-Nov-58	113 16	Handpump	14	113	99	Grey rock	5 4	26 2
60	OTWAL	OKENG	24-Oct-58	92.6	Handpump	33	93	59	Grey soft rock	3 4	25 8
61	OTWAL	OTWAL	04-Oct-58	152.5	Handpump	21	153	132	Grey Rock	0 8	9 5
	Average for county			**112.4**				**85.2**		**3.0**	**18.2**
	Average for district			**87 3**				**35.7**		**3.0**	**18.7**
	Median			**84.3**				**26 0**		**2.8**	**12.4**
	Mode			**152.5**				**9 2**		**1 0**	**9.2**
	Max			**183.0**				**166.5**		**8.2**	**109.8**
	Min			**25.3**				**-0.3**		**0.0**	**5 8**
	Standard deviation			**33.1**				**36.0**		**2.0**	**14.3**

Appendix 12

Technical Solutions for Water Supply

APPENDIX 12

12 TECHNICAL SOLUTIONS FOR WATER SUPPLY

12.1 Introduction

Technical solutions for safe rural water supply include:

- Spring protection
- Shallow dug wells
- Deep wells (boreholes)

Some principle features of these sources are now described.

Protected Springs

- Simplest way of improving quality of water
- Requires very low skills
- Is done using locally a variable materials eg sand, stones, cement and clay
- Very little maintenance; routine maintenance mainly involves cleaning the drainage channel while periodic maintenance will involve repairs to the masonry wall and the stone pitching
- Once surface water is kept out, springs provide good quality water. Access of surface water leads to contamination.

Shallow Dug Wells

- Can be dug by hand, /hand augering or motor drilled
- Hand digging and hand augering requires low skills but motor drilling requires skilled labour
- Auger and drilling rigs have to be imported
- Hand pump is required and is imported. The U2 and U3 pups are utilised. Precast/concrete rings are heavy and require increased labour for handling
- Due to shallow depth, the wells can be easily contaminated.

Deep Wells

- Require drilling rig
- Requires skilled labour to drill and supervise the drilling
- The drilling rigs have to be imported. Hand pumps, casings, screens, riser pipes and rods have to be imported
- Routine maintenance can be carried out by semiskilled labour, say village pump mechanic, but periodic maintenance requires a rig and skilled manpower.

Hand Pumps

The life span of these hand pumps is summarised as follows:

1. Superstructure

- Industrial atmosphere - 18 years
- Urban non-industrial atmosphere - 67 years
- Rural atmosphere - 125 years

2. Rubber Parts - 0.5 to 1 years
3. Galvanised Iron parts - 3 to 4 years
4. Stainless Steel parts - 20 years
5. Electro-galvanised parts - 5 years

The diameter of pipes used vary from 1¼ inch for U2 pumps to 2½ inch for U3 pumps.

Maintenance of U2 and U3 Pumps

U2 Pumps: All pipes, rods and cylinder have to be pulled out during maintenance of the pump, because of a reducer on the cylinder (cylinder cap). This may lead to the damage of the pipes.

U3 Pumps: Only rods and plunger assembly have to be pulled out, without having to pull out the cylinder body.

The galvanised steel pipes and rods have been found to rust rather fast, increasing the maintenance requirements. DWD through the RUWASA project is reviewing these pumps in an effort to improve on the various components. RUWASA is currently using stainless pipes and rods and are considering using PVC rising mains.

12.2 Tendering Procedures at District Level

12.2.1 Introduction

As part of the decentralisation process, functions that were for the Central Tender Board were entrusted to District Tender Boards, thus replacing the Area Tender Boards in Districts (Local Governments (Resistance Council Statute 1993) Financial regulations, Local Government Act, 1997).

The number of Tender Boards serving the Uganda Government rose to four.

(i) Central Tender Board

(ii) Military Tender Board

(iii) Police Tender Board

(iv) District/Urban Tender Board

Purpose/Object of Government Tender Board

(i) Sales of stores or equipment

(ii) Award of tenders for procurement of goods and service

The Local Government Act Section 92, 1997

(i) Establishes District Tender Boards composed of seven members to service all lower councils including administrative units in districts of Uganda.

(ii) Grants Urban Councils the option of establishing an Urban Tender Board or utilising a District Tender Board.

(iii) Term of office is 3 years with eligibility for re-appointment only once.

(iv) The Act provides grounds for removal of a member from any District Tender Board.

12.2.2 Tendering

Generally in the tendering process bids are invited, evaluated and subsequently awarded. This process starts with departments or sections analysing their needs and specifications for goods, presenting the tender proposals to the Boards, reviewing and then inviting bids by advertising or other methods, receiving and opening bids, and awarding the best bid or the lowest evaluated bid.

It may take the following stages:

(i) Identification of needs

(ii) Specification of needs

(iii) Documentation of bidding documents

(iv) Invitation of bids/advertising

(v) Evaluation of bids

(vi) Award of contracts

Contract signing and performance monitoring is carried out by the implementation agency, which in this case is the District Administration.

12.2.3 Tender Board Secretariat

The Chief Administrative Office (CAO) designates one of the public officers in the District to be Secretary to the Board. The Secretary ensures that all decisions of the Board and the activities are co-ordinated and implemented as best as possible. He has the following responsibilities:

- To advise on tender procedure
- Provide a direct linkage between the board and user departments
- Facilitate members of the board
- Maintain a list of proved supplies/contractors
- Responsible to the Chairman for all tender matters

- Receives and vets tender proposals
- Advises on specifications, preparation of tender documents
- Invites tenders, open them
- Participates in tender evaluation
- Prepares agenda for board's meeting
- Attends all board's meetings
- Takes down minutes of the meetings
- Communicates board's decision to heads

12.2.4 Effectiveness and Constraints

Requirements

In view of the heavy responsibilities carried out by the Local Government Tender Boards, there is need to put in place strong Local Government Tender Boards of high calibre, bearing in mind that the Boards handle all tenders for the entire district.

In order to ensure consistency and uniformity, the Ministry of Local Government has issued the following Guidelines to the District Councils to help them select and appoint members of the Local Government Tender Boards.

1. A person should qualify to be a member of the Local Government Tender Board if he/she is a Ugandan citizen.
2. Be a distinguished citizen of proven integrity and high moral character.
3. Should be mature, not below the age of 30 years and not above 65 years of age.
4. Should have a least an 'O' level Certificate or its equivalent. He/She should be able to read, understand and write the official language (English) so as to effectively participate in the proceedings and deliberation of the Local Government Tender Board.
5. Should be a resident of the district.
6. Should have experience of not less than 5 years as a professional, civil servant, entrepreneur, or any other activity that is beneficial to the community.
7. Should have independent sources of income and should be involved in a gainful employment or enterprise as a source of income.
8. Should have a track record of honesty and reliability.
9. Should have tax clearance from a relevant authority (not necessarily from URA). The Subcounty Chief can give such clearance with regard to payments of local taxes.

Once these guidelines are followed by the District Councils, Tender Boards should have very effective membership.

Constraints

The following problems and challenges often prevent the effective performance of the District Tender Boards:

1. Personal interests of members of the Board.

2. Lobbying and or conversing with promise of inducements, kick backs or bribes.

3. Influence of politicians.

4. Differences of opinions during evaluation of bids by interested parties. Member of the board may have individual but conflicting interests.

5. Technical Officers not being honest in the technical evaluation of bids.

Malpractices have adverse effect on the tendering process as follows:

1. Low or poor services or goods are procured as the best offer is not taken.

2. May be expensive to the administration.

3. May lead to legal disputes.

4. Can cause loss of confidence in the District's Leadership

5. Can cause loss of credibility of the Tender Board.

12.3 Cost Estimates

12.3.1 Unit Rates

The unit rates have been estimated on the basis that:

1. Drilling Contractors will carry out borehole construction; spring protection and dug well construction will be small local Contractors.

2. The unit prices of labour and materials were determined based on the economic conditions and market prices in Uganda and more specifically in the project district as of August 1999.

3. The exchange rate for the United States Dollar, Pound Sterling and Uganda shilling used in US$ 1 = £0.649 =Ush 1450.

4. Contractor's overhead and profit (35%) are included.

Materials

Materials to be imported include handpumps, riser pipes, pump rods, UPVC pipe casings and screens. The unit prices have been obtained from importers of these items in Kampala and include transport cost to the project areas. Cement, stone aggregate, sand, clay and precast concrete rings will be procured locally within Uganda and the project areas. Unit costs of these materials is given in Table 12.1.

12.3.2 Borehole Drilling Costs

Labour

The unit price for labour was estimated on the basis of average daily wage of construction workers in the country. The average daily wages for different labour groups are also indicated in Table 12.1.

Equipment

Drilling of boreholes in the country is currently being carried out mainly by private Contractors. Several local and international drilling companies have established the country over the past two years following the privatisation of the drilling operations by the Directorate of Water Development (DWD) through the WES and RUWASA Projects. A list of Contractors currently operating is given in Table 12.2. Many of these Contractors have enough capability for execution of the drilling exercises and hold minimum level of equipment.

Borehole Siting and Supervision

The unit rates used for the siting and supervision of borehole construction have been derived from comparison of standard rates used by DWD and those obtained by RUWASA through their recent privatisation of site selection and drilling supervision. These are indicated in Table 12.3.

The unit rates used for borehole construction have been derived from comparison of rates quoted by the private Contractors for various works in the project districts and other areas in Uganda as well as the rates negotiated between these private Contractors and DWD/RUWASA. With the increase in the number of private drilling Contractors due to current works by WES, RUWASA, and DWD, genuine competitive bidding is starting to take place. Rates for various borehole construction items are compared in Tables 12.4 and 12.5.

Work Quantities

Quantities have been estimated on the basis of the basic designs for boreholes, dug wells and protected springs as detailed in Figures 12.1 to 12.4.

Cost for Boreholes, Dug Wells and Spring Protection

Costs for construction of boreholes, dug wells and spring protection have been arrived at as a product of the unit rates for the work items and the work quantities. A physical price contingency of 10% has been included and a 17% VAT.

Detailed costs for each component are given in Tables 12.4 to 12.12.

12.4 Experience from RUWASA

12.4.1 Source Selection Policy

RUWASA's water source implementation strategy follows this sequence of identification/selection:

1. Spring protection areas; if not available, then
2. Boreholes to be rehabilitated; then
3. Shallow aquifers; then
4. Deep aquifers

This is to enable choosing the cheapest type of technology.

12.4.2 Spring Protection

Spring protection begins with source identification in the sub counties during the dry season. Location of all viable sources is ascertained and the flows measured by the use of a V-notched weir. The minimum dry weather flow should be 6 litres per minute (0.36 m^3/hr).

The project has shortlisted local district Contractors and these are invited to tender for the construction of springs.

The project management prepared standard spring designs, specifications and Bills of Quantities and these are used. Quotations are invited for three sizes of springs; small, medium and large.

The District Water Officer carries out the evaluation to tender assisted by staff of the District Tender Board and an evaluation report is submitted to the District Tender Board, which awards the contract.

The District Water Officer supervises the Contractor's works and liases with the local mobiliser to ensure good community participation. Community participation is in the form of providing labour.

12.4.3 Borehole to be Rehabilitated

Initially RUWASA considered a borehole qualifying for rehabilitation when it was over 15 years old. This has now been abandoned and the criteria currently used is going for a non-working borehole. It is urged that this is so because if the rehabilitation process is not successful, the project is not obliged to provide a new borehole. However, attempting to rehabilitate a working borehole means that if the process fails the project has to provide a new borehole to the community since they will have damaged the existing borehole.

The process is as follows:

- Blow up the borehole and clean as far as possible.
- Re-line the borehole with 4" uPVC casing inside the existing 6" steel casing. (Most of the existing old boreholes were lined with steel casings, which are now badly corroded).
- Pack up the annulus between the existing and new casing with gravel.
- Test pump
- Test water quality
- Provide and install new handpump
- Repair or construct new apron and soakaway.

Figure 1 shows details of borehole rehabilitation while Table 21 gives the cost of rehabilitation.

12.4.4 Dug Wells

RUWASA has stopped construction of hand dug wells citing the following reasons:

- The success rate was quite low.
- The process is very labour intensive.
- The water was always of low quality.

- Community resistance to dug wells.

The project is now instead providing shallow drilled wells.

12.4.5 Deep Boreholes

RUWASA Project Office (PO) manages drilling of the deep boreholes with little involvement by the district staff. Private Contractors carry out the drilling of the boreholes. Privatisation of drilling started in 1997 with RUWASA Phase 2. Initially, due to the limited capacity of the drilling companies in the country, it was difficulty to carry out genuine competitive bidding. Furthermore, tendering through the Central Tender Board was quite a time consuming process so rather than tendering in each case, the PO with the consent of the Central Tender Board introduced a system of standard rates as a basis for negotiating drilling contracts.

More drilling companies have now established in the country and the PO has started competitive bidding through the District Tender Board. The PO assists the districts with Tender Documentation and evaluation.

12.4.6 Selection of Drilling Sites

Currently RUWASA has a group of hydrogeologists who carries out the hydrogeological investigations. The project prepared a socio-technical manual for site selection, which is followed and is reported to be working well. It has helped to reduce conflict between community preferences and hydrogeological realities. RUWASA is in the process of privatising the site selection and drilling supervision and is currently engaging two consultancy firms; Carl Bro. International and Water Environment and Geo Services.

12.4.7 Minimum Yield of Boreholes

In accordance with national standards, hand pumps are only installed if boreholes yield a minimum of 700 litre/hr and under special consideration 500 litre/hr. This can lead to considerable community dissatisfaction and loss of investment.

12.4.8 Hydro-fracturing of Boreholes

Hydro-fracturing can improve the yield from fractured bedrock by opening the existing fractures and/or create new by injection water under high pressure into the borehole. RUWASA is applying hydro fracturing on low yield boreholes and the exercise is reported to be quite successful. The drilling Contractors do not have hydro fracturing equipment so the PO carries out the exercise using own equipment and crew.

12.4.9 Treatment of Dry Boreholes

In ease of a dry borehole, the responsible hydrogeologist goes back and investigates alternative sites. If the hydrogeologist finds a promising site acceptable to the community, then another drilling attempt is made.

12.4.10 Platforms and Handpumps

Construction of platforms and installation of handpumps is managed by the district using small local contractors and trained handpump mechanics.

DWD has standardised handpumps used in the country to the U2 and U3 pumps, which are local names for the India Mark II and III handpumps. The underground components of these pump, ie the galvanised riser pipes and pump connection rods, corrode rather fast. RUWASA is

currently experimenting with the use of stainless steel riser pipes and connection rods, the performance of which is yet to be evaluated. The use of uPVC riser pipes is yet to be tried.

12.4.11 Operation and Maintenance

The main elements of the operation and maintenance systems are:

(i) Water user committees responsible for the management of the water points including collection of funds for its maintenance.
(ii) Caretaker responsible for day to day function of the water points.
(iii) Trained private handpump mechanics responsible for preventive maintenance and repair.
(iv) Spare parts dealer in the district and country.
(v) Major repairs to be carried out with some kind of involvement of district administration.
(vi) Monitoring and back-up support by district and sub-county staff.

Table 12.1 Prices of Labour and Materials

(a) Labour Rates for Uganda Construction Indusry (USh)

Post	Cost rates		
	National average daily rate(USh)*	4 Districts area** Daily (USh)	Hourly (USh)***
Supervisor	n/a	15,000	1,875
Site foreman	13,300	10,000	1,250
Mechanic	10,150	10,000	1,250
Driver	8,700	7,000	875
Mason	8,700	6,000	750
Skilled labour	6,525	5,000	625
Skilled labour dug wells, springs)	n/a	10,000	1,250
Semi-skilled labour	5,800	-	-
Unskilled labour	n/a	2,500	313
Unskilled labour (community contribution)	n/a	1,000	125

(b) Prices of materials (USh)

Material	Unit	Retail price (USh)	Contrators rate for supply
Contractors overhead and profit	-	-	*35%*
Diesel	litre	950	950
Cement	bag	14,500	14,500
Fine sand	tonne	11,000	11,000
Coarse sand	tonne	12,500	12,500
Aggregate up to 20 mm	tonne	27,390	37,000
Coarse aggregate	tonne	20,000	20,000
Hardcore	tonne	10,000	10,000
Clay	tonne	25,000	25,000
12 mm steel bars	kg	650	900
Precast concrete rings 1300 mm dia, 0.6 m long	Nr	40,000	40,000
5" dia. uPVC well casing pipes	m	22,875	22,875
5" dia. uPVC well screen	m	28,739	28,739
4" dia. uPVC well casing pipes	m	20,000	20,000
4" dia. uPVC well screen	m	25,000	25,000
Hand pump head assembly	Nr	305,693	310,000
Cylinder for U3 pump*	Nr	91,000	90,000
Hand pump assembly U3	Nr	-	**400,000**
Riser pipes for U3 pump (2 1/2")	m	15,842	21,400
Cylinder for U2 pump	Nr	60,040	60,000
Hand pump assembly U2	Nr	-	**370,000**
Riser pipes for U2 pump (1 1/4")	m	8,097	11,000

Note: all hand pumps are procured centrally and supplied to the contractors

** Consultants' estimate

*** per 8 hour day

Source: Consultants' interpretation of various sources

Table 12.2 Drilling and Test Pumping Contractors

Name of the Firm	Address	Telephone	Number of Rigs
Nile Drilling Co. (U) Ltd	Plot 497 off Chorley Crescent Luzira P.O. Box 40010 Kampala	223772	Leasing from DWD
Drillco Consult	Plot 1B Mukwaya Rd Iganga P.O. Box 660 Iganga-Uganda	0495 20365	Leasing from DWD
Drilling Spares and Service	P.O. Box 40859 Mombassa-Kenya	823736/823259	1
Draco (U) Ltd	P.O. Box 21324 Kampala	221426 Fax 235540	1
Drillcon Ltd	Plot 2 Nyondo Close Bugolobi Industrial Area P.O. Box 620 Kampala	Tel/Fax 259966	5
Waterwell Development Services Ltd.	P.O. Box 10990 Kampala		1
M/s Mowlem Construction Company (East Africa) Ltd.	P.O. Box 22788 Kampala	02-440805 Fax: 02-791244	Can bring in
Turn-O-Metal Engineers Ltd.	P.O. Box 74074 Nairobi-Kenya	554248/555292 Fax: 544933	1
J.K. International Agencies	P.O. Box 217 Mbale-Uganda	045 33771 Fax: 041 254576	None
M/s China Geo-Engineering (U) Ltd.	P.O. Box 8858 Kampala		3
M/s Mugoma Drilling Company Ltd.	P.O. Box 24422 Kampala	077 507697	Leasing from DWD
STANLY Mining Services (U) Ltd.	Armandida House Rd Plot 13B Kampala Rd P.O. Box 10042 Kampala	234347/256230 Fax: 256230 Mobile:07720193	1

DWD has 19 rigs and has got Central Tender Board authority to sell of 14 rigs. Will retain 5 rigs.

Table 12.3 Borehole Siting and Supervision Rates

Organisation	Siting Rate	Supervision Rate
DWD standard rate	Ush.1,000,000	Ush. 1,000,000
RUWASA	Ush.600,000	Ush. 800,000
Private Consultants	US$ 900 to 1500 for siting and supervision depending on number of boreholes	

Table 12.4 Deep Borehole Costs Estimate - Nominal 75 m Depth

Item	Description	Unit	Qty	Rate (USh)	Amounts (USh)
1 0	**PRELIMINARIES AND GENERAL**				
1 1	Performance bond	Sum	}		
1 2	Insurance of works, construction plant, accidents	Sum	}		
1 3	Mobilisation of personnel, equipment and materials	Sum	1	600,000	600,000
1 4	Provision of all temporary facilities for use	Sum	}		
1 5	Preparation and submission of Completion Report	Sum	}		
1.6	Hydrological siting of bore holes	No.	1	600,000	600,000
1 7	Drilling and Intallation Supervision	No	1	900,000	1,000,000
	Sub total				**2,200,000**
2 0	**BORE HOLE CONSTRUCTION**				
2.1	Setting up and dismantling at every site	No.	1	526,200	526,200
2 2	Shifting between sites	km	10	17,600	176,000
2 3	Drilling through soft formation @ 10(5/8)"	m	35	84,000	2,940,000
2 4	Drilling through rock formation @ 4(1/2)"	m	40	76,000	3,040,000
2 5	Sampling and storing of drill cuttings at 3m	No	30	4,000	120,000
2 6	Supply of 5" ND(125 mm) uPVC Casing	m	35	30,880	1,080,800
2 7	Supply of 5" ND(125 mm) uPVC Screen	m	10	38,800	388,000
2 8	Installation of 5" ND uPVC Casing	m	35	22,200	777,000
2 9	Installation of 5" ND uPVC Screen	m	10	22,200	222,000
2 10	Supply and installation of cement grouting	No	1	175,000	175,000
2.11	Supply and installation of gravel pack	No	10	18,000	180,000
2 12	Supply and installation of inert backfill	Bag	1	47,000	47,000
2 13	Well development	Hr	12	110,000	1,320,000
2 14	Clearing Site	No	1	117,000	117,000
2.15	Standing time	Hr	5	117,000	585,000
	Sub total				**11,694,000**
3 0	**PUMP TESTING**				
3 1	Movement between sites	km	20	2,400	48,000
3 2	Test pump installation and removal	No	1	118,000	118,000
3 3	Pumping time	Hr	6	47,000	282,000
3 4	Recovery time	Hr	2	29,000	58,000
	Sub total				**506,000**
4 0	**BORE HOLE COMPLETION**				
4 1	Casting a sanitary seal	No	1	70,000	70,000
4 2	Water sampling	No	1	8,000	8,000
4 3	Construction of wall head, apron and soak away	No	1	450,000	450,000
	Sub total				**528,000**
5.0	**PUMP INSTALLATION**				
5.1	Supply U3 hand pump head works & cylinder	No	1	400,000	400,000
5.2	Supply riser pipes, pump rods etc.	M	36	21,400	770,400
5 4	Installation of hand pump head works.	No.	1	19,000	20,000
5 5	Installation of riser pipes, pump rods etc.	m	36	2,450	88,200
5.6	Installation of hand pump	No	1	120,000	100,000
	Sub total				**1,378,600**
					Possible savings?
	Summary Borehole 75 m Deep				**20%**
	Preliminaries & General	2,200,000			1,760,000

Table 12.5 'Medium' Borehole Costs Estimate - Nominal 45 m Depth

Item	Description	Unit	Qty	Rate (USh)	Amounts (USh)
1 0	**PRELIMINARIES AND GENERAL**				
1.1	Performance bond	Sum	)		
1.2	Insurance of works, construction plant, accidents	Sum	)		
1.3	Mobilisation of personnel, equipment and materials	Sum	1	600,000	600,000
1.4	Provision of all temporary facilities for use	Sum	)		
1.5	Preparation and submission of Completion Report	Sum	)		
1 6	Hydrological siting of bore holes	No.	1	600,000	600,000
1.7	Drilling and Intallation Supervision	No.	1	900,000	1,000,000
	Sub total				**2,200,000**
2.0	**BORE HOLE CONSTRUCTION**				
2.1	Setting up and dismantling at every site	No.	1	250,000	250,000
2.2	Shifting between sites	km	10	14,000	140,000
2.3	Drilling through soft formation @ 10(5/8)"	m	35	40,000	1,400,000
2.4	Drilling through rock formation @ 4(1/2)"	m	10	30,000	300,000
2 5	Sampling and storing of drill cuttings at 3m	No.	20	4,000	80,000
2 6	Supply of 4" ND(125 mm) uPVC Casing	m	35	26,000	910,000
2 7	Supply of 4" ND(125 mm) uPVC Screen	m	10	34,000	340,000
2 8	Installation of 4" ND uPVC Casing	m	35	4,000	140,000
2.9	Installation of 4" ND uPVC Screen	m	10	6,000	60,000
2.10	Supply and installation of cement grouting	No.	1	150,000	150,000
2 11	Supply and installation of gravel pack	No	10	15,000	150,000
2 12	Supply and installation of inert backfill	Bag	1	45,000	45,000
2.13	Well development	Hr	12	110,000	1,320,000
2 14	Clearing Site	No.	1	100,000	100,000
2 15	Standing time	Hr	5	117,000	585,000
	Sub total				**5,970,000**
3.0	**PUMP TESTING**				
3.1	Movement between sites	km	20	2,000	40,000
3 2	Test pump installation and removal	No.	1	100,000	100,000
3.3	Pumping time	Hr	6	45,000	270,000
3 4	Recovery time	Hr	2	30,000	60,000
	Sub total				**470,000**
4.0	**BORE HOLE COMPLETION**				
4.1	Casting a sanitary seal	No.	1	70,000	70,000
4.2	Water sampling	No.	1	8,000	8,000
4.3	Construction of wall head, apron and soak away	No.	1	450,000	450,000
	Sub total				**528,000**
5 0	**PUMP INSTALLATION**				
5.1	Supply U3 hand pump head works & cylinder.	No.	1	400,000	400,000
5.2	Supply riser pipes, pump rods etc.	M	36	21,400	770,400
5 4	Installation of hand pump head works.	No.	1	19,000	20,000
5 5	Installation of riser pipes, pump rods etc.	m	36	2,450	88,200
5.6	Installation of hand pump	No.	1	120,000	100,000
	Sub total				**1,378,600**
					Possible savings?
	Summary Borehole 45 m Deep				**20%**
	Prelimmaries & General	2,200,000			1,760,000

Table 12.6 Deep Borehole Rehabilitation Costs Estimate

Item	Description	Unit	Qty	Rate (USh)	Amounts (USh)
10	CONTRACTORS' WORK	}			
	Comprising:	}			
	Airlift clean borehole	}			
	Install new 4" uPVC casing	LS	1	4,000,000	4,000,000
	Cement or clay seal	}			
	Test pumping	}			
	Water sampling	}			
20	Supply 4" dia uPVC casing	m	25	20,000	500,000
3	Construct well head, apron and soakway	No.	1	450,000	450,000
4	PUMP INSTALLATION				
41	Supply U3 handpump headworks and cylinder	Nr	1	400,000	400,000
42	Supply 2 1/2" riser pipes and pump rods	m	40	21,400	856,000
43	Install riser pipes and pump rods	Nr	1	30,880	30,880
44	Install hand pump cylinder and headworks	Nr	1	19,000	19,000
	Sub Total				4,950,000
	Add 10% Contingencies	10%		0	495,000
	Sub total			0	5,445,000
	Add 17% VAT	17%		0	925,650
	TOTAL -"full rehab"				**6,370,650**
	Deduct reline cost				-3,217,500
	Sub-total (Clean + apron + handpump)				**3,153,150**
	Deduct apron cost (air lift clean + pump only)				-494,999
	Sub-total (Clean borehole only)				**2,658,151**

Source: RUWASA and Consultants

Table 12.7 Shallow Dug Well Costs Estimate

Cost Estimate - Shallow Dug Well - Maximum Depth 20 m					
Item	Description	Unit	Qty	Rate	Amount
1	Excavation of 1500 mm diameter hole - 20 m deep	m3	36	8,000	288,000
2.1	Precast concrete rings 1300 mm diameter (in 600 mm lengths)	No	20	22,875	457,500
2.2	Well head slab	m3	0 2	290,000	58,000
2.3	Concrete apron	m3	0.5	290,000	145,000
2.4	Access hatch	No	1	60,000	60,000
2.5	Reinforcement steel	kg	10	40,000	400,000
3.1	Gravel pack	m3	2.5	45,000	112,500
3.2	Concrete seal	m3	0.5	290,000	145,000
4.1	Well Development	No	1	100,000	100,000
4.2	Water Quality	No	1	70,000	70,000
4.3	Disinfection	No	1	60,000	60,000
5.1	Hand pump - above ground parts	No	1	400,000	400,000
5.2	2 1/2" diameter pump riser pipe and connecting rod (in 3 m lengths)	No	45	21,400	963,000
6.1	Supervisor	hr.	16	1,875	30,000
6.2	Engineer	hr.	8	8,000	64,000
6.3	Mason	hr.	32	750	24,000
6.4	Unskilled Labourers	hr.	128	125	16,000
	Sub Total				**3,393,000**
	Add 15% contingencies	15%			508,950

Table 12.8 'Average Size' Spring Protection Works - Costs Estimate

Item	PARTICULARS	UNIT	UNIT COST	UANTIT	TOTAL COST (UG SHS
	MATERIALS				
1	Cement	Bags	14,500	10	145,000
2	Concrete blocks	Pcs	1,200	85	102,000
3	Coarse Sand	Tonne	37,000	4	148,000
4	Plaster sand	Tonne	12,500	2	25,000
5	Course aggregates	Tonne	10,000	3	30,000
6	Clay	Tonne	900	6	5,400
7	Boulders (hard core)	Tonne	10,000	12	120,000
8	Pipes (PVC)	Metre	2,000	5	10,000
9	Pipes (GI)	Metre	10,000	0.6	6,000
	Sub Total 1				**591,400**
	Labour				
10	Mason	Man-day	6,000	13	78,000
11	Community labour (unskilled)	Man-day	1,000	80	80,000
	Sub Total 2				**158,000**
12	Transport	30% Materials + Labour	-	-	263,400
13	Supervision	15% Materials + Labour	-	-	131,700

Summary	Materials	591,400
	Labour	158,000
	Sub Total A	**749,400**
15%	Transport 30% of A	112,410
10%	Subervision 15% of A	74,940
	Sub Total B	**936,750**
10%	Add 10% contigency	93,675
	Sub-total	**1,030,425**
17%	Add VAT	175,172
	Total (USh)	**1,205,597**

Source: Consultants' analysis of data from WES and other sources

Appendix 13

Not Used

Appendix 14

District Revenues and Expenditures

Katakwi District Revenue and Expenditure estimates, 1997/98 - 1999/2000

Description	Actual 1997/98	%age	Actual 1998/99	%age	Projected 1999/2000	%age	Projected 2000/20001	%age
Total Sources	**2,599,120,941**	**100**	**5,373,583,490**	**100**	**5,803,470,169**	**100**	**6,267,747,782**	**100**
Local Revenue	157,558,700	**6**	327,453,716	**6**	353,650,013	**6**	381,942,014	**6**
Government Transfers (Unconditional)	2,037,833,705	**78**	2,141,354,400	**40**	2,312,662,752	**40**	2,497,675,772	**40**
Government Transfers (Conditional)	244,939,722	**9**	816,065,084	**15**	881,350,291	**15**	951,858,314	**15**
Donor and NGO's funds	158,788,814	**6**	2,088,710,290	**39**	2,255,807,113	**39**	2,436,271,682	**39**
Expenditure estimates								
Total Outlays	**2,599,111,306**	**100**	**5,373,583,490**	**100**	**5,803,470,169**	**100**	**6,267,747,782**	**100**
Management Services	51,138,015	**2**	104,669,200	**2**	113,042,736	**2**	122,086,155	**2**
Finance and Planning	2,058,506,668	**79**	1,998,537,840	**37**	2,158,420,867	**37**	2,331,094,537	**37**
Production and Marketing	21,440,832	**1**	234,518,000	**4**	253,279,440	**4**	273,541,795	**4**
Technical Services	98,815,712	**4**	639,340,800	**12**	690,488,064	**12**	745,727,109	**12**
Education and Sports	248,368,250	**10**	856,191,000	**16**	924,686,280	**16**	998,661,182	**16**
Health and Environment	48,404,103	**2**	1,386,243,150	**26**	1,497,142,602	**26**	1,616,914,010	**26**
Gender and Community Development	9,284,400	**0**	51,528,500	**1**	55,650,780	**1**	60,102,842	**1**
Council, Committees, Comm. & Boards	63,153,326	**2**	102,555,000	**2**	110,759,400	**2**	119,620,152	**2**

Source Katakwi District Local Government, District Profile

District Revenue and Expenditure estimates for Apac District

Revenues	Budgeted 1997/98	%age	Actual 1997/98	%age col5/col4	Budgeted 1998/99	%age	Actual 1998/99	%age col7/col5	Projected 1999/2000
Local Revenue	1,065,800,027	23	557,018,900	52	512,773,131	5	360,952,197	70	415,915,715
Government Transfers (Unconditional)	1,274,939,000	28	1,414,554,310	111	1,611,340,000	17	1,477,062,101	92	1,654,051,000
Government Transfers (Conditional)	1,056,670,000	23	931,916,641	88	6,185,988,000	66	6,016,147,020	97	8,081,249,000
Donor and NGO's funds	1,138,617,000	25	226,762,042	20	1,113,392,246	12	197,939,224	18	588,878,107
Total Inflows	**4,536,026,027**	**100**	**3,130,251,893**	69	**9,423,493,377**	100	**8,052,100,542**	85	**10,740,093,822**
Outflows									
Management and Support Services	464,325,039	10			553,090,708	23	264,450,003	23	698,025,864
Finance and Planning	202,185,514	4			173,248,343	7	190,537,129	16	205,266,106
Production and Marketing	80,534,071	2			350,385,719	15	197,422,233	17	388,378,928
Technical Services and Works	154,568,847	3			232,527,487	10	113,938,005	10	469,325,744
Education and Sports	3,362,569,572	73			175,219,187	7	77,232,065	7	6,870,264,607
Health and Environment	200,434,469	4			638,077,642	27	155,754,135	13	1,250,060,775
Gender and Community Services	85,567,451	2			105,486,600	4	31,667,768	3	73,655,334
Council	53,949,019	1			127,618,676	5	144,264,392	12	62,387,357
Total Outflows	4,604,133,982	100	0		2,355,654,362	100	1,175,265,730	100	10,017,364,715

Source Chief Finance Officer, Apac District Local Government, August 1999

SUMMARY AND ANALYSIS OF REVENUE PERFOMANCE FOR LIRA DISTRICT LOCAL GOVERNMENT, 1994/95 - 1998/99.

	ESTIMATES							ACTUALS							
F/Y	Donor and NGO funds	%age	Govt. Transfers	%age	Local Revenues	%age	Totals	Donor and NGO funds	%age	Govt. Transfers	%age	Local Revenues	%age	Total	%age
1994/95	207,660,753	4	3,931,344,923	73	1,229,398,956	23	5,368,404,632	99,993,604	3	3,295,943,015	86	449,971,217	12	3,845,907,835	72
1995/96	113,477,795	2	5,568,643,842	83	998,124,627	15	6,680,246,264	614,780,293	12	4,127,078,063	81	345,154,132	7	5,087,012,488	76
1996/97	3,874,782,009	31	6,836,257,300	55	1,672,019,981	14	12,383,059,290	829,733,394	17	3,693,801,576	77	259,318,774	5	4,782,853,744	39
1997/98	5,049,019,967	36	7,309,736,970	53	1,500,158,967	11	13,858,915,904	2,979,516,816	35	5,256,756,650	61	388,286,085	5	8,624,559,551	62
1998/99	4,887,202,000	32	9,483,380,615	62	885,508,535	6	15,256,091,150	3,089,519,242	23	9,264,618,918	68	1,320,427,886	10	13,674,566,046	90
1999/20	6,503,615,700	34	11,455,940,887	59	1,377,423,439	7	19,336,980,026								

Source Finance and Planning Department, Lira District Local Government, August 1999

TABLE: ?? BUDGET EXPENDITURE PERFOMANCE CONTRACTS

CODE	PROGRAMME	Estimates 1996/97	Actual 1996/97	Estimates 1997/98	Actuals 1997/98	Estimates 1998/99	Actuals 1998/99
1	Management Services	8,046,590,246	4,483,226,570	9,829,904,176	2,776,943,381	1,396,324,564	3,092,973,241
2	Finance and Planning	241,704,700	93,752,839	181,707,141	79,118,824	751,702,133	150,652,454
3	Production and Marketing	73,145,036	6,436,500	139,021,711	11,440,950	1,209,844,326	543,765,404
4	Technical Services and Works	1,219,066,205	148,610,019	940,565,848	326,059,921	1,985,675,319	1,095,508,750
5	Education and Sports	914,114,437	144,134,950	666,077,650	4,542,311,447	7,208,616,236	7,215,666,542
6	Health and Environment	1,802,334,920	410,269,028	1,919,382,748	847,507,543	2,885,625,931	1,386,450,570
7	Gender and Community Services	8,103,746	3,842,550	59,943,034	1,550,543	226,429,164	55,097,000
8	Council, Commissory Committees and Boards	nil	nil	122,318,596	1,550,000	319,775,318	134,449,085
9	**Total**	12,305,059,290	5,290,272,456	13,736,602,308	8,584,932,609	15,664,217,673	13,540,113,961

Source Finance and Planning Department, Lira District Local Government, August 1999

Appendix 15

Detailed Financial and Economic Analysis

Appendix 15
Detailed Financial and Economic Analysis

Contents List

4 Districts Water, Hygiene and Sanitation Programme Component Activities

Schedule 1 Hygiene and Sanitation Component Activities and Costs

ACTIVITY		Project Year 1	2	3	4	5	6	
Category	Unit	2001	2002	2003	2004	2005	2006	Total
STAFF - work inputs								
Health Assistants (District)	Days	1430	2310	4070	5170	7480	7480	27 940
Health Assistants (DFID)	Days	0	3740	4620	5720	1100	1100	16,280
Distnct Health Inspector/Educator/Develop	Days	160	240	320	320	320	320	1 680
STAFF - Training days								
Health Assistants	Days	130	380	450	410	195	0	1,565
DHI & DHE (District)	Days	40	20	60	20	10	0	150
STAFF - REIMBURSABLE TRAINING EXPENSES								
Health Assistants (Sub-county)	Days	130	380	450	410	195	0	1,565
DHI & DHE (District)	Days	40	20	60	20	10	0	150
TRAINERS/CONSULTANTS - salary costs								
International consultants	Days	40	40	20	10	0	0	110
Local consultants/NGO facilitators	Days	80	120	140	80	20	0	440
CBO/Local facilitators	Days	40	120	160	160	160	160	800
TRAINERS - REIMBURSABLE EXPENSES								
International consultant subsistence and tra	Days	40	40	20	10	0	0	110
Local Consultant subsistence and travel	Days	80	120	140	80	20	0	440
CBO/Local facilitators subsistence and trav	Days	40	120	160	160	160	160	800
OTHER TRAINING COSTS								
Hire of venues, stationery, consumables etc	Lump sum	1	1	1	1	1	1	6
District Level Workshop	Item	2	2	2	2	2	2	12
Exchange visits	Item	4	4	4	4	2	2	20
MATERIALS DEVELOPMENT								
Assistance dev IEC materials	Lump Sum	1	1	1	1	1	1	6
Assistance production IEC materials	Lump sum	1	1	1	1	1	1	6
Assistance, dev hygiene promotion	Lump Sum	1	1	1	1	1	1	6
Assistance production hygiene promotion m	Lump Sum	1	1	1	1	1	1	6
TRANSPORT - DISTRICT								
Four wheel drive	Item	2	1	1	0	0	0	4
Running costs	km	60000	90000	120000	120000	120000	120000	630,000
SUB COUNTY								
Motor cycle	Item	23	32	14	5	0	0	74
Motor cycle running costs	km	46000	64000	28000	10000	0	0	148 000
Community Level Training Materials	Lump Sum	23	32	14	5	0	0	74
PARISH/VILLAGE								
Demonstration latrines (5 per pansh)	Item	250	550	805	425	230	0	2 260
Demonstration latrines (5 per pansh)	Item	250	550	805	425	230	0	2 260
Exchange visits (1 per pansh)	Visit	50	110	161	85	46	0	452
GoU								
Monitoring and Evaluation	Days	10	10	10	10	10	10	60
Advocacy Tiraining	Days	10	10	10	10	10	10	60

4 Districts Water, Hygiene and Sanitation Programme Component Costs

Schedule 1 Hygiene and Sanitation Component Activities and Costs

COSTS				Project Year 1	2	3	4	5	6		
Category	Unit	Unit Rate	Cost Contribution	2001	2002	2003	2004	2005	2006	Total (U Shs)	Total (£)
STAFF - work inputs											
Health Assistants (Distnct)	Ushs ('000)	5	Distnct	7,150	11 550	20 350	25,850	37,400	37 400	139,700	0
Health Assistants (DFID)	Ushs ('000)	5	DFID	0	18 700	23,100	28,600	5,500	5,500	81,400	0
District Health Inspector/Educator/Develop	Ushs ('000)	10	District	1 600	2 400	3 200	3,200	3 200	3 200	16 800	0
STAFF - Training days											
Health Assistants	Ushs ('000)	5	Distnct	650	1,900	2,250	2,050	975	0	7,825	0
DHI & DHE (District)	Ushs ('000)	10	District	400	200	600	200	100	0	1,500	0
STAFF - REIMBURSABLE TRAINING EXP	Ushs ('000)										
Health Assistants (Sub-county)	Ushs ('000)	15	District	1 950	5,700	6 750	6,150	2,925	0	23,475	0
DHI & DHE (District)	Ushs ('000)	15	District	600	300	900	300	150	0	2,250	0
TRAINERS/CONSULTANTS - salary costs	Ushs ('000)										
International consultants	£	400	District	16,000	16 000	8,000	4,000	0	0	0	44,000
Local consultants/NGO facilitators	Ushs ('000)	250	District	20,000	30 000	35,000	20 000	5 000	0	110,000	0
CBO/Local facilitators	Ushs ('000)	50	District	2,000	6 000	8,000	8,000	8,000	8,000	40,000	0
TRAINERS - REIMBURSABLE EXPENSES											
International consultant subsistence and tra	Ushs ('000)	100	DFID	4,000	4,000	2 000	1,000	0	0	11,000	0
Local Consultant subsistence and travel	Ushs ('000)	100	DFID	8,000	12 000	14,000	8,000	2,000	0	44,000	0
CBO/Local facilitators subsistence and trav	Ushs ('000)	30	DFID	1,200	3 600	4,800	4,800	4,800	4,800	24,000	0
OTHER TRAINING COSTS											
Hire of venues, stationery, consumables etc	Ushs ('000)	2000	DFID	2,000	2,000	2,000	2,000	2,000	2,000	12,000	0
District Level Workshop	Ushs ('000)	2000	DFID	4,000	4,000	4 000	4 000	4,000	4,000	24,000	0
Exchange visits	Ushs ('000)	2000	DFID	8,000	8,000	8 000	8,000	4 000	4,000	40,000	0
MATERIALS DEVELOPMENT											
Assistance dev IEC materials	Ushs ('000)	23800	DFID	23,800	23,800	23 800	23 800	23 800	23,800	142 800	0
Assistance production IEC materials	Ushs ('000)	11900	DFID	11,900	11,900	11,900	11,900	11,900	11,900	71,400	0
Assistance, dev hygiene promotion	Ushs ('000)	23800	DFID	23,800	23,800	23,800	23,800	23,800	23,800	142,800	0
Assistance production hygiene promotion m	Ushs ('000)	11900	DFID	11,900	11 900	11,900	11,900	11,900	11,900	71 400	0
TRANSPORT - DISTRICT											
Four wheel drive	Ushs ('000)	65000	DFID	130,000	65,000	65 000	0	0	0	260,000	0
Running costs	Ushs ('000)	0 65	DFID	39 000	58 500	78,000	78,000	78,000	78 000	409,500	0
SUB COUNTY											
Motor cycle	Ushs ('000)	3000	DFID	69,000	96,000	42,000	15 000	0	0	222,000	0
Motor cycle running costs	Ushs ('000)	0 1	DFID	4,600	6,400	2,800	1,000	0	0	14,800	0
Community Level Training - Materials	Ushs ('000)	250	DFID	5,750	8,000	3,500	1,250	0	0	18,500	0
PARISH/VILLAGE											
Demonstration latrines (5 per pansh)	Ushs ('000)	100	DFID	25,000	55 000	80,500	42,500	23,000	0	226 000	0
Demonstration latrines (5 per parish)	Ushs ('000)	30	DFID	7 500	16,500	24 150	12,750	6,900	0	67,800	0
Exchange visits (1 per parish)	Ushs ('000)	200	DFID	10 000	22,000	32,200	17 000	9 200	0	90 400	0
GoU											
Monitoring and Evaluation	Ushs ('000)	10	DFID	100	100	100	100	100	100	600	0
Advocacy Tiraining	Ushs ('000)	10	DFID	100	100	100	100	100	100	600	0

4 Districts Water, Hygiene and Sanitation Programme Component Activities

Schedule 1 Hygiene and Sanitation Component Activities and Costs

OTHER ACTIVITIES								
International travel	Round trip	2	1	1	1	1	1	7
Accommodation+ subsistence (Kampala hot	Night	8	4	4	4	4	4	28
Visas	Visit	2	1	1	1	1	1	7

4 Districts Water, Hygiene and Sanitation Programme Component Costs

Schedule 1 Hygiene and Sanitation Component Activities and Costs

OTHER ACTIVITIES												
International travel	£	1 500	DFID	3,000	1 500	1 500	1,500	1,500	1 500	0	10,500
Accommodation+ subsistence (Kampala hot	Ushs ('000)	170	DFID	1 360	680	680	680	680	680	4,760	0
Visas	£	100	DFID	200	100	100	100	100	100	0	700
TOTAL - Ushs	Ushs ('000)			425 360	510,030	535,380	381,930	289,430	219,180	########	0
TOTAL - £	£			19 200	17 600	9 600	5,600	1,600	1,600	0	55,200
Fixed Exchange Rate				2 380	2,380	2,380	2 380	2,380	2,380	2,380	
OVERALL TOTAL - Ushs	Ushs ('000)			471,056	551 918	558,228	375,258	273,238	222,988		2,452 686
OVERALL TOTAL - £	£			197 923	231,898	234 550	157,671	114,806	93,692		1,030,540

FINANCING PLAN

Cost Contribution		Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
DFID - local		391,010	451 980	458,330	298,180	211,680	170,580	1,979,760
DFID - Foreign		45,696	41,888	22,848	13,328	3 808	3,808	131,376
GoU		0	0	0	0	0	0	0
District		34 350	58,050	77,050	65,750	57,750	48,600	341,550
NGO/CBO		0	0	0	0	0	0	0
Private Sector		0	0	0	0	0	0	0
Community		0	0	0	0	0	0	0
	Total	471,056	551,918	558 228	375,258	273,238	222,988	2,452,686

Cost Contribution		Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
DFID - local		164 290	189 908	192 576	124,445	88 941	71 672	831 832
DFID - Foreign		19 200	17,600	9,600	5 600	1,600	1,600	55,200
GoU		0	0	0	0	0	0	0
District		14 433	24,391	32,374	27,626	24,265	20,420	143,508
NGO/CBO		0	0	0	0	0	0	0
Private Sector		0	0	0	0	0	0	0
Community		0	0	0	0	0	0	0
	Total	197,923	231,898	234,550	157,671	114,806	93,692	1,030,540

Disbursement Category	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
International staff & equipment foreign currency costs	45,696	41,888	22,848	13,328	3,808	3,808	131,376
Local staff and other local currency staff associated costs	49,110	97 230	121,830	109,030	70,930	59,780	507 910
Training and extension (excl staff costs)	85,400	85 400	85,400	85,400	81,400	81,400	504,400
Vehicles and equipment	248,350	233,900	191,300	95 250	78 000	78,000	924,800
Infrastructure developments	42,500	93,500	136 850	72,250	39,100	0	384,200
Infrastructure maintenance	0	0	0	0	0	0	0
Total	471 056	551,918	558,228	375,258	273,238	222,988	2,452,686

Disbursement Category	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
International staff & equipment foreign currency costs	19,200	17,600	9,600	5,600	1,600	1,600	55,200
Local staff and other local currency staff associated costs	20,834	40,853	51,189	45,811	29,803	25,118	213,408
Training and extension (excl staff costs)	35,882	35,882	35,882	35,882	34,202	34,202	211,933
Vehicles and equipment	104,349	98 277	80,378	40,021	32,773	32,773	388,571
Infrastructure developments	17 857	39,286	57,500	30 357	18,429	0	161,429
Infrastructure maintenance	0	0	0	0	0	0	0
Total	197,923	231,898	234,550	157,671	114,806	93,692	1,030,540

Rationale and Assumptions for Hygiene and Sanitation Budget

Staffing - work inputs

- ***District Staff***

It is assumed that the District Health Educator and Health Inspector will between them work 80 days per year on the programme . The division of this time will be agreed between the two personnel in each district. Their time on the programme is a cost to the district.

The DHE and DHI in each district will receive 10 days training at the start of the programme. Some of this training will be in conjunction with the District Water Officer to ensure common understanding and integration of approach.

The proposed phasing of the district staff inputs and training is outlined below:

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
DHI/DHE Katakwi	work training	80 days 20 days	80 days	80 days	80 days	80 days	80 days
DHI/DHE Apac	work training	80 days 20 days	80 days	80 days	80 days	80 days	80 days
DHI/DHE Lira	work training		80 days 20 days	80 days	80 days	80 days	80 days
DHI/DHE Kumi	work training			80 days 20 days	80 days	80 days	80 days

Each DHE/DHI working on the programme will be provided with a motorcycle to share which will assist them with sub-county and community visits.

- ***Sub-County Staff***

The Health Assistants are the key government staff who will have responsibility for implementing this programme. They provide the essential link between the district and the communities. It is proposed that they will be responsible for delivering the hygiene promotion message and creating demand for latrines in conjunction with LCII and LCI leaders and with assistance from NGOs and CBOs where they exist. They also have role to play in assisting the CDAs with the water component.

Unfortunately, many of the HAs are not in place at sub-county level, and some HAs are having to cover more than one sub-county at present. In order to ensure that the programme can be effectively managed and sustained at the lowest appropriate level and in order to build capacity within the local

government structure it is therefore proposed that DFID should underwrite some Health Assistant posts during the programme as detailed in the tables below:

Status of Health Assistant Posts in the four districts at September 1999:

	Health Assistant Posts	
	Established	Filled
Katakwi	14	5
Apac	20	12
Lira	24	24
Kumi	15	10

Proposed underwriting of Health Assistant Posts by DFID:

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Katakwi	nr HAs underwritten	0	9	9	9	0	0
Apac	nr HAs underwritten	0	8	8 plus 4	8 plus 4	0	0
Lira	nr HAs underwritten	0	0	0	0	0	0
Kumi	nr HAs underwritten	0	0	0	5	5	5

In the first year, the intention is to work with the existing HAs and to train them in the programme approach and the use of participatory hygiene promotion tools etc. In the following years the new, underwritten HAs will be phased in and will be trained together with existing HAs. Once the full complement of HAs has been recruited in a district they will receive a further five days of training together.

In this way, the hygiene and sanitation programme will be replicated in all sub-counties in all four districts by the end of the six year programme. It is assumed that all HAs will spend 50% of their time working on the programme (regardless of whether their salary is being paid by the district or by DFID). The phasing of the training and work inputs for the HAs in each district is shown below:

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
HA s Katakwi	training work	50 days 550 days	140 days 1540 days	70 days 1540 days	1540 days	1540 days	1540 days
HA s Apac	training work	80 days 880 days	160 days 1760 days	120 days 2200 days	100 days 2200 days	2200 days	2200 days
HA s Lira	training work	0 0	80 days 880 days	160 days 1760 days	160 days 2640 days	120 days 2640 days	2640 days
HA s Kumi	training work	0 0	0 0	100 days 880 days	150 days 1650 days	75 days 1650 days	1650 days

Each HA will be provided with a motorcycle in order to facilitate working with communities throughout the sub-county.

- ***Training Expenses***

Both district and sub-county staff will be provided with a travel/subsistence allowance to cover their expenses. No staff will be paid any field allowances for day-to-day work under the programme.

- ***Consultants and Trainers***

The budget allows for a total input of 90 days from international consultants over the duration of the programme. These consultants will carry out further baseline studies as necessary in order to develop and refine the hygiene promotion programme and to advise on ways of creating demand for sanitation. Most of the training of district and sub-county staff will be done by local consultants and specialist NGOs who have been budgeted for a total of 440 days. Some initial training of communities will also be carried out by these local consultants and NGOs but the aim is to train trainers within communities (CBOs or local facilitators). These grass roots trainers have been budgeted for a total of 800 days over the six years.

Consultants, NGOs CBOs and local facilitators will be reimbursed for travel and subsistence as shown in the schedule.

- ***Workshops and Exchange Visits***

A total of 12 district level workshops has been allowed for over the programme period. The location, frequency and subject of these workshops will be driven by demand and cannot be determined at present.

Exchange visits have been found by many other projects (e.g. WaterAid, RUWASA, UNICEF) to be a powerful way of sharing information and motivating staff at all levels. A total of 20 exchange visits has been budgeted for at district and sub-county level. A lump sum has been allocated for these exchange visits - it is assumed that government staff will organise and undertake the visits in the course of their work and will only be reimbursed for actual expenditure related to the visit.

Exchange visits have also been budgeted for at parish level: a total of 452 visits has been assumed which is one per parish in all four districts. A lump sum has

been allowed to cover costs of transport and subsistence but it is assumed that no paid staff or unpaid representatives e.g. LCI Chairperson will receive any additional payment.

- ***Development of Training Materials***

A one month input by a local consultant has been assumed for preparing Information, Education and Communication (IEC) materials. These materials can be used in all the other districts as long as they get adapted and translated (second one month input assumed to revise and adapt accordingly).

Similarly a hygiene promotion package will be developed with assistance from a one month local consultancy and the package can be adapted for all districts (second one month input).

- ***Demonstration Latrines***

Although demonstration latrines have not always proved effective this is often because they are built to inappropriate design standards (e.g. VIPs) or are too far removed from the village level i.e. at district, county or sub-county head-quarters. It is therefore proposed to encourage construction of real "demonstration" latrines at village level in people's homes. A total of 2260 (five per parish) has been budgeted for. The location of the latrines will be negotiated between the parish chief, LCIs and householders; they should be built to demonstrate how constraints such a hard rock, loose soils, high water tables or lack of logs can be overcome using traditional techniques of construction. Priority will be given to half-completed or neglected latrines. The latrines will be built under a cost sharing exercise so that the household will be expected to contribute Ush 30,000 in labour and materials and the programme will contribute Ush 80,000. It is anticipated that this approach will help to raise the profile and status of the traditional latrine in the household.

- ***Government of Uganda Contribution***

The GOU contribution has been costed in terms of central monitoring and evaluation (10 days per year) and advocacy training (10 days per year).

4 Districts Water, Hygiene and Sanitation Programme Component Activities

4 Districts Water, Hygiene and Sanitation Programme Component Costs

Schedule 2 Community Development Component Activities and Costs

Activity		Project Year							COSTS					Project Year							
		1	2	3	4	5	6				Unit	Cost	1	2	3	4	5	6	Total	Total
Catergory	Unit	2,001	2,002	2,003	2,004	2,005	2,006	Total	Input	Unit	Rate	Contribution	2,001	2,002	2,003	2,004	2,005	2,006	(U Shs)	(£)
STAFFING									**STAFFING**											
(a) District staff receiving training									**(a) District staff receiving training**											
District Community Development Officer	Days	60	60	60	60	60	60	360	District Community Development Officer	shs ('000	10	District	600	600	600	600	600	600	3,600	0
Community Development Assistant - District	Days	220	120	200	190	130	90	950	Community Development Assistant - District	shs ('000	5	District	1 100	600	1,000	950	650	450	4,750	0
Community Development Assistant - Unwritten	Days	0	80	120	190	185	105	680	Community Development Assistant - Unwritten	shs ('000	5	DFID	0	400	600	950	925	525	3,400	0
(b) District staff giving training									**(b) District staff giving training**											
District Community Development Officer	Days	90	0	0	0	0	0	90	District Community Development Officer	shs ('000	10	District	900	0	0	0	0	0	900	0
Community Development Assistant - District	Days	112	5,508	11,456	12 342	8,942	4 969	43,329	Community Development Assistant - District	shs ('000	5	District	560	27,540	57,280	61,710	44 710	24 845	216,645	0
Community Development Assistant - Unwritten	Days	0	2 992	7,716	11,730	6,681	3,670	32,789	Community Development Assistant - Unwritten	shs ('000	5	DFID	0	14,960	38,580	58,650	33 405	18 350	163,945	0
Gender Adviser (Local Cons)	Days	88	88	88	88	88	88	528	Gender Adviser (Local Cons)	shs ('000	250	DFID	22 000	22 000	22,000	22 000	22,000	22,000	132 000	0
NGO Workshop Facilitators	Days	360	360	360	360	360	360	2,160	NGO Workshop Facilitators	shs ('000	150	DFID	54 000	54 000	54 000	54,000	54,000	54,000	324,000	0
Local Water Consultant - Water Needs	Days	44	44					88	Local Water Consultant - Water Needs	shs ('000	250	DFID	11,000	11 000	0	0	0	0	22,000	0
International Water Consultant - Water Needs	Days	44	44					88	International Water Consultant - Water Needs	£	500	DFID	22,000	22,000	0	0	0	0	0	44 000
NGO/CBO Assessment (Local Cons)	Days	44	44					88	NGO/CBO Assessment (Local Cons)	shs ('000	250	DFID	11,000	11,000	0	0	0	0	22,000	0
Monitoring Expert - GoU	Days	30	30	30	30	30	30	180	Monitoring Expert - GoU	shs ('000	10	GoU	300	300	300	300	300	300	1,800	0
Monitoring Expert - Project	Days	30	30	30	30	30	30	180	Monitoring Expert - Project	shs ('000	150	DFID	4,500	4 500	4,500	4,500	4 500	4,500	27,000	0
Int Monitoring Expert - MIS/Data Analysis	Days	66	66	66	66	66	66	396	Int Monitoring Expert - MIS/Data Analysis	£	500	DFID	33 000	33 000	33,000	33,000	33 000	33 000	0	198,000
REIMBURSABLE TRAINING EXPENSES									**REIMBURSABLE TRAINING EXPENSES**											
Night Out Allowance - DCDO	Units	114	24	24	24	24	24	234	Night Out Allowance - DCDO	shs ('000	50	District	5,700	1,200	1,200	1,200	1,200	1,200	11,700	0
Out of Pocket Allowance - CDA	Units	206	8,574	19,366	24 326	15 812	8 708	76 992	Out of Pocket Allowance - CDA	shs ('000	5	DFID	1 030	42 870	96,830	121 630	79,060	43,540	384,960	0
Gender Adviser - Subsistence & Travel	Units	88	88	88	88	88	88	528	Gender Adviser - Subsistence & Travel	shs ('000	100	DFID	8,800	8 800	8,800	8,800	8,800	8,800	52,800	0
NGO W/S Facilitator - Subsistence & Travel	Units	360	360	360	360	360	360	2 160	NGO W/S Facilitator - Subsistence & Travel	shs ('000	50	DFID	18,000	18,000	18,000	18,000	18,000	18,000	108,000	0
LWC - Water Needs - Subsistence & Travel	Units	44	44	0	0	0	0	88	LWC - Water Needs - Subsistence & Travel	shs ('000	100	DFID	4 400	4,400	0	0	0	0	8,800	0
IWC - Water Needs - Subsistence & Travel	Units	44	44	0	0	0	0	88	IWC - Water Needs - Subsistence & Travel	shs ('000	100	DFID	4 400	4 400	0	0	0	0	8,800	0
NGO/CBO - Subsistence & Travel	Units	44	44	0	0	0	0	88	NGO/CBO - Subsistence & Travel	shs ('000	100	DFID	4,400	4,400	0	0	0	0	8,800	0
GoU - Subsistence & Travel	Units	30	30	30	30	30	30	180	GoU - Subsistence & Travel	shs ('000	50	DFID	1,500	1,500	1,500	1,500	1,500	1,500	9,000	0
Project - Subsistence & Travel	Units	30	30	30	30	30	30	180	Project Subsistence & Travel	shs ('000	50	DFID	1,500	1,500	1,500	1,500	1,500	1,500	9,000	0
MIS - Subsistence & Travel	Units	66	66	66	66	66	66	396	MIS - Subsistence & Travel	shs ('000	100	DFID	6,600	6 600	6,600	6,600	6,600	6,600	39,600	0
TRANSPORT									**TRANSPORT**											
4 Wheel Drive	Vehicle	1						1	4 Wheel Drive	shs ('000	65 000	DFID	65,000	0	0	0	0	0	65,000	0
Vehicle Running Costs	Km	20,000	20 000	20,000	20,000	20 000	20 000	120,000	Vehicle Running Costs	shs ('000	0 65	DFID	13,000	13,000	13,000	13 000	13,000	13,000	78,000	0
Motorcycle	Item	2	28	20	5	18		73	Motorcycle	shs ('000	3 000	DFID	6,000	84,000	60,000	15,000	54,000	0	219,000	0
Motorcycle running costs	Km	32 000	480,000	800,000	880,000	########	########	########	Motorcycle running costs	shs ('000	0 10	DFID	3 200	48 000	80,000	88,000	116,800	116,800	452,800	0
Bycicle	Item	10	10	10	10	10		50	Bycicle	shs ('000	80	DFID	800	800	800	800	800	0	4,000	0
TRAINING									**TRAINING**											
Community Level Training - Materials	Lump Sum	1	1	1	1	1	1	6	Community Level Training - Materials	shs ('000	5 000	DFID	5,000	5,000	5,000	5,000	5,000	5,000	30,000	0
District Level Training	Training Days	36	36	36	36	36	36	216	District Level Training	shs ('000	100	DFID	3,600	3,600	3,600	3,600	3,600	3,600	21,600	0
Sub-county Level Training	Training Days	126	126	126	126	126	126	756	Sub-county Level Training	shs ('000	75	DFID	9 450	9 450	9,450	9,450	9,450	9,450	56,700	0
Parish Level Training	Training Days	168	168	168	168	168	168	1 008	Parish Level Training	shs ('000	75	DFID	12,600	12,600	12,600	12,600	12,600	12,600	75,600	0
NGO Training	Training Days	42	42	42	42	42	42	252	NGO Training	shs ('000	75	DFID	3,150	3,150	3,150	3,150	3,150	3,150	18,900	0
Village Resource Person Training	Training Days	371	371	371	371	371	371	2 226	Village Resource Person Training	shs ('000	75	DFID	27,825	27,825	27,825	27,825	27,825	27,825	166,950	0
Workshops	Lump Sum	1	1	1	1	1	1	6	Workshops	shs ('000	2,000	DFID	2,000	2,000	2,000	2,000	2,000	2,000	12,000	0
Video Production	Prodn Day	18	18	18	18	18	18	108	Video Production	shs ('000	190	DFID	3,420	3,420	3 420	3,420	3,420	3,420	20 520	0
Hiring Training Venues	Training Days	36	36	36	36	36	36	216	Hiring Training Venues	shs ('000	30	DFID	1,080	1,080	1,080	1,080	1,080	1,080	6,480	0

4 Districts Water, Hygiene and Sanitation Programme Component Activities

Schedule 2 Community Development Component Activities and Costs

OTHER ACTIVITIES								
International travel costs (Consultants)	Round trip	3	3	3	3	3	3	18
Accommodation+ subsistence (Kampala hotel)	Night	12	12	12	12	12	12	72
Visas	Visit	3	3	3	3	3	3	18

4 Districts Water, Hygiene and Sanitation Programme Component Costs

OTHER ACTIVITIES													
International travel costs (Consultants)	£	1 500	DFID	4 500	4 500	4 500	4,500	4,500	4,500	0	27,000
Accommodation+ subsistence (Kampala hotel)	shs (000	170	DFID	2 040	2 040	2 040	2 040	2 040	2 040	12 240	0
Visas	£	100	DFID	300	300	300	300	300	300	0	1,800
TOTAL - Ushs	shs ('000)			320 455	456 535	537 255	549,855	532 515	498 675	########	0
TOTAL - £	£			59,800	59 800	37 800	37 800	37,800	37,800	0	270 800
Fixed Exchange Rate				2 380	2 380	2 380	2 380	2,380	2 380	2 380	
OVERALL TOTAL - Ushs	shs ('000)			462 779	598 859	627 219	639,819	622,479	498,839		3,447 794
OVERALL TOTAL - £	£			194 445	251 621	263,537	268 832	261 548	208,872		1 448 653

FINANCING PLAN

Cost Contribution		Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
DFID local		311 295	426 295	478 875	485,095	485,055	378,280	2 563,895
DFID - Foreign		142 324	142 324	89 964	89,964	89 964	89,964	644,504
GoU		300	300	300	300	300	300	1 800
District		8,860	29,940	60 080	64 460	47 160	27 095	237 595
NGO/CBO		0	0	0	0	0	0	0
Private Sector		0	0	0	0	0	0	0
Community		0	0	0	0	0	0	0
	Total	462,779	598 859	627 219	639 819	622,479	498,839	3,447,794

Cost Contribution		Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
DFID - local		130,796	179,116	200 388	203 821	203,805	159,361	1,077,287
DFID - Foreign		59 800	59 800	37,800	37 800	37 800	37 800	270 800
GoU		126	126	126	126	126	126	756
District		3 723	12 580	25,244	27,084	19,815	11 384	99,830
NGO/CBO		0	0	0	0	0	0	0
Private Sector		0	0	0	0	0	0	0
Community		0	0	0	0	0	0	0
	Total	194,445	251,621	263,537	268,832	261,548	208,672	1,448,653

Disbursement Category		Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs (000)
International staff & equipment foreign currency costs		142,324	142,324	89,964	89,964	89,964	89,964	644,504
Local staff and other local currency staff associated costs		108,000	148,940	180,900	205,700	163 130	127 610	934 280
Training and extension (excl staff costs)		124,455	161,795	202 555	227,355	184,785	149,265	1 050 210
Vehicles and equipment		88,000	145,800	153 800	116 800	184,800	129 800	818 800
Infrastructure developments		0	0	0	0	0	0	0
Infrastructure maintenance		0	0	0	0	0	0	0
	Total	462 779	598,859	627 219	639,819	822 479	498,839	3,447,794

Disbursement Category		Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
International staff & equipment foreign currency costs		59,800	59 800	37,800	37 800	37,800	37,800	270,800
Local staff and other local currency staff associated costs		45,378	62 580	76 008	86 429	68,542	53,618	392,555
Training and extension (excl staff costs)		52 292	67 981	85 107	95 527	77,641	62,716	441,265
Vehicles and equipment		36 975	61,261	84 622	49 076	77 563	54 538	344,034
Infrastructure developments		0	0	0	0	0	0	0
Infrastructure maintenance		0	0	0	0	0	0	0
	Total	194,445	251,621	263,537	268,832	261,548	208,672	1,448,653

4 Districts Water, Hygiene and Sanitation Programme Component Activities

4 Districts Water, Hygiene and Sanitation Programme Component Costs

Schedule 3 Capacity Building Component Activities and Costs

ACTIVITY		Project Year 1	2	3	4	5	6	
Category	Unit	2,001	2,002	2,003	2,004	2,005	2,006	Total
STAFFING								
Institutional Appraisal - Local Cons	Days	20	20	0	0	0	0	40
Institutional Appraisal - Int Cons	Days	20	20	0	0	0	0	40
Training Needs Assessment - Local Cons	Days	160	160	0	0	0	0	320
Training Needs Assessment - Int Cons	Days	160	160	0	0	0	0	320
Specialist Training Inputs - Distnct Staff	Days	160	120	80	40	40	40	480
Specialist Training Inputs - Councillors	Days	20	20	20	20	20	20	120
Specialist Training Inputs - District Organs	Days	20	20	20	20	20	20	120
Specialist Training Inputs - S-C Staff (Cons)	Days	80	80	80	80	80	80	480
Specialist Training Inputs - S-C Councillors (	Days	75	75	75	75	75	75	450
Specialist Training Inputs - S-C Staff (Distric	Days	80	80	80	80	80	80	480
Specialist Training Inputs - S-C Staff (Distric	Days	75	75	75	75	75	75	450
NGO & CBO Support	Days	40	40	40	40	40	40	240
Private Sector Support	Days	40	40	40	40	40	40	240
Central Government Monitoring & Support	Days	150	150	150	150	150	150	900
International Consultant Input	Days	60	60	60	60	60	60	360
REIMBURSABLE TRAINING EXPENSES								
Consultant Subsistence & Travel	Days	1,005	985	565	525	525	525	4 110
District Staff Subsistence & Travel	Days	155	155	155	155	155	155	930
District Staff Trainee Subsistence & Travel	Days	100	100	0	0	0	0	200
Councillor District Trainee Subsistence & Tr	Days	750	750	750	750	750	750	4,500
District Organ Trainee Subsistence & Travel	Days	80	80	80	80	80	80	480
S-C Staff Trainee Subsistence & Travel	Days	2 310	2 310	2,310	2,310	2 310	2,310	13,860
S-C Councillor Training Expenses	Days	1,155	1,155	1 155	1,155	1 155	1 155	6,930
NGO & CBO Expensess	Days	800	800	800	800	800	800	4,800
Private Sector Expensess	Days	800	800	800	800	800	800	4,800
Central Government Staff Expenses	Days	150	150	150	150	150	150	900
International Consultant Subsistence	Days	60	60	60	60	60	60	360
VEHICLES AND EQUIPMENT								
4 x 4 Vehicles	Vehicle	2	2					4
Vehicle Running Costs	Km	20,000	20 000	20,000	20,000	20,000	20,000	120,000
Motor Cycles	Unit	30	30	17				77
Motor Cycles Running Costs	Km	150 000	150,000	85,000				385,000
Typewriters	Unit	200	200	142				542
Bycicle	Unit	200	200	142				542
TRAINING MATERIALS								
Consumables	Lump Sum	1	1	1	1	1	1	6
Training Materials	Lump Sum	1	1	1	1	1	1	6
PARISH/VILLAGE LEVEL TRAINING	Lump Sum	1	1	1	1	1	1	6
EXCHANGE VISITS	Lump Sum	1	1	1	1	1	1	6

COSTS				Project Year 1	2	3	4	5	6		
Category	Unit	Unit Rate	Cost Contribution	2,001	2,002	2,003	2,004	2,005	2,006	Total (U Shs)	Total (£)
STAFFING											
Institutional Appraisal - Local Cons	Ushs ('000)	250	DFID	5,000	5 000	0	0	0	0	10 000	0
Institutional Appraisal - Int Cons	£	400	DFID	8 000	8,000	0	0	0	0	0	16,000
Training Needs Assessment - Local Cons	Ushs ('000)	250	DFID	40,000	40 000	0	0	0	0	80 000	0
Training Needs Assessment - Int Cons	£	400	DFID	64 000	64 000	0	0	0	0	0	128,000
Specialist Training Inputs - District Staff	Ushs ('000)	250	DFID	40,000	30,000	20 000	10,000	10,000	10 000	120 000	0
Specialist Training Inputs - Councillors	Ushs ('000)	250	DFID	5,000	5,000	5,000	5,000	5,000	5,000	30,000	0
Specialist Training Inputs - District Organs	Ushs ('000)	250	DFID	5,000	5,000	5 000	5 000	5 000	5,000	30,000	0
Specialist Training Inputs - S-C Staff (Cons)	Ushs ('000)	250	DFID	20 000	20 000	20 000	20 000	20,000	20 000	120,000	0
Specialist Training Inputs - S-C Councillors (	Ushs ('000)	250	DFID	18,750	18 750	18,750	18,750	18,750	18,750	112,500	0
Specialist Training Inputs - S-C Staff (Distric	Ushs ('000)	5	District	400	400	400	400	400	400	2,400	0
Specialist Training Inputs - S-C Staff (Distric	Ushs ('000)	5	District	375	375	375	375	375	375	2,250	0
NGO & CBO Support	Ushs ('000)	250	DFID	10,000	10,000	10,000	10,000	10,000	10,000	60,000	0
Private Sector Support	Ushs ('000)	250	DFID	10,000	10,000	10,000	10,000	10,000	10,000	60,000	0
Central Government Monitoring & Support	Ushs ('000)	10	GoU	1,500	1,500	1,500	1,500	1,500	1,500	9,000	0
International Consultant Input	£	400	DFID	24 000	24,000	24 000	24,000	24,000	24,000	0	144,000
REIMBURSABLE TRAINING EXPENSES											
Consultant Subsistence & Travel	Ushs ('000)	100	DFID	100 500	96,500	56,500	52 500	52,500	52,500	411,000	0
District Staff Subsistence & Travel	Ushs ('000)	50	DFID	7 750	7,750	7 750	7,750	7,750	7,750	46,500	0
District Staff Trainee Subsistence & Travel	Ushs ('000)	50	DFID	5 000	5,000	0	0	0	0	10,000	0
Councillor District Trainee Subsistence & Tr	Ushs ('000)	50	DFID	37 500	37,500	37,500	37,500	37 500	37,500	225,000	0
District Organ Trainee Subsistence & Travel	Ushs ('000)	50	DFID	4 000	4,000	4,000	4,000	4,000	4,000	24 000	0
S-C Staff Trainee Subsistence & Travel	Ushs ('000)	50	DFID	115 500	115,500	115,500	115,500	115,500	115,500	693,000	0
S-C Councillor Training Expenses	Ushs ('000)	50	DFID	57,750	57,750	57,750	57,750	57,750	57,750	346,500	0
NGO & CBO Expensess	Ushs ('000)	50	NGO/CBO	40,000	40,000	40,000	40,000	40,000	40,000	240,000	0
Private Sector Expensess	Ushs ('000)	50	Private Sector	40,000	40,000	40 000	40,000	40 000	40,000	240 000	0
Central Government Staff Expenses	Ushs ('000)	50	GoU	7,500	7,500	7,500	7,500	7,500	7,500	45,000	0
International Consultant Subsistence	Ushs ('000)	100	DFID	6 000	6 000	6,000	6,000	6,000	6,000	36,000	0
VEHICLES AND EQUIPMENT											
4 x 4 Vehicles	Ushs ('000)	65 000	DFID	130 000	130,000	0	0	0	0	260,000	0
Vehicle Running Costs	Ushs ('000)	1	District	13,000	13,000	13,000	13,000	13,000	13 000	78,000	0
Motor Cycles	Ushs ('000)	3,000	DFID	90,000	90,000	51 000	0	0	0	231,000	0
Motor Cycles Running Costs	Ushs ('000)	0	District	15,000	15,000	8,500	0	0	0	38,500	0
Typewriters	Ushs ('000)	80	DFID	16,000	16,000	11,360	0	0	0	43,360	0
Bycicle	Ushs ('000)	80	DFID	16 000	16 000	11,360	0	0	0	43,360	0
TRAINING MATERIALS											
Consumables	Ushs ('000)	10,000	District	10,000	10,000	10,000	10,000	10,000	10 000	60,000	0
Training Materials	Ushs ('000)	10 000	DFID	10,000	10 000	10,000	10 000	10,000	10,000	60,000	0
PARISH/VILLAGE LEVEL TRAINING	Ushs ('000)	452 000	DFID	452,000	452,000	452,000	452 000	452,000	452,000	########	0
EXCHANGE VISITS	Ushs ('000)	452,000	DFID	452,000	452,000	452,000	452,000	452,000	452,000	########	0

4 Districts Water, Hygiene and Sanitation Programme Component Activities

Schedule 3 Capacity Building Component Activities and Costs

OTHER ACTIVITIES								
International travel costs (Consultants)	Round trip	8	8	2	2	2	2	24
Accommodation+ subsistence (Kampala hot	Night	32	32	8	8	8	8	96
Visas	Visit	8	8	2	2	2	2	24

4 Districts Water, Hygiene and Sanitation Programme Component Costs

OTHER ACTIVITIES												
International travel costs (Consultants)	£	1 500	DFID	12,000	12 000	3,000	3,000	3 000	3,000	0	36 000
Accommodation+ subsistence (Kampala hot	Ushs ('000)	170	DFID	5 440	5,440	1 360	1,360	1,360	1,360	16 320	0
Visas	£	100	DFID	800	800	200	200	200	200	0	2,400
TOTAL - Ushs	Ushs ('000)			1 788,985	########	########	########	########	########	########	0
TOTAL - £	£			108 800	108 800	27,200	27,200	27 200	27,200	0	326,400
Fixed Exchange Rate				2 380	2,380	2 380	2 380	2,380	2,380	2,380	
OVERALL TOTAL - Ushs	Ushs ('000)			2,045,909	########	########	########	########	########		9,984,522
OVERALL TOTAL - £	£			859 626	853 743	650 774	610,345	610 345	610,345		4,195,177

FINANCING PLAN

Cost Contribution	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
DFID - local	1 659,190	########	########	########	########	########	8,492,540
DFID Foreign	258,944	258 944	64,736	64 736	64,736	64 736	776 832
GoU	9 000	9,000	9,000	9,000	9,000	9,000	54 000
District	38 775	38,775	32,275	23,775	23,775	23,775	181,150
NGO/CBO	40,000	40,000	40,000	40 000	40,000	40,000	240 000
Private Sector	40,000	40,000	40,000	40,000	40 000	40,000	240 000
Community	0	0	0	0	0	0	0
Total	2 045,909	########	########	########	########	########	9,984,522

Cost Contribution	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
DFID - local	697 139	691,256	572,618	535,781	535,781	535 781	3,568,294
DFID - Foreign	108 800	108,800	27,200	27,200	27,200	27 200	326,400
GoU	3,782	3,782	3,782	3,782	3,782	3,782	22,689
District	16,292	16,292	13 581	9,989	9,989	9,989	76,113
NGO/CBO	16,807	16 807	16,807	16,807	16,807	16,807	100,840
Private Sector	16 807	16 807	16,807	16,807	16,807	16,807	100,840
Community	0	0	0	0	0	0	0
Total	859,626	853,743	650,774	610,345	610,345	610,345	4,195,177

Disbursement Category	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
International staff & equipment foreign currency costs	258,944	258 944	64 736	64,736	64,736	64 736	776,832
Local staff and other local currency staff associated costs	161,465	151,465	92,385	82,385	82 385	82,385	652,470
Training and extension (excl staff costs)	1,345,500	########	########	########	########	########	7 861,000
Vehicles and equipment	280,000	280,000	95,220	13,000	13 000	13,000	694,220
Infrastructure developments	0	0	0	0	0	0	0
Infrastructure maintenance	0	0	0	0	0	0	0
Total	2,045,909	########	########	########	########	########	9,984,522

Disbursement Category	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
International staff & equipment foreign currency costs	108 800	108 800	27 200	27,200	27,200	27,200	326,400
Local staff and other local currency staff associated costs	67 842	63 641	38,817	34,618	34 618	34,618	274 147
Training and extension (excl staff costs)	565 336	563 655	544,748	543,067	543 067	543,067	3,302,941
Vehicles and equipment	117 647	117,647	40 008	5,462	5 462	5,462	291 689
Infrastructure developments	0	0	0	0	0	0	0
Infrastructure maintenance	0	0	0	0	0	0	0
Total	859,626	853,743	650,774	610,345	610,345	610,345	4,195,177

4 Districts Water, Hygiene and Sanitation Programme Component Activities

Schedule 4 Infrastructure Development Component Activities and Costs

ACTIVITY		Project Year 1	2	3	4	5	6	
Category	Unit	2001	2002	2003	2004	2005	2006	Total
STAFF - work inputs								
District Water Officer	Days	220	330	440	440	440	440	2310
District Water Assistants	Days	330	495	660	660	660	660	3465
GoU Monitoring & Evaluation	Days	10	20	10	10	10	20	80
BOREHOLE TEAM - staff costs								
Senior hydrogeologist - international	Days	88	0	0	0	0	0	88
Long-term hydrogeologist - international	Days	0	220	220	88	66	44	638
Long-term hydrogeologist - local	Days	88	220	220	220	220	220	1188
Geophysicist - international	Days	44	66	66	44	22	0	242
Geophysicist - local	Days	33	66	132	132	0	0	363
Drilling specialist	Days	44	132	220	220	66	66	748
BOREHOLE TEAM - REIMBURSABLE EXPENSES								
International travel	Item	3	3	3	3	3	3	18
Field work subsistence allowance	Days	2970	7040	8580	7040	3740	3300	32670
BOREHOLE TEAM - TRANSPORT								
Four wheel drive	Item	2	0	0	0	0	0	2
Running costs	km	60000	60000	60000	60000	60000	60000	360000
STAFF - Training days								
DWO & DHI/Water Assistants (Districts)	Days	30	15	15	0	0	0	60
Health Assistants & Comm Dev Assts (Sub-	Days	130	380	450	410	195	0	1565
STAFF - REIMBURSABLE TRAINING EXPENSES								
District Staff Subsistence & Travel	Days	30	15	15	0	0	0	60
HA and CDA Subsistence & Travel	Days	130	380	450	410	195	0	1565
Fundi Subsistence & Travel	Days	90	90	80	80			340
Pump mechanic Subsistence & Travel	Days	66	110	72	30			280
TRAINERS/CONSULTANTS - salary costs								
International consultants - training	Days	20	10	10	0	0	0	40
Local consultants/NGOs - training	Days	40	120	160	160	160	160	800
CBO/Local artisans	Days	40	120	160	160	160	160	800
TRAINERS - reimbursable expenses								
International travel	Item	1	1	1	0	0	0	3
International consultant subsistence and tra	Days	20	10	10	0	0	0	40
Local Consultant subsistence and travel	Days	40	120	160	160	160	160	800
CBO/Local facilitators subsistence and trav	Days	40	120	160	160	160	160	800
OTHER TRAINING COSTS								
Training materials	Lump sum	1	1	1	1	1	1	6
Hire of venues, stationery, consumables etc	Lump sum	1	1	1	1	1	1	6
District Level Workshop	Item	2	1	1	1	1	1	7
Exchange visits	Item	4	4	4	4	4	4	24
TRANSPORT & EQUIPMENT								
Motor Cycles	Vehicle	4	2	2				8
Motor Cycle Running Costs	Km	20000	30000	40000	0	0	0	90000
Bicycles	Item	15	250	585	640	460	255	2185
Hydrogeological equipment	Lump sum	1	1	0	0	0	0	2
INSTITUTIONAL WATER & SANITATION								
School latrines (5 stance)	Item	0	200	400	400	200	200	1400

4 Districts Water, Hygiene and Sanitation Programme Component Costs

Schedule 4 Infrastructure Development Component Activities and Costs

COSTS		Unit	Cost	Project Year 1	2	3	4	5	6	Total	Total
Category	Unit	Rate	Contribution	2001	2002	2003	2004	2005	2006	(U Shs)	(£)
STAFF - work inputs											
District Water Officer	Ushs ('000)	10	District	2200	3300	4400	4400	4400	4400	23100	0
District Water Assistants	Ushs ('000)	7	DFID	2310	3465	4620	4620	4620	4620	24255	0
GoU Monitoring & Evaluation	Ushs ('000)	10	DFID	100	200	100	100	100	200	800	0
BOREHOLE TEAM - staff costs											
Senior hydrogeologist - international	£	550	DFID	48400	0	0	0	0	0	0	48400
Long-term hydrogeologist - international	£	410	DFID	0	90200	90200	36080	27060	18040	0	261580
Long-term hydrogeologist - local	Ushs ('000)	150	DFID	13200	33000	33000	33000	33000	33000	178200	0
Geophysicist - international	£	410	DFID	18040	27060	27060	18040	9020	0	0	99220
Geophysicist - local	Ushs ('000)	150	DFID	4950	9900	19800	19800	0	0	54450	0
Drilling specialist	£	410	DFID	18040	54120	90200	90200	27060	27060	0	306680
BOREHOLE TEAM - REIMBURSABLE EXPENSES											
International travel	£	1500	DFID	4500	4500	4500	4500	4500	4500	0	27000
Field work subsistence allowance	Ushs ('000)	40	DFID	118800	281600	343200	281600	149600	132000	1308800	0
BOREHOLE TEAM - TRANSPORT											
Four wheel drive	Ushs ('000)	65000	DFID	130000	0	0	0	0	0	130000	0
Running costs	Ushs ('000)	1	Distnct	39000	39000	39000	39000	39000	39000	234000	0
STAFF - Training days											
DWO & DHI/Water Assistants (Districts)	Ushs ('000)	10	District	300	150	150	0	0	0	600	0
Health Assistants & Comm Dev Assts (Sub-	Ushs ('000)	5	Distnct	650	1900	2250	2050	975	0	7825	0
STAFF - REIMBURSABLE TRAINING EXPENSES											
District Staff Subsistence & Travel	Ushs ('000)	15	DFID	450	225	225	0	0	0	900	0
HA and CDA Subsistence & Travel	Ushs ('000)	15	DFID	1950	5700	6750	6150	2925	0	23475	0
Fundi Subsistence & Travel	Ushs ('000)	15	DFID	1350	1350	1200	1200	0	0	5100	0
Pump mechanic Subsistence & Travel	Ushs ('000)	15	DFID	1020	1650	1080	450	0	0	4200	0
TRAINERS/CONSULTANTS - salary costs											
International consultants - training	£	400	DFID	8000	4000	4000	0	0	0	0	16000
Local consultants/NGOs - training	Ushs ('000)	250	DFID	10000	30000	40000	40000	40000	40000	200000	0
CBO/Local artisans	Ushs ('000)	50	DFID	2000	6000	8000	8000	8000	8000	40000	0
TRAINERS - reimbursable expenses											
International travel	£	1500	DFID	1500	1500	1500	0	0	0	0	4500
International consultant subsistence and tra	Ushs ('000)	100	DFID	2000	1000	1000	0	0	0	4000	0
Local Consultant subsistence and travel	Ushs ('000)	100	DFID	4000	12000	16000	16000	16000	16000	80000	0
CBO/Local facilitators subsistence and trav	Ushs ('000)	30	DFID	1200	3600	4800	4800	4800	4800	24000	0
OTHER TRAINING COSTS											
Training materials	Ushs ('000)	2000	DFID	2000	2000	2000	2000	2000	2000	12000	0
Hire of venues, stationery, consumables etc	Ushs ('000)	2000	District	2000	2000	2000	2000	2000	2000	12000	0
District Level Workshop	Ushs ('000)	2000	DFID	4000	2000	2000	2000	2000	2000	14000	0
Exchange visits	Ushs ('000)	2000	DFID	8000	8000	8000	8000	8000	8000	48000	0
TRANSPORT & EQUIPMENT											
Motor Cycles	Ushs ('000)	3000	DFID	12000	6000	6000	0	0	0	24000	0
Motor Cycle Running Costs	Ushs ('000)	0 10	Distnct	2000	3000	4000	0	0	0	9000	0
Bicycles	Ushs ('000)	0	DFID	0	0	0	0	0	0	0	0
Hydrogeological equipment	£	100000	DFID	100000	100000	0	0	0	0	0	200000
INSTITUTIONAL WATER & SANITATION											
School latrines (5 stance)	Ushs (000)	1500	DFID	0	300000	600000	600000	300000	300000	2100000	0

4 Districts Water, Hygiene and Sanitation Programme Component Activities

Schedule 4 Infrastructure Development Component Activities and Costs								
School Handwashing facilities	Item	0	200	400	400	200	200	1400
School Rainwater catchment	Item	0	100	200	200	100	100	700
Health centre latrines (2 stance)	Item	0	40	80	80	40	40	280
Health centre Handwashing facilities	Item	0	40	80	80	40	40	280
Health centre Rainwater catchment	Item	0	40	80	80	40	40	280
OTHER ACTIVITIES								
District Tender Board Meetings	Units	0	2	4	6	6	4	22
Support to slab construction (Provisional)	Lump sum	1	1	1	1	1	1	6
INFRASTRUCTURE DEVELOPMENT - CAPITAL COST								
Borehole Rehabilitation	Item	0	50	75	90	80	20	315
Borehole Drilling	Item	0	20	90	80	50	35	275
Spring Protection	Item	15	80	190	300	200	100	885
Shallow Well Rehabilitation	Item	0	40	50	10	0	0	100
Shallow Well Protection	Item	0	30	20	0	0	0	50
Medium boreholes (shallow)	Item	0	10	60	40	80	60	250
Hand Augured Well	Item	0	20	80	120	50	40	310
Other 1	Item	0	0	0	0	0	0	0
Other 2	Item	0	0	0	0	0	0	0
Other 3	Item	0	0	0	0	0	0	0
INFRASTRUCTURE DEVELOPMENT - OPERATING AND MAINTENANCE COST								
Borehole Rehabilitation	Item	0	50	75	90	80	20	315
Borehole Drilling	Item	0	20	90	80	50	35	275
Spring Protection	Item	15	80	190	300	200	100	885
Shallow Well Rehabilitation	Item	0	40	50	10	0	0	100
Shallow Well Protection	Item	0	30	20	0	0	0	50
Medium boreholes (shallow)	Item	0	10	60	40	80	60	250
Hand Augured Well	Item	0	20	80	120	50	40	310
Other 1	Item	0	0	0	0	0	0	0
Other 2	Item	0	0	0	0	0	0	0
Other 3	Item	0	0	0	0	0	0	0

4 Districts Water, Hygiene and Sanitation Programme Component Costs

Schedule 4 Infrastructure Development Component Activities and Costs												
School Handwashing facilities	Ushs ('000)	50	DFID	0	10000	20000	20000	10000	10000	70000	0
School Rainwater catchment	Ushs ('000)	2000	DFID	0	200000	400000	400000	200000	200000	1400000	0
Health centre latrines (2 stance)	Ushs ('000)	1000	DFID	0	40000	80000	80000	40000	40000	280000	0
Health centre Handwashing facilities	Ushs (000)	50	DFID	0	2000	4000	4000	2000	2000	14000	0
Health centre Rainwater catchment	Ushs (000)	1500	DFID	0	60000	120000	120000	60000	60000	420000	0
OTHER ACTIVITIES											
District Tender Board Meetings	Ushs (000)	500	DFID	0	1000	2000	3000	3000	2000	11000	0
Support to slab construction (Provisional)	Ushs ('000)	3000	DFID	3000	3000	3000	3000	3000	3000	18000	0
INFRASTRUCTURE DEVELOPMENT - CAPITAL COST											
Borehole Rehabilitation	Ushs ('000)	5000	DFID/Com/GoU	0	250000	375000	450000	400000	100000	1575000	0
Borehole Drilling	Ushs ('000)	19000	DFID/Com/GoU	0	380000	1710000	1520000	950000	665000	5225000	0
Spring Protection	Ushs ('000)	1200	DFID/Com/GoU	18000	96000	228000	360000	240000	120000	1062000	0
Shallow Well Rehabilitation	Ushs (000)	2400	DFID/Com/GoU	0	96000	120000	24000	0	0	240000	0
Shallow Well Protection	Ushs ('000)	2000	DFID/Com/GoU	0	60000	40000	0	0	0	100000	0
Medium boreholes (shallow)	Ushs ('000)	12000	DFID/Com/GoU	0	120000	720000	480000	960000	720000	3000000	0
Hand Augured Well	Ushs ('000)	3200	DFID/Com/GoU	0	64000	256000	384000	160000	128000	992000	0
Other 1	Ushs (000)	0	DFID/Com/GoU	0	0	0	0	0	0	0	0
Other 2	Ushs ('000)	0	DFID/Com/GoU	0	0	0	0	0	0	0	0
Other 3	Ushs ('000)	0	DFID/Com/GoU	0	0	0	0	0	0	0	0
INFRASTRUCTURE DEVELOPMENT - OPERATING AND MAINTENANCE COST											
Borehole Rehabilitation	Ushs (000)	200	Community	0	10000	25000	43000	59000	63000	200000	0
Borehole Drilling	Ushs ('000)	190	Community	0	3800	20900	36100	45600	52250	158650	0
Spring Protection	Ushs ('000)	36	Community	540	3420	10260	21060	28260	31860	95400	0
Shallow Well Rehabilitation	Ushs ('000)	144	Community	0	5760	12960	14400	14400	14400	61920	0
Shallow Well Protection	Ushs ('000)	120	Community	0	3600	6000	6000	6000	6000	27600	0
Medium boreholes (shallow)	Ushs ('000)	180	Community	0	1800	12600	19800	34200	45000	113400	0
Hand Augured Well	Ushs ('000)	112	Community	0	2240	11200	24640	30240	34720	103040	0
Other 1	Ushs ('000)	0	Community	0	0	0	0	0	0	0	0
Other 2	Ushs ('000)	0	Community	0	0	0	0	0	0	0	0
Other 3	Ushs ('000)	0	Community	0	0	0	0	0	0	0	0
TOTAL - Ushs	Ushs ('000)			387 020	2 169,680	5 326 495	5 088,170	3 883 120	2,893,250	19,727 715	0
TOTAL - £	£			198,460	281,380	217,460	148,820	87 640	49,600	0	963,380
Fixed Exchange Rate				2 380	2,380	2,380	2,380	2 380	2,380	2,380	
OVERALL TOTAL - Ushs	Ushs ('000)			859,402	2 839,344	5 844,050	5,442,362	4 024,103	3,011,298		22,020,559
OVERALL TOTAL - £	£			361,093	1,193,002	2,455 483	2,288,707	1,690,800	1 265,251		9,252,336

4 Districts Water, Hygiene and Sanitation Programme Component Activities

Schedule 4 Infrastructure Development Component Activities and Costs

4 Districts Water, Hygiene and Sanitation Programme Component Costs

Schedule 4 Infrastructure Development Component Activities and Costs

FINANCING PLAN

Cost Contribution			Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
DFID - local	83 4%		337 344	1 912 863	4 803 658	4 341,921	3 149,513	2,313,151	16 858 450
DFID - Foreign			472 382	669,684	517,555	354,192	160,983	118,048	2,292,844
GoU	12 0%		2 160	127 920	413 880	388,180	325,200	207,960	1,463,280
District			46 150	49,350	51,800	47,450	46,375	45,400	286,525
NGO/CBO			0	0	0	0	0	0	0
Private Sector			0	0	0	0	0	0	0
Community	4 6%		1 366	79,527	257 157	312,639	342,032	326,739	1,319,460
	100%	Total	859 402	2,839,344	5 844,050	5,442,362	4,024,103	3,011,298	22,020,559

Cost Contribution		Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
DFID - local		141 741	803,724	1,934,310	1,824 337	1,323 325	971,912	6 999 349
DFID - Foreign		198,480	281,380	217,460	148,820	67,640	49,600	963,380
GoU		908	53,748	173,899	162,252	136,639	87,378	614,824
District		19 391	20 735	21,765	19,937	19 485	19 076	120,389
NGO/CBO		0	0	0	0	0	0	0
Private Sector		0	0	0	0	0	0	0
Community		574	33,415	108,049	131,361	143,711	137,285	554,395
	Total	361,093	1,193,002	2,455,483	2,288,707	1,690,800	1,265,251	9,252,336

Disbursement Category		Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
International staff & equipment foreign currency costs		472 382	669,684	517,555	354,192	160,983	118,048	2,292,844
Local staff and other local currency staff associated costs		156,580	371,465	458,120	397,520	245,720	227,220	1,856,605
Training and extension (excl staff costs)		28 920	41,575	47,455	44,650	38,700	34,800	236,100
Vehicles and equipment		183 000	48 000	49 000	39 000	39,000	39,000	397 000
Infrastructure developments		18 000	1 878 000	4 673 000	4 442,000	3 322,000	2,345,000	16,478,000
Infrastructure maintenance		540	30,620	98,920	165,000	217,700	247,230	760,010
	Total	859,402	2 839 344	5,844,050	5 442,362	4,024,103	3,011,298	22,020,559

Disbursement Category		Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
International staff & equipment foreign currency costs		198 480	281,380	217 460	148,820	67,640	49,600	963,380
Local staff and other local currency staff associated costs		65,782	156,078	192 487	167,025	103 244	95,471	780,088
Training and extension (excl staff costs)		12,151	17,468	19,939	18,781	16,261	14,622	99,202
Vehicles and equipment		76 891	20 168	20,588	16,387	16,387	16,387	166,807
Infrastructure developments		7,583	705,042	1,963,445	1 868,387	1,395,798	985,294	6 923,529
Infrastructure maintenance		227	12,868	41,563	69,328	91 471	103,878	319,332
	Total	361,093	1,193,002	2,455,483	2,288,707	1,690,800	1,265,251	9,252,336

Rationale and Assumptions for Infrastructure Development Budget

Staffing - work inputs

- ***District Staff***

The District Water Officer in each of the four districts has a key role in planning and monitoring the implementation of the physical infrastructure component of the programme. The assumption is that each DWO will spend 50% of his time working on the programme. This is a cost to the district.

One Water Officer in each district is assumed to spend 75% of his time working on the programme once it has commenced in his district. This is a cost to the district. The WA will be the key link person between the district and the Health Assistants (HAs) and Community Development Assistants (CDAs) in the sub-counties. He will be responsible for overseeing the planning and co-ordination of the work undertake by these extension will also have a significant role in training extension staff, NGOs and the private sector.

Training of key staff at district level is proposed at the start of the programme in each district to provide relevant skills and an understanding of the purpose of the programme.

The proposed phasing of the district staff inputs and training is outlined below:

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
DWO Katakwi	work training	110 days 5 days	110 days	110 days	110 days	110 days	110 days
DWO Apac	work training	110 days 5 days	110 days	110 days	110 days	110 days	110 days
DWO Lira	work training		110 days 5 days	110 days	110 days	110 days	110 days
DWO Kumi	work training			110 days 5 days	110 days	110 days	110 days
DHI Katakwi	training	5 days					
DHI Apac	training	5 days					
DHI Lira	training		5 days				
DHI Kumi	training			5 days			
WA Katakwi	work training	165 days 5 days	165 days	165 days	165 days	165 days	165 days
WA Apac	work training	165 days 5 days	165 days	165 days	165 days	165 days	165 days
WA Lira	work training		165 days 5 days	165 days	165 days	165 days	165 days
WA Kumi	work training			165 days 5 days	165 days	165 days	165 days

Each DWO and each WA working on the programme will be provided with a motorcycle to assist with sub-county and community visits.

- ***Sub-County Staff***

The HAs and CDAs at sub-county level have a key role to play throughout the project cycle. They will be responsible for informing, mobilising and assisting communities during identification, preparation and construction of water points. Their specific inputs are detailed under the community development and hygiene and sanitation schedules. In order to ensure a well-integrated approach to the water, hygiene and sanitation components it is proposed to train CDAs and HAs together for 5 days at the start of the programme in each district. This will allow them to develop a common understanding and to define their roles and responsibilities. The phasing of this training is dependent on the phased recruitment of a full recruitment of HAs and CDAs in each district (as described in the community development and hygiene schedules. The proposed training schedule is shown below:

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
HA s& CDAs Katakwi	training	50 days	140 days	70 days			
HA s& CDAs Apac	training	80days	160 days	120 days	100 days		
HA s& CDAs Lira	training		80 days	160 days	160 days	120 days	
HA s& CDAs Kumi	training			100 days	150 days	75 days	

- Training of Spring Fundis and Pump Mechanics

In each sub-county where springs are to be protected, one spring fundi will be given a period of 10 days hands-on training.

Two pump mechanics in each sub-county will receive a two day-refresher training course. These artisans will not get paid for this training but will be provided with a subsistence/travel allowance. The phasing of this private-sector training is shown below:

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fundi Katakwi	Hands-on training	50 days					
Fundi Apac	Hands-on training	40 days	40 days				
Fundi Lira	Hands-on training		50 days	50 days	50 days		
Fundi Kumi	Hands-on training			30 days	30 days		
Pump Mechanic Katakwi	Refresher training	28 days	28 days				
Pump Mechanic	Refresher	40 days	40 days				

Apac	training						
Pump Mechanic Lira	Refresher training		42 days	42 days			
Pump Mechanic Kumi	Refresher training			30 days	30 days		

Note: The number of sub-counties with spring potential in each district are as follows:

Katakwi: 5 s/c
Apac: 8 s/c
Lira: 15 s/c
Kumi: 6 s/c

- ***Trainers and Consultants***

The budget allows for a 10 day training input from international consultants in each district. The majority of the training at district, sub-county and community level will be done by local consultants and NGOs with particular skills and expertise in water source development (40 days per year in each district as per schedule). Extensive use will also be made of indigenous NGOs, CBOs and local facilitators to train at grass roots level (40 days per year in each district as per schedule). However this will depend on the capacity of these local organisations to train others.

- ***Workshops and Exchange Visits***

A total of seven workshops has been allowed for over the programme period. These will be held in the district headquarters and will be attended by district, sub-county and possibly some parish staff.

Exchange visits have been found by many other projects (e.g. WaterAid, RUWASA, UNICEF) to be a powerful way of sharing information and motivating staff at all levels. Four exchange visits per year have been budgeted for: these can be allocated at different levels so that village, parish, sub-county and district staff can all benefit. The visits may be intra- or inter-district depending on the focus. A lump sum has been allocated for these exchange visits - it is assumed that government staff will undertake this in the course of their work and will only be reimbursed for actual expenditure related to the visit. Unpaid participants (e.g. LCI Chairperson or village representatives) will not be paid for their time but will be reimbursed for actual expenditures during the visits.

- ***Borehole Team***

RJC to explain rationale/assumptions for the inputs

- ***Hydrogeological Equipment***

RJC to detail

- ***Construction of Water Sources***

The proposed programme of water source construction and rehabilitation over the six year programme is based on the following assumptions:

* The total number of water sources constructed under the programme will increase safe water coverage in each of the four districts to 75% by the year 2006. This calculation has been based on the medium population growth forecasts as presented in Appendix ?? and on the following design criteria:

Type of source	Number of People served
New borehole	400
Rehabilitated borehole	400
New shallow well	400
Rehabilitated shallow well	400
Hand augered well	400
Protected spring	250

These criteria give a slightly lower level of service than the criteria proposed in the Draft National Water Policy. In view of the relatively low population density in much of the programme area and the fact that many safe sources are used by well in excess of 1000 people at present the above design criteria are considered to be realistic and appropriate.

* All non-functioning boreholes will be assessed for rehabilitation potential since this is a relatively low cost option. It has been assumed that some 40% of the non-functioning boreholes will be rehabilitated.

* Drilling of deep boreholes will be restricted to areas where there are no other appropriate sources of safe water to develop or protect.

* Number/percentage of dry boreholes drilled? RC to confirm

* The estimated number of springs to be protected is based on data from the District Water Offices on number on protectable, perennial springs in each sub-county.

* The estimated number of shallow wells to be rehabilitated or protected is based on data from the District Water Offices.

* The number of hand augered and shallow motorised wells has been extrapolated in order to achieve the desired 75% coverage.

The numbers of sources shown below are purely indicative for the purposes of developing a budget cost. The actual number of each type of source to be constructed will be determined during the course of the programme and should remain flexible in the spirit of a demand-responsive approach.

Number of sources required to achieve 75% coverage by 2006

Katakwi Year	Borehole Rehab	Borehole Drilling	Spring Protection	Shallow well Rehab	Shallow well Protection	Motorised shallow well	Hand augered well
1	0	0	15	0	0	0	0
2	20	20	30	0	30	10	0
3	20	20	40	0	20	10	10
4	0		50	0			10
5	0			0			
6							
Total	***40***	***40***	***135***	***0***	***50***	***20***	***20***

Apac Year	Borehole Rehab	Borehole Drilling	Spring Protection	Shallow well Rehab	Shallow well Protection	Motorised shallow well	Hand augered well
1							
2	30	0	50	40		0	20
3	15	20	100	20		20	20
4	0	20	100	0		10	10
5		10				10	
6							
Total	***45***	***50***	***250***	***60***	***0***	***40***	***50***

Lira Year	Borehole Rehab	Borehole Drilling	Spring Protection	Shallow well Rehab	Shallow well Protection	Motorised shallow well	Hand augered well
1							
2							
3	40	50	50	30		30	50
4	40	30	100	10		30	50
5	30	20	50	0		30	20
6	0	20	0	0		30	20
Total	***110***	***120***	***200***	***40***	***0***	***120***	***140***

Kumi Year	Borehole Rehab	Borehole Drilling	Spring Protection	Shallow well Rehab	Shallow well Protection	Motorised shallow well	Hand augered well
1							
2							
3							
4	50	30	50				50
5	50	20	150			40	30

6	20	15	100			30	20
Total	*120*	*65*	*300*	*0*	*0*	*70*	*100*

Totals Year	Borehole Rehab	Borehole Drilling	Spring Protection	Shallow well Rehab	Shallow well Protection	Motorised shallow well	Hand augered well
1	0	0	15	0	0	0	0
2	50	20	80	40	30	10	20
3	75	90	190	50	20	60	80
4	90	80	300	10	0	40	120
5	80	50	200	0	0	80	50
6	20	35	100	0	0	60	40
Total	***315***	***275***	***885***	***100***	***50***	***250***	***310***

- ***Cost Sharing Arrangements***

The need to establish community ownership of water sources through cost sharing is well accepted in Uganda and most donor and NGO programmes require both financial and non-financial contributions towards the capital cost of a new or rehabilitated source. The proposed cost sharing arrangements for the different types of source to be constructed under this programme are shown below:

Type of Source	Total % capital contribution from community (labour, materials, cash)	Value of total contribution (Ush)	Cash contribution required (Ush)
New protected spring	20%	300,000	50,000
New deep borehole	1 5%	375,000	150,000
New shallow well	1 5%	250,000	100,000
New hand augered well	10%	380,000	80,000
Rehabilitated deep borehole	2%	120,000	80,000
Rehabilitated shallow well	5%	120,000	80,000

Total contributions for protected springs and hand augered wells are higher because communities can make a significant contributions in terms of unskilled labour and local materials. In the case of new wells and boreholes the requirement for local materials and unskilled labour is lower. However it is not realistic to increase the financial contributions for these technologies because the results of the field work survey indicate that most households would not be able to afford (or willing to pay) more than Ush 2000/- towards a new source.

- ***Institutional Water and Sanitation***

It is proposed that two five-stance latrines (one for boys and one for girls) will be constructed in at least 10 needy schools in each sub-county in the four districts. A hand-washing facility will be provided at each of these latrine blocks. A rainwater harvesting facility will also be constructed at 10 schools in each sub-county (not necessarily at the same location as the latrines - prioritisation will be done with the sub-county staff). Cost-sharing is not being proposed for this component of the programme since during the field work it was noted that many latrine blocks and school buildings have been left uncompleted due to lack of parental contributions. There are heavy financial demands on parents and the ownership factor is less critical for school facilities.

A two-stance latrine block (male/female) will be constructed at at least two health centres, dispensaries or sub-dispensaries in each sub-county. A hand-washing facility will be provided with each latrine block constructed. Two rainwater harvesting facilities will also be constructed at two health units in each sub-county county (not necessarily at the same location as the latrines - prioritisation will be done with the sub-county staff).

The schedule for constructing these facilities in the four districts is shown below:

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Katakwi - Schools	5-stance latrines Handwashing Rainwater catchment		100 nr 100 nr 50 nr	100 nr 100 nr 50 nr	100 nr 100 nr 50 nr		
Katakwi - Health Units	2-stance latrines Handwashing Rainwater catchment		20 nr 20 nr 10 nr	20 nr 20 nr 10 nr	20 nr 20 nr 10 nr		
Apac - Schools	5-stance latrines Handwashing Rainwater catchment		100 nr 100 nr 50 nr	200 nr 200 nr 100 nr	100 nr 100 nr 50 nr		
Apac - Health Units	2-stance latrines Handwashing Rainwater catchment		20 nr 20 nr 10 nr	40 nr 40 nr 20 nr	20 nr 20 nr 10 nr		
Lira - Schools	5-stance latrines Handwashing Rainwater catchment			100 nr 100 nr 50 nr	100 nr 100 nr 50 nr	100 nr 100 nr 50 nr	
Lira - Health Units	2-stance latrines Handwashing Rainwater catchment			20 nr 20 nr 10 nr	20 nr 20 nr 10 nr	20 nr 20 nr 10 nr	
Kumi - Schools	5-stance latrines Handwashing Rainwater catchment				100 nr 100 nr 50 nr	100 nr 100 nr 50 nr	100 nr 100 nr 50 nr
Kumi - Health Units	2-stance latrines Handwashing Rainwater catchment				20 nr 20 nr 10 nr	20 nr 20 nr 10 nr	20 nr 20 nr 10 nr

- ***Other Activities***

It is proposed that all tendering and procurement is done at district level and therefore the District Tender Boards will be required to meet at relatively frequent intervals. In order to facilitate this process a sum of money has budgeted to allow the DTB to sit when necessary.

Schedule 5 Programme Support Unit and Logistical Support Activities and Costs

ACTIVITY		Project Year						
		1	2	3	4	5	6	
Category	Unit	2,001	2,002	2,003	2,004	2,005	2,006	Total
STAFFING								
Project Management Advisor	Days	220	220	220	220	220	220	1,320
Financial/Management Systems Adviser	Days	220	220	220	0	0	0	660
Water & Sanitation Specialist (Technical)	Days	220	220	220	0	0	0	660
Water & Sanitation Specialist (Social)	Days	220	220	220	220	220	220	1,320
GoU Project Co-ordinator	Days	110	110	110	110	110	110	660
District Coordinator (Apac)	Days	220	260	260				740
District Coordinator (Katakwi)	Days	220	260	260				740
District Coordinator (Lira)	Days		130	260	130			520
District Coordinator (Kumi)	Days			130	260	130		520
Unallocated Specialist Inputs	Days	44	66	66	44	22	0	242
ACCOMMODATION & ALLOWANCES								
Housing - core long-term staff	Month	68	78	90	42	32	24	334
Rest House - Lira	Month	0	12	12	12	12	0	48
Hotels & subsistence - Kampala duty visits	Nights	50	50	50	50	50	50	300
Hotels - Fieldwork	Nights	176	286	286	143	88	88	1,067
Daily allowance (field) long term staff	Nights	176	286	286	143	88	88	1,067
Daily allowance - short term staff	Nights	62	92	92	62	31	0	339
OFFICES (PSU and district coordinators)								
PSU Office rent, running costs, security etc	Month	12	12	12	12	12	12	12
DC Offices rent, running costs, security etc	Month	24	36	48	30	12	0	150
Office equipment and supplementary furniture	Sum	1			0			1
Computers	Sum	1			1			2
TRANSPORT								
Land Rover purchase	Vehicle	6	1	1		2		10
Vehicle Running Costs	Km	120,000	140,000	160,000	160,000	160,000	160,000	900,000
Bycicle	Item	10	10	10	10	10		50
TRAINING								
Community Level Training - Materials	Lump Su	1	1	1	1	1	1	6
District Staff Training	raining Da	300	300	300	300	300	300	1,800
Workshops	Lump Su	1	1	1	1	1	1	6
SUPPORT STAFF								
Administrator (Lira)	Days	260	260	260	260	260	260	1,560
Cashier (Lira)	Days	780	780	780	780	780	780	4,680
Secretaris (Lira & districts)	Days	1,040	1,170	1,430	1,040	520	260	5,460
Drivers (Lira & districts)	Days	1,560	1,820	2,080	2,080	2 080	2,080	11,700

COSTS				Project Year								
		Unit	Cost	1	2	3	4	5	6	Total	Total
Category	Unit	Rate	Contribution	2,001	2,002	2,003	2,004	2,005	2,006	(U Shs)	(£)
STAFFING											
Project Management Advisor	£	500	DFID	110,000	110,000	110,000	110,000	110,000	110,000	0	660,000
Financial/Management Systems Adviser	£	500	DFID	110,000	110,000	110,000	0	0	0	0	330,000
Water & Sanitation Specialist (Technical)	£	420	DFID	92,400	92,400	92,400	0	0	0	0	277,200
Water & Sanitation Specialist (Social)	£	420	DFID	92,400	92,400	92,400	92,400	92,400	92,400	0	554,400
GoU Project Co-ordinator	shs ('000	20	GoU	2,200	2,200	2,200	2,200	2,200	2,200	13,200	0
District Coordinator (Apac)	shs ('000	645	DFID	141,900	167,700	167,700	0	0	0	477,300	0
District Coordinator (Katakwi)	shs ('000	645	DFID	141,900	167,700	167,700	0	0	0	477,300	0
District Coordinator (Lira)	shs ('000	645	DFID	0	83,850	167,700	83,850	0	0	335,400	0
District Coordinator (Kumi)	shs ('000	645	DFID	0	0	83,850	167,700	83,850	0	335,400	0
Unallocated Specialist Inputs	£	530	DFID	23,320	34,980	34,980	23,320	11,660	0	0	128,260
ACCOMMODATION & ALLOWANCES											
Housing core long-term staff	shs ('000	3,000	DFID	204,000	234,000	270,000	126,000	96,000	72,000	1,002,000	0
Rest House - Lira	shs (000	3,800	DFID	0	45,600	45,600	45,600	45,600	0	182,400	0
Hotels & subsistence - Kampala duty visits	Ushs ('00	170	DFID	8,500	8,500	8,500	8,500	8,500	8,500	51,000	0
Hotels - Fieldwork	shs ('000	65	DFID	11,440	16,590	18,590	9,295	5,720	5,720	69,355	0
Daily allowance (field) - long term staff	shs ('000	25	DFID	4,400	7,150	7 150	3,575	2,200	2,200	26,675	0
Daily allowance - short term staff	shs ('000	25	DFID	1,540	2,310	2,310	1,540	770	0	8,470	0
OFFICES (PSU and district coordinators)											
PSU Office rent, running costs security etc	shs ('000	5,400	DFID	64,800	64,800	64,800	64,800	64,800	64,800	388,800	0
DC Offices rent, running costs, security etc	shs (000	2,850	DFID	68,400	102,600	136,800	85,500	34,200	0	427,500	0
Office equipment and supplementary furniture	shs ('000	50,000	DFID	50,000	0	0	15,000	0	0	65,000	0
Computers	shs ('000	30,000	DFID	30,000	0	0	30,000	0	0	60,000	0
TRANSPORT											
Land Rover purchase	shs ('000	65,000	DFID	390,000	65,000	65,000	0	130,000	0	650,000	0
Vehicle Running Costs	shs (000	1	GoU	78,000	91,000	104,000	104,000	104,000	104,000	585,000	0
Bycicle	shs (000	80	DFID	800	800	800	800	800	0	4,000	0
TRAINING											
Community Level Training Materials	shs ('000	5,000	DFID	5,000	5,000	5,000	5,000	5,000	5,000	30,000	0
District Staff Training	shs ('000	100	DFID	30,000	30,000	30,000	30,000	30,000	30,000	180,000	0
Workshops	shs (000	2,000	DFID	2,000	2,000	2,000	2,000	2,000	2,000	12,000	0
SUPPORT STAFF											
Administrator (Lira)	shs ('000	78	DFID	20,280	20,280	20,280	20,280	20,280	20,280	121,680	0
Cashier (Lira)	shs (000	25	DFID	19,500	19,500	19,500	19,500	19,500	19,500	117,000	0
Secretaris (Lira & districts)	shs ('000	43	DFID	44,720	50,310	61,490	44,720	22,360	11,180	234,780	0
Drivers (Lira & districts)	shs ('000	16	DFID	24,960	29,120	33,280	33,280	33,280	33,280	187,200	0

Schedule 5 Programme Support Unit and Logistical Support Activities and Costs

OTHER ACTIVITIES								
International Travel Costs (consultant + family)	Flights	14	12	13	7	6	4	56
International Travel Costs (visiting specialists)	Flights	2	3	3	3	2	0	13
Kampala hotel/subsistence on arrival/departure	Nights	48	45	48	30	24	12	207
Personal air freight long term staff	kg	1,800	300	300	900	300	600	4,200
Visas	Visits	14	12	13	7	6	4	56

OTHER ACTIVITIES										
International Travel Costs (consultant + family	£	1 500	DFID	21,000	18,000	19,500	10,500	9,000	6,000	0	84,000
International Travel Costs (visiting specialists)	£	1,500	DFID	3,000	4,500	4 500	4,500	3,000	0	0	19,500
Kampala hotel/subsistence on arrival/departur	shs (000	125	DFID	6,000	5,625	6,000	3,750	3,000	1,500	25,875	0
Personal air freight long term staff	£	10	DFID	18,000	3 000	3,000	9,000	3,000	6,000	0	42 000
Visas	£	100	DFID	1,400	1,200	1,300	700	600	400	0	5,600
TOTAL - Ushs	shs (000)			1,350,340	1,223,635	1,490,250	906,890	714,060	382,160	6,067,335	0
TOTAL - £	£			471,520	466,480	468,080	250,420	229,660	214,800	0	2,100,960
Fixed Exchange Rate				2,380	2,380	2,380	2,380	2,380	2,380	2,380	
OVERALL TOTAL - Ushs	shs (000)			2,472,558	2,333,857	2,604,280	1,502,890	1,260,651	893,384		**11,067,620**
OVERALL TOTAL - £	£			1,038,890	980,612	1,094,235	631,466	529,685	375,371		**4,650,260**

FINANCING PLAN

Cost Contribution		Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
DFID - local		1,270,140	1,130,435	1,384,050	800,890	607,860	275,960	5,469,135
DFID - Foreign		1,122,218	1,110,222	1,114,030	596,000	546,591	511,224	5,000,285
GoU		80,200	93,200	106,200	106,200	106,200	106,200	598,200
District		0	0	0	0	0	0	0
NGO/CBO		0	0	0	0	0	0	0
Private Sector		0	0	0	0	0	0	0
Community		0	0	0	0	0	0	0
	Total	2,472,558	2,333,857	2,604,280	1,502,890	1,260,651	893,384	11,067,620

Cost Contribution		Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
DFID local		533,672	474,973	581,534	336,424	255,403	115,950	2,297,956
DFID - Foreign		471,520	466,480	468,080	250,420	229,660	214,800	2,100,960
GoU		33,697	39,160	44,622	44,622	44,622	44,622	251,345
District		0	0	0	0	0	0	0
NGO/CBO		0	0	0	0	0	0	0
Private Sector		0	0	0	0	0	0	0
Community		0	0	0	0	0	0	0
	Total	1,038,890	980,612	1,094,235	631,466	529,685	375,371	4,650,260

Disbursement Category	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
International staff & equipment foreign currency costs	1,122,218	1,110,222	1,114,030	596,000	546,591	511,224	5,000,285
Local staff and other local currency staff associated costs	844,540	1,029,835	1,283,450	765,090	442,260	241,160	4,606,335
Training and extension (excl staff costs)	37,000	37,000	37,000	37,000	37,000	37,000	222,000
Vehicles and equipment	468,800	156,800	169,800	104,800	234,800	104,000	1,239,000
Infrastructure developments	0	0	0	0	0	0	0
Infrastructure maintenance	0	0	0	0	0	0	0
Total	2,472,558	2,333,857	2,604,280	1,502,890	1,260,651	893,384	11,067,620

Disbursement Category	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
International staff & equipment foreign currency costs	471,520	466,480	468,080	250,420	229,660	214,800	2,100,960
Local staff and other local currency staff associated costs	354,849	432 704	539,285	321 466	185,824	101,328	1,935,435
Training and extension (excl staff costs)	15,546	15,546	15,546	15,548	15,546	15,546	93,277
Vehicles and equipment	196,975	65,882	71,345	44,034	98,655	43,697	520,588
Infrastructure developments	0	0	0	0	0	0	0
Infrastructure maintenance	0	0	0	0	0	0	0

Schedule 5 Programme Support Unit and Logistical Support Activities and Costs

Total	1 038 890	980,612	1,094,235	631 468	529,685	375,371	4,650,260

Schedule 6: 4 Districts Water, Hygiene and Sanitiation Programme Costs Summary (1999 Prices)

COMPONENT	Project Year 1 2001 Ushs ('000)	2 2002 Ushs ('000)	3 2003 Ushs ('000)	4 2004 Ushs ('000)	5 2005 Ushs ('000)	6 2006 Ushs ('000)	Total Ushs ('000)
HYGIENE AND SANITATION	471,056	551,918	558,228	375,258	273,238	222,988	2,452,686
COMMUNITY DEVELOPMENT	462,779	598,859	627,219	639,819	622,479	496,639	3,447,794
CAPACITY BUILDING	2,045,909	2,031,909	1,548,841	1,452,621	1,452,621	1,452,621	9,984,522
INFRASTRUCTURE DEVELOPMENT	859,402	2,839,344	5,844,050	5,442,362	4,024,103	3,011,298	22,020,559
PROGRAME SUPPORT UNIT	2,472,558	2,333,857	2,604,280	1,502,890	1,260,651	893,384	11,067,620
TOTAL COST	6,311,704	8,355,888	11,182,618	9,412,949	7,633,092	6,076,930	48,973,181

COMPONENT	Project Year 1 2001 (£)	2 2002 (£)	3 2003 (£)	4 2004 (£)	5 2005 (£)	6 2006 (£)	Total (£)
HYGIENE AND SANITATION	197,923	231,898	234,550	157,671	114,806	93,692	1,030,540
COMMUNITY DEVELOPMENT	194,445	251,621	263,537	268,832	261,546	208,672	1,448,653
CAPACITY BUILDING	859,626	853,743	650,774	610,345	610,345	610,345	4,195,177
INFRASTRUCTURE DEVELOPMENT	361,093	1,193,002	2,455,483	2,286,707	1,690,800	1,265,251	9,252,336
PROGRAME SUPPORT UNIT	1,038,890	980,612	1,094,235	631,466	529,685	375,371	4,650,260
TOTAL COST	2,651,976	3,510,877	4,698,579	3,955,021	3,207,182	2,553,332	20,576,967

Schedule 7: 4 Districts Water, Hygiene and Sanitiation Programme Financing Plan (1999 Prices)

Cost Contribution	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
DFID - local	3,968,979	5,566,763	8,285,743	7,198,996	5,729,218	4,414,081	35,163,780
DFID - Foreign	2,041,564	2,223,063	1,809,133	1,118,219	866,082	787,780	8,845,841
GoU	91,660	230,420	529,380	501,660	440,700	323,460	2,117,280
District	128,135	176,115	221,205	201,435	175,060	144,870	1,046,820
NGO/CBO	40,000	40,000	40,000	40,000	40,000	40,000	240,000
Private Sector	40,000	40,000	40,000	40,000	40,000	40,000	240,000
Community	1,366	79,527	257,157	312,639	342,032	326,739	1,319,460
Total	6,311,704	8,355,888	11,182,618	9,412,949	7,633,092	6,076,930	48,973,181

Cost Contribution	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
DFID - local	1,667,638	2,338,976	3,481,405	3,024,788	2,407,234	1,854,656	14,774,697
DFID - Foreign	857,800	934,060	760,140	469,840	363,900	331,000	3,716,740
GoU	38,513	96,815	222,429	210,782	185,168	135,908	889,613
District	53,838	73,998	92,943	84,637	73,555	60,870	439,840
NGO/CBO	16,807	16,807	16,807	16,807	16,807	16,807	100,840
Private Sector	16,807	16,807	16,807	16,807	16,807	16,807	100,840
Community	574	33,415	108,049	131,361	143,711	137,285	554,395
Total	2,651,976	3,510,877	4,698,579	3,955,021	3,207,182	2,553,332	20,576,967

% Cost Contribution (Ushs)	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total
DFID - local	62 88%	66 62%	74 09%	76 48%	75 06%	72 64%	71 80%
DFID - Foreign	32 35%	26 60%	16 18%	11 88%	11 35%	12 96%	18 06%
GoU	1 45%	2 76%	4 73%	5 33%	5 77%	5 32%	4 32%
District	2 03%	2 11%	1 98%	2 14%	2 29%	2 38%	2 14%
NGO/CBO	0 63%	0 48%	0 36%	0 42%	0 52%	0 66%	0 49%
Private Sector	0 63%	0 48%	0 36%	0 42%	0 52%	0 66%	0 49%
Community	0 02%	0 95%	2 30%	3 32%	4 48%	5 38%	2 69%
Total	100 00%	100 00%	100 00%	100 00%	100 00%	100 00%	100 00%

Disbursement Category	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
International staff & equipment foreign curre	2,041,564	2,223,063	1,809,133	1,118,219	866,082	787,780	8,845,841
Local staff and other local currency staff ass	1,319,675	1,798,935	2,136,685	1,559,725	1,004,425	738,155	8,557,600
Training and extension (excl. staff costs)	1,621,275	1,667,270	1,668,910	1,686,905	1,634,385	1,594,965	9,873,710
Vehicles and equipment	1,268,150	864,500	659,120	368,850	549,400	363,800	4,073,820
Infrastructure developments	60,500	1,771,500	4,809,850	4,514,250	3,361,100	2,345,000	16,862,200
Infrastructure maintenance	540	30,620	98,920	165,000	217,700	247,230	760,010
Total	6,311,704	8,355,888	11,182,618	9,412,949	7,633,092	6,076,930	48,973,181

Disbursement Category	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
International staff & equipment foreign curre	857,800	934,060	760,140	469,840	363,900	331,000	3,716,740
Local staff and other local currency staff ass	554,485	755,855	897,767	655,347	422,027	310,149	3,595,630
Training and extension (excl staff costs)	681,208	700,534	701,223	708,784	686,716	670,153	4,148,618
Vehicles and equipment	532,836	363,235	276,941	154,979	230,840	152,857	1,711,689
Infrastructure developments	25,420	744,328	2,020,945	1,896,744	1,412,227	985,294	7,084,958
Infrastructure maintenance	227	12,866	41,563	69,328	91,471	103,878	319,332
Total	2,651,976	3,510,877	4,698,579	3,955,021	3,207,182	2,553,332	20,576,967

Schedule 8: 4 Districts Water, Hygiene and Sanitiation Programme Financing Plan (Current Prices)

Cost Contribution	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
DFID - local	4,101,402	5,879,745	8,945,189	7,943,874	6,461,867	5,088,683	38,420,760
DFID - Foreign	2,109,679	2,348,051	1,953,119	1,233,921	976,836	908,176	9,529,782
GoU	94,718	243,375	571,512	553,567	497,057	372,894	2,333,123
District	132,410	186,017	238,810	222,277	197,447	167,010	1,143,972
NGO/CBO	41,335	42,249	43,184	44,139	45,115	46,113	262,134
Private Sector	41,335	42,249	43,184	44,139	45,115	46,113	262,134
Community	1,411	83,998	277,624	344,988	385,771	376,674	1,470,466
Total	6,522,290	8,825,684	12,072,622	10,386,904	8,609,208	7,005,663	53,422,371

Cost Contribution	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
DFID - local	1,723,278	2,470,481	3,758,483	3,337,762	2,715,070	2,138,102	16,143,176
DFID - Foreign	886,420	986,576	820,638	518,454	410,435	381,587	4,004,110
GoU	39,798	102,258	240,131	232,591	208,847	156,678	980,304
District	55,635	78,158	100,340	93,394	82,961	70,172	480,660
NGO/CBO	17,367	17,752	18,144	18,546	18,956	19,375	110,140
Private Sector	17,367	17,752	18,144	18,546	18,956	19,375	110,140
Community	593	35,293	116,649	144,953	162,089	158,266	617,843
Total	2,740,458	3,708,271	5,072,530	4,364,245	3,617,314	2,943,556	22,446,374

% Cost Contribution (Ushs)	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total
DFID - local	62 88%	66 62%	74 09%	76 48%	75 06%	72 64%	71 92%
DFID - Foreign	32 35%	26 60%	16 18%	11 88%	11 35%	12 96%	17 84%
GoU	1 45%	2 76%	4 73%	5 33%	5 77%	5.32%	4 37%
District	2 03%	2 11%	1 98%	2 14%	2 29%	2 38%	2 14%
NGO/CBO	0 63%	0 48%	0 36%	0 42%	0 52%	0 66%	0 49%
Private Sector	0 63%	0 48%	0 36%	0 42%	0 52%	0 66%	0 49%
Community	0 02%	0 95%	2 30%	3 32%	4 48%	5 38%	2 75%
Total	100 00%	100 00%	100 00%	100 00%	100 00%	100 00%	100 00%

Disbursement Category	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total Ushs ('000)
International staff & equipment foreign curre	2,109,679	2,348,051	1,953,119	1,233,921	976,836	908,176	9,529,782
Local staff and other local currency staff ass	1,363,705	1,900,077	2,306,740	1,721,109	1,132,870	850,967	9,275,468
Training and extension (excl staff costs)	1,675,368	1,761,010	1,801,735	1,861,449	1,843,389	1,838,722	10,781,673
Vehicles and equipment	1,310,461	913,105	711,578	407,015	619,657	419,399	4,381,215
Infrastructure developments	62,519	1,871,100	5,192,657	4,981,338	3,790,916	2,703,385	18,601,914
Infrastructure maintenance	558	32,342	106,793	182,072	245,539	285,014	852,318
Total	6,522,290	8,825,684	12,072,622	10,386,904	8,609,208	7,005,663	53,422,371

Disbursement Category	Project Year 1 2001	2 2002	3 2003	4 2004	5 2005	6 2006	Total (£)
International staff & equipment foreign curre	886,420	986,576	820,638	518,454	410,435	381,587	4,004,110
Local staff and other local currency staff ass	572,985	798,352	969,218	723,155	475,996	357,549	3,897,256
Training and extension (excl staff costs)	703,936	739,920	757,032	782,121	774,533	772,572	4,530,115
Vehicles and equipment	550,614	383,658	298,982	171,015	260,360	176,218	1,840,847
Infrastructure developments	26,268	786,176	2,181,789	2,092,999	1,592,822	1,135,876	7,815,930
Infrastructure maintenance	234	13,589	44,871	76,501	103,168	119,754	358,117
Total	2,740,458	3,708,271	5,072,530	4,364,245	3,617,314	2,943,556	22,446,374

Benefit Cost Analysis

Sheet 1

Summary		10%	Discount Rate	
	FIRR	n/a		
	AIC operating	0 85	UShs/m3	
	EIRR	30 5%		
	AIC economic	0 75	UShs/m3	

Key to Programme Costs	
1	International staff & equipment foreign currency costs
2	Local staff and other local currency staff associated costs
3	Training and extension (excl staff costs)
4	Vehicles and equipment
5	Infrastructure developments

FIRR Calculation	1999 Prices			2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2020	2025	2030
Incremental Water	Clean water collected	Th m3/d		86	2097	6611	11434	14954	16943	16943	16943	16943	16943	16943	16943	16943	16943	16943	16943	16943	16943
	Clean water collected	Th m3/an		31286	765457	2413171	4173514	5458314	6184143	6184143	6184143	6184143	6184143	6184143	6184143	6184143	6184143	6184143	6184143	6184143	6184143
	Clean water collected	M m3/an		31 29	765 46	2413 17	4173 51	5458 31	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14
	Discounted flow	10%	43,214 07																		
			Totals																		
Costs	Programme Costs	1	8,845 84	2041 56	2223 06	1809 13	1118 22	866 08	787 78												
		2	8,557 60	1319 68	1798 94	2136 69	1559 73	1004 43	738 16												
		3	9,873 71	1621 28	1667 27	1668 91	1686 91	1634 39	1594 97												
		4	4,073 82	1268 15	864 50	659 12	368 85	549 40	363 80												
		5	16,862 20	60 50	1771 50	4809 85	4514 25	3361 10	2345 00												
			48,213 17																		
	Maintenance Costs			0 54	30 62	98 92	165 00	217 70	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23
	Maintenance and major repairs	Ushs Mn/a		0 54	30 62	98 92	165 00	217 70	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23
	Other Expenses	Ushs Mn/a		0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
	Net costs	10%	36,883 96	6311 70	8355 89	11182 62	9412 95	7833 09	6076 93	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23	247 23
	Average operating cost per m3			0 05	0 11	0 11	0 11	0 11	0 11	0 11	0 11	0 11	0 11	0 11	0 11	0 11	0 11	0 11	0 11	0 11	0 11
	AIC (operating)	UShs/m3	0 85																		
	Net cash flow	FIRR	#DIV/0!	-6311 70	-8355 89	-11182 62	-9412 95	-7833 09	-6076 93	-247 23	-247 23	-247 23	-247 23	-247 23	-247 23	247 23	-247 23	-247 23	-247 23	247 23	-247 23
	NPV	10%	- 36,883 96																		

Benefit Cost Analysis

Benefit Cost Analysis

Sheet 2

EIRR Calculation (Ushs Million)			
Price adjustment factors for financial to economic conversion			
Item	Market Adjustment	Tax Adjustment	Conversion Factor
1	1 00	1 00	1 00
2	1 00	1 00	1 00
3	1 00	1 00	1 00
4	1 00	0 73	0 73
5	1 00	0 73	0 73
Maintenance and majo	1 00	0 73	0 73

Key to Programme Costs	
1 00	International staff & equipment foreign currency costs
2 00	Local staff and other local currency staff associated costs
3 00	Training and extension (excl staff costs)
4 00	Vehicles and equipment
5 00	Infrastructure developments

Benefit-Cost Analysis

				2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2020	2025	2030
Benefits	Clean water collected	Mm3/a		31 29	765 46	2413 17	4173 51	5458 31	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14	6184 14
	Value of time saved annually	Ushs (M)		61 10	1495 03	4713 23	8151 40	10660 77	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40
	Other quantifiable benefits	Ushs (M)		0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
	Total quantifiable benefits	Ushs (M)		61 10	1495 03	4713 23	8151 40	10660 77	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40	12078 40
			Conversions																		
Costs	1	Ushs (M)	1 00	2041 56	2223 06	1809 13	1118 22	866 08	787 78	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
	2	Ushs (M)	1 00	1319 68	1798 94	2138 69	1559 73	1004 43	738 16	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
	3	Ushs (M)	1 00	1621 28	1667 27	1668 91	1686 91	1634 39	1594 97	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
	4	Ushs (M)	0 73	932 02	635 36	484 42	271 08	403 78	267 37	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
	5	Ushs (M)	0 73	44 46	1301 95	3534 97	3317 72	2470 22	1723 44	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
	Maintenance and major repairs	Ushs (M)	0 73	0 40	22 50	72 70	121 27	160 00	181 70	181 70	181 70	181 70	181 70	181 70	181 70	181 70	181 70	181 70	181 70	181 70	181 70	181 70
	Other Expenses	Ushs (M)	0 73	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
	Total economic costs	10%	32506 58	5959 39	7649 08	9706 81	8074 91	6538 88	5293 41	181 70	181 70	181 70	181 70	181 70	181 70	181 70	181 70	181 70	181 70	181 70	181 70
		AIC	0 75																		
	Benefits - Costs	EIRR	30 5%	-5898 29	-6154 05	-4993 58	76 48	4121 89	6784 99	11896 70	11896 70	11896 70	11896 70	11896 70	11896 70	11896 70	11896 70	11896 70	11896 70	11896 70	11896 70	11896 70

Sensitivity Analysis

NPV @	10%	51895 91
NPV @	12%	38619 19

			Change in Parameter				Switching Value	
Sensitivity	EIRR	Parameter	+10%	+5%	-5%	-10%	@10%	@12%
		Benefits	33 8%	32 1%	28 8%	27 2%	81 0%	55 0%
		Programme costs	27 5%	28 9%	32 2%	34 1%	265 0%	230 0%
		Maintenance costs	30 4%	30 5%	30 5%	30 5%	n/a	n/a

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