Appendix-7

Result of Hydraulic Calculation

Hydraulic Calculation of Transmission Pipelines

RGC/Source Borehole	Water Demand		Operation Hours	Design Discharge			Actual Head					Head Loss								Head Loss in Elevated Tank Yard (4) (m)	Total Head of Motor Pump (1)+(2) +(3)+(4) (m)
												Riser Pipe				Transmission Pipeline					
	Water Demand (m3/day)	Allocated Demand (m3/day)		Discharge (m3/hr)	Discharge (m3/min)	Discharge (m3/sec)	Elevated Tank GL (m)	Elevated Tank HWL (m)	Borehole GL (m)	Borehole LWL (m)	Actual Head (1) (m)	Velocity Coefficient	Pipe Diameter (mm)	Length* (m)	Head Loss (2) (m)	Velocity Coefficient	Pipe Diameter (m)	Length (m)	Head Loss (3)** (m)		
1. Nambale																					
I-03-NBH-1	50	50	6	8.40	0.140	0.0023	1,112.70	1,133.10	1,106.17	1,070.07	63.03	110	80	40.0	0.40	110	0.1446	1,276.70	0.37	1.00	64.80
I-03-NBH-2			Stand-by	2.60	0.043	0.0007	1,112.70	1,133.10	1,108.10	1,082.12	50.98	110	80	30.0	0.04	110	0.1446	1,055.70	0.03	1.00	52.06
2. Lambala																					
I-06-NBH-1.	47	47	6	7.80	0.131	0.0022	1,085.40	1,109.00	1,175.50	1,045.38	63.62	110	80	35.0	0.32	110	0.0814	483	2.11	1.00	67.05
3. Naigobya																					
JTB-06	46	46	13	3.53	0.059	0.0010	1,094.60	1,108.40	1,067.20	1,041.27	67.13	110	50	30.0	0.33	110	0.0536	1,035.00	8.04	1.00	76.50
4.Kyamvuma																					
I-06-NBH-2	88	88	6	14.70	0.245	0.0041	1,122.90	1,141.50	1,082.50	1,043.62	97.88	110	80	45.0	1.30	110	0.1242	4,872.00	8.60	1.00	108.78
5.Kasassira									1065.9												
DWD55991	271	271	16	17.00	0.283	0.0047	1,076.30	1,097.50	1,065.90	1,035.41	62.09	110	80	35.0	1.30	110	0.0936	1,265.00	11.40	1.00	75.79
6. Kameke																					
JTB-11	42	42	6	7.00	0.117	0.0020	1,117.10	1,135.90	1,099.30	1,062.18	73.72	110	50	45.0	1.77	110	0.0936	1,920.00	3.56	1.00	80.05
7. Kapala																					
P-04-NBH-1	74	56	7	8.00	0.133	0.0022	-	1,057.50	1,056.40	1,027.84	29.66	110	80	35.0	0.32	110	0.0536	81.70	2.73	-	32.71
P-04-NBH-2		18	7	2.57	0.043	0.0008	-	1,057.70	1,056.70	1,031.81	25.89	110	80	35.0	0.05	110	0.0936	181.60	0.60	-	26.54
Junction Pipe		74	7	10.57	0.176	0.0030	1,070.10	1,088.60	-	1,057.00	31.60	-	-	-	-	110	0.0936	2,740.20	10.76	1.00	43.36
8. Buseta																					
P^05-NBH-1	61	61	6	10.16	0.170	0.0028	1,073.80	1,094.80	1,074.80	1,049.93	44.87	110	80	30.0	0.43	110	0.0814	862.00	5.88	1.00	52.18
9. Kidetok																					
JTB-17	108	36	6	6.00	0.100	0.0017	-	1,066.86	1,055.50	1,027.70	39.16	110	50	35.0	1.02	110	0.0766	558.00	2.03	-	42.21
JTB-18		72	6	12.00	0.200	0.0033	-	1,088.86	1,061.30	1,029.54	59.32	110	50	40.0	3.97	110	0.0936	799.00	3.74	-	67.03
Junction Pipe		108	6	18.00	0.300	0.0050	1,090.60	1,111.80	-	1,088.86	22.94	-	-	-	-	110	0.136	1,445.20	2.37	1.00	26.31

Note:

*: The water source of which diameter is 5in shall have riser pipes of DN50mm, and the others DN80mm.

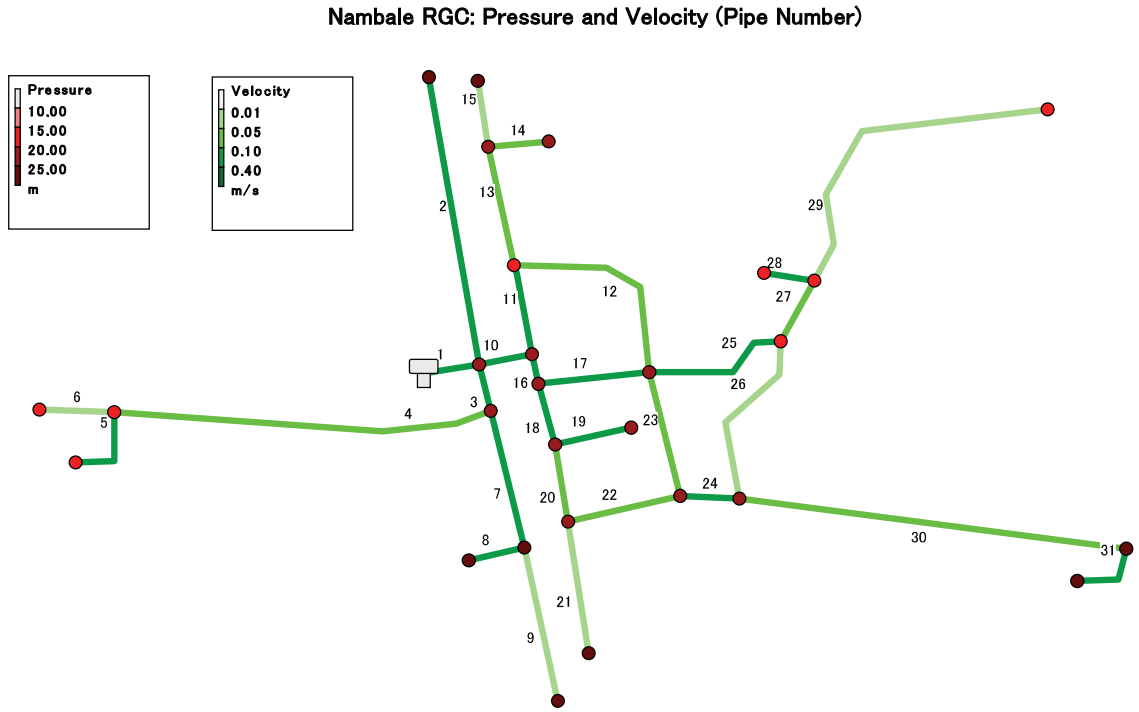
**: The following Hazen-Williams Equation is applied for calculating head loss in pipelines.

$Hp = 10.666 \cdot C^{-1.85} \cdot D^{-4.87} \cdot Q^{1.85} \cdot L$

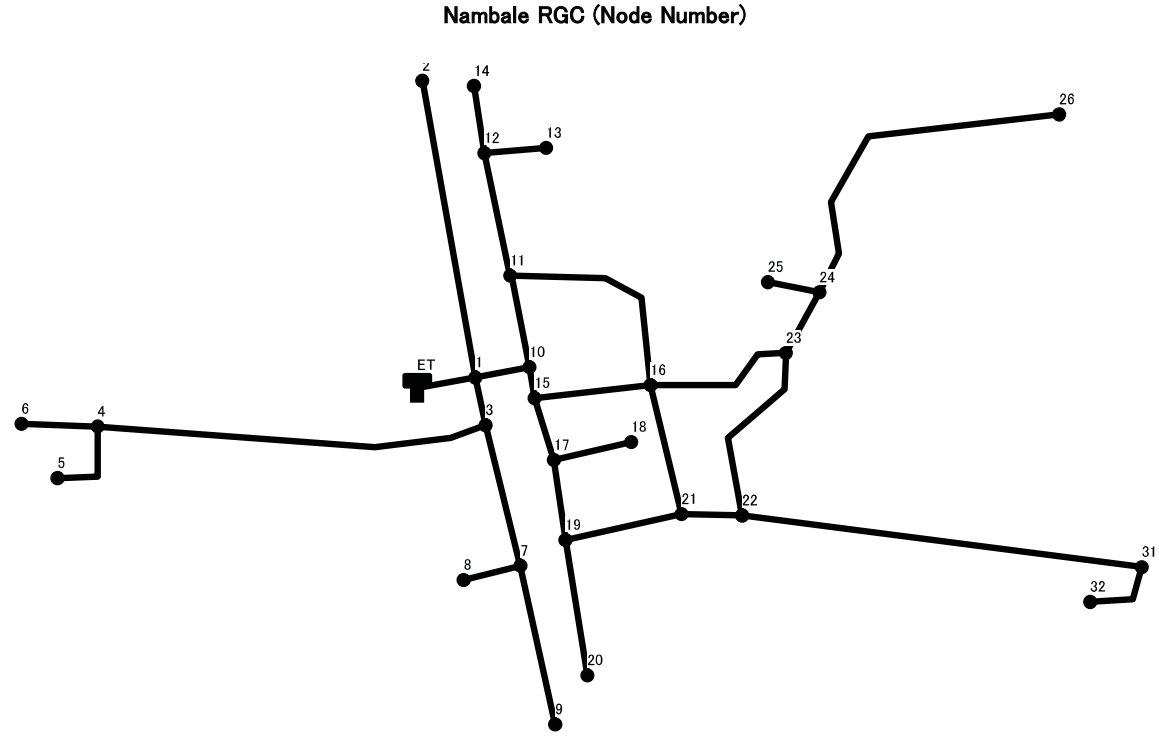
where;
C: Velocity Coefficient
D: Diameter of pipe (m)
Q: Discharge (m3/sec)
L: Length of pipeline (m)
Hp: Head loss (m)

Hydraulic Calculatioon of Distribution Pipelines

1. Nambale RGC



1 Nambale Page 1



1 Nambale Page 1

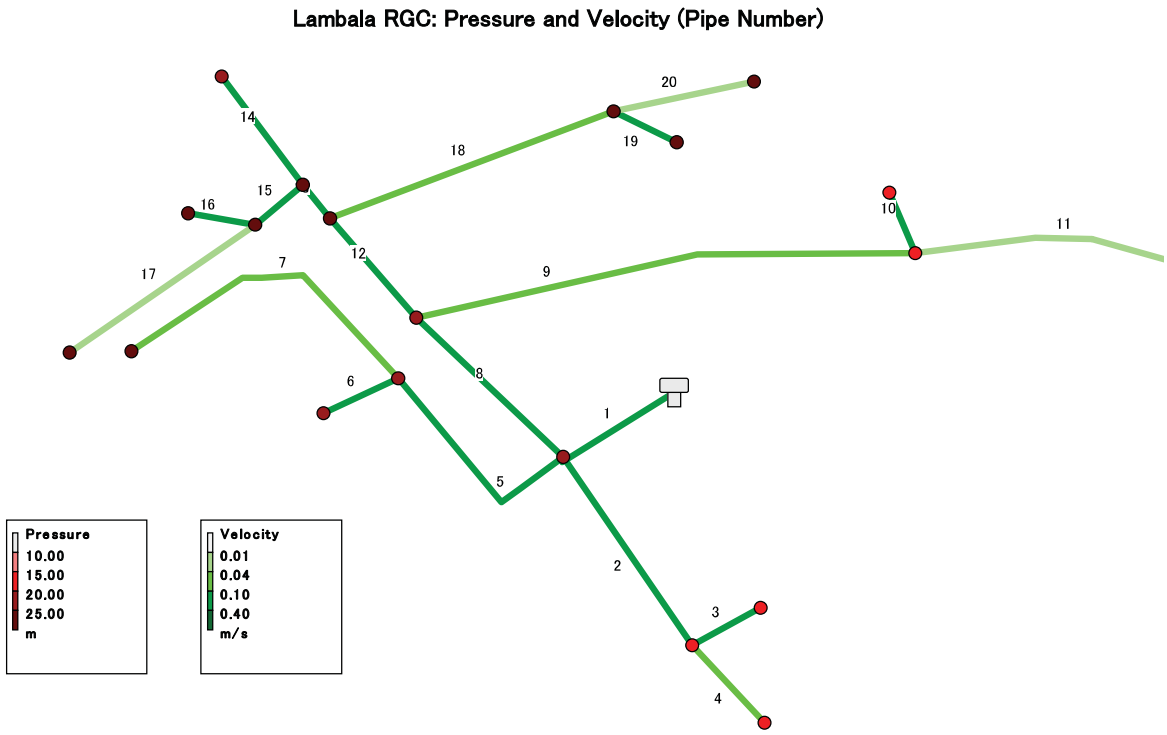
Nambale RGC : Network Table - Links

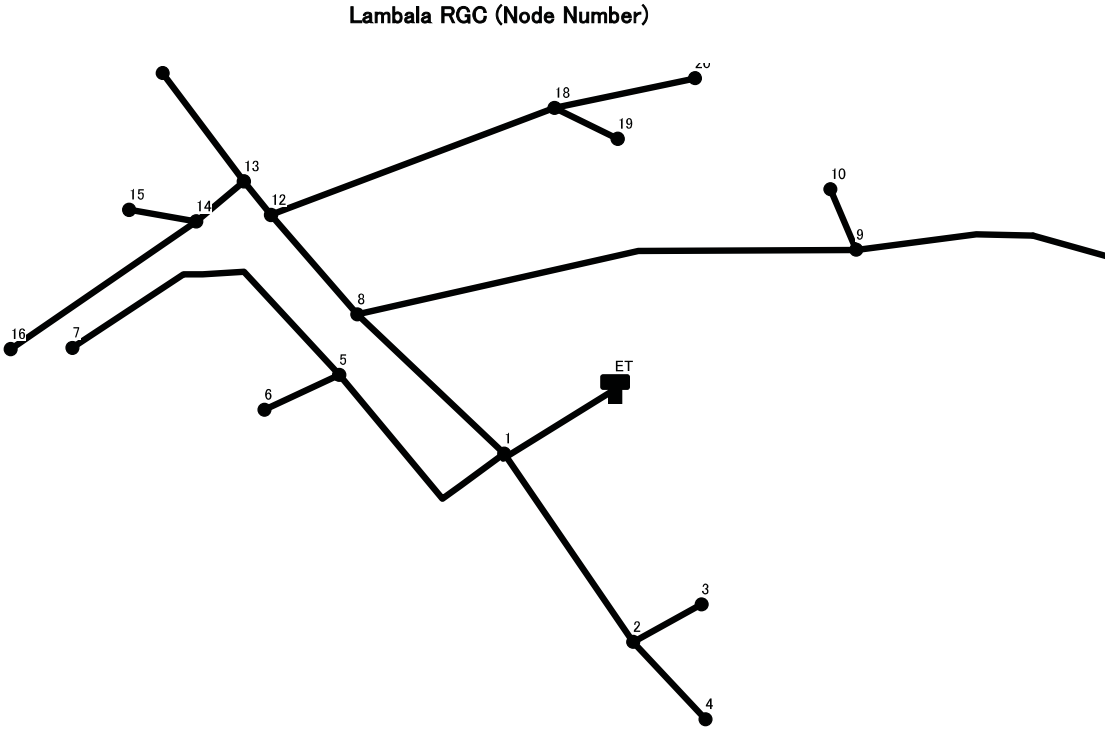
Link ID	Length(m)	Diameter(mm)	Roughness	Flow(CMD)	Velocity(m/s)	Unit Head loss(m/km)
Pipe1	12.70	99.40	110.00	200.12	0.30	1.78
Pipe2	567.40	57.00	110.00	27.28	0.12	0.67
Pipe3	69.00	81.40	110.00	58.88	0.13	0.49
Pipe4	601.50	81.40	110.00	32.28	0.07	0.16
Pipe5	6.10	28.40	110.00	8.88	0.16	2.48
Pipe6	13.80	57.00	110.00	5.88	0.03	0.04
Pipe7	173.10	57.00	110.00	22.60	0.10	0.47
Pipe8	13.70	28.40	110.00	9.40	0.17	2.76
Pipe9	223.20	57.00	110.00	4.68	0.02	0.03
Pipe10	30.10	81.40	110.00	109.96	0.24	1.56
Pipe11	76.70	57.00	110.00	32.71	0.15	0.93
Pipe12	187.80	57.00	110.00	11.71	0.05	0.14
Pipe13	249.90	57.00	110.00	17.00	0.08	0.28
Pipe14	1.70	28.40	110.00	5.40	0.10	0.96
Pipe15	235.70	57.00	110.00	5.36	0.02	0.03
Pipe16	20.30	81.40	110.00	73.25	0.16	0.73
Pipe17	102.10	57.00	110.00	30.34	0.14	0.81
Pipe18	53.80	57.00	110.00	38.91	0.18	1.29
Pipe19	11.20	28.40	110.00	14.76	0.27	6.37
Pipe20	84.00	57.00	110.00	20.15	0.09	0.38
Pipe21	300.40	57.00	110.00	4.68	0.02	0.03
Pipe22	100.80	57.00	110.00	11.47	0.05	0.13
Pipe23	135.10	57.00	110.00	−15.56	0.07	0.24
Pipe24	92.50	57.00	110.00	23.04	0.10	0.49
Pipe25	170.90	57.00	110.00	22.48	0.10	0.47
Pipe26	183.10	57.00	110.00	3.48	0.02	0.01
Pipe27	29.60	57.00	110.00	18.76	0.09	0.33
Pipe28	1.30	28.40	110.00	6.08	0.11	1.20
Pipe29	182.80	57.00	110.00	8.68	0.04	0.08
Pipe30	368.50	57.00	110.00	18.76	0.09	0.33
Pipe31	28.50	28.40	110.00	14.76	0.27	6.37

Nambale RGC : Network Table - Nodes

Node ID	Elevation(m)	Base Demand(CMD)	Demand(CMD)	Head(m)	Pressure(m)
Junc1	1112.72	1.00	4.00	1133.09	20.37
Junc2	1099.72	6.82	27.28	1132.71	32.99
Junc3	1112.56	1.00	4.00	1133.05	20.49
Junc4	1116.49	4.38	17.52	1132.96	16.47
Junc5	1116.76	2.22	8.88	1132.94	16.18
Junc6	1116.60	1.47	5.88	1132.96	16.36
Junc7	1106.69	2.13	8.52	1132.97	26.28
Junc8	1106.74	2.35	9.40	1132.93	26.19
Junc9	1096.77	1.17	4.68	1132.97	36.20
Junc10	1112.59	1.00	4.00	1133.04	20.45
Junc11	1113.06	1.00	4.00	1132.97	19.91
Junc12	1110.27	1.56	6.24	1132.90	22.63
Junc13	1109.86	1.35	5.40	1132.90	23.04
Junc14	1099.72	1.34	5.36	1132.89	33.17
Junc15	1112.41	1.00	4.00	1133.03	20.62
Junc16	1112.00	1.00	4.00	1132.94	20.94
Junc17	1111.88	1.00	4.00	1132.96	21.08
Junc18	1112.18	3.69	14.76	1132.89	20.70
Junc19	1110.47	1.00	4.00	1132.92	22.46
Junc20	1097.04	1.17	4.68	1132.92	35.88
Junc21	1111.11	1.00	4.00	1132.91	21.80
Junc22	1110.06	0.20	0.80	1132.87	22.81
Junc23	1113.82	1.80	7.20	1132.86	19.04
Junc24	1114.16	1.00	4.00	1132.85	18.69
Junc25	1114.16	1.52	6.08	1132.85	18.69
Junc26	1113.59	2.17	8.68	1132.84	19.25
Junc31	1106.66	1.00	4.00	1132.74	26.08
Junc32	1106.13	3.69	14.76	1132.56	26.43
Tank ET	1132.70	#N/A	−200.12	1133.11	0.41

2. Lambala RGC





Lambala RGC : Network Table - Links

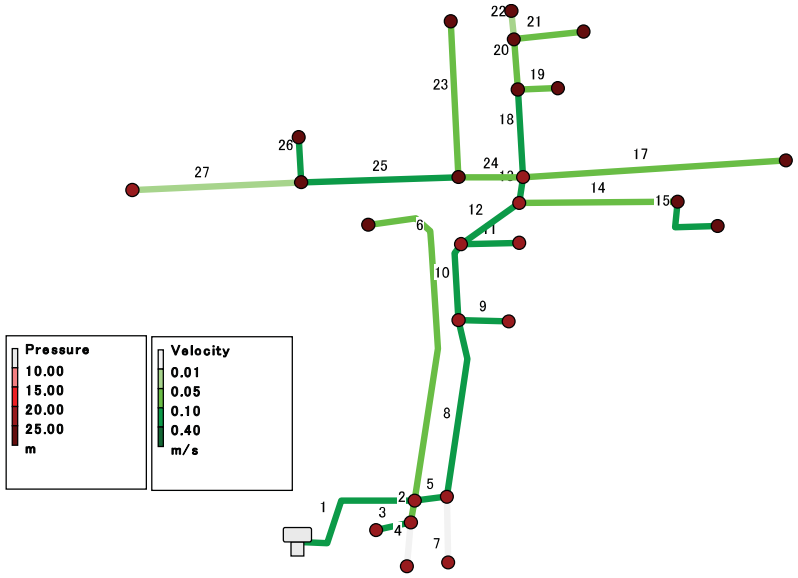
Link ID	Length(m)	Diameter(mm)	Roughness	Flow(CMD)	Velocity(m/s)	Unit Head loss(m/km)
Pipe1	87.70	99.40	110.00	188.12	0.28	1.59
Pipe2	394.30	57.00	110.00	24.16	0.11	0.53
Pipe3	2.90	28.40	110.00	10.08	0.18	3.16
Pipe4	0.40	57.00	110.00	10.08	0.05	0.19
Pipe5	108.90	57.00	110.00	29.60	0.13	0.78
Pipe6	2.40	28.40	110.00	8.08	0.15	2.08
Pipe7	255.40	57.00	110.00	17.52	0.08	0.29
Pipe8	106.00	99.40	110.00	127.64	0.19	0.77
Pipe9	345.60	81.40	110.00	26.88	0.06	0.11
Pipe10	19.50	28.40	110.00	10.08	0.18	3.14
Pipe11	169.40	81.40	110.00	10.08	0.02	0.02
Pipe12	137.50	81.40	110.00	96.76	0.22	1.23
Pipe13	30.00	81.40	110.00	69.88	0.16	0.67
Pipe14	206.90	57.00	110.00	41.72	0.19	1.47
Pipe15	16.70	57.00	110.00	24.16	0.11	0.53
Pipe16	210.20	28.40	110.00	12.08	0.22	4.39
Pipe17	132.40	57.00	110.00	8.08	0.04	0.07
Pipe18	241.10	57.00	110.00	20.16	0.09	0.38
Pipe19	4.00	28.40	110.00	9.12	0.17	2.60
Pipe20	79.20	57.00	110.00	7.04	0.03	0.05

Lambala RGC : Network Table - Nodes

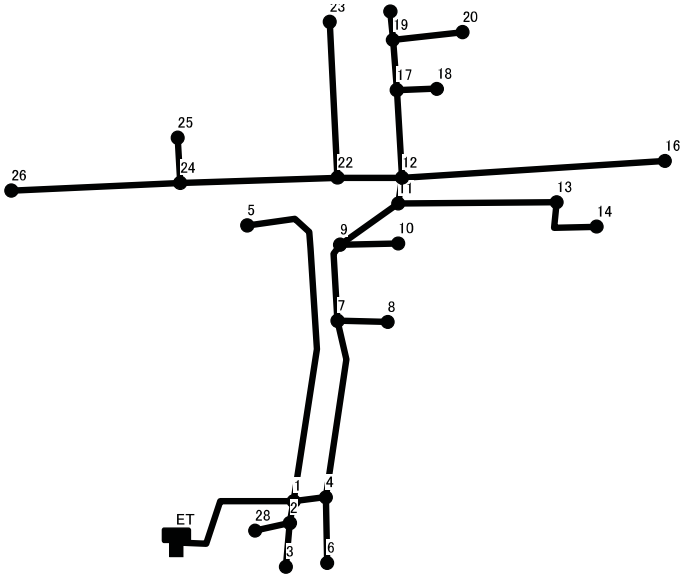
Node ID	Elevation(m)	Base Demand(CMD)	Demand(CMD)	Head(m)	Pressure(m)
Junc1	1081.07	1.68	6.72	1105.67	24.60
Junc2	1086.84	1.00	4.00	1105.46	18.62
Junc3	1086.91	2.52	10.08	1105.45	18.54
Junc4	1086.84	2.52	10.08	1105.46	18.62
Junc5	1081.02	1.00	4.00	1105.59	24.57
Junc6	1081.02	2.02	8.08	1105.58	24.56
Junc7	1073.76	4.38	17.52	1105.51	31.75
Junc8	1081.28	1.00	4.00	1105.59	24.31
Junc9	1089.03	1.68	6.72	1105.55	16.52
Junc10	1088.56	2.52	10.08	1105.49	16.93
Junc11	1092.24	2.52	10.08	1105.55	13.31
Junc12	1076.21	1.68	6.72	1105.42	29.21
Junc13	1075.49	1.00	4.00	1105.40	29.91
Junc14	1075.06	1.00	4.00	1105.39	30.34
Junc15	1074.90	3.02	12.08	1104.47	29.57
Junc16	1073.84	2.02	8.08	1105.38	31.54
Junc17	1080.12	10.43	41.72	1105.10	24.98
Junc18	1076.95	1.00	4.00	1105.33	28.38
Junc19	1076.95	2.28	9.12	1105.32	28.37
Junc20	1077.54	1.76	7.04	1105.32	27.78
Tank ET	1105.40	#N/A	−188.12	1105.81	0.41

3. Naigobya RGC

Naigobya RGC: Pressure and Velocity (Pipe Number)



Naigobya RGC (Node Number)



Naigobia RGC : Network Table - Links

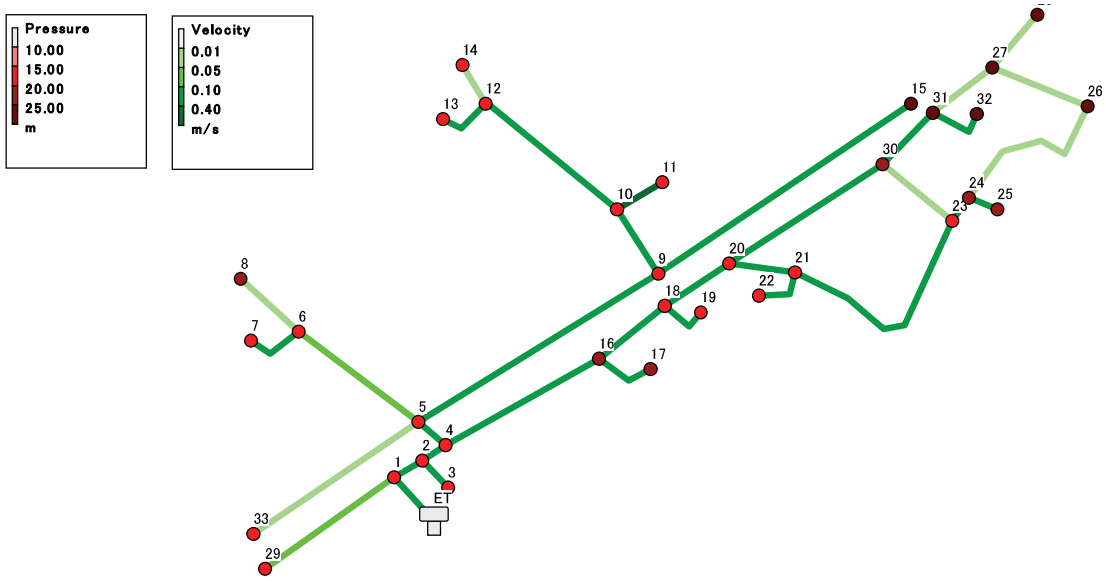
Link ID	Length(m)	Diameter(mm)	Roughness	Flow(CMD)	Velocity(m/s)	Unit Head loss(m/km)
Pipe1	324.00	99.40	110.00	183.92	0.27	1.52
Pipe2	16.50	57.00	110.00	16.04	0.07	0.25
Pipe3	3.30	28.40	110.00	10.24	0.19	3.25
Pipe4	123.70	57.00	110.00	1.80	0.01	0.00
Pipe5	28.50	99.40	110.00	152.00	0.23	1.07
Pipe6	1061.70	57.00	110.00	11.88	0.05	0.14
Pipe7	126.60	57.00	110.00	1.76	0.01	0.00
Pipe8	419.80	81.40	110.00	146.24	0.33	2.64
Pipe9	1.50	28.40	110.00	13.80	0.25	5.61
Pipe10	293.20	81.40	110.00	128.44	0.29	2.07
Pipe11	8.70	28.40	110.00	13.80	0.25	5.62
Pipe12	63.80	81.40	110.00	110.64	0.25	1.57
Pipe13	28.50	81.40	110.00	83.04	0.18	0.92
Pipe14	179.20	57.00	110.00	21.68	0.10	0.44
Pipe15	2.00	28.40	110.00	13.80	0.25	5.62
Pipe17	317.70	57.00	110.00	13.80	0.06	0.19
Pipe18	372.00	57.00	110.00	23.76	0.11	0.52
Pipe19	3.30	28.40	110.00	4.92	0.09	0.83
Pipe20	344.40	57.00	110.00	12.92	0.06	0.17
Pipe21	4.10	28.40	110.00	5.36	0.10	0.96
Pipe22	191.90	57.00	110.00	3.56	0.02	0.02
Pipe23	865.70	57.00	110.00	13.76	0.06	0.19
Pipe24	42.00	81.40	110.00	−41.48	0.09	0.26
Pipe25	220.20	57.00	110.00	23.72	0.11	0.52
Pipe26	0.30	28.40	110.00	13.80	0.25	5.46
Pipe27	348.10	57.00	110.00	5.92	0.03	0.04

Naigobia RGC : Network Table - Nodes

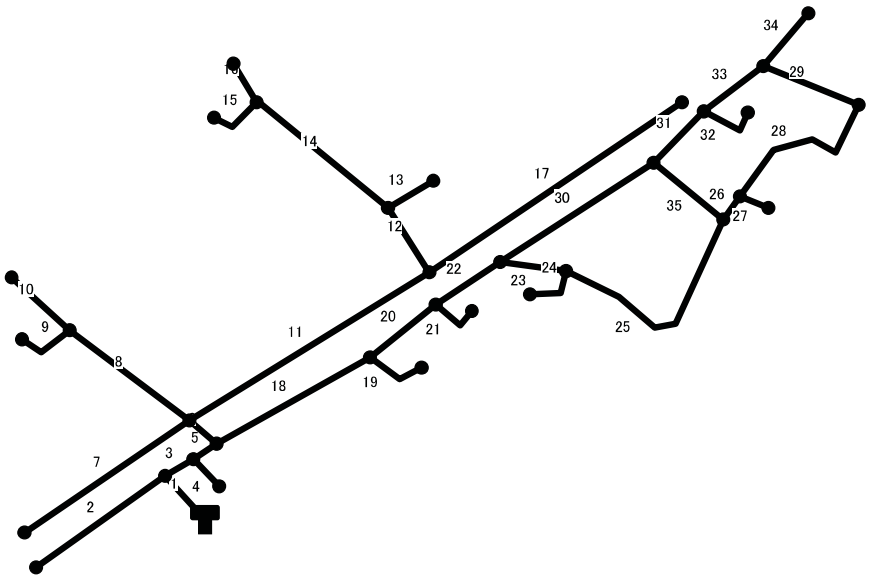
Node ID	Elevation(m)	Base Demand(CMD)	Demand(CMD)	Head(m)	Pressure(m)
Junc1	1081.60	1.00	4.00	1104.42	22.82
Junc2	1082.51	1.00	4.00	1104.41	21.90
Junc3	1082.33	0.45	1.80	1104.41	22.08
Junc4	1081.60	1.00	4.00	1104.39	22.79
Junc5	1069.87	2.97	11.88	1104.26	34.39
Junc6	1082.51	0.44	1.76	1104.39	21.88
Junc7	1080.64	1.00	4.00	1103.28	22.64
Junc8	1080.64	3.45	13.80	1103.27	22.63
Junc9	1078.53	1.00	4.00	1102.67	24.14
Junc10	1078.53	3.45	13.80	1102.62	24.09
Junc11	1077.73	1.48	5.92	1102.57	24.84
Junc12	1077.59	1.00	4.00	1102.54	24.95
Junc13	1074.61	1.97	7.88	1102.49	27.88
Junc14	1074.61	3.45	13.80	1102.48	27.87
Junc16	1070.10	3.45	13.80	1102.48	32.38
Junc17	1075.40	1.48	5.92	1102.35	26.95
Junc18	1075.40	1.23	4.92	1102.35	26.95
Junc19	1075.89	1.00	4.00	1102.30	26.40
Junc20	1075.89	1.34	5.36	1102.29	26.40
Junc21	1074.99	0.89	3.56	1102.29	27.30
Junc22	1077.27	1.00	4.00	1102.53	25.26
Junc23	1075.52	3.44	13.76	1102.37	26.85
Junc24	1071.61	1.00	4.00	1102.42	30.81
Junc25	1071.61	3.45	13.80	1102.42	30.81
Junc26	1080.91	1.48	5.92	1102.41	21.50
Junc28	1082.51	2.56	10.24	1104.40	21.89
Tank ET	1104.60	#N/A	−183.92	1104.91	0.31

4. Kyanvuma RGC

Kyanvuma RGC : Pressure and Velocity (Pipe Number)



Kyanvuma RGC （ Node Number ）



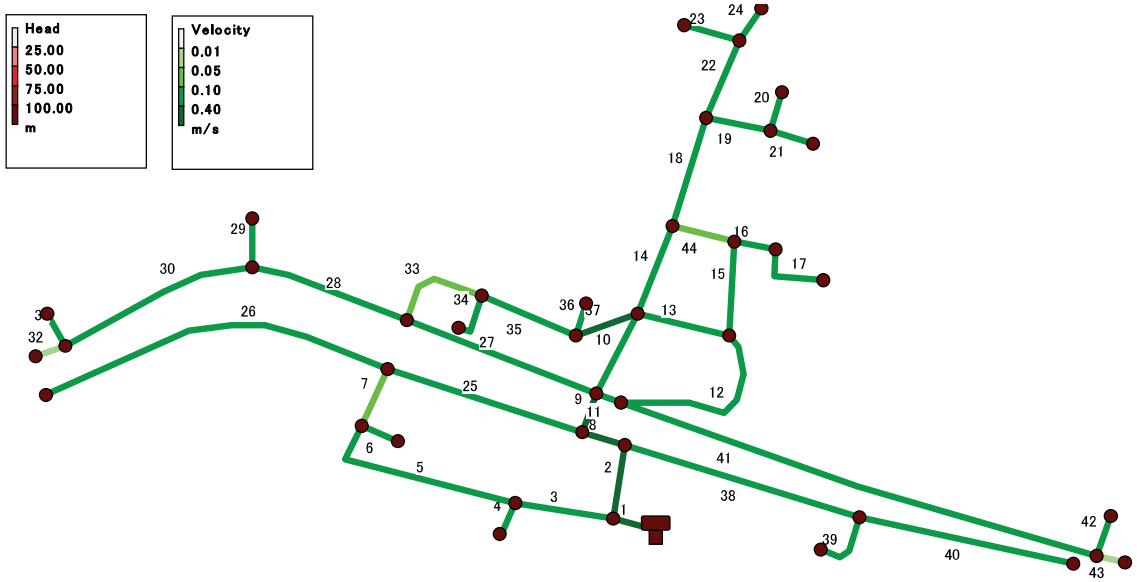
Kyanvuma RGC : Network Table - Links

Link ID	Length(m)	Diameter(mm)	Roughness	Flow(CMD)	Velocity(m/s)	Unit Head loss(m/km)
Pipe1	90.50	144.60	110.00	356.04	0.25	0.83
Pipe2	345.80	81.40	110.00	38.28	0.09	0.22
Pipe3	7.90	144.60	110.00	315.76	0.22	0.67
Pipe4	0.10	28.40	110.00	10.92	0.20	3.72
Pipe5	15.20	144.60	110.00	302.84	0.21	0.62
Pipe6	28.50	99.40	110.00	174.04	0.26	1.38
Pipe7	340.50	57.00	110.00	8.04	0.04	0.07
Pipe8	170.20	57.00	110.00	20.96	0.10	0.41
Pipe9	3.40	28.40	110.00	9.20	0.17	2.67
Pipe10	175.90	57.00	110.00	9.76	0.04	0.10
Pipe11	760.30	99.40	110.00	141.04	0.21	0.93
Pipe12	123.50	81.40	110.00	84.16	0.19	0.95
Pipe13	1.20	28.40	110.00	22.96	0.42	14.45
Pipe14	322.70	81.40	110.00	53.56	0.12	0.41
Pipe15	28.50	28.40	110.00	18.36	0.34	9.54
Pipe16	38.50	57.00	110.00	4.60	0.02	0.03
Pipe17	493.70	57.00	110.00	33.92	0.15	1.00
Pipe18	347.80	99.40	110.00	126.80	0.19	0.76
Pipe19	0.20	28.40	110.00	18.96	0.35	10.42
Pipe20	179.50	99.40	110.00	103.84	0.15	0.53
Pipe21	19.10	28.40	110.00	18.96	0.35	10.13
Pipe22	272.10	99.40	110.00	80.88	0.12	0.33
Pipe23	38.40	57.00	110.00	41.59	0.19	1.46
Pipe24	4.90	28.40	110.00	14.96	0.27	6.53
Pipe25	373.10	57.00	110.00	22.63	0.10	0.47
Pipe26	53.60	57.00	110.00	27.09	0.12	0.66
Pipe27	4.40	28.40	110.00	12.08	0.22	4.38
Pipe28	217.40	57.00	110.00	11.01	0.05	0.12
Pipe29	205.10	57.00	110.00	4.13	0.02	0.02
Pipe30	201.10	57.00	110.00	35.29	0.16	1.07
Pipe31	170.30	57.00	110.00	22.83	0.10	0.48
Pipe32	11.80	28.40	110.00	16.08	0.29	7.46
Pipe33	59.50	57.00	110.00	2.75	0.01	0.01
Pipe34	149.40	57.00	110.00	4.60	0.02	0.02
Pipe35	207.30	57.00	110.00	8.46	0.04	0.08

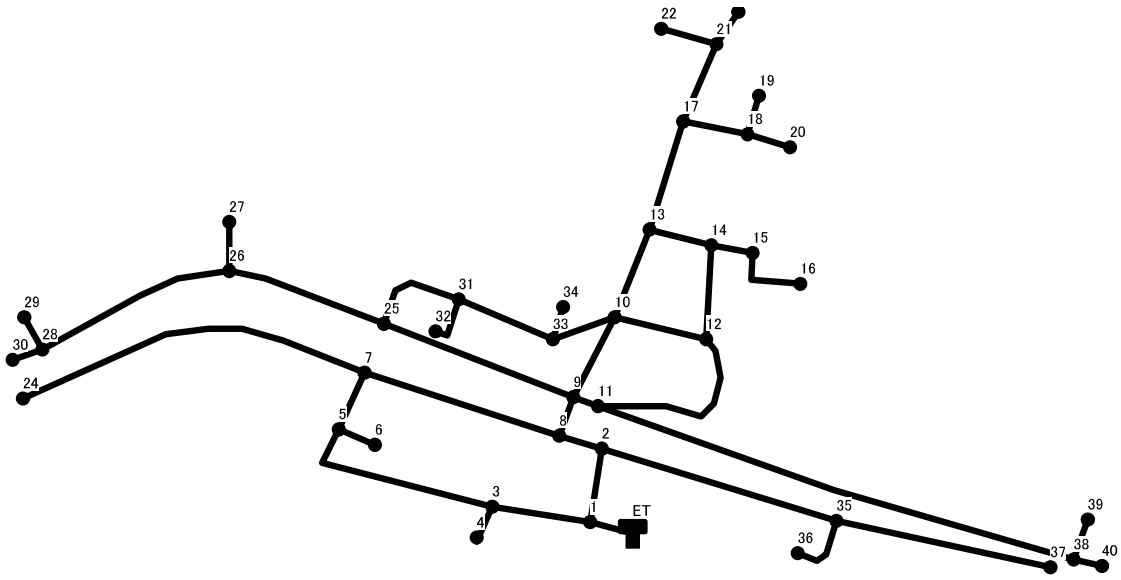
Kyanvuma RGC : Network Table - Nodes

Node ID	Elevation(m)	Base Demand(CMD)	Demand(CMD)	Head(m)	Pressure(m)
Junc1	1123.18	0.50	2.00	1138.23	15.05
Junc2	1123.14	0.50	2.00	1138.23	15.09
Junc3	1123.14	2.73	10.92	1138.23	15.09
Junc4	1122.84	0.50	2.00	1138.22	15.38
Junc5	1122.74	1.00	4.00	1138.18	15.44
Junc6	1120.60	0.50	2.00	1138.11	17.51
Junc7	1120.60	2.30	9.20	1138.10	17.50
Junc8	1117.41	2.44	9.76	1138.09	20.68
Junc9	1121.20	5.74	22.96	1137.47	16.27
Junc10	1121.13	1.91	7.64	1137.36	16.22
Junc11	1121.13	5.74	22.96	1137.34	16.20
Junc12	1119.93	7.65	30.60	1137.22	17.29
Junc13	1119.93	4.59	18.36	1136.95	17.02
Junc14	1119.77	1.15	4.60	1137.22	17.45
Junc15	1107.46	8.48	33.92	1136.98	29.52
Junc16	1116.74	1.00	4.00	1137.95	21.21
Junc17	1116.74	4.74	18.96	1137.95	21.21
Junc18	1118.83	1.00	4.00	1137.86	19.03
Junc19	1118.63	4.74	18.96	1137.67	19.04
Junc20	1121.08	1.00	4.00	1137.77	16.69
Junc21	1122.27	1.00	4.00	1137.71	15.45
Junc22	1121.32	3.74	14.96	1137.68	16.36
Junc23	1118.10	1.00	4.00	1137.54	19.44
Junc24	1117.42	1.00	4.00	1137.50	20.09
Junc25	1117.42	3.02	12.08	1137.48	20.07
Junc26	1112.12	1.72	6.88	1137.47	25.35
Junc27	1109.32	0.57	2.28	1137.47	28.15
Junc28	1102.80	1.15	4.60	1137.47	34.67
Junc29	1119.73	9.57	38.28	1138.16	18.43
Junc30	1116.96	1.00	4.00	1137.55	20.59
Junc31	1111.46	1.00	4.00	1137.47	26.01
Junc32	1111.46	4.02	16.08	1137.38	25.92
Junc33	1120.00	2.01	8.04	1138.16	18.16
Tank ET	1137.90	#N/A	−356.04	1138.31	0.41

Kasassira RGC: Pressure and Velocity (Pipe Number)



Kasassira RGC (Node Number)



Kasassira RGC : Network Table - Links

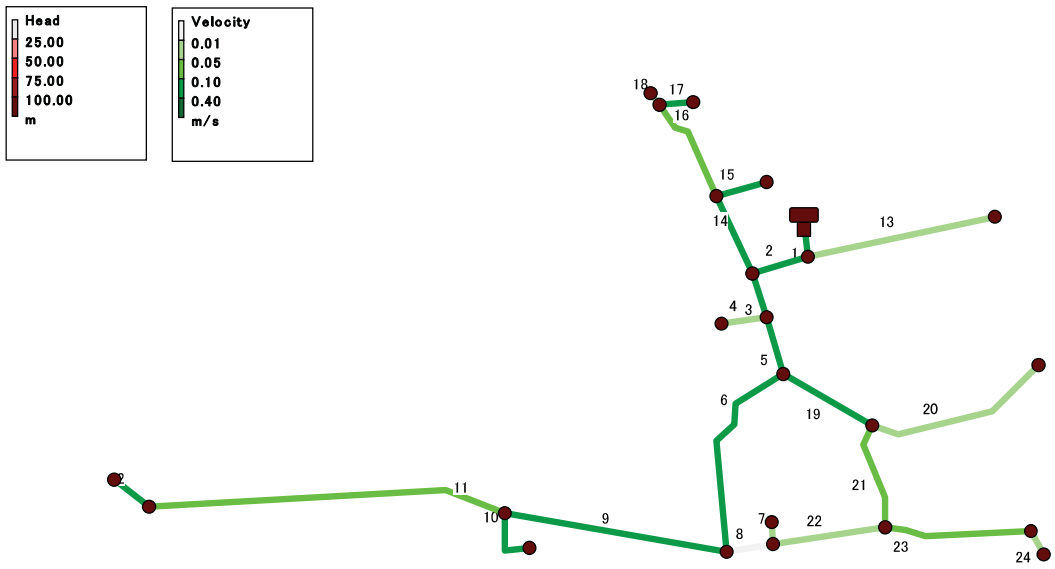
Link ID	Length(m)	Diameter(mm)	Roughness	Flow(CMD)	Velocity(m/s)	Unit Head loss(m/km)
Pipe1	22.80	144.60	110.00	1086.20	0.77	6.58
Pipe2	87.20	144.60	110.00	905.90	0.64	4.70
Pipe3	131.20	81.40	110.00	178.30	0.40	3.81
Pipe4	5.10	57.00	110.00	51.76	0.23	2.19
Pipe5	275.20	81.40	110.00	118.54	0.26	1.79
Pipe6	4.10	57.00	110.00	51.76	0.23	2.18
Pipe7	72.20	81.40	110.00	44.18	0.10	0.29
Pipe8	61.80	144.60	110.00	743.26	0.52	3.26
Pipe9	28.50	144.60	110.00	635.92	0.45	2.44
Pipe10	71.50	144.60	110.00	383.93	0.27	0.96
Pipe11	31.60	99.40	110.00	119.47	0.18	0.69
Pipe12	180.20	57.00	110.00	25.67	0.12	0.60
Pipe13	130.40	57.00	110.00	−22.42	0.10	0.46
Pipe14	95.00	99.40	110.00	172.39	0.26	1.35
Pipe15	59.30	57.00	110.00	40.09	0.18	1.36
Pipe16	27.00	57.00	110.00	−43.76	0.20	1.60
Pipe17	2.40	57.00	110.00	−35.76	0.16	1.12
Pipe18	238.40	81.40	110.00	152.72	0.34	2.86
Pipe19	36.70	57.00	110.00	70.36	0.32	3.86
Pipe20	2.80	57.00	110.00	39.76	0.18	1.36
Pipe21	46.00	57.00	110.00	22.60	0.10	0.47
Pipe22	474.50	81.40	110.00	74.36	0.17	0.75
Pipe23	20.00	57.00	110.00	51.76	0.23	2.18
Pipe24	22.10	57.00	110.00	22.60	0.10	0.47
Pipe25	310.80	81.40	110.00	99.34	0.22	1.29
Pipe26	805.20	81.40	110.00	135.52	0.30	2.29
Pipe27	314.40	81.40	110.00	124.52	0.28	1.96
Pipe28	231.30	81.40	110.00	143.52	0.32	2.55
Pipe29	7.40	57.00	110.00	59.76	0.27	2.85
Pipe30	582.30	57.00	110.00	75.76	0.34	4.42
Pipe31	0.30	57.00	110.00	61.00	0.28	2.98
Pipe32	4.40	57.00	110.00	6.76	0.03	0.05
Pipe33	123.80	81.40	110.00	−27.00	0.06	0.12
Pipe34	1.70	57.00	110.00	55.76	0.25	2.50
Pipe35	212.80	81.40	110.00	−105.36	0.23	1.44
Pipe36	14.30	57.00	110.00	67.76	0.31	3.60
Pipe37	57.90	81.40	110.00	−181.12	0.40	3.92
Pipe38	446.80	81.40	110.00	154.64	0.34	2.92
Pipe39	3.10	57.00	110.00	40.64	0.18	1.39
Pipe40	392.70	57.00	110.00	54.24	0.25	2.38
Pipe41	825.00	99.40	110.00	85.80	0.13	0.37
Pipe42	0.10	57.00	110.00	33.88	0.15	0.74
Pipe43	36.20	57.00	110.00	6.76	0.03	0.05
Pipe44	93.10	57.00	110.00	11.67	0.05	0.14

Kasassira RGC : Network Table - Nodes

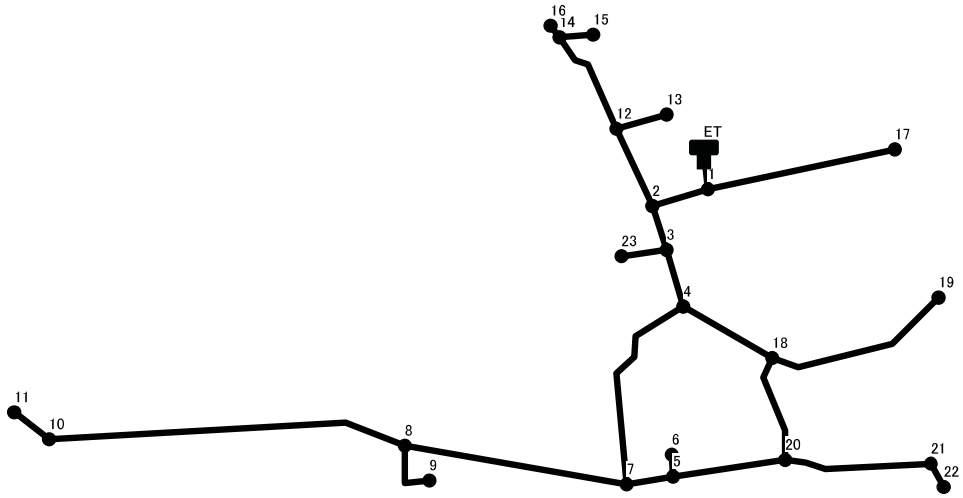
Node ID	Elevation(m)	Base Demand (CMD)	Demand(CMD)	Head(m)	Pressure(m)
Junc1	1076.40	0.50	2.00	1093.96	17.56
Junc2	1075.78	2.00	8.00	1093.55	17.77
Junc3	1075.36	2.00	8.00	1093.46	18.10
Junc4	1075.18	12.94	51.76	1093.45	18.27
Junc5	1071.97	5.65	22.60	1092.97	20.99
Junc6	1072.07	12.94	51.76	1092.96	20.89
Junc7	1070.90	2.00	8.00	1092.95	22.05
Junc8	1075.14	2.00	8.00	1093.35	18.21
Junc9	1075.08	2.00	8.00	1093.28	18.20
Junc10	1074.95	2.00	8.00	1093.21	18.26
Junc11	1075.36	2.00	8.00	1093.26	17.90
Junc12	1075.00	2.00	8.00	1093.15	18.15
Junc13	1074.52	2.00	8.00	1093.08	18.56
Junc14	1074.42	2.00	8.00	1093.07	18.65
Junc15	1074.62	2.00	8.00	1093.03	18.41
Junc16	1074.62	8.94	35.76	1093.02	18.41
Junc17	1070.82	2.00	8.00	1092.40	21.58
Junc18	1070.94	2.00	8.00	1092.26	21.32
Junc19	1070.89	9.94	39.76	1092.26	21.37
Junc20	1071.26	5.65	22.60	1092.24	20.98
Junc21	1065.22	0.00	0.00	1092.04	26.83
Junc22	1065.16	12.94	51.76	1092.00	26.84
Junc23	1064.99	5.65	22.60	1092.03	27.04
Junc24	1071.00	33.88	135.52	1091.10	20.10
Junc25	1070.62	2.00	8.00	1092.66	22.04
Junc26	1070.08	2.00	8.00	1092.07	21.99
Junc27	1069.92	14.94	59.76	1092.05	22.14
Junc28	1070.73	2.00	8.00	1089.50	18.77
Junc29	1070.73	15.25	61.00	1089.50	18.76
Junc30	1070.74	1.69	6.76	1089.50	18.76
Junc31	1069.90	5.65	22.60	1092.68	22.78
Junc32	1069.90	13.94	55.76	1092.67	22.78
Junc33	1074.01	2.00	8.00	1092.98	18.98
Junc34	1073.88	16.94	67.76	1092.93	19.06
Junc35	1076.50	14.94	59.76	1092.24	15.74
Junc36	1076.52	10.16	40.64	1092.24	15.72
Junc37	1077.13	13.56	54.24	1091.31	14.18
Junc38	1075.92	11.29	45.16	1092.95	17.03
Junc39	1075.92	8.47	33.88	1092.95	17.03
Junc40	1076.34	1.69	6.76	1092.95	16.61
Tank ET	1093.80	#N/A	−1086.20	1094.11	0.31

6. Kameke RGC

Kamake RGC : Pressure and Velocity (Pipe Number)



Kamake RGC (Node Number)



Kameke RGC: Network Table - Links

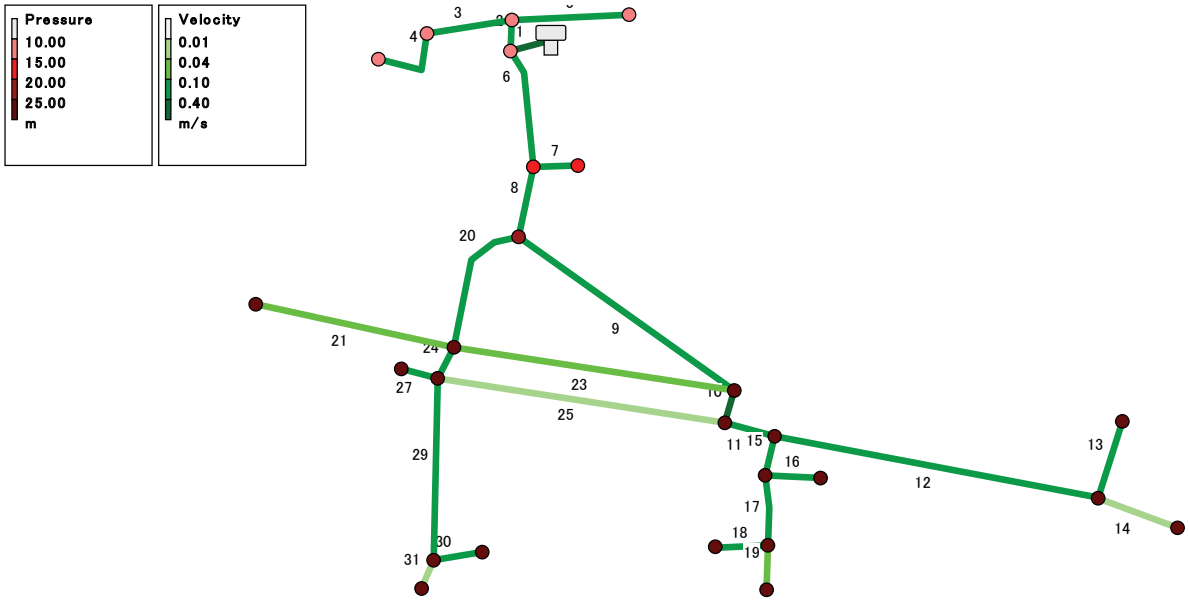
Link ID	Length(m)	Diameter(mm)	Roughness	Flow(CMD)	Velocity(m/s)	Unit Head loss(m/km)
Pipe1	25.10	99.40	110.00	168.00	0.25	1.29
Pipe2	81.20	99.40	110.00	157.40	0.23	1.14
Pipe3	45.30	99.40	110.00	122.00	0.18	0.71
Pipe4	17.60	57.00	110.00	10.60	0.05	0.11
Pipe5	54.20	99.40	110.00	107.40	0.16	0.56
Pipe6	257.20	81.40	110.00	50.39	0.11	0.37
Pipe7	7.90	57.00	110.00	8.60	0.04	0.08
Pipe8	31.40	81.40	110.00	−3.79	0.01	0.00
Pipe9	500.00	57.00	110.00	42.40	0.19	1.51
Pipe10	106.60	28.40	110.00	8.60	0.16	2.34
Pipe11	778.00	57.00	110.00	16.60	0.08	0.27
Pipe12	35.30	28.40	110.00	12.60	0.23	4.75
Pipe13	132.40	57.00	110.00	8.60	0.04	0.08
Pipe14	138.50	57.00	110.00	31.40	0.14	0.87
Pipe15	4.50	28.40	110.00	10.60	0.19	3.46
Pipe16	258.60	57.00	110.00	16.60	0.08	0.27
Pipe17	13.30	28.40	110.00	10.08	0.18	3.14
Pipe18	70.20	57.00	110.00	2.52	0.01	0.01
Pipe19	110.10	81.40	110.00	53.01	0.12	0.40
Pipe20	544.40	57.00	110.00	8.40	0.04	0.08
Pipe21	126.40	81.40	110.00	40.61	0.09	0.25
Pipe22	243.80	81.40	110.00	21.81	0.05	0.08
Pipe23	247.60	57.00	110.00	14.80	0.07	0.22
Pipe24	42.10	57.00	110.00	10.60	0.05	0.11

Kameke RGC : Network Table - Nodes

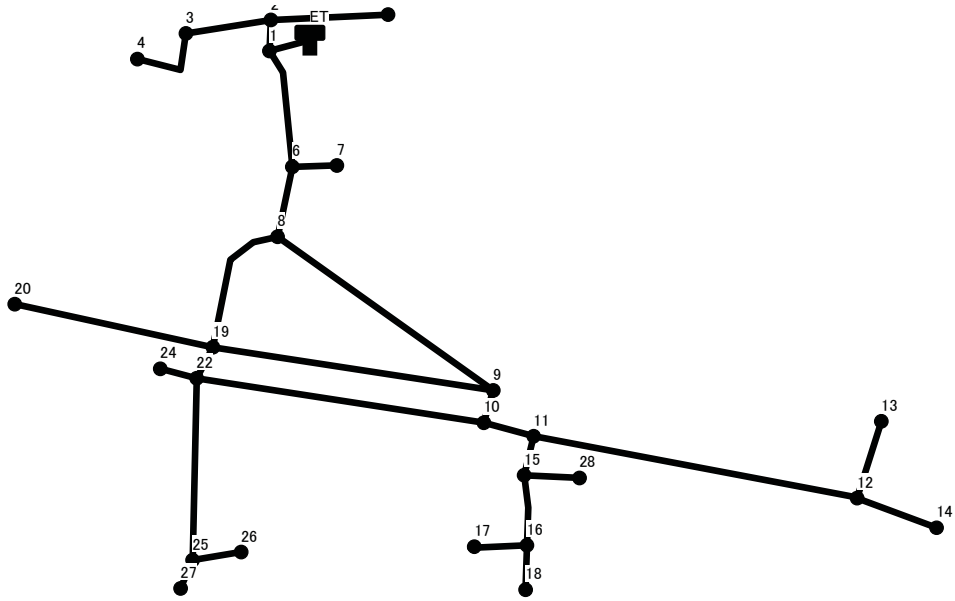
Node ID	Elevation(m)	Base Demand(CMD)	Demand (CMD)	Head(m)	Pressure(m)
Junc1	1116.93	0.50	2.00	1132.38	15.45
Junc2	1117.54	1.00	4.00	1132.28	14.74
Junc3	1117.51	1.00	4.00	1132.25	14.74
Junc4	1117.28	1.00	4.00	1132.22	14.94
Junc5	1116.95	4.25	17.00	1132.13	15.18
Junc6	1117.08	2.15	8.60	1132.13	15.05
Junc7	1116.53	1.05	4.20	1132.13	15.60
Junc8	1111.61	4.30	17.20	1131.37	19.77
Junc9	1110.87	2.15	8.60	1131.12	20.26
Junc10	1098.14	1.00	4.00	1131.17	33.03
Junc11	1099.28	3.15	12.60	1131.00	31.72
Junc12	1117.89	1.05	4.20	1132.17	14.28
Junc13	1117.99	2.65	10.60	1132.15	14.16
Junc14	1114.78	1.00	4.00	1132.10	17.32
Junc15	1114.99	2.52	10.08	1132.05	17.07
Junc16	1113.06	0.63	2.52	1132.10	19.04
Junc17	1115.44	2.15	8.60	1132.37	16.93
Junc18	1116.25	1.00	4.00	1132.18	15.92
Junc19	1111.12	2.10	8.40	1132.14	21.02
Junc20	1115.96	1.00	4.00	1132.15	16.18
Junc21	1111.88	1.05	4.20	1132.09	20.21
Junc22	1111.41	2.65	10.60	1132.09	20.68
Junc23	1117.79	2.65	10.60	1132.25	14.46
Tank ET	1132.10	#N/A	−168.00	1132.41	0.31

7. Kapala RGC

Kapala RGC : Pressure and Velocity (Pipe Number)



Kapala RGC (Node Number)



Kapala RGC : Network Table - Links

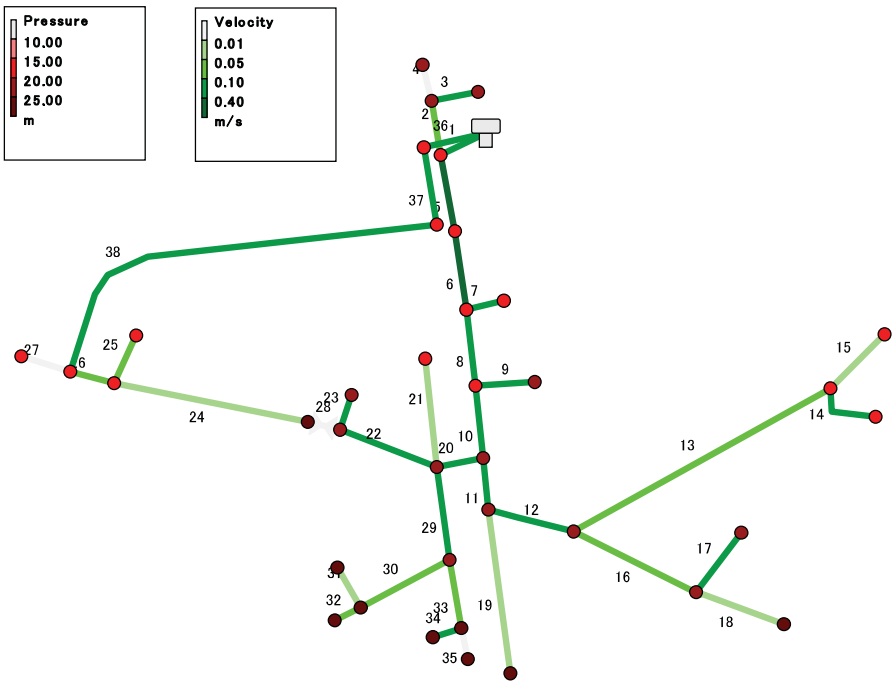
Link ID	Length(m)	Diameter(mm)	Roughness	Flow(CMD)	Velocity(m/s)	Unit Head loss(m/km)
Pipe1	4.60	99.40	110.00	295.96	0.44	3.67
Pipe2	10.70	81.40	110.00	75.48	0.17	0.78
Pipe3	101.50	57.00	110.00	45.12	0.20	1.69
Pipe4	8.30	28.40	110.00	18.76	0.34	9.92
Pipe5	84.20	57.00	110.00	26.36	0.12	0.63
Pipe6	499.50	99.40	110.00	216.48	0.32	2.06
Pipe7	3.80	28.40	110.00	18.76	0.34	9.93
Pipe8	171.00	99.40	110.00	178.96	0.27	1.45
Pipe9	509.40	81.40	110.00	114.46	0.25	1.67
Pipe10	32.40	57.00	110.00	89.28	0.40	5.99
Pipe11	45.20	57.00	110.00	87.44	0.40	5.77
Pipe12	300.40	57.00	110.00	26.76	0.12	0.64
Pipe13	23.50	28.40	110.00	18.20	0.33	9.39
Pipe14	34.20	57.00	110.00	4.56	0.02	0.02
Pipe15	31.40	57.00	110.00	56.68	0.26	2.59
Pipe16	9.10	28.40	110.00	14.76	0.27	6.36
Pipe17	162.90	57.00	110.00	37.92	0.17	1.23
Pipe18	4.20	28.40	110.00	16.48	0.30	7.81
Pipe19	99.20	57.00	110.00	17.44	0.08	0.29
Pipe20	372.90	57.00	110.00	56.90	0.26	2.60
Pipe21	9.20	57.00	110.00	−12.16	0.06	0.15
Pipe23	282.10	57.00	110.00	−21.18	0.10	0.42
Pipe24	27.80	57.00	110.00	58.32	0.26	2.72
Pipe25	18.20	57.00	110.00	5.76	0.03	0.04
Pipe27	5.70	28.40	110.00	−18.20	0.33	9.39
Pipe29	333.70	57.00	110.00	30.36	0.14	0.81
Pipe30	123.50	28.40	110.00	18.20	0.33	9.39
Pipe31	287.40	57.00	110.00	4.56	0.02	0.02

Kapala RGC : Network Table - Nodes

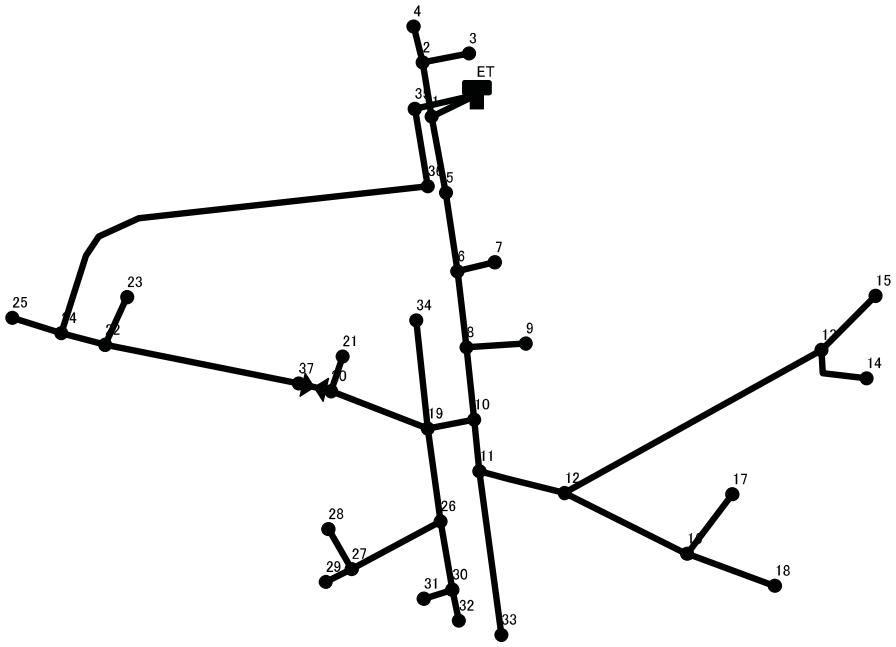
Node ID	Elevation(m)	Base Demand(CMD)	Demand(CMD)	Head(m)	Pressure(m)
Junc1	1072.77	1.00	4.00	1085.49	12.72
Junc2	1072.77	1.00	4.00	1085.48	12.71
Junc3	1072.95	6.59	26.36	1085.31	12.36
Junc4	1072.95	4.69	18.76	1085.23	12.28
Junc5	1073.00	6.59	26.36	1085.43	12.43
Junc6	1065.80	4.69	18.76	1084.46	18.66
Junc7	1065.80	4.69	18.76	1084.43	18.63
Junc8	1062.17	1.90	7.60	1084.22	22.05
Junc9	1058.02	1.00	4.00	1083.36	25.34
Junc10	1057.62	1.90	7.60	1083.17	25.55
Junc11	1057.21	1.00	4.00	1082.91	25.70
Junc12	1052.02	1.00	4.00	1082.71	30.70
Junc13	1052.19	4.55	18.20	1082.49	30.30
Junc14	1051.15	1.14	4.56	1082.71	31.56
Junc15	1057.07	1.00	4.00	1082.83	25.76
Junc16	1055.72	1.00	4.00	1082.63	26.91
Junc17	1055.72	4.12	16.48	1082.59	26.87
Junc18	1055.08	4.36	17.44	1082.60	27.52
Junc19	1054.87	1.90	7.60	1083.25	28.38
Junc20	1053.12	3.04	12.16	1083.24	30.12
Junc22	1055.02	1.00	4.00	1083.17	28.15
Junc24	1055.30	4.55	18.20	1083.12	27.82
Junc25	1054.74	1.90	7.60	1082.90	28.16
Junc26	1054.73	4.55	18.20	1081.74	27.01
Junc27	1054.74	1.14	4.56	1082.89	28.15
Junc28	1057.05	3.69	14.76	1082.77	25.72
Tank ET	1085.10	#N/A	−295.96	1085.51	0.41

8. Buseta RGC

Buseta RGC: Pressure and Velocity (Pipe Number)



Buseta RGC (Node Number)



Buseta RGC : Network Table - Links

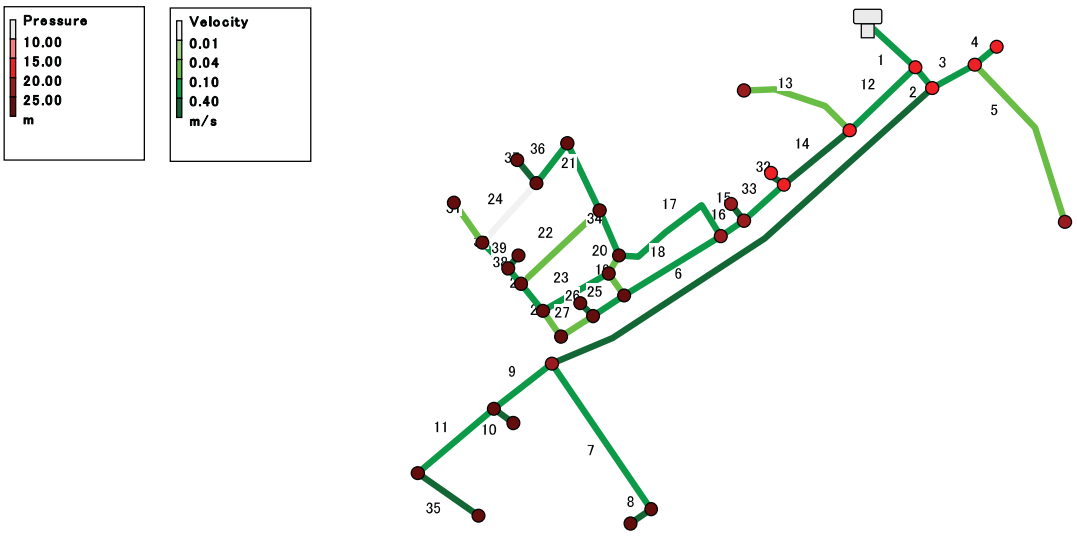
Link ID	Length(m)	Diameter(mm)	Roughness	Flow(CMD)	Velocity(m/S)	Unit Head loss(m/km)
Pipe1	19.70	99.40	110.00	213.52	0.32	2.01
Pipe2	227.20	57.00	110.00	17.04	0.08	0.28
Pipe3	10.30	28.40	110.00	11.32	0.21	3.89
Pipe4	100.80	57.00	110.00	1.72	0.01	0.00
Pipe5	160.30	81.40	110.00	192.48	0.43	4.38
Pipe6	241.30	81.40	110.00	181.12	0.40	3.92
Pipe7	8.50	28.40	110.00	13.04	0.24	5.07
Pipe8	276.70	81.40	110.00	162.40	0.36	3.20
Pipe9	79.90	28.40	110.00	10.24	0.19	3.24
Pipe10	232.20	81.40	110.00	148.16	0.33	2.70
Pipe11	66.00	57.00	110.00	55.64	0.25	2.50
Pipe12	94.50	57.00	110.00	−41.44	0.19	1.45
Pipe13	550.90	57.00	110.00	17.04	0.08	0.28
Pipe14	4.60	28.40	110.00	9.64	0.18	2.90
Pipe15	103.50	57.00	110.00	3.40	0.02	0.01
Pipe16	159.80	57.00	110.00	20.40	0.09	0.39
Pipe17	5.70	28.40	110.00	6.24	0.11	1.29
Pipe18	94.70	57.00	110.00	8.48	0.04	0.08
Pipe19	570.00	57.00	110.00	10.20	0.05	0.11
Pipe20	38.50	57.00	110.00	72.12	0.33	4.04
Pipe21	284.60	57.00	110.00	6.80	0.03	0.05
Pipe22	244.00	57.00	110.00	26.08	0.12	0.61
Pipe24	518.90	57.00	110.00	7.92	0.04	0.07
Pipe23	4.30	28.40	110.00	13.04	0.24	5.05
Pipe25	6.30	28.40	110.00	3.40	0.06	0.41
Pipe26	46.80	57.00	110.00	-15.32	0.07	0.23
Pipe27	33.50	57.00	110.00	1.72	0.0l	0.00
Pipe29	149.50	57.00	110.00	35.24	0.16	1.07
Pipe30	209.90	57.00	110.00	18.72	0.08	0.33
Pipe31	10.80	57.00	110.00	9.64	0.04	0.10
Pipe32	4.40	28.40	110.00	3.40	0.06	0.41
Pipe33	264.30	57.00	110.00	12.52	0.06	0.16
Pipe34	3.90	28.40	110.00	6.80	0.12	1.51
Pipe35	19.80	57.00	110.00	1.72	0.0l	0.00
Pipe36	19.70	57.00	110.00	30.72	0.14	0.83
Pipe37	160.30	57.00	110.00	26.72	0.12	0.64
Pipe38	656.00	57.00	110.00	22.72	0.10	0.48
Valve28	#N.iA	57.00	#N.iA	0.00	0.00	0.00

Buseta RGC : Network Table - Nodes

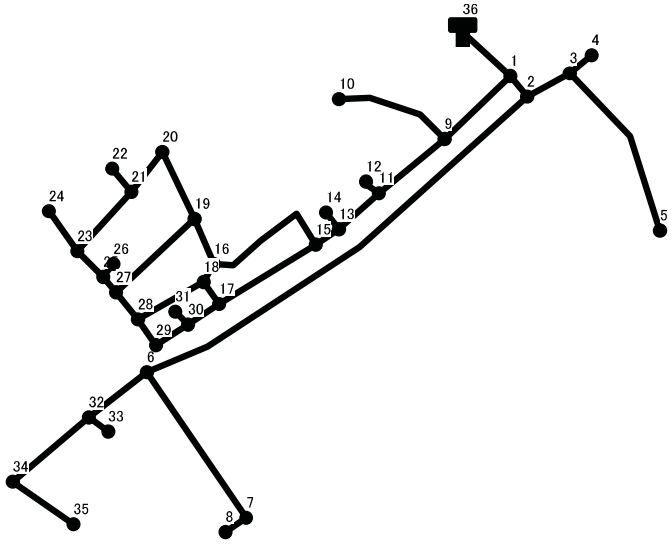
Node ID	Elevation(m)	Base Demand(CMD)	Demand	Head(m)	Pressure(m)
Junc1	1074.39	1.00	4.00	1091.67	17.28
Junc2	1070.14	1.00	4.00	1091.61	21.47
Junc3	1070.34	2.83	11.32	1091.57	21.23
Junc4	1067.45	0.43	1.72	1091.61	24.16
Junc5	1074.83	2.84	11.36	1090.97	16.14
Junc6	1073.50	1.42	5.68	1090.02	16.52
Junc7	1073.31	3.26	13.04	1089.98	16.67
Junc8	1069.53	1.00	4.00	1089.14	19.61
Junc9	1068.86	2.56	10.24	1088.88	20.02
Junc10	1065.79	5.10	20.40	1088.51	22.72
Junc11	1065.00	1.00	4.00	1088.34	23.34
Junc12	1065.30	1.00	4.00	1088.21	22.91
Junc13	1070.20	1.00	4.00	1088.05	17.85
Junc14	1069.92	2.41	9.64	1088.04	18.12
Junc15	1070.93	0.85	3.40	1088.05	17.12
Junc16	1063.59	1.42	5.68	1088.15	24.56
Junc17	1063.72	1.56	6.24	1088.14	24.42
Junc18	1062.82	2.12	8.48	1088.14	25.32
Junc19	1065.71	1.00	4.00	1088.35	22.64
Junc20	1064.68	3.26	13.04	1088.20	23.52
Junc21	1064.73	3.26	13.04	1088.18	23.45
Junc22	1074.42	1.00	4.00	1091.27	16.85
Junc23	1074.80	0.85	3.40	1091.27	16.47
Junc24	1074.93	1.42	5.68	1091.28	16.35
Junc25	1075.39	0.43	1.72	1091.28	15.89
Junc26	1063.94	1.00	4.00	1088.19	24.25
Junc27	1061.02	1.42	5.68	1088.12	27.11
Junc28	1060.67	2.41	9.64	1088.12	27.45
Junc29	1060.67	0.85	3.40	1088.12	27.45
Junc30	1060.34	1.00	4.00	1088.15	27.81
Junc31	1060.40	1.70	6.80	1088.15	27.75
Junc32	1060.24	0.43	1.72	1088.15	27.91
Junc33	1055.00	2.55	10.20	1088.28	33.28
Junc34	1069.00	1.70	6.80	1088.34	19.34
Junc35	1074.39	1.00	4.00	1091.69	17.30
Junc36	1074.83	1.00	4.00	1091.59	16.76
Junc37	1064.76	1.98	7.92	1091.23	26.47
Tank ET	1091.30	#N/A	−244.24	1091.71	0.41

9. Kidetok RGC

Kidetok RGC: Pressure and Velocity (Pipe Number)



Kidetok RGC (Node Number)



Kidetok RGC : Network Table - Links

Link ID	Length(m)	Diameter(mm)	Roughness	Flow(CMD)	Velocity(m/s)	Unit Head
Pipe1	140.40	144.60	110.00	432.00	0.30	1.19
Pipe2	31.70	81.40	110.00	174.08	0.39	3.64
Pipe3	69.20	57.00	110.00	29.92	0.14	0.79
Pipe4	4.40	28.40	110.00	15.56	0.28	7.02
Pipe5	346.00	57.00	110.00	10.36	0.05	0.11
Pipe6	1278.80	57.00	110.00	140.16	0.64	13.82
Pipe7	791.30	57.00	110.00	25.92	0.12	0.61
Pipe8	8.10	28.40	110.00	21.92	0.40	13.24
Pipe9	159.60	57.00	110.00	51.84	0.24	2.19
Pipe10	4.60	28.40	110.00	21.92	0.40	13.25
Pipe11	280.30	57.00	110.00	25.92	0.12	0.61
Pipe12	230.00	99.40	110.00	222.08	0.33	2.16
Pipe13	245.00	57.00	110.00	17.28	0.08	0.29
Pipe14	259.60	81.40	110.00	200.80	0.45	4.74
Pipe15	4.70	28.40	110.00	21.92	0.40	13.24
Pipe16	58.90	81.40	110.00	148.96	0.33	2.73
Pipe17	293.30	57.00	110.00	72.68	0.33	4.10
Pipe18	287.50	57.00	110.00	72.28	0.33	4.05
Pipe19	94.10	57.00	110.00	21.61	0.10	0.43
Pipe20	40.30	57.00	110.00	−10.80	0.05	0.12
Pipe21	160.50	57.00	110.00	34.41	0.16	1.03
Pipe22	293.00	57.00	110.00	19.47	0.09	0.36
Pipe23	242.40	57.00	110.00	28.41	0.13	0.72
Pipe24	240.20	57.00	110.00	−0.15	0.00	0.00
Pipe25	121.10	57.00	110.00	42.02	0.19	1.49
Pipe26	4.10	28.40	110.00	21.92	0.40	13.25
Pipe27	92.60	57.00	110.00	16.10	0.07	0.25
Pipe28	81.40	57.00	110.00	12.10	0.05	0.15
Pipe29	96.70	57.00	110.00	36.51	0.17	1.15
Pipe30	135.50	57.00	110.00	26.07	0.12	0.61
Pipe31	120.20	57.00	110.00	21.92	0.10	0.45
Pipe32	5.90	28.40	110.00	21.92	0.40	13.24
Pipe33	182.10	81.40	110.00	174.88	0.39	3.67
Pipe34	68.90	57.00	110.00	57.89	0.26	2.69
Pipe35	124.70	28.40	110.00	21.92	0.40	13.25
Pipe36	86.30	57.00	110.00	25.77	0.12	0.60
Pipe37	41.50	28.40	110.00	21.92	0.40	13.25
Pipe38	13.00	57.00	110.00	51.99	0.24	2.20
Pipe39	7.20	28.40	110.00	21.92	0.40	13.25

Kidetok RGC : Network Table - Nodes

Node ID	Elevation(m)	Base Demand(CMD)	Demand(CMD)	Head(m)	Pressure(m)
Junc1	1089.57	8.96	35.84	1108.34	18.77
Junc2	1091.24	1.00	4.00	1108.23	16.99
Junc3	1088.32	1.00	4.00	1108.17	19.85
Junc4	1088.32	3.89	15.56	1108.14	19.82
Junc5	1084.00	2.59	10.36	1108.13	24.13
Junc6	1066.85	15.60	62.40	1090.55	23.70
Junc7	1061.13	1.00	4.00	1090.07	28.94
Junc8	1061.35	5.48	21.92	1089.96	28.61
Junc9	1090.00	1.00	4.00	1107.85	17.85
Junc10	1087.00	4.32	17.28	1107.78	20.78
Junc11	1087.17	1.00	4.00	1106.61	19.45
Junc12	1087.28	5.48	21.92	1106.54	19.26
Junc13	1083.33	1.00	4.00	1105.95	22.61
Junc14	1083.37	5.48	21.92	1105.88	22.51
Junc15	1083.96	1.00	4.00	1105.79	21.82
Junc16	1074.00	1.00	4.00	1104.58	30.58
Junc17	1073.41	2.16	8.64	1104.62	31.21
Junc18	1071.00	1.00	4.00	1104.58	33.58
Junc19	1074.00	1.00	4.00	1104.40	30.40
Junc20	1075.00	2.16	8.64	1104.23	29.23
Junc21	1075.70	1.00	4.00	1104.18	28.48
Junc22	1075.60	5.48	21.92	1103.63	28.03
Junc23	1069.67	1.00	4.00	1104.18	34.51
Junc24	1070.40	5.48	21.92	1104.13	33.73
Junc25	1068.73	1.00	4.00	1104.27	35.53
Junc26	1068.99	5.48	21.92	1104.17	35.18
Junc27	1065.56	1.00	4.00	1104.29	38.74
Junc28	1068.00	1.00	4.00	1104.40	36.40
Junc29	1067.97	1.00	4.00	1104.42	36.45
Junc30	1070.35	1.00	4.00	1104.44	34.09
Junc31	1070.33	5.48	21.92	1104.39	34.06
Junc32	1063.26	1.00	4.00	1090.20	26.94
Junc33	1063.19	5.48	21.92	1090.14	26.95
Junc34	1055.05	1.00	4.00	1090.03	34.98
Junc35	1055.46	5.48	21.92	1088.38	32.92
Tank36	1108.10	#N/A	−432.00	1108.51	0.41

Appendix-8

Cost Estimation of Connection with Existing Power Line

Cost Estimate of Connection with Existing Power Line of UMEME to be Undertaken by MOWE

Based on the Minutes of Discussion made between the Preparatory Survey Team of JICA and MOWE on May 22, 2015, MOWE shall prepare the connections with the existing power line of UMEME for the construction of piped water supply facilities for Kidetok, Kapala, Kasassira, Naigobya and Kyamvuma RGCs.

This rough estimate is prepared to facilitate the above preparation by MOWE.

1. Scope of Preparation

The power lines shall be extended from the existing power line to the site of water source boreholes with down-transforming to 415V from 11,000V or 33,000V with 25kVA transformer (the minimum size of transformer of UMEME) as summarized below.

<Kidetok RGC>

- Extension of 11,000V power line to JTB-17 and JTB-18 with the distances of 540m and 867m, reskpectively.
- Installation of down transformers at each borehole site (25kVA) with distribution panels and meters.

<Kapala RGC>

- Extension of 11,000V line to P-04-NBH-1 with the distance of 732m.
- Installation of down transformer (25kVA) with distribution panel and meter at the borehole site.
- Further extension of 415V power line with 130m to the borehole site of P-04-NBH-2.

<Kasassira RGC>

- Extension of 11,000V power line to the borehole site of DWD55991 with the distance of 1,150m.
- Installation of down transformer (25kVA) with distribution panel and meter at the borehole site.

<Naigobya RGC>

- Extension of 11,000V of power line to the borehole site with the distance of 1,521m.
- Installation of down transformer (25kVA) with distribution panel and meter

<Kyamvuma RGC>

- Extentsion of 11,000V of power line to the borehole site with the distance of 45m.
- Installation of down transformer (25kVA) with distribution panel and meter.

The land for electric poles shall be arranged by the applicant according to UMEME.

2. Estimated Costs for Power Line Connections

The total amount of 16,500,000JPY is estimated as stated in the attached table.

Total Connection Fee by UMEME

(Unit:UGX)

No.	Items	Specification	Unit	Q'ty	Unit Price	Amount	Remark
1	Inspection Fee		L/S	1.0	-	531,000	
2	New Connection Fees (Non-Standerd Connection)		L/S	1.0	-	1,000,000	
3	Connection Cost						
	Kidetok RGC		L/S	1.0	-	141,651,400	
	Kapala RGC		L/S	1.0	-	81,338,400	
	Kasassira RGC		L/S	1.0	-	97,350,000	
	Naigobya RGC		L/S	1.0	-	116,910,200	
	Kayanvuma RGC		L/S	1.0	-	36,317,000	
	Total 3					473,567,000	
4.	Total Cost for Connection					475,098,000	$140,106
							¥16,490,523
	V.A.T. = 18%		%	0.18	-	85,517,640	
	Ground Total incl, VAT		L/S	1.0	-	560,615,640	$165,326
							¥19,458,817

Rate: UGX/USD 3,390.98
JPY/USD ¥117.70

Conditions;

1. Not include V.A.T.
2. Reffer to General Conditions of Supply of UMEME and Electricity Reguratory Aushority

(Unit:UGX)

No.	Items	Specification	Unit	Q'ty	Unit Price	Amount	Remark
I.	**Kidetok RGC**						(USD)
1	**Inspection Fee**						
1-1	Wayleave clerarance, permission/consent) from affected land owners.		site	1.0	-	-	To be arranged by the applicant
1-2	Umeme Inspection Fee 2working dats per one site	3-Phase Time of use	site	1.0	88,500	88,500	
	Total 1					88,500	
2	**New Connection Fees (Non-Standerd Connection)**						
2-1	Commercial- Three phase(Time of Use)	Scurity deposit	site	1.0	200,000	200,000	
	Total 2					200,000	
3	**Connection Cost**						
3-1	Survey Cost		L/S	1.0	-	1,500,000	
3-2	Woodn Pole, L=540m JTB-17	540m/100m=5nos	nos	5.0	860,000	4,300,000	
	Woodn Pole, L=867m JTB-18	867m/100m=8nos	nos	8.0	860,000	6,880,000	
3-3	Wireing 3 Phase 11kV line toJTB-17	L=540m	m	540.0	42,000	22,680,000	
	Wireing 3 Phase 11kV line toJTB-18	L=867m	m	867.0	42,000	36,414,000	
3-4	Installation Transformer and Accessories (11kV/415V) for JTB-17	Max. 25kVA	set	1.0	25,000,000	25,000,000	
	Installation Transformer and Accessories (11kV/415V) for JTB-18	Max. 25kVA	set	1.0	25,000,000	25,000,000	
3-5	Power distribution panel and electricity usage meter at JTB-17		set	1.0	3,500,000	3,500,000	
	Power distribution panel and electricity usage meter at JTB-18		set	1.0	3,500,000	3,500,000	
3-6	Others	10% of above Total Cost	L/S	1.0		12,877,400	
	Total 3					141,651,400	
	Total of Kidetok RGC					141,939,900	

(Unit:UGX)

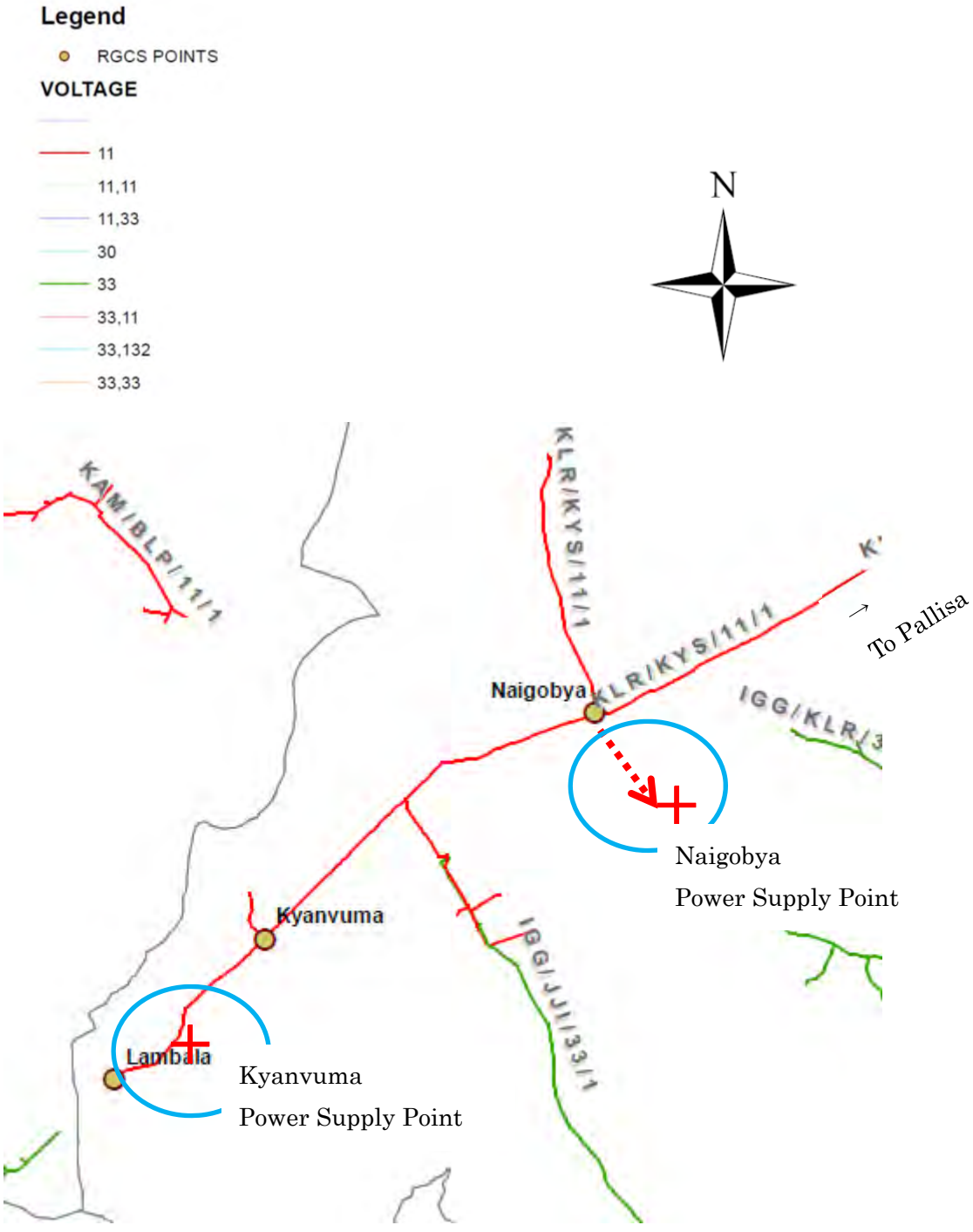
No.	Items	Specification	Unit	Q'ty	Unit Price	Amount	Remark
II.	**Kapala RGC**						(USD)
1	Inspection Fee						
1-1	Wayleave clerarance, permission/consent) from affected land owners.		site	1.0	-	-	To be arranged by the applicant
1-2	Umeme Inspection Fee 2working dats per one site	3-Phase Time of use	site	1.0	88,500	88,500	
	Total 1					88,500	
2	New Connection Fees (Non-Standerd Connection)						
2-1	Commercial- Three phase(Time of Use)	Scurity deposit	site	1.0	200,000	200,000	
	Total 2					200,000	
3.	Connection Cost						
3-1	Survey Cost		L/S	1.0	-	1,500,000	
3-2	Woodn Pole, L=732m NBH-1	732m/100m=7nos	nos	7.0	860,000	6,020,000	
	Woodn Pole, L=130m NBH-2	150m/100m=2nos	nos	2.0	860,000	1,720,000	
3-3	Wireing Cost, 3 Phase 11000Volt line to P-04-NBH-1		m	732.0	42,000	30,744,000	
	Wireing Cost, 3 Phase 415V line to P-04-NBH-2		m	130.0	42,000	5,460,000	
3-4	Installation Transformer and Accessories, 11kV/415V	Max. 25kVA	set	1.0	25,000,000	25,000,000	
3-5	Power distribution panel and electricity usage	with Arrester and Earthing	set	1.0	3,500,000	3,500,000	
3-6	Others	10% of above Total Cost	L/S	1.0		7,394,400	
	Total 3					81,338,400	
	Total of Kapala RGC					81,626,900	

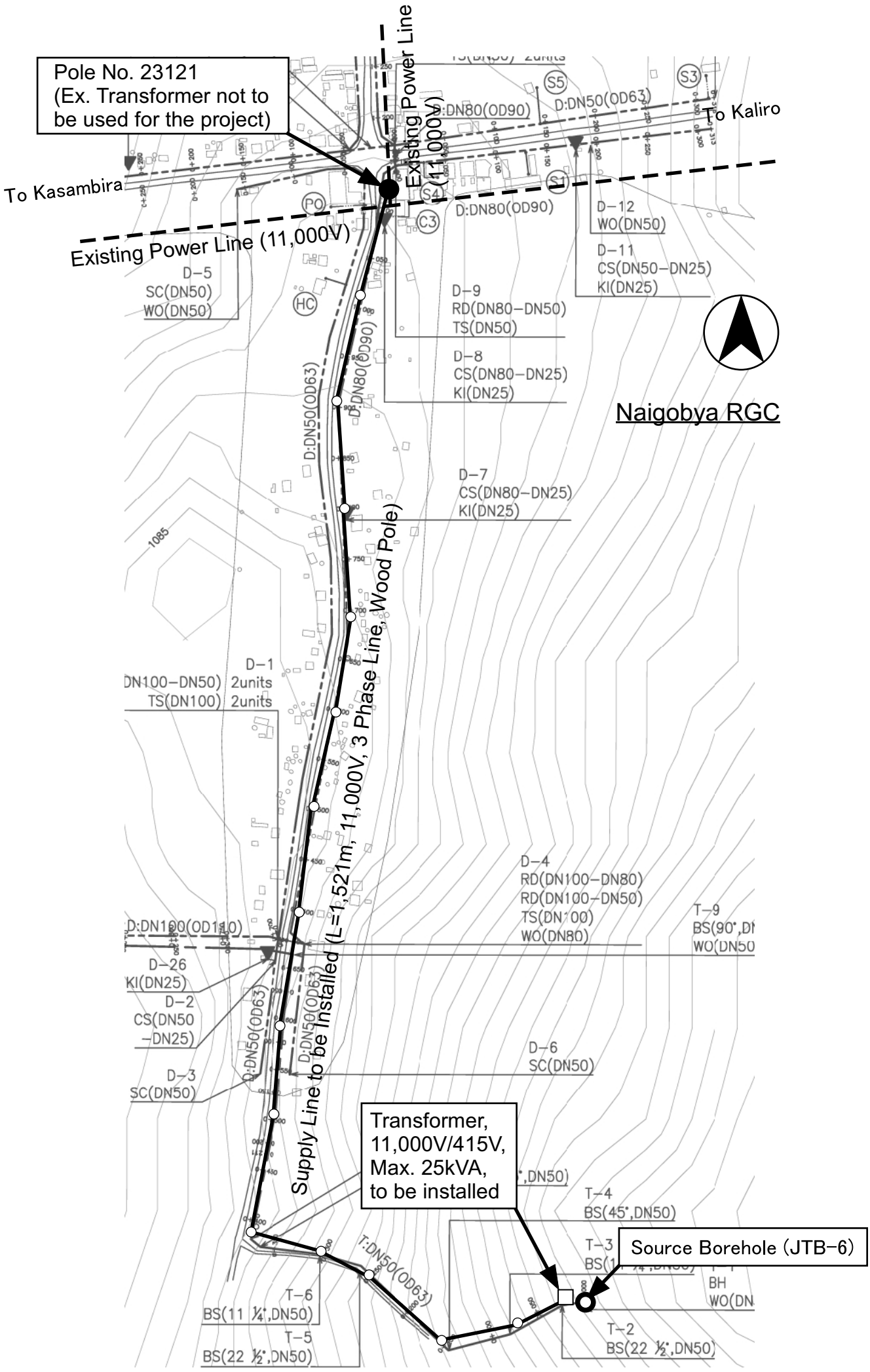
No.	Items	Specification	Unit	Q'ty	Unit Price	Amount	Remark
III.	Kasassira RGC						
1	Inspection Fee						
1-1	Wayleave clerarance, permission/consent) from affected land owners.		site	1.0	-	-	To be arranged by the applicant
1-2	Umeme Inspection Fee 2working dats per one site	3-Phase Time of use	site	1.0	88,500	88,500	
	Total 1					88,500	
2	New Connection Fees (Non-Standerd Connection)						
2-1	Commercial- Three phase(Time of Use)	Scurity deposit	site	1.0	200,000	200,000	
	Total 2					200,000	
3.	Connection Cost						
3-1	Survey Cost		L/S	1.0	-	1,500,000	
3-2	Treated Wood Pole, L=1,150m	1,150m/100m=12nos	nos	12.0	850,000	10,200,000	
3-3	Wireing Cost, 3 Phase 11kV line to DWD55991		m	1,150.0	42,000	48,300,000	
3-4	Installation Transformer and Accessories, 11kV/415V	Max. 25kVA	set	1.0	25,000,000	25,000,000	
3-5	Power distribution panel and electricity usage	with Arrester and Earthing	set	1.0	3,500,000	3,500,000	
3-6	Others	10% of above Total Cost	L/S	1.0		8,850,000	
	Total 3					97,350,000	
	Total of Kasassira RGC					97,638,500	

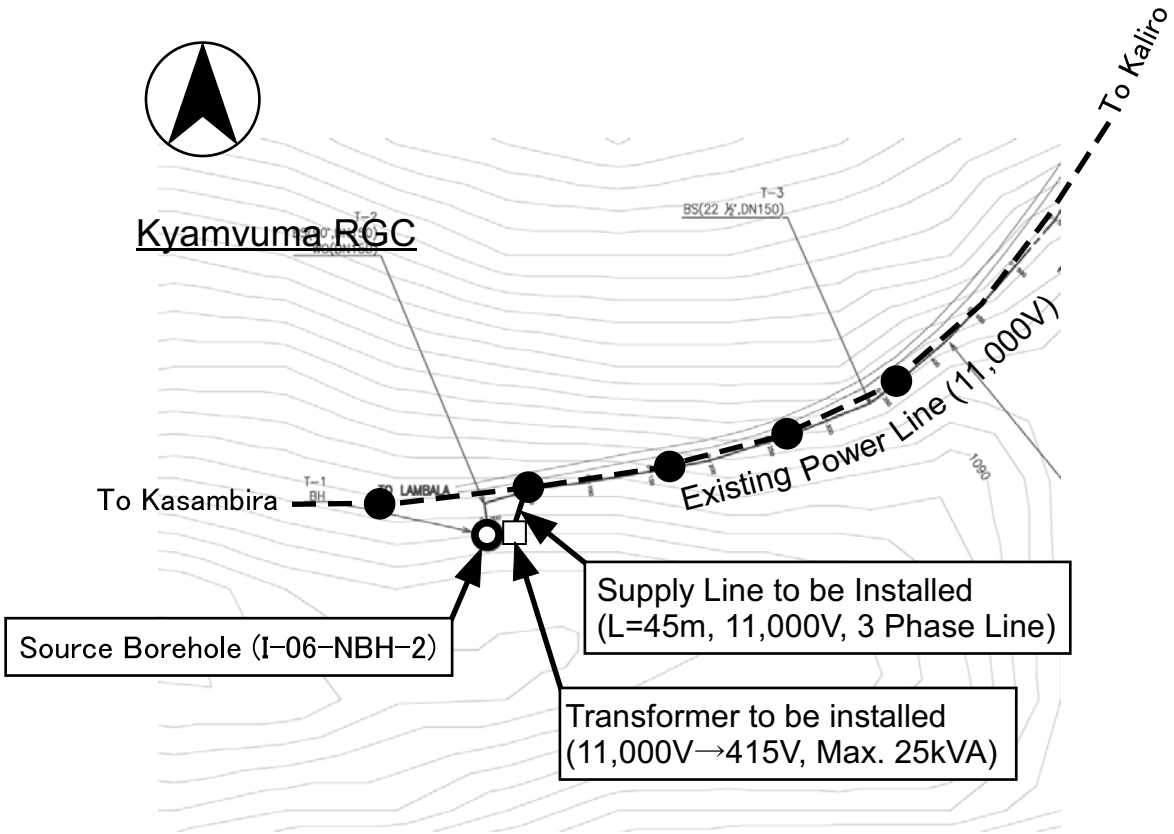
(Unit:UGX)

No.	Items	Specification	Unit	Q'ty	Unit Price	Amount	Remark
IV.	**Naigobya RGC**						(USD)
1	Inspection Fee						
1-1	Wayleave clerarance, permission/consent) from affected land owners.		site	1.0	-	-	To be arranged by the applicant
1-2	Umeme Inspection Fee 2 working dats per one site		site	1.0	88,500	88,500	
	Total 1					88,500	
2	New Connection Fees (Non-Standerd Connection)						
2-1	Commercial- Three phase(Time of Use)	Scurity deposit	site	1.0	200,000	200,000	
	Total 2					200,000	
3.	Connection Cost						
3-1	Survey Cost		L/S	1.0	-	1,000,000	
3-2	Treated Wood Pole, L=1,521m	1,521m/100m=15nos	nos	15.0	860,000	12,900,000	
3-3	Wireing, 3 Phase 415Volt line to the source borehole		m	1,521.0	42,000	63,882,000	
3-4	Installation Transformer and Accessories (11kV/415V)	Max. 25kVA	set	1.0	25,000,000	25,000,000	
3-5	Power distribution panel and electricity usage	with Arrester and Earthing	set	1.0	3,500,000	3,500,000	
3-6	Others	10% of above Total Cost	L/S	1.0	-	10,628,200	
	Total 3					116,910,200	
	Total of Naigobya RGC					117,198,700	
V.	**Kyamvuma RGC**						
1	Inspection Fee						
1-1	Wayleave clerarance, permission/consent) from affected land owners.		site	1.0	-	-	To be arranged by the applicant
1-2	Umeme Inspection Fee 2 working dats per one site		site	1.0	88,500	88,500	
	Total 1					88,500	
2	New Connection Fees (Non-Standerd Connection)						
2-1	Commercial- Three phase(Time of Use)	Scurity deposit	site	1.0	200,000	200,000	
	Total 2					200,000	
3.	Connection Cost						
3-1	Survey Cost		L/S	1.0	-	500,000	
3-2	Woodn Pole, L=45m		nos	3.0	860,000	2,580,000	
3-3	Wireing, 3 Phase 11kV line to I-06-NBH-2		m	45.0	42,000	1,890,000	
3-4	Installation Transformer and Accessories (11kV/415V)	Max. 25kVA	set	1.0	25,000,000	25,000,000	
3-5	Power distribution panel and electricity usage	with Arrester and Earthing	set	1.0	3,500,000	3,500,000	
3-6	Others	10% of above Total Cost	L/S	1.0	-	3,347,000	
	Total 3					36,317,000	
	Total of Naigobya RGC					36,605,500	

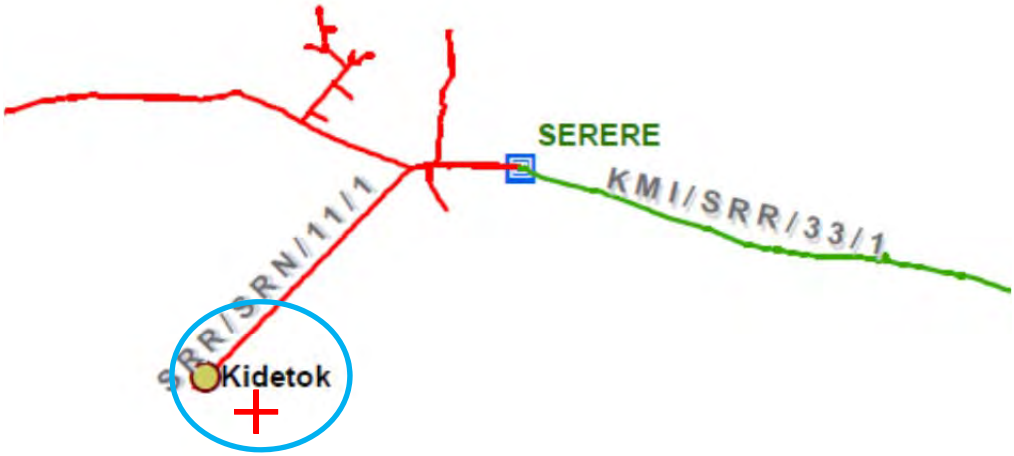
Naigobya and Kyanvuma




Pole No. 23121
(Ex. Transformer not to be used for the project)
To Kasambira
To Kaliro
Existing Power Line (11,000V)
Existing Power Line (11,000V)
Naigobya RGC
Supply Line to be installed (L=1,521m, 11,000V, 3 Phase Line, Wood Pole)
Transformer, 11,000V/415V, Max. 25kVA, to be installed
Source Borehole (JTB-6)
D:DN80(OD90)
D:DN50(OD63)
D:DN100(OD110)
D-1 2units TS(DN100)
D-2 CS(DN50 -DN25)
D-3 SC(DN50)
D-4 RD(DN100-DN80) RD(DN100-DN50) TS(DN100) WO(DN80)
D-5 SC(DN50) WO(DN50)
D-6 SC(DN50)
D-7 CS(DN80-DN25) KI(DN25)
D-8 CS(DN80-DN25) KI(DN25)
D-9 RD(DN80-DN50) TS(DN50)
D-11 CS(DN50-DN25) KI(DN25)
D-12 WO(DN50)
D-26 KI(DN25)
T-2 BS(22 ½",DN50)
T-3
T-4 BS(45°,DN50)
T-5 BS(22 ½",DN50)
T-6 BS(11 ¼",DN50)
T:DN50(OD63)


Kyamvuma RGC
To Kaliro
To Kasambira
Existing Power Line (11,000V)
Supply Line to be Installed
(L=45m, 11,000V, 3 Phase Line)
Source Borehole (I-06-NBH-2)
Transformer to be installed
(11,000V→415V, Max. 25kVA)

Kidetok RGC



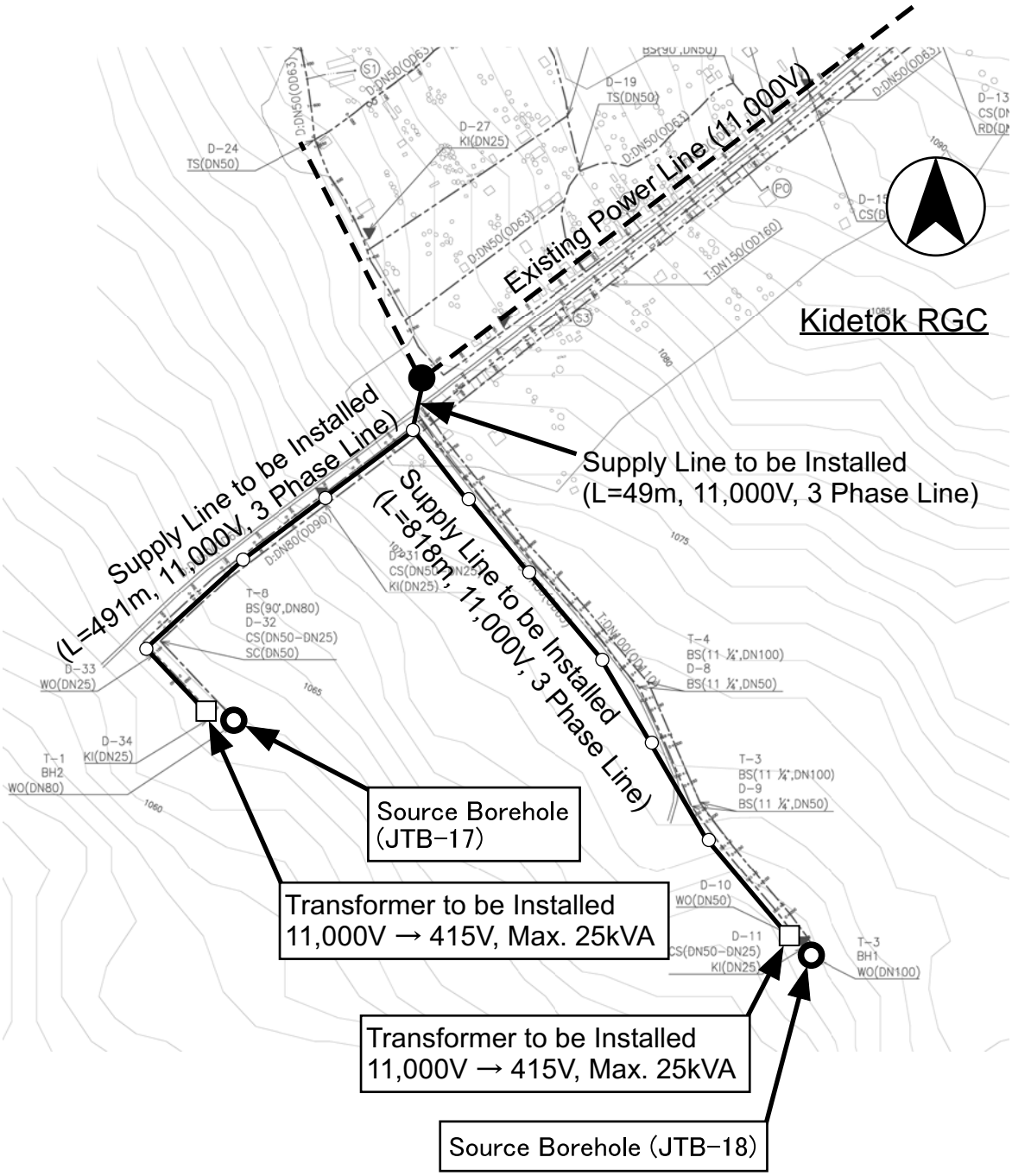
Legend

- RGCS POINTS

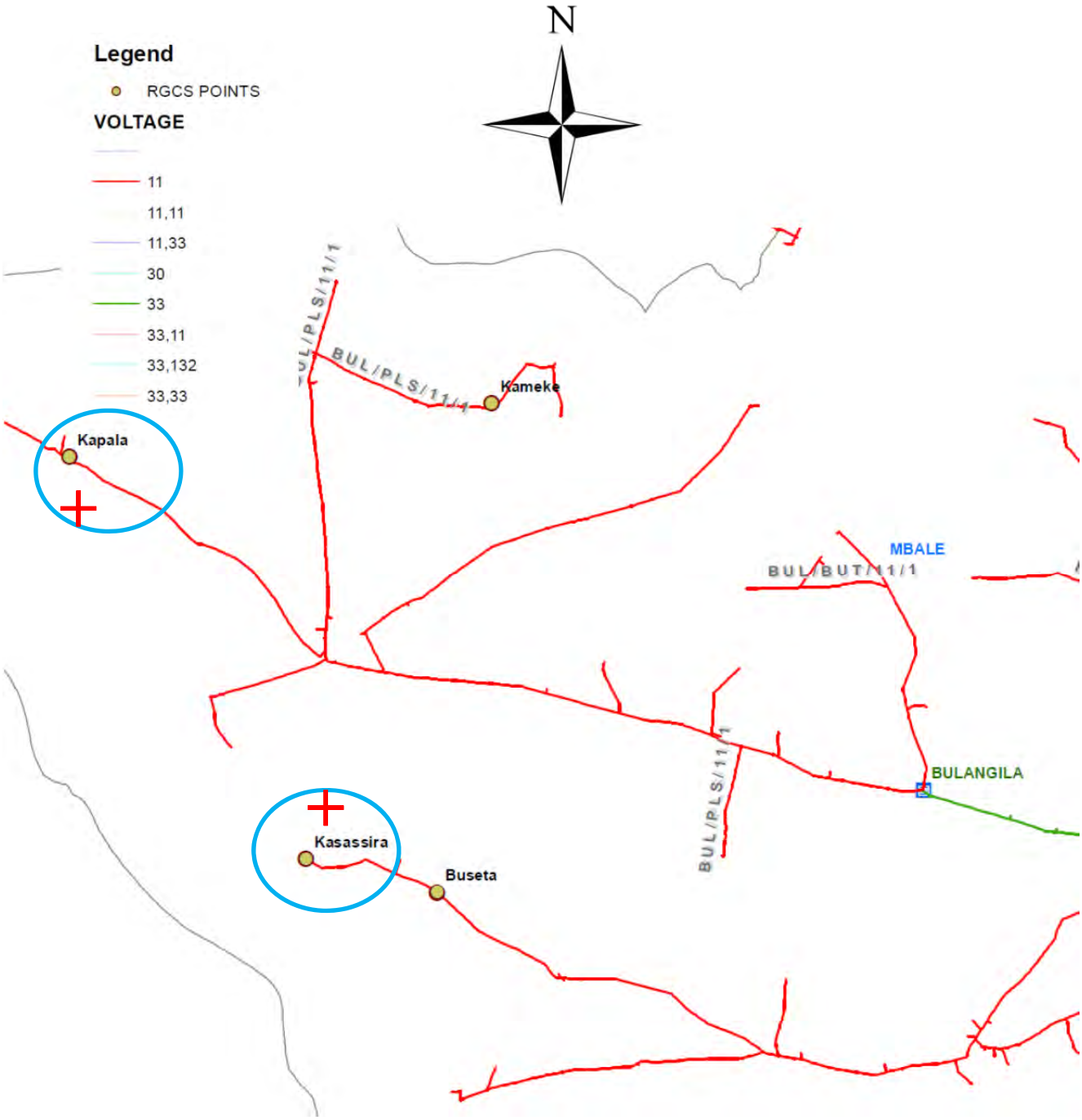
VOLTAGE

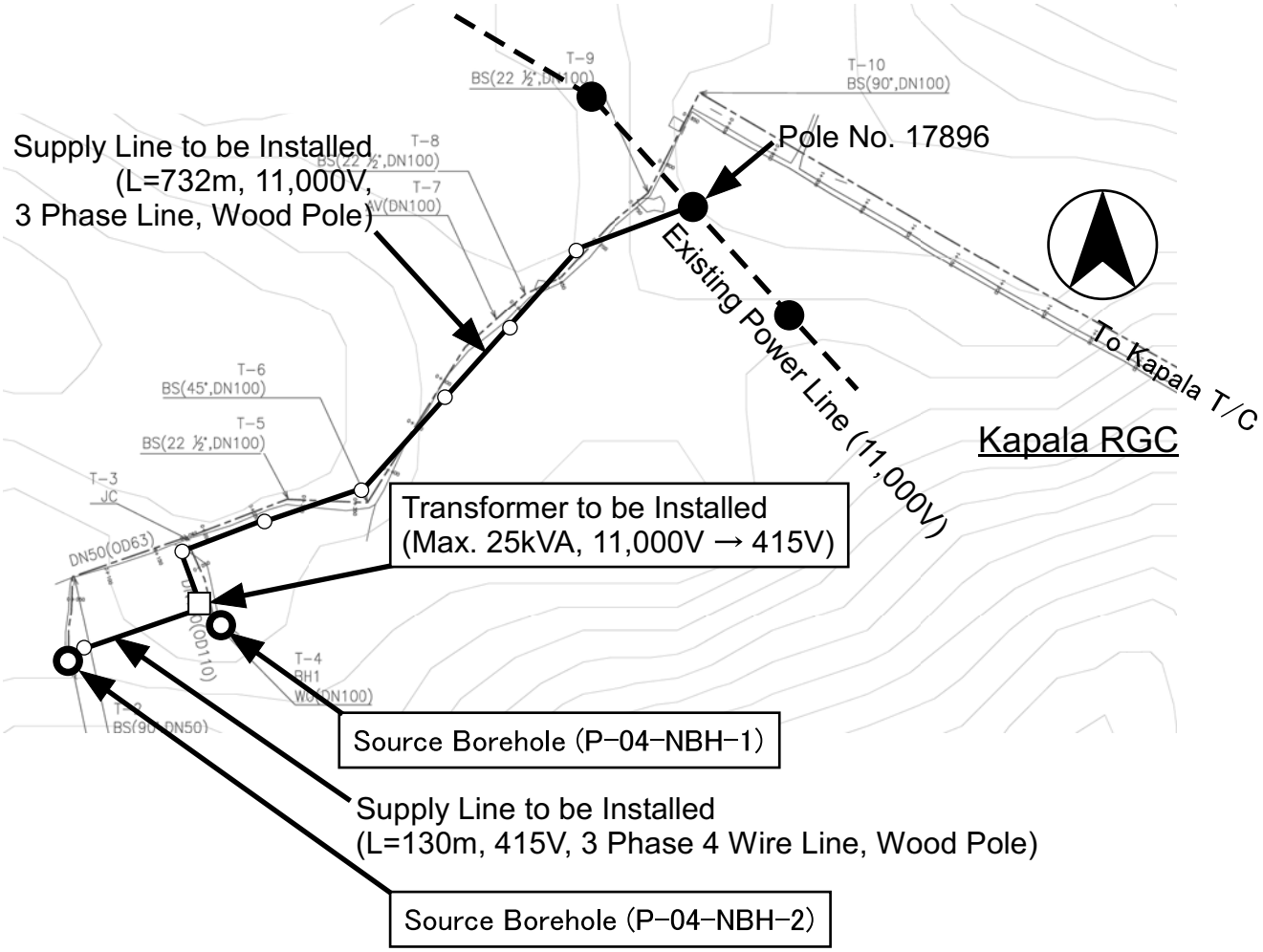
- 11
- 11,11
- 11,33
- 30
- 33
- 33,11
- 33,132
- 33,33

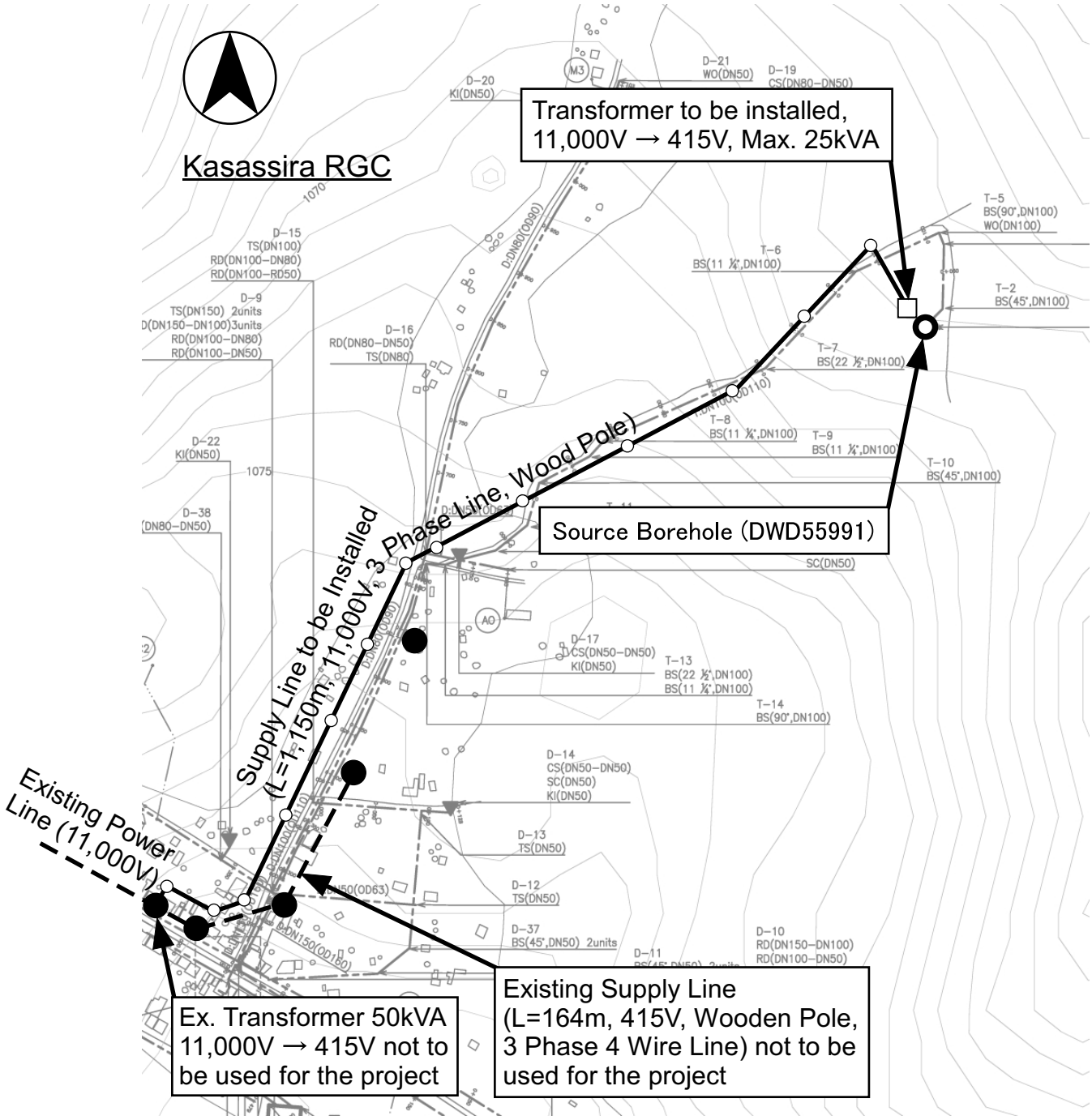
N


Existing Power Line (11,000V)
Kidetok RGC
Supply Line to be Installed
(L=49m, 11,000V, 3 Phase Line)
Supply Line to be Installed
(L=491m, 11,000V, 3 Phase Line)
Supply Line to be Installed
(L=818m, 11,000V, 3 Phase Line)
Source Borehole
(JTB-17)
Transformer to be Installed
11,000V → 415V, Max. 25kVA
Transformer to be Installed
11,000V → 415V, Max. 25kVA
Source Borehole (JTB-18)

Kapala and Kasassira RGC




Supply Line to be Installed
(L=732m, 11,000V,
3 Phase Line, Wood Pole)
Pole No. 17896
Existing Power Line (11,000V)
To Kapala T/C
Kapala RGC
Transformer to be Installed
(Max. 25kVA, 11,000V → 415V)
Source Borehole (P-04-NBH-1)
Supply Line to be Installed
(L=130m, 415V, 3 Phase 4 Wire Line, Wood Pole)
Source Borehole (P-04-NBH-2)


Kasassira RGC
Transformer to be installed, 11,000V → 415V, Max. 25kVA
Source Borehole (DWD55991)
Supply Line to be Installed (L=1,150m, 11,000V, 3 Phase Line, Wood Pole)
Existing Power Line (11,000V)
Ex. Transformer 50kVA 11,000V → 415V not to be used for the project
Existing Supply Line (L=164m, 415V, Wooden Pole, 3 Phase 4 Wire Line) not to be used for the project

Appendix-9

Annual Operation and Maintenance Costs

for Piped Water Supply Facilities

Annual Operation and Maintenance Costs for
Piped Water Supply Facilities

					Nambale		Lambala		Naigobya	
No	Item	Description	Unit	Rate	Quantity	Amount	Quantity	Amount	Quantity	Amount
				(UGX)		(UGX)		(UGX)		(UGX)
1.	Operation Costs									
a.	Scheme Operator		month	2,100,000	12.0	25,200,000	12.0	25,200,000	12.0	25,200,000
b.	Security Guards		month	500,000	12.0	6,000,000	12.0	6,000,000	-	-
c.	Kiosk Attendants	No. of Water Kiosks	Nos.	-	6.0	-	5.0	-	7.0	-
		Water Kiosk:	month	300,000	72.0	21,600,000	60.0	18,000,000	84.0	25,200,000
d.	Electricity									
	Normal Operation	Normal Operation days a week	days	-	Solar	-	Solar	-	7.0	-
		Operation Time (Off-peak)	Hrs./day	-	-	-	-	-	6.0	-
		Operation Time (Peak)	Hrs./day	-	-	-	-	-	1.0	-
		Operation Time (Shoulder)	Hrs./day	-	-	-	-	-	6.0	-
		Total Operation Time	Hrs./day	-	6.0	-	6.0	-	13.0	-
		Motor output	kW	-	10.40	-	7.20	-	1.50	-
		UMEME (Off-peak time)	kWh/day	313.4	-	-	-	-	9.0	2,821
		UMEME (Peak time)	kWh/day	695.7	-	-	-	-	1.5	1,044
		UMEME (Shoulder time)	kWh/day	533.5	-	-	-	-	9.0	4,802
		Electricity Consumption	kWh/day	-	-	-	-	-	-	8,667
		Electricity Consumption	Year	-	-	-	-	-	-	3,163,455
	Emargency Operation for Power Outage	Emergency Operation days a week	days	-	Solar	-	Solar	-	2.0	-
	Power outage of twice a week for 12 hours are considered.	Operation Time (Off-peak)	Hrs./day	-	-	-	-	-	0.0	-
		Operation Time (Peak)	Hrs./day	-	-	-	-	-	6.5	-
		Operation Time (Shoulder)	Hrs./day	-	-	-	-	-	0.0	-
		Total Operation Time	Hrs./day	-	-	-	-	-	6.5	-
		Motor output	kW	-	-	-	-	-	1.50	-
		UMEME (Off-peak time)	kWh/day	313.4	-	-	-	-	0.0	0
		UMEME (Peak time)	kWh/day	695.7	-	-	-	-	42.3	29,393
		UMEME (Shoulder time)	kWh/day	533.5	-	-	-	-	0.0	0
		Electricity Consumption	kWh/day	-	-	-	-	-	-	29,393
		Electricity Consumption	Year	-	-	-	-	-	-	3,056,872
e.	Fuel (Diesel)	Emergency Operation Time	Hrs.	-	-	-	-	-	-	-
	Generator (Diesel engin	Unit Fuel Consumption	L/hr.	-	-	-	-	-	-	-
		Fuel (Diesel) Consumption	Year	2,690	-	-	-	-	-	-
f.	Chemicals	Volume of Elevated Tank	m3	-	64.0	-	64.0	-	80.0	-
	(Calcium Hypochlorite)	Chlorine Dosage	mg/l	-	0.2	-	0.2	-	0.2	-
		Amount of Chemicals Required	kg/day	-	0.021	-	0.021	-	0.027	-
		Chemicals Consumption	Year	22,381	7.8	174,273	7.8	174,273	9.7	217,842
	Sub-total					52,974,273		49,374,273		56,838,169
2.	Maintenance Costs									
a.	Mechanic & Electrican	8 days/Borehole per year	day	241,992	8.0	1,935,936	8.0	1,935,936	8.0	1,935,936
b.	Common Labors	50 days/Borehole per year	man/day	25,932	50.0	1,296,600	50.0	1,296,600	50.0	1,296,600
c.	Spare Parts	Submersible Motor Pump,etc.	L.S.		1.0	168,922,853	1.0	123,841,251	1.0	42,907,566
					Class SQF 3A-10, 3 nos.		Class SQF 3A-10, 3 nos.		SP3A-22 (1.5kW)	
		Solar Modul, etc	sets	4,181,336	42	175,616,112	36	150,528,096		
		5% of procurement cost				17,226,948		13,718,467		2,145,378
	Sub-total					20,459,484		16,951,003		5,377,914
3.	Other Costs									
a.	Water Permit (up to 400m3)	DWRM	year	200,000	1.0	200,000	1.0	200,000	1.0	200,000
b.	Subscription Fee	Umbllerar East	year	100,000	1.0	100,000	1.0	100,000	1.0	100,000
c.	Allowance for Accountant		man-day	30,000	24.0	720,000	24.0	720,000	24.0	720,000
d.	Allowancese for Members		man-day	20,000	48.0	960,000	48.0	960,000	48.0	960,000
	Sub-total					1,980,000		1,980,000		1,980,000
	Total					75,413,757		68,305,276		64,196,083

Daily Water Demand (m3/day)	m3/day	-	50	-	47	-	46	-
Annual Water Demand (m3/year)	m3/year	-	18,250	-	17,155	-	16,790	-
Price for jerry can (Estimated price)	UGX/20L	-	-	82.6	-	79.6	-	76.5
Price for jerry can (Willingness-to-Pay)	UGX/20L	-	-	120.2	-	83.8	-	80.0

Annual Operation and Maintenance Costs for
Piped Water Supply Facilities

					Kyamvuma		Kasassira		Kameke	
No	Item	Description	Unit	Rate	Quantity	Amount	Quantity	Amount	Quantity	Amount
				(UGX)		(UGX)		(UGX)		(UGX)
1.	Operation Costs									
a.	Scheme Operator		month	2,100,000	12.0	25,200,000	12.0	25,200,000	12.0	25,200,000
b.	Security Guards		month	500,000	-	-	-	-	12.0	6,000,000
c.	Kiosk Attendants	No. of Water Kiosks	Nos.	-	9.0	-	11.0	-	7.0	-
		Water Kiosk:	month	300,000	108.0	32,400,000	132.0	39,600,000	84.0	25,200,000
d.	Electricity									
	Normal Operation	Normal Operation days a week	days	-	7.0	-	5.0	-	Solar	-
		Operation Time (Off-peak)	Hrs./day	-	6.0	-	6.0	-	-	-
		Operation Time (Peak)	Hrs./day	-	0.0		6.0	-	-	-
		Operation Time (Shoulder)	Hrs./day	-	0.0		4.0	-	-	-
		Total Operation Time	Hrs./day	-	6.0		16.0	-	-	-
		Motor output	kW	-	7.50	-	5.50	-	7.20	-
		UMEME (Off-peak time)	kWh/day	313.4	45.00	14,103	33.0	10,342	-	-
		UMEME (Peak time)	kWh/day	695.7	0.00	0	33.0	22,958	-	-
		UMEME (Shoulder time)	kWh/day	533.5	0.00	0	22.0	11,737	-	-
		Electricity Consumption	kWh/day	-	-	14,103	-	45,037	-	-
		Electricity Consumption	Year	-	-	5,147,595	-	11,709,620	-	-
	Emargency Operation for Power Outage	Emergency Operation days a week	days	-	2.0	-	2.0	-	Solar	-
	Power outage of twice a week for 12 hours are considered.	Operation Time (Off-peak)	Hrs./day	-	0.0	-	4.0	-	-	-
		Operation Time (Peak)	Hrs./day	-	0.0	-	0.0	-	-	-
		Operation Time (Shoulder)	Hrs./day	-	3.0	-	0.0	-	-	-
		Total Operation Time	Hrs./day	-	3.0	-	4.0	-	-	-
		Motor output	kW	-	7.50	-	5.50	-	-	-
		UMEME (Off-peak time)	kWh/day	313.4	0.0	0	16.0	5,014	-	-
		UMEME (Peak time)	kWh/day	695.7	0.0	0	0.0	0	-	-
		UMEME (Shoulder time)	kWh/day	533.5	9.0	4,802	0.0	0	-	-
		Electricity Consumption	kWh/day	-	-	4,802	16.0	5,014	-	-
		Electricity Consumption	Year	-	-	499,408	-	521,456	-	-
e.	Fuel (Diesel)	Emergency Operation Time	Hrs.	-	-	-	24.0	-	-	-
	Generator (Diesel engin	Unit Fuel Consumption	L/hr.	-	-	-	3.9	-	-	-
		Fuel (Diesel) Consumption	Year	2,690	-	-	93.6	13,092,768	-	-
f.	Chemicals	Volume of Elevated Tank	m3	-	168.0	-	324.0	-	48.0	-
	(Calcium Hypochlorite)	Chlorine Dosage	mg/l	-	0.2	-	0.2	-	0.2	-
		Amount of Chemicals Required	kg/day	-	0.056	-	0.108	-	0.016	-
		Chemicals Consumption	Year	22,381	20.4	457,468	39.4	882,259	5.8	130,705
	Sub-total					63,704,471		91,006,103		56,530,705
2.	Maintenance Costs									
a.	Mechanic & Electrican	8 days/Borehole per year	day	241,992	8.0	1,935,936	8.0	1,935,936	8.0	1,935,936
b.	Common Labors	50 days/Borehole per year	man/day	25,932	50.0	1,296,600	50.0	1,296,600	50.0	1,296,600
c.	Spare Parts	Submersible Motor Pump,etc.	L.S.		1.0	79,710,532	1.0	65,593,197	1.0	123,670,167
					SP14-27 (7.5kW)		SP14-23 (5.5kW)		Class SQF 2.5-2, 3 nos.	
		Solar Modul, etc	sets	4,181,336					36	150,528,096
		5% of procurement cost				3,985,527		3,279,660		13,709,913
	Sub-total					7,218,063		6,512,196		16,942,449
3.	Other Costs									
a.	Water Permit (up to 400m3)	DWRM	year	200,000	1.0	200,000	1.0	200,000	1.0	200,000
b.	Subscription Fee	Umbllerar East	year	100,000	1.0	100,000	1.0	100,000	1.0	100,000
c.	Allowance for Accountant		man-day	30,000	24.0	720,000	24.0	720,000	24.0	720,000
d.	Allowancese for Members		man-day	20,000	48.0	960,000	48.0	960,000	48.0	960,000
	Sub-total					1,980,000		1,980,000		1,980,000
	Total					72,902,534		99,498,299		75,453,154
Daily Water Demand (m3/day)			m3/day	-	88	-	271	-	42	-
Annual Water Demand (m3/year)			m3/year	-	32,120	-	98,915	-	15,330	-
Price for jerry can (Estimated price)			UGX/20L	-	-	45.4	-	20.1	-	98.4
Price for jerry can (Willingness-to-Pay)			UGX/20L	-	-	88.6	-	101.6	-	94.4

Annual Operation and Maintenance Costs for
Piped Water Supply Facilities

					Kapala		Buseta		Kidetok	
No	Item	Description	Unit	Rate	Quantity	Amount	Quantity	Amount	Quantity	Amount
				(UGX)		(UGX)		(UGX)		(UGX)
1.	Operation Costs									
a.	Scheme Operator		month	2,100,000	12.0	25,200,000	12.0	25,200,000	12.0	25,200,000
b.	Security Guards		month	500,000	-	-	12.0	6,000,000	-	-
c.	Kiosk Attendants	No. of Water Kiosks	Nos.	-	7.0	-	9.0	-	9.0	-
		Water Kiosk:	month	300,000	84.0	25,200,000	108.0	32,400,000	108.0	32,400,000
d.	Electricity									
	Normal Operation	Normal Operation days a week	days	-	7.0	-	Solar	-	7.0	-
		Operation Time (Off-peak)	Hrs./day	-	6.0	-	-	-	6.0	-
		Operation Time (Peak)	Hrs./day	-	0.0	-	-	-	0.0	-
		Operation Time (Shoulder)	Hrs./day	-	1.0	-	-	-	0.0	-
		Total Operation Time	Hrs./day	-	7.0	-	-	-	6.0	-
		Motor output	kW	-	4.10	-	7.20	-	8.50	-
		UMEME (Off-peak time)	kWh/day	313.4	24.6	7,710	-	-	51.0	15,983
		UMEME (Peak time)	kWh/day	695.7	0.0	0	-	-	0.0	0
		UMEME (Shoulder time)	kWh/day	533.5	4.1	2,187	-	-	0.0	0
		Electricity Consumption	kWh/day	-	-	9,897	-	-	-	15,983
		Electricity Consumption	Year	-	-	3,612,405	-	-	-	5,833,795
	Emargency Operation for Power Outage	Emergency Operation days a week	days	-	2.0	-	Solar	-	2.0	-
	Power outage of twice a week for 12 hours are considered.	Operation Time (Off-peak)	Hrs./day	-	0.0	-	-	-	0.0	-
		Operation Time (Peak)	Hrs./day	-	0.0	-	-	-	3.0	-
		Operation Time (Shoulder)	Hrs./day	-	3.5	-	-	-	0.0	-
		Total Operation Time	Hrs./day	-	3.5		-	-	3.0	-
		Motor output	kW	-	4.10	-	-	-	8.50	-
		UMEME (Off-peak time)	kWh/day	313.4	0.0	0	-	-	0.0	0
		UMEME (Peak time)	kWh/day	695.7	0.0	0	-	-	9.0	6,261
		UMEME (Shoulder time)	kWh/day	533.5	12.3	6,535	-	-	0.0	0
		Electricity Consumption	kWh/day	-	12.3	6,535	-	-	9.0	6,261
		Electricity Consumption	Year	-	-	679,640	-	-	-	651,144
e.	Fuel (Diesel)	Emergency Operation Time	Hrs.	-	-	-	-	-	-	-
	Generator (Diesel engin	Unit Fuel Consumption	L/hr.	-	-	-	-	-	-	-
		Fuel (Diesel) Consumption	Year	2,690	-	-	-	-	-	-
f.	Chemicals	Volume of Elevated Tank	m3	-	144.0	-	80.0	-	196.0	-
	(Calcium Hypochlorite)	Chlorine Dosage	mg/l	-	0.2	-	0.2	-	0.2	-
		Amount of Chemicals Required	kg/day	-	0.048	-	0.027	-	0.065	-
		Chemicals Consumption	Year	22,381	17.5	392,115	9.7	217,842	23.8	533,712
	Sub-total					55,084,160		63,817,842		64,618,651
2.	Maintenance Costs									
a.	Mechanic & Electrican	8 days/Borehole per year	day	241,992	8.0	1,935,936	8.0	1,935,936	8.0	1,935,936
b.	Common Labors	50 days/Borehole per year	man/day	25,932	50.0	1,296,600	50.0	1,296,600	50.0	1,296,600
c.	Spare Parts	Submersible Motor Pump,etc.	L.S.		1.0	88,709,873	1.0	123,841,251	1.0	111,395,396
					SP7-23 (3.0kW)		Class SQF 3A-10, 3 nos.		SP7-23 (3.0kW)	
					SP3A-18 (1.1kW)				SP14-20 (5.5kW)	
		Solar Modul, etc	sets	4,181,336			36	150,528,096		
		5% of procurement cost				4,435,494		13,718,467		5,569,770
	Sub-total					7,668,030		16,951,003		8,802,306
3.	Other Costs									
a.	Water Permit (up to 400m3)	DWRM	year	200,000	1.0	200,000	1.0	200,000	1.0	200,000
b.	Subscription Fee	Umbllerar East	year	100,000	1.0	100,000	1.0	100,000	1.0	100,000
c.	Allowance for Accountant		man-day	30,000	24.0	720,000	24.0	720,000	24.0	720,000
d.	Allowancese for Members		man-day	20,000	48.0	960,000	48.0	960,000	48.0	960,000
	Sub-total					1,980,000		1,980,000		1,980,000
	Total					64,732,190		82,748,845		75,400,957
Daily Water Demand (m3/day)			m3/day	-	74	-	61	-	108	-
Annual Water Demand (m3/year)			m3/year	-	27,010	-	22,265	-	39,420	-
Price for jerry can (Estimated price)			UGX/20L	-	-	47.9	-	74.3	-	38.3
Price for jerry can (Willingness-to-Pay)			UGX/20L	-	-	120.0	-	95.0	-	103.3

Appendix-10

Soft Component (Technical Assistance) Plan

Appendix 10

THE PREPARATORY SURVEY
FOR
THE PROJECT FOR RURAL WATER SUPPLY PHASE III
IN LAKE KYOGA BASIN, EASTERN UGANDA
IN THE REPUBLIC OF UGANDA

SOFT COMPONENT (TECHNICAL ASSISTANCE) PLAN

2016 November

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
OYO INTERNATIONAL CORPORATION
IN ASSOCIATION WITH
TEC INTERNATIONAL CO., LTD.

THE PROJECT FOR RURAL WATER SUPPLY PHASE III IN LAKE KYOGA BASIN, EASTERN UGANDA, IN THE REPUBLIC OF UGANDA
SOFT COMPONENT PLAN

Table of Contents

Note:

Board and committees appeared in this document.

- Water supply and Sanitation Board（WSSB）:
  Organization responsible for operation and maintenance of the constructed pipe water supply facility: the members consist of representative of RGC residents, Sub-county chief and a Sub-county councilor.
- Water and Sanitation Committee（WSC）:
  Resident organization for operation and maintenance of a point water source.
- Water and Sanitation Implementation Committee (WSIC):
  Residents organization for support of the implementation of this preparatory survey after pre-sensitization

activities.

- Project Implementation Committee（PIC）:
  Residents organization for support of the implementation of the Project at the stage of signing of MoU (Minutes of Understanding) between MOWE and the District local government where the target RGC is located.

1. Background of Soft Component (Technical Assistance) Plan

1.1 Outline of the Project

The objective of The Project for Rural Water Supply Phase III in Lake Kyoga Basin, Eastern Uganda in The Republic of Uganda (the Project) is to improve water supply coverage in the eastern area of the Lake Kyoga basin in Uganda, using Japan grant aid for the Project as described below.

Table 1 The Outline of the Project

Items	Contents	Outline
Water supply facilities	Construction of piped water supply facilities	9 nos. (construction of deep borehole, transmission lines, elevated tanks, distribution liens, kiosks and yard taps for public facilities)
Software (Technical) Assistance	Activities for improvement on operation & maintenance capacities of target RGCs	- Support of establishment of Water Supply and Sanitation Board (WSSB), selection of: Scheme Operator (S/O) and Kiosk Attendants (K/As), workshop and training on operation and maintenance (O&M) of a piped water supply system such as collection of water fee and the management, production of monthly report, cleaning of Kiosks, and so on in each target RGC. - Community mobilization and sensitization in each target RGC

Responsible organization: Ministry of Water and Environment (MOWE),
Implementation organization: Directorate of Water Development

1.2 Background of Soft Component Plan

(1) Operation and maintenance management system of current public piped water supply facilities in Uganda

After surveying the existing public water supply facilities, the operations and maintenance systems actually used in the rural areas of Uganda could be sorted out as shown in the table below.

Table 2 Current Operation & Maintenance Systems for Piped Water Supply Facility in Rural Area of Uganda

O&M Body	Relation to WSSB	Responsible Body of O&M	Works by Operator	Scale of Served Population (Rough Standard)
a. National Water and Sewerage Company (NWSC)	None	NWSC is responsible for all O&M.		More than 30,000
b. WSSB & P/O	Contract on O&M P/O pays fixed amount or fixed rate of collected water fee to WSSB. P/O is a kind of private company	P/O WSSB on major repairs	Pump operation and the record, collection of water fee, payment on power supply cost, inspection of the scheme and minor repair.	Between 5,000 ～ 30,000
c. WSSB & S/O	Selection and employment of S/O A part of collected water fee will be paid to	WSSB WSSB on major repairs.	Many variations exist according to their responsibilities. The idea of MOWE is "S/O is responsible to	Less than 5,000

	S/O as his/her salary.		pump operation and its recording, collection of water fee, inspection of the scheme, and minor repairs."	

Points listed below should be kept in mind concerning the target RGCs when conducting O&M for this Project with the O&M bodies listed above.

- The facilities and served populations are too small for direct O&M by NWSC.
- If P/Os are used for O&M, as they are companies, overhead costs are necessary. For the small scale piped water supply facilities, however, the portion of expenditure accounts for large percentage in collected water fees, and as can be seen from past experience, maintenance via P/O is very likely to face financial trouble.
- In MOWE, there are registered 17 P/Os, but very few have earned good reputations.
- At the time of this survey started, MOWE recommended the P/O system, however it recommends the S/O system at present for such small scale water supply facilities to be constructed in the Project.

The RGC populations to be served by the planned water supply facilities for the target year are all less than 5,000 people except Kasassira RGC as shown in the following table.

Table 3 Population of Target RGCs

Target District	Target RGC	Population (2022)
Iganga	Nambale	1,863
Luuka	Lambala	1,742
	Naigobya	1,711
	Kyanvuma	3,228
Kibuku	Kasassira	5,676
	Buseta	2,276
Pallisa	Kameke	1,546
	Kapala	2,735
Serere	Kidetok	3,961

(Source: Social survey by the Team)

Therefore, from the lessons learnt, strategy of MOWE and the population scale, the "WSSB + S/O" system is best suited to the target RGCs of this Project. In case of Kasassira RGC, the population is slightly more than 5,000 persons, and the location is very near to Buseta RGC. The total population of both RGCs is slightly less than 8,000 so that a single P/O may manage the two facilities: this plan offers the scale merit. Still, few P/Os can be trusted, and because MOWE and other donors are attempting to shift away from the P/O system, the same system, that is "WSSB + S/O" system, would be best for Kasassira as well.

The WSSB + S/O system of O&M can be expected to work as shown in the figure below..

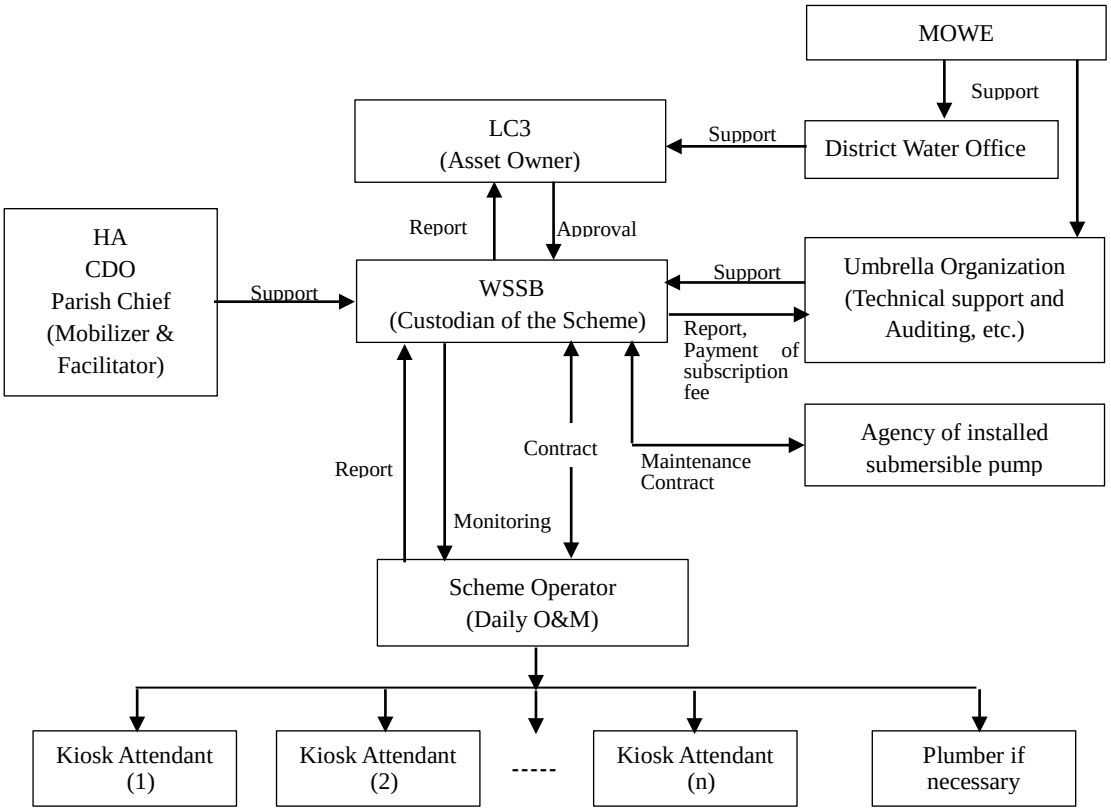


Figure 1 Supposed Organization/Constitution of O&M in the Project

Concerning the division of roles and responsibility between WSSB executives and the S/O, there are several possible patterns, and from which each RGC can choose by its own decision.

That is to say, the WSSB (including a S/O and K/As), which is given authority to operate and maintain the water supply system from the Sub-County Council (LC3), will operate and maintain the facilities. In addition, a maintenance contract should be made with the supplier of the submersible pump as it requires highly professional skills; and major repairs, etc., can be done by joining in the Umbrella Organization (U/O) to obtain their support.

(2) Support system of MOWE for the O&M of piped water supply facilities

O&M are vital to the sustainability of the water supply facilities to be built by this Project. The RGC's population and the WSSB, those are users of the facilities, will perform the main roles in the O&M.

District Water Offices (DWO) and Umbrella will serve as governmental organizations that support the O&M. For DWOs, however, as they are so highly affected by decentralization strategy of the central government so that it results in a shortage of manpower in local governments. They can handle the O&M of hand-pump wells; but, they don't have enough stuff to look after O&M for piped water supply schemes. On the other hand, Umbrella is an organization under MOWE, which is specialized in O&M support of piped water supply schemes with a mission to provide maintenance training, technical advice,

management support, preventative maintenance control, water fee collection, support plans for facility reconstruction and expansion, etc., as well as monitoring water quality. Except for areas under NWSC control, all the other areas are under U/Os. Presently, there are six Umbrellas in whole Uganda. Umbrella-East, whose office is in Mbale, is in charge of the Project areas. Previously, it was a semipublic organization, and in 2016, it became a completely governmental one. The Ugandan government has been investing its subsidy to the umbrellas for aiming smooth implementation of extensive repairs, extension and rehabilitation of facilities, and more. Therefore, it is necessary to join an U/O and receive its support as one of the measures for ensuring sustainability of the piped water supply facilities built by this Project.

However, each Umbrella has not enough officers for the purpose at present. For example, the responsible Umbrella of the Project area is “Umbrella-East”, whose personnel composition is listed in the table below.

Table 4 Personnel Composition of Umbrella-East

Role	Nos.
Manager	1
Admin/Accounts Assistant	1
Electrical & Mechanical Technician	0
Water Quality Analyst	1
Social Mobiliser	1
Assist Social Mobiliser	1
Engineering Assistant	1
Secretary	1
Driver	1
Office Attendant	1

Thus WSSB executives and the S/O must cooperate and take responsibility for the daily O&M of the facilities. Umbrella should be recognized just a support organization at present.

(3) Aid coordination with other donors

Other donors have tried various methods of O&M of piped water supply facilities. The results of those attempts are Umbrella, P/Os (private companies), S/O, etc. Recently, , MOWE is moving the O&M method from P/Os to S/Os which have no overhead expenses for small piped water supply facilities. And other donors are supporting this transition. Therefore, using a combination of “WSSB and S/O” for O&M of small scale piped water supply facilities is suitable from the standpoint of aid coordination as well.

(4) Prerequisites for water supply facility construction

Concerning the contents of the Project including basic installation plan of piped water supply facility in each site, MOWE has held meeting with the stakeholders at each site and exchanged a Memorandum of

Understanding with each local government (district) where construction will be done. In the Memorandum, the target RGCs are required to "fulfill the community sanitation and hygiene environment (especially latrine use) 100% safe before implementation of the Project (however, in case of this Project, this is not a prerequisite of implementation of the Project). Therefore, mobilization and sensitization activities are necessary to spread wide understanding on this issue, and a specific improvement plan must be drawn up and promoted to achieve the proper environment.

(5) On guidelines for mobilization and sensitization activities, and O&M training

In Uganda, "Steps in Carrying Out Mobilization Activities in Rural Growth Centres (September 2005)" is the guideline for steps taken to mobilize the community in terms of mobilization and sensitization activities when constructing water supply facilities in RGC, and basically, action steps must be taken as described in the guideline. However, the sanitation baseline survey required by the guidelines is outside the scope of this Project so that the Ugandan side will conduct the survey if it is necessary.

Further, where O&M training is concerned, the Water and Sanitation Development Facility (WSDF) under the MOWE has been preparing training manuals or trainer guidebook.

Due to these conditions, the Soft Component plan will necessitate reference and compliance to the guidelines and manuals referred to above.

(6) Coordination with the technical cooperation project

Currently, JICA has been implementing a technical cooperation project called "The Project for Operation & Maintenance for Rural Water Supply and Improved Hygiene and Sanitation" (Project period: September 2015 - September 2019). A specialist on piped water supply facilities has been dispatched in the technical cooperation project, and he is expected to produce appropriate contracts form and monthly report form for small scale piped water supply facility management. Thus by coordinating with this technical cooperation project, the results of those activities can be used to make Soft Component activities more efficient.

1.3 Necessities for implementation of Soft Component

O&M of the small-scale piped water supply facilities built in rural areas by this Project is planned to be operated by WSSB, S/Os, and K/As. In their implementing O&M, they surely face the big challenges listed below. These issues should be resolved in advance in order for the facilities to be sustainably used. This is the reason why appropriate planning and implementation of Soft Component is necessary and essential.

Issue 1: Villagers do not know the importance of safe water, and the relation among safe water, health and sanitation.

In order to secure self-sufficient sustainability of piped water supply facilities, villagers must understand

the necessity of using safe water and creating and maintaining a healthy and sanitary environment, and thereby willingly paying their water fees.

In addition, it is necessary that water fee shall be set under consideration for poor classes. Also, it is important that mobilization and sensitization activities related to this should begin in the early stage of soft component activities.

However, according to the social survey, average water fetching time per household is some 8.9 hours per day during the dry season, but drops to 2.4 hours per day in the rainy season, probably because villagers use surface water or rainwater in that season.

Table 5 Current Situation of Fetching Water Work in Target RGCs

District	Code	Target RGC	Time spent for fetching water Dry season (hr/day)	Time spent for fetching water Rainy season (hr/day)
Iganga	I-3	Nambale	11.9	2.1
Luuka	I-6	Lambala	4.0	1.9
	I-7	Naigobya	8.0	1.5
	I-9	Kyanvuma	8.8	3.1
Kibuku	P-2	Kasassira	10.5	2.9
	P-5	Buseta	7.8	1.4
Pallisa	P-3	Kameke	11.4	2.6
	P-4	Kapala	11.3	3.7
Serere	S-1	Kidetok	6.8	2.4
		Average	8.9	2.4

Further, field survey results (water quality test of existing boreholes) show that in high population areas such as Buseta, Kapala, etc., E-coli were found in a number of boreholes. As MOWE concerned, it can be said that water pollution tends to spread in some RGCs with large populations.

The table below shows the interview survey results at health centres in each sub-county. The morbidity of water borne diseases changes from 0.1 to 13.4 % in the target sub-counties

Table 6 Morbidity of Water Borne Diseases

District	Sub-county	Target RGC	Number of Patients (Yearly)					Population (Sub-county)	Morbidity (%)
			Diarrhea	Parasite	Intestinal disease	Typhoid	Dysentery		
Iganga	Nambale	Nambale	648	2,088	0	18	N/A	47,115	5.8
	Makuutu	Nondwe	364	288	240	48	N/A	27,992	3.4
Luuka	Irongo	Lambala	239	433	N/A	6	N/A	28,691	2.4
		Kyanvuma							
		Naigobya	36	12	N/A	5	N/A	39,049	0.1
Kibuku	Kasassira	Kasassira	879	131	0	0		21,840	4.6
	Buseta	Buseta	1,392	756	0	0	89	16,709	13.4
Pallisa	Kameke	Kameke	250	180	0	0	N/A	17,273	2.5
	Gogonyo	Kapala	639	538	0	0	N/A	29,568	4.0
Serere	Pingire	Kidetok	121	1	N/A	N/A	N/A	34,581	0.4

Looking at payment and collection status of water fees, which are basic to O&M, many villagers use hand pump wells without paying the relevant fees, and the community allows that to happen. Further, there are no preparations/savings for repairing and maintaining the hand pump wells, and when repair or maintenance must be done, donations are collected.

Issue 2: Neither the local administrative officers nor the villagers understand the purpose, roles and importance of the Water WSSB, S/O, K/As, and U/O.

Because the target RGCs have no piped water supply facilities, most of the villagers have no understanding of what is required to conduct O&M properly and sustainably. Naturally, therefore, they know nothing of the specific roles of WSSB executives, S/O, K/As, or Umbrella.

On the other hand, even if DWOs are very aware of the O&M of point water sources, they cannot be said to be well versed in the O&M of piped water supply facilities. Therefore, both DWO and villagers in the Project sites must be fully informed about the roles and purposes of WSSBs and Umbrella.

Issue 3: Members of WSSBs do not know objectives of WSSB, roles of each member, and method of organizational operation.

The RGCs and the sub-counties involved have no piped water supply facilities, so the sub-county councilors and the sub-county chiefs, who are the main members on WSSBs, do not know the purposes and roles of the Boards, or the O&M issues. And of course the members to be chosen from the RGC community (routinely three people) do not know as well. Further, in some communities, even the water user committees for hand pump management do not function properly.

Thus, education and training for WSSB members chosen when construction of facilities begins should take place, and such training should include concrete information on O&M including objectives and roles of WSSBs, and necessity of transparency.

Issue 4: A S/O for this Project, chosen by the WSSB, has not learned the technical knowledge and skills for the O&M of the piped water supply facilities such as structures, inspection and repair of the facilities constructed by this Project.

S/Os are chosen by WSSB executives, and together with those WSSB executives, they operate and maintain facilities. Specifically, hand pump mechanics are thought to be one of candidates, and of course these people cannot be expected to have necessary knowledge and skills for O&M of piped water supply facilities. S/Os must work with WSSBs on day-to-day O&M, and to do this, workshops that give the basic knowledge necessary must be held. Even though the available time period is limited, as much training as possible should be inputted; when monitoring of their O&M indicate the necessity of additional training, such training can be accomplished through continuous input with OJT method.

Issue 5: K/As do not understand the importance of collecting water fees, maintaining flow meters, and cleaning the soak pit.

K/As are at the position of the front line of water supply service by piped water supply facilities. Further, they have the important duty of collecting water fees, which enable sustainable O&M of facilities. In order to do that effectively, the Attendants must have the knowledge necessary to maintain the Kiosk, manage the collection of water fees, treat flow meters and record its value, etc. Also, in reality, hand pumps often have no fences, their soak pits are clogged, and repairs are left undone.

It is well known that challanges described in Issue 2 to Issue5 have happened even in the similar existing projects; specifically thefts of public taps, broken down of gate valves due to water theft, and

breakdown caused by no respect for manuals have happened commonly. Therefore, it is necessary to repeat trainings on matters pertaining to the sustainable use of the facility, etc., until to make stakeholders fully understood the contents of the O&M.

2. Objectives of the Soft Component (Technical Assistance)

Based on the previously stated "Background of Soft Component Plan" and "Necessities for implementation of Soft Component," and aiming for sustainable use of the piped water supply facilities built by this Project, the objectives of Soft Components introduced by this plan are set as described below.

Objective 1: Basic activities such as water charge collection are done smoothly and the facilities are operated on financially stable conditions.

Objective 2: The piped water supply facilities constructed under the Project are used cleanly and continuously under proper O&M (inspection and repair)

3. Expected Outputs of the Soft Component

The expected outputs of Soft Components are as follows.

Output 1: Villagers understand the importance of safe water and the relations among safe water, and health and sanitation.

Output 2: Administrative officers and villagers understand the importance and roles of WSSB, S/Os, K/As and U/O.

Output 3: Members of WSSB including S/Os and K/As understand objectives of WSSB, roles of each member, and method of organizational operation.

Output 4: Members of WSSB including S/Os and K/As learn about the technical knowledge and skills for the O&M of the piped water supply facilities such as structures , inspection and repair of the facilities.

Output 5: Members of WSSB including S/Os and K/As understand water charge collection at kiosk, reading flow meter, and importance of cleaning kiosk and soak pit.

4. Confirmation Procedure of the Output Achievement

How to confirm degree of achievement of each output is shown below.

Table 7 Confirmation Procedure of the Output Achievement

Contents of Outputs		Confirmation items of output achievement
1	Villagers understand the importance of safe water and the relations among safe water, and health and sanitation	1. Increased number of villagers with willingness to pay for water fee.
		2. Increased amount of willingness to pay
2	Administrative officers and villagers understand the importance and roles of	1. Frequency of WSSB meetings and community meetings

	WSSB, S/Os, K/As and U/O	2. Increased number of participants to community meetings
3	Members of WSSB including S/Os and K/As understand objectives of WSSB, roles of each member, and method of organizational operation.	1. Employment of S/O
		2. Affiliation to Umbrella
		3. Setting of water fee
		4. Bank account opening for WSSB
4	Members of WSSB including S/Os and K/As learn about the technical knowledge and skills for the O&M of the piped water supply facilities such as structures , inspection and repair of the facilities.	1. Record of pump operation
		2. Record of pumped groundwater amount from water source boreholes
		3. Record of flowmeter at each Kiosk by S/O
		4. Periodic Inspection
		5. Implementation of necessary minor repairs
		6. Monthly reporting
5	Members of WSSB including S/Os and K/As understand water charge collection at kiosk, reading flow meter, importance of cleaning kiosk and soak pit.	1. Record of flow meter at each Kiosk by K/A
		2. Does the amount of collected water fee correspond to record of flowmeter (distributed water amount) ?
		3. Keeping Kiosk clean.
		4. Infiltration status of surplus water to soak pit

5. Activities of the Soft Components (Inputs Plan)

To achieve the above-mentioned outputs, the Project inputs “community mobilization and sensitization activities” and “WSSB (including S/O and K/A) trainings” described below.

The above-mentioned activities are subsequently implemented in the following phases.

Phase 1: Sensitization and mobilization of villagers and administrative staff (during pre-construction)

(Activities for Output 1 and Output 2)

Phase 2: Training of WSSB including S/Os and K/As (Workshops during construction of the facilities)

(Activities for Output 3)

Phase 3: Training of WSSB including S/Os and K/As (mainly OJT activities conducted in the actual O&M in post-construction)

As for the RGCs of which construction works of water supply facilities will be completed at the last moment of the whole implementation period, their trainings will be conducted by using the other water supply facilities having been completed.

(Activities for Output 4 and Output 5)

5.1 Community Mobilization and Sensitization Activities during Pre-Construction (Phase 1)

(1) Contents of Activities

As indicated below, mobilization and sensitization activities are implemented preceding construction of water supply facilities.

Pre-Construction: A workshop targeting RGC representatives, the Project Implementation Committee, (PIC) members, officers in charge of water supply and sanitation/hygiene issues in sub-counties, and beneficiaries with an objective to raise awareness of these people. The workshop is also intended to facilitate collective efforts of the community members,

working in groups.

At the outset of the Detailed Design stage, the Project initiates this mobilization and sensitization activities . Specific activities related to mobilization and sensitization are shown below.

<Workshops>

Table 8 Contents of Workshop during Pre-Construction Phase

No.	Activities	Participants	Number of days per RGC
1	・ Greeting and courtesy call on sub-county, RGC leaders and PIC - Introduction/Explanation of the Project - Request for cooperation and assistance for the Project - Promotion of latrine construction by village leaders. ・ Explanation to representatives of target RGC and PIC -- Explanation of Pre-Construction Workshop (objectives, procedures, schedule) - Brief explanation of safe water and health (expected approach) - Introduction/Explanation of the water supply facility (kind of facility, function, safety of supply water, cost of repair/inspection, etc.) - Introduction/Explanation of O&M method by WSSB. - Explanation of O&M fee including subscription fee to U/O, allowance to S/O and K/As and community contribution - Explanation of necessity of continuous promotion of latrine construction by RGC representatives to aim 100% coverage before implementation of the construction. - Explanation of requested matters from the Project to RGC	LCIII councilor, Sub-county chief and responsible person, Member of PIC, RGC representatives (RGC leader, ・LCI leader, Elders, Teachers, Religious leaders, Medical personnel, and women group leaser), and residents.	1.0 Day
2	・ Explanation of the role and responsibility of PIC during pre-construction phase and Training of the operation ・ Promotion of safe water and health, sanitation and hygiene ・ Explanation on necessity of consideration about setting payable water fee for poor classes Explanation ・ Explanation about countermeasures against vandalism to the piped water supply facility to be constructed ・ Sensitization/awareness on gender issues, HIV/ AIDS and Environmental issues. - Community members are to understand different roles of men and women, and realize that women do almost all activities related to water. ・ Consultation on S/O candidates, Document preparation on its recruitment advertising and Onset of recruitment	Member of PIC, RGC representatives (RGC leader, ・LCI leader, Elders, Teachers, Religious leaders, Medical personnel, and women group leaser), and residents.	1.0 Day
3	・ Explanation of registration of beneficiary households and start of the registration ・ Determination of collection method of contribution and start of the collection ・ Promotion of safe water and health, sanitation and hygiene ・ Sensitization/awareness on gender issues, HIV/ AIDS and Environmental issues - Sensitization/Awareness education on household wealth and gender (especially on wealth related to water). ・ Making action plan for achieving 100% toilet coverage and agreement of the execution	Member of PIC, RGC representatives (RGC leader, ・LCI leader, Elders, Teachers, Religious leaders, Medical personnel, and women group leaser), and residents.	1.0 Day
4	・ Promotion of safe water use, awareness on health, sanitation and hygiene, and contribution to community thorough household visits. ・ Explanation on necessity of consideration about setting payable water fee for poor classes Explanation ・ Explanation about countermeasures against vandalism to the piped water supply facility to be constructed ・ Confirmation of registered beneficiary households ・ Sensitization/awareness on gender issues, HIV/ AIDS and Environmental issues - Sensitization/Awareness education on household wealth and gender (especially on wealth related to water).	Member of PIC, RGC representatives (RGC leader, ・LCI leader, Elders, Teachers, Religious leaders, Medical personnel, and women group leaser), and residents.	1.0 Day

No.	Activities	Participants	Number of days per RGC
	・ Confirmation of the progress of the activities for achieving 100% toilet coverage.		
5	・ Confirmation of the amount of contribution ・ Confirmation of registered beneficiary households ・ Confirmation of the progress of the activities for achieving 100% toilet coverage. ・ Selection of S/O candidates (2 – 3 person)	Member of PIC, Sub-county	1.0 Day

(2) Detailed Input Plan (Resources for Implementation and the Input Plan)

1) Number of target sites

The number of piped water facilities (target RGCs) requiring mobilization and sensitization is as indicated below.

Table 9 Number of Piped Water Facilities which need the Activities

Phase	Number of Water Supply Facilities Break Down
1. Pre-Construction (Detailed Design Phase)	Piped Water Supply Facility (RGC: 9 sites)

2) Resources for implementation

a. Description of resources to implement the activities and the corresponding roles

Mobilization and sensitization activities are implemented entirely by a team of a Japanese consultant (O&M), a Community Development Expert serving also as a Facilitator (local NGO/local consultant), and an Assistant Facilitator.

The table below outlines the main actors of the Pre-Construction sensitization activities and their functions, including the local government officers.

Table 10 Actors and Their Roles in the Soft Component Program (Pre-Construction Phase)

Actors	Roles
Japanese side	
1) Japanese O&M Consultant	➢ Overall planning, management and reporting of the soft component program. ➢ Supervision/Guidance of local NGO/consultancy firm
2) Community Development Expert (Local NGO or Consultancy Firm)	➢ Preparation of workshop materials, handouts, and necessary forms ➢ Preparation of workshop planning report, manuals, and reports ➢ Facilitation of community mobilization and sensitization workshop ➢ Keep contacts with RGCs and sub-county officers to strengthen the system of support ➢ Coordination of concerned organizations/community so that villagers (RGC residents) can receive information on the Project ➢ Support of the activities by DWO, CDA and HA ➢ Preparation of the Activity Reports
3) Assistant Facilitator (Local NGO or Consultancy Firm)	➢ Support of workshops held by the Community Development Expert
Ugandan side	
1) DWD/ Counterparts	➢ Overall planning and management of the program with the Japanese consultant. ➢ Supervision/Guidance of local NGO/consultancy firm with the Japanese consultant ➢ Request of assistance and cooperation to other ministries and local government offices for program implementation when necessary

Actors	Roles
	➢ Coordination among the Japanese consultant, local NGO/consultancy firm, and government offices concerned
2) District Water Office Staff	➢ Presence at the workshops ➢ Coordination among local NGO/consultancy firm, sub-county and RGC communities ➢ Checking the contents and progress of community mobilization and sensitization activities by local NGO/consultancy firm ➢ Guidance of PICs in the target RGCs and monitoring of their activities and conditions of sanitation and hygiene related to water ➢ Support of PICs ➢ Implementation of sanitation baseline survey of target RGCs if necessary.
3) Capacity Development Assistant (CDA)	➢ Presence at the workshops ➢ Checking the contents and progress of community mobilization and sensitization activities done by local NGO/consultancy firm ➢ Guidance of PICs in the target RGCs and monitoring of their activities and conditions of sanitation and hygiene related to water ➢ Support of PICs ➢ Implementation of sanitation baseline survey of target RGCs if necessary.
4) Health Assistant (HA)	➢ Check the contents and progress of community mobilization and sensitization activities done by local NGO/consultancy firm ➢ Monitoring of conditions of sanitation and hygiene in target RGCs ➢ Support of PICs ➢ Implementation of sanitation baseline survey of target RGCs if necessary.

b. Input planning and man-month calculation (M/M)

The table below shows how the Project plans the function-based input and the required amount.

Table 11 Input Experts during Pre-Construction Phase

Input Resources	Explanation of Input	Assignment period	Frequency of passage
1. Japanese Consultant			
O&M Consultant	Dispatch period of a Japanese Consultant is to be applied to selection and employment contract/sub-contract of local consultants, producing manuals, mutual consultation on method of mobilization and sensitization activities and the schedules before commencement of the activities, and confirmation of the results and degree of attainment of the activities after finishing all activities. 1.5 months is to be applied to the former work, and 0.5 months is to be applied to the latter work. The total dispatch period of a Japanese Consultant is to be 2.0 months. Details of work contents of the Japanese Consultant are summarized in the end of this plan.	2.0 M/M	2 times
Sub-Total		2.0 M/M	2 times
2. Local NGO/Consultant Firm			
Community Development Expert (CDE)	One CDE is to be employed/sub-contracted. The employment/sub-contract period of the CDE is to be total three (3) months: ・ 0.5 months for consideration/adoption of scheduling and concrete methods of the activities, and preparation of manuals and handouts for the activities in cooperation with Japanese Consultant. ・ 2.0 months for workshop activities: One workshop per one site can be held in one day including travelling time. Therefore, total necessary calendar days for the workshop activities in RGCs will be 61 days (9 sites x 1 day x 5 times x 1.35). ・ 0.5 months for confirmation of degree of attainment of the activities and summary of the result after completion of the	3.0 M/M	

	activities		
Assistant Facilitator (AF)	One AF is to be employed/sub-contracted. The employment/sub-contract period of the A/F is to be total two (2) months The same input with CDE is necessary. Because the AF supports CDE's activities during Workshops at sites. .	2.0 M/M	

Note: Calendar day conversion factor is set to 1.35.

c. Transportation

Four wheel drive vehicles are required to drive unpaved roads to access the Project sites and implement the intended activities efficiently in a short period.

3) Outputs to be delivered

Deliverables of the above activities are as listed below.

Table 12 Outputs of the Soft Component Activities during Pre-Construction Phase

Outputs	Contents
1. Pre-Construction Workshop Program	Contents of Workshop, procedure, methods, etc.,
2. Handout/materials for Workshop	Handout/material on outline of the Project and Workshops
	Handout/material on introduction of the piped water supply facility
	Handout/material on water and health, sanitation and hygiene
	Handout/material for Community sensitization
	Handout/material on O&M
	Form on meetings record
3. Progress Report (1)	Report on initial goal, implementation status on input and activities, and output at the point

5.2 Trainings for WSSB during Construction (Phase 2)

(1) Contents of Activities

During Construction: Preparation for facility construction including site verification, transfer of basic knowledge on O&M of the water supply facilities, and ceremonies of provisional hand-over of the facilities to relevant sub-counties

Upon completion, the facilities will be provisionally handed over to sub-counties in the target RGCs. This essential process needs to be completed during the construction period, because the operations of the facilities start immediately after the provisional hand-overs.

Specific components of the above activities are provided below.

<Workshops>

Targeting WSSB (including S/O and K/A candidates), a series of workshop will be provided so as to foster its understanding of essential O&M matters.

Table 13 Training during Construction Phase (Workshops)

No.	Activities	Participants	Number of Days per RGC

No.	Activities	Participants	Number of Days per RGC
1	・ Visit of Water Supply Facility Construction Sites - Although selection and approval of the land use of the construction sites were completed before this workshop, the sites should be re-confirmed under attendance of involved persons so that there will be no conflicts or misunderstanding about the construction sites. The other main purpose of the visit of the construction sites is to make the relevant communities to understand the outline of the facilities to be constructed at each site, and raise awareness toward the construction ・ Establishment of Water and Sanitation Service Board (WSSB) and Dissolution of PIC for better future. ・ Confirmation of wills of S/O candidates (2 – 3 person) to take trainings.	PIC members, Residents, LC3 Councilor, RGC representatives, Sub-county officers.	1.0 Day
2	<u>Explanation on outline of O&M</u> ・ Understanding on the meaning of O&M, general problems frequently occurred and its countermeasures, importance of collection of water fee and its saving for sustainable water use, and preliminary practice on setting water fee in consideration of poor classes ・ Understanding on the water usage management method; all produced water by the facility is to be measured by flow meters (pumped water, elevated tank, Kiosks, yard taps and private connections).	WSSB（including Candidates of S/Os and K/As）	1.0 Day
3	<u>Understanding on responsibilities taken up by the relevant Sub-county and WSSB including S/O and K/As</u> ・ Clarification of the duties of Sub-county council and Sub-county office ・ Clarification of the duties of WSSB ・ Clarification of the duties of S/O ・ Clarification of the duties of K/A	WSSB（including Candidates of S/Os and K/As）	1.0 Day
4	<u>Understanding on U/O" and significance to be a member of U/O.</u> ・ The Objectives and job description ・ The structure ・ Budget resource ・ Service/Support contents ・ Responsibilities of Umbrella members (WSSB under Umbrella) ・ Procedure to be Umbrella member and the expense.	WSSB（including Candidates of S/Os）	1.0 Day
5	<u>Flow meter reading and the recording</u> ・ Explanation on flow meters applied to the water supply facility (types and installation points). ・ Method of flow meter readings and its appropriate recording - Readings and recordings by WSSB (Monthly inspection of total distributed water amount) - Readings and recordings by S/O (Transmitted water volume, distributed water volume at elevated tank, Kiosks and public yard taps)) - Readings and recordings by K/A (daily recording at starting and finishing time of water selling service)	WSSB（including Candidates of S/Os and K/As）	1.0 Day
6	<u>Understanding on the piped water supply facility (Scheme components, their use and O&M)</u> ・ Structure of water source and the O&M ・ Operation method by commercial electric power source, solar power and stand-by generator: especially on - Commercial electric power supply: explanation of operation hours which can save electric bill; operation from 0:00 to 6:00 a.m. - Solar panel: Explanation of decrease of pumped water amount and necessity of saving water during rainy and cloudy weather.	WSSB（including Candidates of S/Os）	1.0 Day

No.	Activities	Participants	Number of Days per RGC
	- Structure and O&M on transmission pipeline - Structure and O&M on elevated tank including chlorine input work. - Structure and O&M on distribution pipeline - Structure and O&M on service pipes for yard tap connection - Structure and O&M on Kiosk - Cleaning of guardhouse and flush toilet Trouble shooting ・ When water not pumping up from the water source. ・ When water is not reaching the elevated tank. ・ When water is not reaching Kiosks and/or yard taps Prevention measures against theft of a water supply facility, especially on solar modules.		
7	Book keeping ・ Definition of book keeping and the purpose ・ Explanation of terminology and documents (receipts, invoice, income an expenditure book) ・ Explanation on forms and contents of necessary documents ・ Budget management ・ Calculation of financial condition on O&M ・ Analysis of financial condition on O&M Review and test on the technical issues learnt.	WSSB（including Candidates of S/Os）	1.0 Day
8	Checking money records (Audit) ・ Finding mistakes and the correction in records ・ Mistakes commonly made when recording accounts ・ Explanation of money records that should be checked (receipt, bankbook, cash book, etc.) ・ Preparation and present of audit report ・ Explanation of the audit result to relevant community ・ Explanation on how to open bank account if necessary. Note: Guidance on responsible person of audit; the audit shall be conducted by WSSB members but other than chairperson, accountant and secretary. Review and test on the technical issues learnt.	WSSB（including Candidates of S/Os）	1.0 Day
9	Preparation of WSSB's organization regulation Setting water fee and budget analysis on O&M ・ Identification of necessary items of expenses for O&M and the amount estimation ・ Prioritization of each item. ・ Identification of income items and the expected amount ・ Estimation of the balance between expenditures and incomes ・ Setting water fee in consideration for poor classes ・ Setting water fee Checking current status on bank account opening.	WSSB（including Candidates of S/Os）	1.0 Day
10	Preparation of O&M Plan ・ O&M of the water supply facility was rather a notion/knowledge in villagers'' heads during the pre-construction phase. Looking at the process of the construction will make the facility a part of community's reality. O&M will become more tangible to them. Under such a circumstance, community will have better and realistic understanding of importance of	WSSB（including Candidates of S/Os）	1.0 Day

No.	Activities	Participants	Number of Days per RGC
	O&M, and, thus are in a better position to make a plan of O&M. After understanding that O&M of the water supply facility is not a responsibility given by government but a measure of achieving community's objectives written in O&M Plan, self-motivated O&M lead to sustainability of the water supply facility. Confirmation of bank account opening Selection/Employment of S/O and K/As		
11	Handing-over of the Water Supply Facility to the relevant Sub-county Before community's first use of the water supply facility, an assembly in RGC will be held to confirm completion of the facility construction and its handing-over to the sub-county. Community can confirm its ownership of the facility through this assembly. The contents of the assembly are brief introduction by WSSB members and Sub-county officers, and if possible, document of proofing handing–over to be prepared. The document will promote community's ownership.	Sub-county officer, WSSB, Residents,, RGC Representatives	1.0 Day

＜On the Job Training（OJT）＞

Table 14　Training during Construction Phase (OJT)

No.	Activities	Participants	Number of Days per RGC
More than once	O&M experts are to visit each RGC periodically and practice OJT for turning simple knowledge on O&M obtained through workshops into more practical one. Management aspects: OJT aims understanding on necessary document for book keeping, how to set water fee, method of selling water (collection method of water fee), contents of account book, WSSB regulation, etc. Technical aspects: OJT aims concrete understanding on structure of the water supply facility, which will be used by the WSSB and the community, through visits of the real construction process of their facilities at site. This activity is to be conducted in days, those have no workshops held, until handing over the facility to relevant Sub-county.	WSSB（including Candidates of S/Os and K/As）	Repeated until taking over the facility

(2) Detailed Input Plan (Resources for Implementation and the Input Plan)

1) Number of target sites

The number of piped water facilities (target RGCs) requiring training during construction is as indicated below.

Table 15 Number of Piped Water Facilities which need the Activities

Phase	Number of Water Supply Facilities
	Break Down
1. During-Construction	Piped Water Supply Facility (RGC: 9 sites)

2) Resources for implementation

a. Description of resources to implement the activities and the corresponding roles

Preliminary trainings on O&M are implemented by a team of a Japanese consultant (O&M), a Community Development Expert (local NGO/consultant), and O&M Experts respectively specialized in Management or Engineering (local NGO/consultant). Experts of Management and Engineering are separately assigned because such resource person, who is capable of handling both know-hows, is probably unavailable.

The table below outlines the main actors of O&M trainings and their roles including the local government staff during construction phase.

Table 16 Actors and Their Roles in the Soft Component Program (During Construction)

Actors	Roles
Japanese side	
1) Japanese O&M Consultant	➢ Overall planning and management of O&M training, and reporting of the activities. ➢ Supervision/Guidance of local NGO/consultancy firm
2) Community Development Expert (Local NGO or Consultancy Firm)	➢ Supervision/Guidance of local NGO/consultancy firm under the Japanese consultant ➢ Preparation of training plan, manual and materials in corporation with Japanese consultant. Important lessons learnt, which obtained through workshop activities during pre-construction phase, will be reflected to the training plan. ➢ Preparation of handouts/materials and necessary forms for training operation ➢ Facilitation of the training and the implementation ➢ Periodical check on activities of WSSBs in target RGCs ➢ Keep contacts with RGCs and Sub-county officers to strengthen the support system ➢ Grasping progress of the facility construction, and adjustment of training schedule in response to the progress. ➢ Support of the activities by DWO, CDA and HA ➢ Preparation of the Activity Reports
3） O&M Expert in charge of management matters (Local NGO or Consultancy Firm)	➢ This expert is in charge of issues on financial management in O&M, bank account opening, preparation of WSSB regulation, setting water fee, etc. ➢ Preparation of training plan and manuals. ➢ Preparation of handouts/materials, and forms for operation of training ➢ Facilitation and implementation of the training
4） O&M Expert in charge of technical matters (Local NGO or Consultancy Firm)	➢ This expert is in charge of technical issues of O&M, preparation of WSSB regulation, setting water fee, etc. ➢ Preparation of training plan and manuals. ➢ Preparation of handouts/materials, and forms for operation of training ➢ Facilitation and implementation of the training
Ugandan side	
1) DWD/ Counterparts	➢ Overall planning and management of the program with the Japanese consultant. ➢ Supervision/Guidance of local NGO/consultancy firm with the Japanese consultant ➢ Request of assistance and cooperation to Umbrella and local government offices for program implementation when necessary ➢ Coordination among the Japanese consultant, local NGO/consultancy firm, and government offices concerned
2） Umbrella	➢ Advise to training program ➢ Support on explanation of the activity contents of U/O ➢ Guidance to WSSBs, and monitoring on WSSBs' activities, saving status for O&M, sanitation and hygiene status of the target RGCs ➢ Support of WSSBs
3) District Water Office Staff	➢ Presence at the workshops ➢ Coordination among local NGO/consultancy firm, sub-county and RGC communities

Actors	Roles
	➢ Checking the contents and progress of the training activities done by local NGO/consultancy firm ➢ Support of WSSBs
4) Capacity Development Assistant (CDA)	➢ Presence at the workshops ➢ Checking the contents and progress of the training activities done by local NGO/consultancy firm ➢ Support of WSSBs
5) Health Assistant (HA)	➢ Checking the contents and progress of the training activities done by local NGO/consultancy firm ➢ Support of WSSBs

b. Input planning and man-month calculation (M/M)

The table below shows how the Project plans the function-based input and the required amount.

Table 17 Input Experts during Construction Phase

Input Resources	Explanation of Input	Assignment period	Frequency of passage
1. Japanese Consultant			
O&M Consultant	Dispatch period of a Japanese Consultant is to be applied to; a) selection and employment/contract of local consultants, producing training manuals and the scheduling before commencement of the training, and b) confirmation of the degree of attainment of the activities, finding challenges in the activities and taking the counter measures If necessary, and preparation of the report. 1.0 month is to be applied to the former work, and 1.0 months is to be applied to the latter work. The total dispatch period of a Japanese Consultant is to be 2.0 months. Details of work contents of the Japanese Consultant are summarized in the end of this plan.	2.0 M/M	2 times
Sub-total		2.0 M/M	2 times
2. Local NGO/Consultant Firm			
Community Development Expert (CDE)	One CDE is to be employed. The employment period of the CDE is to be total four (4) months: ・ 1.0 month for consideration/adoption of scheduling and concrete methods of the training (workshop and OJT), and preparation of training manuals and handouts with O&M Experts for the activities in cooperation with Japanese Consultant. ・ 1.0 months for management of workshop activities, those give basic knowledge of O&M to WSSBs, instead of Japanese consultant during his/her absence period. ・ 2.0 months for; - confirmation of degree of attainment of the activities, finding challenges in the activities and taking the counter measures (If necessary) at the timing of completion of the first piped water supply facility construction, and - manage the training activities instead of Japanese consultant during his/her absence period.	4.0 M/M	
O&M Expert in charge of management matters	One O&M Expert on management matter is to be employed. The employment period of the expert is to be total nine (9) months: ・ 1.0 months for preparation of training manuals and handouts for O&’M, and consideration on training method and	9.0 M/M	

Input Resources	Explanation of Input	Assignment period	Frequency of passage
	scheduling. ・ 4.8 months for workshop activities: those give basic knowledge of O&M. One workshop per one site can be held in one day including travelling time. Therefore, total necessary calendar days for the workshop activities in RGCs will be 144 days (9 sites x 1 day x 11 times x 1.35).=4.8 M/M. ・ 2,.7 M/M months for OJT activities: those complement the workshop activities and enlighten WSSBs mainly about how to set water fee, method of water selling (collection method), contents of book keeping, WSSB's regulation through periodical discussion/consultation. ・ 0.5 months for - confirmation of degree of attainment of the activities, finding challenges in the activities and taking the counter measures (If necessary) at the timing of completion of the first piped water supply facility construction, and - preparation of the summary		
O&M Expert in charge of technical matters	One O&M Expert on technical matter is to be employed. The employment period of the Expert is to be total nine (9) months: ・ 1.0 months for preparation of training manuals and handouts for O&'M, and consideration on training method and scheduling. ・ 4.8 months for workshop activities: those give basic knowledge of O&M. One workshop per one site can be held in one day including travelling time. Therefore, total necessary calendar days for the workshop activities in RGCs will be 144 days (9 sites x 1 day x 11 times x 1.35).=4.8 M/M. ・ 2,.7 M/M months for OJT activities: those complement the workshop activities and enlighten WSSBs mainly about structure of the piped water facility (scheme components) through periodical discussion/consultation. ・ 0.5 months for - confirmation of degree of attainment of the activities, finding challenges in the activities and taking the counter measures (If necessary) at the timing of completion of the first piped water supply facility construction, and - preparation of the summary	9.0 M/M	
Sub-total		18.0 M/M	

Note: Calendar day conversion factor is set to 1.35.

c. Transportation

Four wheel drive vehicles are required to drive unpaved roads to access the Project sites and implement the intended activities efficiently in a short period.

3) Outputs to be delivered

Deliverables of the above activities are as listed below.

Table 18 Outputs of the Sort Component Activities during Construction Phase

Outputs	Contents
1. O&M training program	Contents of Workshop, procedure, methods, etc.,

Outputs	Contents
2. O&M manual（First edition）	Drawings of the piped water supply facility (Outline)
	Handout/material for O&M
	Form of water fee collection
	Form of record of receipt and expenditure on O&M
	Monitoring form of the facility operation
	Monitoring form of WSSB meeting
	Handout/material for S/O
	Handout/material for K/A
	Handout/material for preparing O&M plan
	Handout/material for monitoring O&M
3. Progress Report (2)	Initial targets, inputs and degree of achievement, output at the reporting time

5.3 Trainings for WSSB during Post Construction (Phase 3)

(1) Contents of Activities

Post-Construction: Construction of piped water supply facilities are completed and provisionally are handed over to the relevant community, and the WSSB (including S/O and K/As) starts to undertake practical O&M work. Accordingly, the Project provides follow-up occasions so that the WSSB can pursue proper O&M, applying its trained skills.

In the Post-Construction Phase, the soft component undertakes on-site monitoring in the target RGCs, assessing O&M status of the facilities and activities carried out by the WSSB (including S/O and K/A) and community members. Workshops will be provided in order to fulfill underdeveloped capabilities, where identified.

In practice, however, O&M of the facilities will be challenging and less smooth than expected, when WSSBs actually attempt O&M by themselves with knowledge gained through workshops. Therefore, the soft component provides on-the-job trainings mainly to WSSBs (including S/Os and K/As) to resolve any discrepancy between a learned knowledge and practice, and enable WSSBs to master smooth O&M in a shorter period of time. The soft component will help those O&M activities established locally through such follow-up and training schemes. An evaluation survey of achievement degree of O&M practices is to be conducted, and the survey result is to be reported.

Any RGCs where the survey identifies challenges-left about its facility O&M will be reported to DWD, the Umbrella, and local governments for promoting further activities by Ugandan side to resolve the challenges. .

Specific components of the above activities are provided below.

<Workshops>

Table 19 Training Post Construction Phase (Workshops)

No.	Activities	Participants	Number of Days per RGC
1	Explanation of operation method of the constructed piped water supply facility (immediately after the facility provisionally handed-over to the relevant WSSB) At the timing that the WSSB (including S/O and K/As) starts the actual O&M of the facility, the WSSB is to review and confirm issues learnt about O&M using actual facility under the local consultant's guidance.	WSSB（including S/Os and K/As）	1.0 Day

No.	Activities	Participants	Number of Days per RGC
	Contents: ・Confirmation on handling method of the facility (On/off of submersible pump, cleaning of solar modules/elevated tank/Kiosks, opening/closing of valves, record of distributed amount, finding leakage point at transmission/distribution pipe, etc.). ・Review on financial management (book keeping, management of bank deposit and cash, etc.), Note: Explanation on simple technical issues will be conducted by a contractor. The local consultants are to witness it and add supplementary explanation if necessary.		
2	Self-monitoring on Implementation Status of O&M activities by Cooperation between WSSB members and S/O After WSSB's taking-over of a facility and getting used to the O&M, the WSSB shall implement self-monitoring. Local consultants will introduce and assist the self-monitoring system to grasp status on water supply, accounting, and audit by WSSB itself. Self-monitoring system requires records of the periodical activities so that the local consultants are to explain contents and recording methods of self-monitoring, and confirm the monitoring form. Main items of a self-monitoring form: Status on collection of O&M cost, its balance, contents of discussion at WSSB meetings, problems in O&M, transmitted and distributed water amount, water quality, cleaning of Kiosks, implementation status on checking and repairs, requests from users, etc.	WSSB（including S/Os and K/As）, Sub-county officers	1.0 Day
3	Checking and improvement of self-monitoring system in cooperation with Sub-county officer The Local consultants and Sub-county officer are to check implementation status of WSSB's self-monitoring together. When they find factors that impede autonomy and sustainability of O&M activities, they will survey the causes and contents of the problems, and consider the counter measures including holding additional workshop.	WSSB（including S/Os and K/As）, Sub-county officers	1.0 Day

＜On the Job Training（OJT）>

Table 20　Training during Post Construction (OJT)

No.	Activities	Participants	Number of Days per RGC
More than once	Supervision to WSSB through OJT The local consultants will visit each RGC as many as possible, and conduct activities which solves challenges WSSB facing during actual O&M. This kind of activity is very important one for riding O&M by WSSB on a good track.	WSSB（including S/Os and K/As）	Repeated until the end of construction period

<A monitoring study and report on O&M achievements>

In accordance with a schedule shown in the below table, a Community Development Expert will visit the target RGCs and check if their WSSBs have successfully or partly achieved locally defined objectives. Findings will be reported using standard format.

Table 21 Survey and Report on Achievement Status of O&M Activities by WSSB

Timing	Main items to be reported	Participants	Number of Days per RGC
About 1 month later from hand-over the facility	Expected achievements ・ Employment of a S/O ・ Subscription to U/O ・ Setting water fee ・ Opening bank account for WSSB	WSSB (including S/Os and K/As)	1.0 Day
About 2.5 months later from hand-over the facility	Expected achievements ・ Recording of Pump operation ・ Recording of water production amount ・ Recording of flow meter at Kiosks by S/O ・ Recording of flow meter at Kiosks by K/A ・ Conducting periodical checking of the facility components. ・ Prepared monthly report	WSSB (including S/Os and K/As)	1.0 Day
About 4 months later from hand-over the facility	Expected achievements ・ Consistency between collected amount of water fee and readings of flowmeters. ・ Keeping Kiosks clean ・ Infiltration of surplus water into soak pit ・ Mainor repairs if necessary	WSSB (including S/Os and K/As)	1.0 Day

Note) For the RGC which forced provisional hand-over of the facility to be near the end of the Project construction period and cannot keep the check timing in the above table due to the construction schedule, the checking timing will be adjusted appropriately and be made earlier if possible.

(2) Detailed Input Plan (Resources for Implementation and the Input Plan)

1) Number of target sites

The number of piped water facilities (target RGCs) requiring trainings during post-construction is as indicated below.

Table 22 Number of Piped Water Facilities which need the Activities

Phase	Number of Water Supply Facilities
	Break Down
1. Post Construction	Piped Water Supply Facility (RGC: 9 sites)

2) Resources for implementation

a. Description of resources to implement the Project and the corresponding roles

Trainings on O&M are implemented by a team of a Japanese consultant (O&M), a Community Development Expert (local NGO/consultant), and O&M Experts respectively specialized in Management or Engineering (local NGO/consultant). Experts of Management and Engineering are separately assigned because such resource person, who is capable of handling both know-hows, is probably unavailable.

The table below outlines the main actors of the Post-Construction O&M and their functions, including the local government staff.

Table 23 Actors and Their Roles in the Soft Component Program (Post Construction)

Actors	Roles
Japanese side	
1) Japanese O&M Consultant	➢ Identification of challenges in O&M training and consideration of the counter measures ➢ Reporting of the activities ➢ Identification of challenges-left in target RGCs, and hand-over the issues and relevant RGCs to Ugandan side ➢ Preparation of final report
2) Community Development Expert (Local NGO or Consultancy Firm)	➢ Review and revision of handouts/materials ➢ Preparation of WSSB's self-monitoring form ➢ Management of workshops and OJT conducted by O&M experts ➢ Confirmation and reporting on achievement status of O&M activities by WSSB ➢ Keep contacts with RGCs and Sub-county officers to strengthen the system of support ➢ Support of the activities by DWO, CDA and HA ➢ Preparation of the final soft component activity reports
3） O&M Expert in charge of management matters (Local NGO or Consultancy Firm)	➢ Monitoring on financial management aspects in O&M conducted by WSSB ➢ Finding challenges in O&M ➢ Fixing challenges/suggesting the countermeasures for improving O&M activities ➢ Preparation of report on activity, the results, and the issues to be considered
4） O&M Expert in charge of technical matters (Local NGO or Consultancy Firm)	➢ Monitoring on technical aspect in O&M conducted by WSSB ➢ Finding challenges in O&M ➢ Fixing challenges/suggesting the countermeasures for improving O&M activities ➢ Preparation of report on activity, the results, and the issues to be considered
Ugandan side	
1) DWD/ Counterparts	➢ Overall planning and management of the program with the Japanese consultant. ➢ Supervision/Guidance of local NGO/consultancy firm with the Japanese consultant ➢ Request of assistance and cooperation to Umbrella and local government offices for program implementation when necessary ➢ Coordination among the Japanese consultant, local NGO/consultancy firm, and government offices concerned
2） Umbrella	➢ Advise to training program ➢ Guidance to WSSB, and monitoring on WSSB's activities, saving status for O&M, sanitation and hygiene status of the target RGCs ➢ Support of WSSBs
3) District Water Office Staff	➢ Presence at the workshops ➢ Coordination among local NGO/consultancy firm, sub-county and RGC communities ➢ Check the contents and progress of the training activities done by local NGO/consultancy firm ➢ Support of WSSBs ➢ Conduct of survey on sanitation and hygiene status of each RGC if necessary
4) Capacity Development Assistant (CDA)	➢ Presence at the workshops ➢ Check the contents and progress of the training activities done by local NGO/consultancy firm ➢ Support of WSSBs ➢ Conduct of survey on sanitation and hygiene status of each RGC if necessary
5) Health Assistant (HA)	➢ Check the contents and progress of the training activities done by local NGO/consultancy firm ➢ Support of WSSB ➢ Conduct of survey on sanitation and hygiene status of each RGC if necessary

b. Input planning and man-month calculation (M/M)

The table below shows how the soft component plans the function-based input and the required amount.

Table 24 Input Experts during Post Construction Phase

Input Resources	Explanation of Input	Assignment period	Frequency of passage
1. Japanese Consultant			
O&M Consultant	Dispatch period of a Japanese Consultant is to be applied to; a) confirmation of the degree of attainment of the activities, finding challenges in the activities, and taking the counter measures. If necessary. b) summary of challenges-left and its hand over to Ugandan side, and preparation of final report. 0.5 month is to be applied to the former work, and 1.0 months is to be applied to the latter work. The total dispatch period of a Japanese Consultant is to be 1.5 months. Details of work contents of the Japanese Consultant are summarized in the end of this plan.	1.5 M/M	2 times
Sub-total		1.5 M/M	2 times
2. Local NGO/Consultant Firm			
Community Development Expert (CDE)	The employment period of the CDE is to be total 3.9 months: ・ 2.0 months for management of workshop and OJT activities conducted by local O&M experts including scheduling, finding challenges and taking counter measures instead of Japanese consultant during his/her absence period. ・ 0.9 months for confirmation of degree of attainment of the activities, finding challenges in the activities, taking the counter measures if necessary The activity will apply to RGCs that can have enough period after handing over the facilities Therefore, total necessary calendar days for the activities in RGCs will be 25 days (6 sites x 1 day x 3 times x 1.35).=0.9 M/M. ・ 1.0 M/M for preparation of summary of challenges-left and final report in corporation with Japanese consultant.	3.9 M/M	
O&M Expert in charge of technical matters	One O&M Expert on technical matter is to be employed. The employment period of the expert is to be total six and a half (6.5) months: ・ 1.3 months for workshop activities: those review learned on O&M, explanation of self-monitoring and the follow-ups. One workshop per one site can be held in one day including travelling time. Therefore, total necessary calendar days for the workshop activities in RGCs will be 37 days (9 sites x 1 day x 3 times x 1.35).=1.3 M/M. ・ 4.5 M/M for OJT activities: the local consultant visits each RGC periodically, and monitor implementation status of WSSBs' O&M, and give concrete guidance such as finding challenges and fixing the challenges/taking the counter measures. ・ 0.5 M/M for assisting preparation work conducted by Japanese consultant and the CDE	6.5 M/M	
O&M Expert in charge of technical matters	ditto	6.5 M/M	
Sub-total		16.9 M/M	

Note: Calendar day conversion factor is set to 1.35.

c. Transportation

Four wheel drive vehicles are required to drive unpaved roads to access the Project sites and implement the intended activities efficiently in a short period.

3) Outputs to be delivered

Deliverables of the above activities are as listed below.

Table 25 Outputs of the Soft Component Activities during Post Construction Phase

Outputs	Contents
1. O&M manual（Final edition）	Drawings of the piped water supply facility (Outline)
	Form of water fee collection record
	Form of accounting records on O&M
	Monitoring form of the facility operation
	Monitoring form for the checking facility
	Self-monitoring form of WSSB's' O&M
	Form of record for meeting
2. Other important outputs	Regulation of WSSB
3. Reports on the degree of achievement of O&M	Reports on the degree of achievement of O&M activities by the WSSBs
4. Final Report	Activity program and the activity results, planned goals and the degree of achievement, factors affected the degree of achievement, clarification of challenges and proposal for the future to make effects sustainable and develop it.

6. Procurement of Implementing Resource for Soft Component

In Uganda, constructions for piped water supply systems have been developed through donor assistance by Japan and other donors. Especially, European and American donners have included community mobilization and sensitization activities in their projects to improve the constructed facilities' sustainability from early on. Some donors have entrusted piped water supply construction projects, and/or O&M to NGOs. The Uganda government has also left up the task of mobilization and sensitization activities of the communities to the local NGOs and local consultants, and it has taken various approaches on O&M of small scale piped water supply facilities, including the use of P/Os and S/Os.

As the results, Uganda has now many local NGOs and consultants that have enough capacity to perform works in the soft component program planned in the Project. Here is also a way that the O&M workshops and trainings can also be entrusted to the Association of Private Water Operators (APWO) consisting of registered P/Os to the Uganda Government.

In the Project, a few experts, who have excellent knowledge about the activities of mobilization and sensitization and O&M training planned for the Project, will be appointed as candidates from local NGOs/consultants and P/Ors in consultation with DWD, and then they will be requested to submit their proposals for the implementation of the soft component. After evaluation of them, the most capable and suitable candidate to carry out the soft component activities will be selected to, after negotiations of salary and the like, be in charge of the work as a member of the Japanese consultant or contracted consultant.

7. Soft Component Plan Implementation Schedule

The Soft Component program is to be carried out during the detailed design period (4 months) and the construction (16 months).

7.1 Schedule of Community Mobilization and Sensitization Activities during the Pre-Construction Phase

The Pre-Construction Phase's community mobilization and sensitization activities are to be conducted during the detailed design phase. Immediately after the contract between Ugandan government and the Japanese consultant, a local NGO/consultant is chosen as a Community Development Expert (CDE), also serving as the facilitator of the workshops. After that, the contents of community mobilization and sensitization activities and their schedule are to be reviewed with selected CDE. Manuals, including handouts, to be used in the program are also to be prepared.

The preparation of the activities is to be done in accordance with the existing manuals for community mobilization and sensitization. Approx. 1.5 months are planned for the preparation. The community mobilization and sensitization activities are planned to take 2.0 months for the target 9 RGCs. It is planned to take 0.5 month to summarize the outcome of the activities. The activities will overlap partially to implement the entire plan in 4.0 months.

Among these activities, the staff of MOWE dispatched for the coordination of the consultant's field works shall attend the workshops to be held at the initial stage and those relating to the trainings of candidate S/Os and the confirmation of amount of contribution in order to indicate that the Project is implemented by the Ugandan government as well as to facilitate the assistance in O&M after the handover by the participation of the government staff in the decisions of the important issues.

A progress report (1) of the soft component program, that contains an overview on community mobilization and sensitization activities and their outcomes, will be submitted at the end of the Pre-Construction Phase.

7.2 Schedule of Trainings for WSSBs during Construction Phase

As target WSSBs need to have acquired the basic knowledges of O&M before provisional hand-over of the facility, O&M training during the Construction Phase is provided in consideration of the facilities' construction progress. With an assumption that the preparatory work for the construction will require approximately1.0 month, Japanese consultants and a CDE will begin selection of local consultants (O&M experts) and prepare the manual before the real construction work commences. Training will be provided by the local consultants (O&M experts). The activities are carried out within approximately 15 months until the construction is completed.

About 15 months period is allocated for this activity. More practical trainings for the works of S/As, K/As and accountants will be carried out and the staff of MOWE shall attend the important workshops especially on setting water tariff and handing over the facilities to the communities.

When the first facility is completed, a progress report (2) of the soft component program that contains an activity overview, etc., is submitted.

7.3 Schedule of Trainings for WSSB during Post Construction Phase

The O&M training during Post Construction Phase consists of monitoring on WSSBs' O&M of completed facilities and OJT to improve their O&M. Thus, it begins after the provisional hand-over of the facility to be completed at first. The monitoring and the OJT are carried out in approximately 9.0 months in the latter half of the construction phase. In addition, the achievement survey is conducted to evaluate WSSB O&M skills each RGC has acquired.

This monitoring activity is considered quite important because the issues found in such monitoring activities will affect the contents of assistance to be provided after the completion of the Project. It is, therefore, essential for the government staff to experience and feel the extent of mastering the skills and practices for the required O&M by participating in such monitoring activities by themselves.

The final 1.0 month is allocated for summarizing outcomes of mobilization and sensitization activities and trainings; the completion report that contains the contents, schedule and outcomes of all activities is submitted.

8. Outputs of Soft Component Activities

Outputs of each activity of Soft Component program are listed in the table below.

Table 26 Outputs of the Soft Component Activities

Outputs	Contents
1. Pre-Construction Workshop Program	Contents of Workshop, procedure, methods, etc.,
2. Handout/materials for Workshop	Handout/material on outline of the Project and Workshops
	Handout/material on introduction of the piped water supply facility
	Handout/material on water and health, sanitation and hygiene
	Handout/material for Community sensitization
	Handout/material on O&M
	Form on meeting record
3. Progress Report (1)	Report on initial goal, implementation status on input and activities, and output at the point
4. O&M training program	Contents of Workshop, procedure, methods, etc.,
5. Progress Report (2)	Initial targets, inputs, degree of achievement, output at the reporting time
6. O&M manual（Final edition）	Drawings of the piped water supply facility (Outline)
	Form of water fee collection
	Form of accounting records on O&M
	Monitoring form of the facility operation
	Monitoring form of the facility checking
	Self-monitoring form of WSSB's' O&M
	Form for meeting record
7. Other important outputs	Regulation of WSSBs
8. Reports on the degree of achievement of O&M	Reports on the degree of achievement of each target WSSB's O&M activities
9. Final Report	Activity program and the activity results, planned goals and the degree of achievement, factors affected the degree of achievement, clarification of challenges and proposal for the future to make effects sustainable and develop it.

9. Approximate Operation Cost Estimation of the Soft Components

Approximate operation costs of above activities are estimated as below.

Table 27 Breakdown of Software Assistance Cost

Items	Japanese Yen (1,000 JPY)	Local Currency (1,000 UGX)	Yen Conversion (1,000 JPY)	Total (1,000 JPY)
1. Direct Labor Cost	4,785	0	0	4,785
2. Direct Expense	4,992	786,416	26,502	31,494
3. Overhead Cost	6,125	0	0	6,125
Inclusive Sum	15,902	786,416	26,502	42,404

Remarks: 1 USD=113.65 JPY、 1 UGX=0.03368JPY (Average from February 2016 to April 2016)

10. Obligations of Recipient Country

Ugandan side is obliged to perform the followings to carry out the soft component activities smoothly, and enhance the effects and its sustainability brought by the activities:

- Allocation of one DWD officer specialized to mobilization and sensitization and O&M activities about piped water supply systems,
- To bear his/her labor cost and field allowance,
- To bear the expenses of vehicles used by the above officer and its fuel cost
- Support by DWD and DWO for registration of newly established WSSBs in target RGCs
- Implementation of monitoring and follow-up activities for sustainable O&M of the constructed facilities in target RGCs after the soft component activities

Simple guidance for operation of the constructed piped water supply facility for each target WSSB and S/O is provided by the contractor (Japanese Construction Company): the contractor dispatches its personnel for the purpose as part of the construction work.

Annex Table 1 PDM for Soft Component (Technical Assistance)

Project Name:
The Project for Rural Water Supply Phase III in Lake Kyoga Basin

Period of Implementation:
Target Group: Residents of target RGCs, WSSB
Scheme Operators, Kiosk attendants

Target Country: Uganda

Date: October 2016

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Project purpose (Overall Goal) ・To increase supply amount of safe water in target RGCs, and improve their livelihood conditions	・Supply amount of safe water by the constructed piped water supply facility in each target RGC	・ Monthly report of O&M	Water policy or National development policy doesn't change
Purpose of Software Component ・Basic activities such as water charge collection are done smoothly and the facilities are operated and maintained under financially stable conditions ・ The piped water supply facilities constructed under the Project are used cleanly and sustainably under proper operation and maintenance (inspection and repair)	・Rate of water fee collection (Sales amount) ・ Balance of income and expenditure ・Amount of water supply by the constructed facility ・Status and frequency of repair and check by Scheme Operator	・Record of water fee collection/ account book ・Monthly report for operation and maintenance ・Operation records of the constructed facility ・Record of repair and check/inspection	Residents, staff of local government, staff of DWD and Umbrella organization continue their activities.
Outputs 1 Villagers understand the importance of safe water and the relations among safe water, and health and sanitation.	・ Adoption rate of toilet, dish shelf, soak pit for household effluent	・Interview from Ugandan counterpart	Member of WSSB and staff of local government are not reshuffle frequently
2 Administrative officers and villagers understand the importance and roles of WSSB, scheme operators, kiosk attendants and Umbrella organization.	・Frequency of meeting of WSSB and residents ・ Number of participation for residents meeting	・Progress Report (1)	Trained Scheme Operator continues to work for O&M
3 Members of WSSB including scheme operator and kiosk attendants understand objectives of WSSB, roles of each member, and running method of WSSB.	・Selection of Scheme Operator ・Registration to Umbrella ・Decided water fee ・Opening of bank account	・Record of Scheme Operator selection/contract document ・Registration card of Umbrella ・By-laws of WSSB (including rule on water fee) ・Bank Account Book	Residents continue participation to the O&M activities.
4 Members of WSSB including scheme operators learn about the technical knowledge and skills for the operation and maintenance of the piped water supply facilities such as structures, inspection and repair of the facilities.	・Record of submersible pump operation、 ・Produced amount by boreholes ・Sold water amount at Kiosks ・Frequency of periodical check ・Number of minor repairs ・Existence of monthly report	・Monthly report for operation and maintenance	Living condition of residents doesn't change significantly due to natural hazard, etc.
5 Members of WSSB including scheme operators and kiosk attendants understand water charge collection at kiosk, reading flow meter, importance of cleaning kiosk and soak pit.	・Record of flow meter at Kiosk ・Collected amount of water fee ・Cleaning status in and around Kiosks and soak pits	・Monthly report for operation and maintenance ・On-site survey	
Activities Mobilization and Sensitization for residents ①Pre-construction Phase: Holding several workshops to promote awareness and organization against representatives of RGCs, member of Project implementation committee, staff of sub county and residents. Training for WSSB (including Scheme Operator and Kiosk Attendants) ②During Construction Phase: Holding several workshops about basic of Operation and maintenance, training "on the job" practically ③Post Construction Phase: Following up the practices by several workshop and "on the Job" training for WSSB, scheme operator and Kiosk Attendant	Inputs (Japan) ・ Sub-contract and/or employ local NGOs/consultants ・ Dispatch one Japanese Consultant (O&M) (Uganda) ・ Staff of DWD who are in charge of mobilization, sensitization and health promotion ・ Staff of DWO who are in charge of mobilization, sensitization and health promotion ・ Community Development Assistant (CDA) and Health Assistant (HA) in sub-count ・ Staff of Umbrella East		Pre-conditions Residents in the target RGCs are not adverse to the construction of water supply facility

Annex Table 2　Work Contents of Japanese Consultant (Operation & Maintenance)

- Pre-Construction Phase -

Contents	Day
I. The first dispatch (at the timing of commencement of the mobilization and sensitization activity): Preparation of the activities, selection of local consultant, preparation of manuals and handouts, simulation of workshop, check/confirmation of real activities (45 days)	
1. Move (TYO⇒EBB)	2
2. Consultation and meetings with DWD (overall schedule of the soft component during pre-construction phase and contents of activities, nomination of suitable local NGOs/consultants as Community Development Expert and the shortlisting)	1
3. Preparation of TOR for local NGOs/consultants, Notice to them those nominated in the shortlist	3
4. Consultation and meeting with DWD, DWOs and sub counties (Confirmation of overall schedule of the soft component and the contents of the activities) , Confirmation of current situation of target RGCs	5
5. Receiving proposals submitted by local NGOs/consultants and the evaluation, job interviews to them	2
6. Meeting and confirmation of contract/employment condition, TOR and schedule with selected local NGO/consultant	1
8. Consultation and meetings with the local NGO/consultant (contents of workshops, preparation of manuals for facilitators and handouts for workshops)	5
9. Simulation of workshops and revision of the contents if necessary)	2
10. Consideration and decision on implementation schedule of mobilization and sensitization activities.	2
11. Check on implementation status of mobilization and sensitization activities (Observation on activities of the Community Development Expert and instruction for the activities improvement if necessary)	4
12. Report to DWOs, DWD on the mobilization and sensitization activities	4
13. Move (EBB⇒TYO)	3
Total	34 (34×1.35=46days) ⇓ 45days
II. The Second Dispatch (at the timing of the end of the mobilization and sensitization activities): Check and confirmation of the result of Pre-Construction Workshops, Review and check of the attainment of the critical requirement of every village, confirmation of target villages/RGCs, preparation of workshop report (15 days)	
1. Move (TYO⇒EBB)	2
2. Meeting with DWD (Implementation status, issues to be overcome)	1
3. Confirmation of degree of attainment of activities for every target RGCs, Coping strategy for RGCs with difficulties	2
4. Summary of degree of attainment for every target villages/RGCs	1
5. Consultation with DWD and DWO (Report on degree of activity attainments, and addressing challenges in relevant RGCs if there are.)	2
6. Consultation with DWD (result of activities, confirmation of the issues related to the results)	1
7. Move(EBB⇒TYO)	3
Total	12 (12×1.35=16days) ⇓ 15days

Annex Table 3 Work Contents of Japanese Consultant (Operation & Maintenance)
- During Construction Phase -

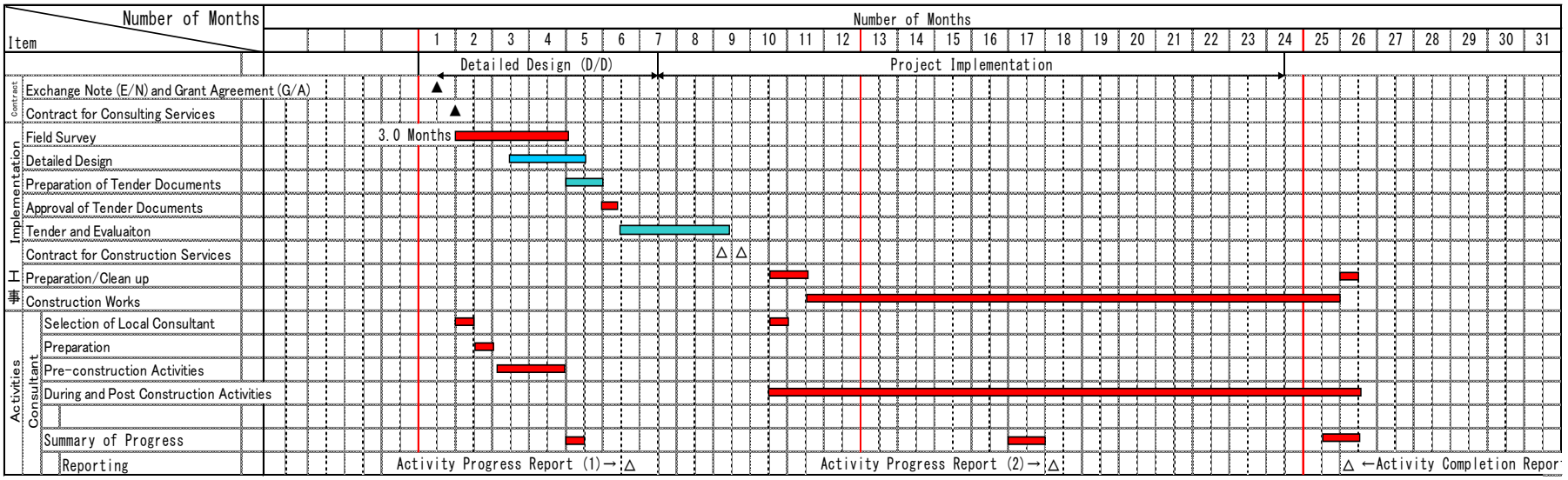
Contents	day
I. The first dispatch (at the timing of the commencement of the Activities): Preparation of the activities, selection of local NGOs/consultants in charge of Operation and Maintenance workshops and OJT, preparation of manuals and handouts, simulation of workshop and OJT, adjustment of the activity schedule (30 days).	
1. Move (TYO⇒EBB)	2
2. Consultation and meeting with DWD (Confirmation of overall schedule and contents of activities,), Notice to local NGOs/consultants nominated in the shortlist	1
3. Preparation of TOR for local NGOs/consultants	2
4. Consultation and meeting with DWD, DWOs and sub counties (Confirmation of overall schedule and contents of activities) , Confirmation of current situation of target RGCs	4
5. Receiving proposals submitted by local NGOs/consultants and the evaluation, job interviews to them	2
6. Meeting and confirmation of contract/employment condition, TOR and schedule with selected local NGOs/consultants	1
7. Consultation and meetings with selected local NGOs/consultants (contents of workshops and trainings, preparation of manuals for facilitators and handouts for workshops)	4
8. Simulation of workshops/OJT and revision of the contents if necessary)	1
9. Meeting with Contractor (confirmation of the construction schedule, planned contents of simple explanation on operation of the facilities by the contractor)	1
10. Consideration on detailed schedule of workshops/OJT activities.	1
11. Report to DWD on the activities conducted and the training schedule during construction phase.	1
12. Move (EBB⇒TYO)	3
Total	23 (23×1.35=31days) ⇓ 30days
II. The Second Dispatch (at the timing after first completion of facility): Check of the activities status, issues with difficulties related to the activities, and consideration of the coping method. (30 days)	
1. Move (TYO⇒EBB)	2
2. Consultation and meeting with DWD (Confirmation of overall schedule and contents of activities,),	1
3. Meeting with experts on community development and O&M (activities and challenges)	1
4. Site reconnaissance for checking implementation status (activity results, interview with member of WSSB, candidates of Scheme Operator, community members, etc.), visits to RGCs which have challenges in the training activities.	4
5. Meeting with the contractor on issues happened between the contractor and WSSBs/residents.	2
6. Meeting with experts of community development, O&M (challenges and coping actions, revision of activities if necessary, etc.)	2
7. Consideration and revision of detailed schedule on the activities including adjustment with construction schedule.	2
8. Consultation with DWD, DWOs and sub-counties (report on the progress of the activities, challenges and the coping results, implementation schedule of the activities, etc.)	4
10. Meeting with experts of community development and O&M (meeting result of discussion with DWD, DWOs and sub-counties, and its coping methods if necessary.)	1
11. Report to DWD and Explanation of current status of the activities	1
12. Move (EBB⇒TYO)	3

Total	23 (23×1.35=31days) ⇓ 30days

Annex Table 4 Work Contents of Japanese Consultant (Operation & Maintenance)
- During/Post Construction Phase -

Contents	day
III. The Third Dispatch (at the middle of activities): Check of the activities status, confirmation of issues with difficulties related to the activities, and consideration of the coping method (15 days)	
1. Move (TYO⇒EBB)	2
2. Meeting with DWD (implementation status of the training, schedule)	1
3. Meeting with experts of community development, O&M (status of activities and challenges, etc.)	0.5
4. Site reconnaissance for checking implementation status (activity results, interview with member of WSSB, candidates of Scheme Operator, community members, etc.), visits to RGCs which have challenges in the training activities.	2
5. Meeting with the contractor on issues happened between the contractor and WSSBs/residents.	0.5
6. Meeting with experts of community development, O&M (challenges and coping actions, revision of activities if necessary, etc.)	2
7. Report to DWD and Explanation of current status of the activities	1
8.. Move (EBB⇒TYO)	3
Total	12 (12×1.35=16days) ⇓ 15days
IV. The Fourth Dispatch (at the end of activities): Check and confirmation of the result of during/post-construction workshops and OJT, preparation of report on the activity result, confirmation of RGCs those have challenges, and issues to be handed over to the Uganda side. (30 days)	
1. Move (TYO⇒EBB)	2
2. Meeting with DWD (Implementation status of the training, schedule)	1
3. Consultative meeting with DWO (Schedule, contents of the activities, explanation of the evaluation method about the effectiveness of the activities, etc.)	1
4. Check of the O&M status for each target RGC (collection of water fee, operation record, record of account book, water supply status (readings of flow meter), records of repair, water usage, RGCs with challenges-left and the coping methods)	7
5. Preparation of report on O&M status regarding each target RGC	2
6. Consultation with DWD, DWO and Umbrella (report on O&M status, coping method for RGCs with challenges, confirmation of the issues to be handed over to the Ugandan side)	1
7. Meeting with DWD (result of the activities, O&M status, the issues to be handed over to the Ugandan side)	1
8. Preparation of document on achievement and result of the during/post-construction workshops and OJT, confirmation of the outcome, summary of the challenges-left.	2
9. Preparation and submission of final report of the soft component	3
10. Move (EBB⇒TYO)	3
Total	23 (23×1.35=31days) ⇓ 30days

Implementation Schedule of Technical Assistance (Soft Component)



Appendix-11

Reference

(1) Result of Socio-Economic Survey

Socio-economic Condition Survey for the Outline Design Survey for the Project for Rural Water Supply Phase III in Lake Kyoga Basin, Eastern Uganda

Survey A: Simple Socio-economic Survey

Date: / / 2015

RGC _____ RGC number _____ District _____ County _____
Sub county _____ Parish _____
Villages _____
Name of Enumerator _____ Respondent _____ Position _____
Phone Number _____
Location of the Centre (GPS Arc 1960) UTM-E (m) _____ UTM-N (m) _____ Altitude (m) _____

A. **Population and Households**

A1. Population of villages within the RGC by Interviewing

Name of Village	Population			No. of Households in RGC
	Total	Within RGC	Without RGC	
Total	-		-	

A2. Population of the Blocks in RGC by Counting

Block	Counted Households	per Households	Population
Block A			
Block B			
Block C			
Block D			
Block E			
Block F			
Block G			
Block H			
Total			

Compare

A3. Population in RGC
Total:

B. **Public Institutions**

B1. Hospitals and Clinic

Name of Hospitals, Clinics, Health Centers etc.	No. Beds
1.	
2.	
3.	
4.	
5.	

B2. Educational Facilities

Name of Facility	No. of Students and/or Pupils	Public/Private	No. of Boarders in Dormitory
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

B3. Public Offices

Name of Public Offices in RGC	Number
1. Sub-county Office	
2. Parish Office	
3. LC1 Office	
4. Police Office	
5.	
6.	
7.	
8.	
9.	
10.	

B4. Religious Facilities

No. of Churches: _____
No. of Mosques: _____
Others: _____

C. **Commercial and Industrial Facilities**

C1. Commercial Facilities

Name of Commercial Facilities	Number
Public Markets	
Shops, Stores and Restrants (total)	

Name of Hotels and Motels	No. of Beds for Guests
1.	
2.	
3.	

Name of Other Facilities	
1.	
2.	

C2. Industrial Facilities

Name of Industrial Facilities	Remarks
1.	
2.	
3.	
4.	
5.	

D. **Basic Infrastructures**

D1. Electric Power Supply

1. Existence of Electricity a. None b. Single Phases c. Three Phases
2. When there is electric power service, how many hours (daily average) is there any electric power service?
(hr./day)

D2. Road Conditions

1. Vehicle Accessibility to the RGC in Dry Season 1. Good 2. No good 3. Impossible 4. Others (_____)
2. Vehicle Accessibility to the RGC in Rainy Season 1. Good 2. No good 3. Impossible 4. Others (_____)
3. Transportation 1. None 2. Daily bus 3. Weekly bus 4. Others (_____)
4. Daily Frequency of Bus (if daily bus is available) 1. Once a day 2. Twice a day 3. 3 times a day 4. Others (_____)

E. **Hygiene and Sanitation**

E1. Coverage of Toilet in RGC: _____ %

E2. Types of household latrine in use

Type	% of all the existing households
Ordinary Pit Latrine	
Improved Pit Latrine	
Eco-sanitary Toilet	
Other (specify:	

E3. What are the methods of latrine cleaning? Answer _____

E4. *What are some of the constraints to construction and use of latrine, if any? Answer: _____

E5. Water-Borne Diseases in RGCs

Disease	Prevalence			
	very common	common	rare	very rare
a. Malaria/fever				
b. Diarrhea				
c. Skin Disease				
d. Respiratory Disease				
e. Worms				
f. Eye Disease/Infection				
g. Typhoid and				
h. Other (Specify:				

E6. Infant Mortality Rate (Year:)_____ /1000 Infant less than one year old

F. **Existing Water Source**

F1. Existing Water Supply

Water Source	Number	Main person to fetch water 1. men 2. women 3. boys 4. girls	Use of facility 1. all season 2.dry season only 3. rainy season only	Water Amount in Dry Season 1. Good 2. o.k./ so-so 3. bad	Water Quality 1. Good 2. o.k./ so-so 3. bad
a. Borehole (functioning)		1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
b. Borehole (not functioning)					
c. Shallow Well		1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
d. Protected Spring		1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
e. Unprotected Spring		1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
f. Dam/Valley Tank		1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
g. River		1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
h. Other (Specify)		1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3

F2. Are there any water purification facilities? 1. Yes 2. No

F3. If the answer of F2 is yes, what kind of water quality problems do you have? Answer: _____

F4. Do you have satisfaction with the existing water supply facilities? 1. Yes 2. No

F5. If the answer to F4 is No, what is the problem? Answer: _____

F6. What kind of activity did the villagers do for solving the problem? Answer: _____

F7. Functioning Borehole

Functioning Boreholes (Location: area name)	UTM Cordinate (Northing)	UTM Cordinate (Easting)	DWD Number	Year Constructed	Well Depth (m)	Static Water Level (m)	Pumping Method 1. Engine 2. *Motor (Electric) 3. Wind mill 4. Handpump 5. Nothing	Constructed by 1. Government 2. UNICEF 3. Individual/ Private sector 4. Other donor 5. Don't know
Borehole 1							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Borehole 2							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Borehole 3							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Borehole 4							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Borehole 5							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Borehole 6							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Borehole 7							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Borehole 8							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Borehole 9							1, 2, 3, 4, 5	1, 2, 3, 4, 5

Functioning Borehole (continued)

Functioning Boreholes	O&M by 1. Government 2. UNICEF 3. Individual/Private sector 4. Other (NGO) 5. Don't know	Water Fee if any (Ush. Per month)	Satisfaction 1. very satisfied 2 satisfied 3. o.k. 4. not satisfied 5 disgusted	Tank Volume (elevated tank) (m^3)	Population Served	No. of Times Broken	Reason for Having been Broken	Spare Parts Changed
Borehole 1	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Borehole 2	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Borehole 3	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Borehole 4	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Borehole 5	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Borehole 6	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Borehole 7	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Borehole 8	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Borehole 9	1, 2, 3, 4, 5		1, 2, 3, 4, 5					

Functioning Borehole (continued)

Functioning Boreholes	Repair done by Whom	Cost of Repair (Ush.)	Method for Collection Money for Repair (who paid)
Borehole 1			
Borehole 2			
Borehole 3			
Borehole 4			
Borehole 5			
Borehole 6			
Borehole 7			
Borehole 8			
Borehole 9			

F8. Non-Functioning Borehole

Non-Functioning Boreholes (Location: area name)	UTM Cordinate (Northing)	UTM Cordinate (Easting)	DWD Number	Year Constructed	Constructed by 1. Government 2. UNICEF 3. Individual/ Private sector 4. Other donor 5. Don't know	Year Broken	Reason for being broken, if known
Borehole 1					1, 2, 3, 4, 5		
Borehole 2					1, 2, 3, 4, 5		
Borehole 3					1, 2, 3, 4, 5		
Borehole 4					1, 2, 3, 4, 5		
Borehole 5					1, 2, 3, 4, 5		

Non-Functioning Borehole (continued)

Non-Functioning Boreholes	Reason for no repair
Borehole 1	
Borehole 2	
Borehole 3	
Borehole 4	
Borehole 5	

F9. Functioning Shallow Well

Functioning Shallow Well (Location: area name)	UTM Cordinate (Northing)	UTM Cordinate (Easting)	DWD Number	Year Constructed	Well Depth (m)	Static Water Level (m)	Pumping Method 1. Engine 2. Motor 3. Wind mill 4. Handpump 5. Nothing	Constructed by 1. Government 2. UNICEF 3. Individual/ Private sector 4. Other donor 5. Don't know
Well 1							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Well 2							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Well 3							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Well 4							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Well 5							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Well 6							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Well 7							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Well 8							1, 2, 3, 4, 5	1, 2, 3, 4, 5
Well 9							1, 2, 3, 4, 5	1, 2, 3, 4, 5

Functioning Shallow Well (continued)

Functioning Shallow well .	O&M by 1. Government 2. UNICEF 3. Individual/Private sector 4. Other (NGO) 5. Don't know	Water Fee if any (Ush. Per month)	Satisfaction 1. very satisfied 2 satisfied 3. o.k. 4. not satisfied 5 disgusted	Tank Volume (elevated tank) (m^3)	Population Served	No. of Times Broken	Reason for Having been Broken	Spare Parts Changed
Well 1	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Well 2	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Well 3	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Well 4	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Well 5	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Well 6	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Well 7	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Well 8	1, 2, 3, 4, 5		1, 2, 3, 4, 5					
Well 9	1, 2, 3, 4, 5		1, 2, 3, 4, 5					

Functioning Shallow Well (continued)

Functioning Shallow Well (continued)	Repair done by Whom	Cost of Repair (Ush.)	Method for Collection Money for Repair
Well 1			
Well 2			
Well 3			
Well 4			
Well 5			
Well 6			
Well 7			
Well 8			
Well 9			

F10. Non-Functioning Shallow Well

Non-Functioning Shallow Well (Location: area name)	UTM Cordinate (Northing)	UTM Cordinate (Easting)	DWD Number	Year Constructed	Constructed by 1. Government 2. UNICEF 3. Individual/ Private sector 4. Other donor	Year Broken	Reason for being broken, if known
Well 1					1, 2, 3, 4, 5		
Well 2					1, 2, 3, 4, 5		
Well 3					1, 2, 3, 4, 5		
Well 4					1, 2, 3, 4, 5		
Well 5					1, 2, 3, 4, 5		

Non-Functioning Shallow Well (continued)

Non-Functioning Shallow Wells	Reason for no repair
Well 1	
Well 2	
Well 3	
Well 4	
Well 5	

F11. Springs/Ponds/Rivers

	Type 1=Spring 2=Pond 3=River	UTM Cordinate (Northing)	UTM Cordinate (Easting)	Water amount 1= good, 2= so so, 3=no good	Water quality 1= good, 2= so so, 3=no good
Unprotected 1	1, 2, 3			1, 2, 3	1, 2, 3
Unprotected 2	1, 2, 3			1, 2, 3	1, 2, 3
Unprotected 3	1, 2, 3			1, 2, 3	1, 2, 3
Unprotected 4	1, 2, 3			1, 2, 3	1, 2, 3
Unprotected 5	1, 2, 3			1, 2, 3	1, 2, 3

6/14/2015

THE SIMPLE SOCIO-ECONOMIC SURVEY OF 16 RGCs

The Simple Socio-Economic Condition Survey for the Preparatory Survey for the Project for Rural Water Supply Phase III in Lake Kyoga Basin, Eastern Uganda in the Republic of Uganda .

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BH	Borehole
ECOSAN	Ecological Sanitation
HH	Household
HP	Hand Pump
JICA	Japan International Cooperation Agency
LPCPD	Litres Per Capita Per Day
MWE	Ministry of Water and Environment
O & M	Operation and Maintenance
PERT - DC	PERT Development Consult Ltd
RGCs	Rural Growth Centres
SACCO	Savings and Credit Cooperative Organisation
TECI	Tokyo Engineering Consultants International
UTM	Universal Transverse Mercator

List of Attachments

1. Questionnaire Social Economic Survey – the survey of 16 RGCs
2. Copy of the Technical Specifications/ Terms of reference
3. Photos from the RGCs
4. List of Water Sources in RGCs
5. List of Major Institutions in the RGCs

CHAPTER ONE: BACKGROUND AND PROJECT AREA DESCRIPTION

1.0 Introduction and Background to the Assignment

In May 2015 JICA Study Team composed of OYO International Corporation and Tokyo Engineering Consultants Co., Ltd ("the Client") commissioned - PERT Development Consult Ltd (PERT - DC) ("the Local Consultant") to undertake the Simple Socio-economic Condition Survey for the Preparatory Survey for the Project for Rural Water Supply Phase III in Lake Kyoga Basin, Eastern Uganda in the Republic of Uganda. The survey covered 16 Rural Growth Centres (RGCs). This is a report of the observations and findings from the survey of 16 RGCs

1.1 Justification for the Study

The Kyoga Basin area covered under this study is one of the areas where water coverage is still a problem. With a combined population of some 1,917,329 people, (2014 Census Results, www.citypopulation.de) the area is one of the major regions in the country. With a poor water coverage, the potential for water borne diseases and poor health in general increases, slowing the growth of the area. The region has also suffered some neglect due to the focus on the rehabilitation of the post conflict Northern Uganda. Yet the impact of the conflict was also felt in this region but due to the fact that it is not classified under the areas directly affected by the war, it has been by passed in terms of development activity.

This region is also one of the areas with a great potential for growth having good fertile soils and beautiful weather conditions that make for good agriculture. It is therefore important that conditions for growth especially in the RGCs which are quickly developing into towns are put in place. One of these is access to safe water.

In the last ten years, this region has also seen the break out of a number of mini epidemics of water borne diseases in particular typhoid, dysentery and other diarrhoeal diseases. This can be partly attributed to insufficient access to safe water and indeed the Government has responded with a number of measures including the introduction of chlorine dispenser to purify water at many of the water sources in the region. This underlines the need to understand the level of access to safe water as well as the hygiene and sanitation practices in area.

1.2 The Objectives of the Assignment

The objectives of the Village Survey of 16 RGCs were:

- To grasp actual condition of 16 RGCs,

- To obtain the basic data for preparing the prioritization list of the RGCs for the project implementation
- To obtain the basic data for designing water supply facilities and the formulation of efficient operation and maintenance plan for the project.

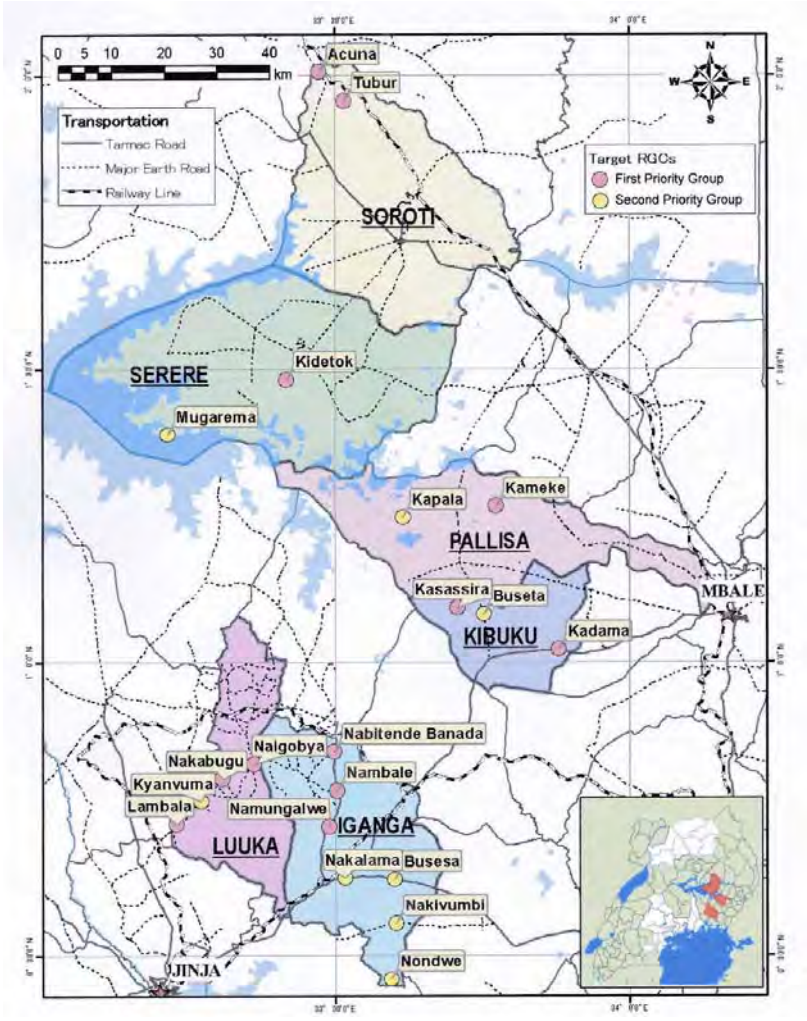
1.3 Description of the Project Area

1.3.1 Location

As of June 2015, the proposed Kyoga Basin project area included the six districts of Iganga, Luuka, Paliisa, Kibuku, Soroti and Serere. These district lie on the eastern and southern parts of Lake Kyoga which is found in the centre of the Ugandan Territory. The lake is part of the river Nile which flows from Lake Victoria and on through West Nile to South Sudan and eventually to Egypt. Figure 1.1 below shows the location of the region in Uganda (A-coloured brown) and Figure 1.2 the detail of the region with the location of the RGCs that have been covered in the study.

Figure 1.1 Location of Kyoga Region.

Figure 1.2 Detail of the Kyoga Region



NB. RGCs Kadama, Nakalama, Nakbugu and Mugarema were taken out of the out of the scope of survey work.

1.3.2 Relief

Kyoga Basin is lies at an altitude between 1,000m to 1800m ASL. The topography is hilly flat with wetlands and forested areas.

Lake Kyoga has undergone some changes in its old pattern. The older Kyoga was a larger lake than the present body of water. It is a shallow depression consisting of a number of arms, many of which are filled with swamp vegetation. The lake has a basin 7,500km2 in area including 6,720 km2 which form the areas occupied by the lake arms and enclosing high land up to an elevation of 1,030metres. The depth of the lake at its western end is from 3 to 5m, the maximum recorded depth is 7m.

The drainage basin of Lake Kyoga is characterised with a series of low hills and flat valleys with impeded drainage.

1.3.3 Vegetation

The vegetation is typical savannah type mainly characterized by grass cover. Perennial trees normally shed their leaves during the dry season. Much of the natural vegetation has been felled down for economic activities including charcoal burning and farming.

1.3.4 Geology and soils

The soil types vary from place to place but are generally well drained sandy loams and clay. Clay loams occupy areas along the rivers and streams. The soils are fertile, with potential for high productivity and especially suitable for agriculture. In some places the following soil exists: Foresails, Gleysols, Nitrosols, Reyasols and Cilhosols. The soils along major rivers in Kyoga Basin Region constitute mostly of Reyasols and Cilhosols which are poorly developed and prone to water logging.

The soil of a greater part of Kyoga Basin Region consists of ferruginous soil with a high percentage of sandy soils and therefore susceptible to erosion. Due to its sandy nature, the soil has low water retention capacity and high rate of water infiltration. The soils are usually deep with little differentiation into clearly defined zones and possess fine granular structure, others moulded into large, weak coherent clods that are very porous.

1.3.4 Climate

In general, the Kyoga Basin Region gets average rainfall of between 1200 to 1450 mm a year. The monthly average rainfall varies between 14 mm in January and 230 mm in August. Temperature ranges from 15 to 39 degrees Centigrade. The climate is hot throughout the year with two marked rainy seasons from March to June and August to November.

It is hot, dry and windy from December to mid-March. The southern part is part of the lake Vitoria watershed and its climate is moderated by the lake. Both rainy and dry seasons are therefore less marked as there is some rain even in the dry season. The maximum temperature is about 31.8˚C and the annual minimum temperature is about 17.3˚C giving a mean annual temperature of 24.6˚C.

1.3.5 Water Resources

The water resources of the area are heavily influenced by the rainfall pattern, topography and geological formation. The immediate response to rainfall is the runoff which finds its way to the streams and gradually into the groundwater system. The relatively dry and windy conditions mean that most of the rainfall is lost through evaporation.

Surface water is dominated by the marginally perennial rivers which essentially form the boundaries of districts, counties and sub-counties at times. Smaller streams can also be found within the vicinity of some RGCs. None of these streams are gauged and therefore there is no data on stream flows to inform planning.

These surface sources are used by the community for non-culinary purposes. The growing population, coupled with lack of enforcement of environment laws and regulations and a lack of alternative energy sources have had a serious impact on the quality of the water in the streams. The streams are heavily polluted.

Groundwater is the main source of drinking water although the geology of the area does not lend it to high expansive productive aquifers. Groundwater is found in valleys and in isolated pockets of the decomposed Precambrian rocks that form most of the geological stratum.

1.4 General Information and Location of RGCs

The Preparatory Survey for the Project for Rural Water Supply Phase III in Lake Kyoga Basin in Uganda is proposed to cover the 6 selected districts namely: Soroti, Serere, Pallisa, Kibuku, Iganga and Luuka in Eastern Uganda. Below is a brief about each of the selected districts.

1.4.1 Soroti District

This is found in the Eastern region and it's named after its chief municipal, administrative and commercial headquarters, Soroti, where the district headquarters are located. Soroti District is bordered by Amuria District to the north, Katakwi District to the east, Ngora District to the south east, Serere District to the south, and Kaberemaido District to the west. The Soroti district headquarters is located approximately 116 kilometres (72 mi), by road, northwest of Mbale, the nearest large city.

Population:

As of now, the sub-region is home to an estimated 2.5 million people. The district has one of the highest levels of poverty in the country. In February 2009, it was estimated that 53% of the population in the district (an estimated 124,300 people), live on less than US1.00 per day. The two predominant ethnicities in the district are the Iteso, and the Kumam. The main languages spoken in the district are: (a) Ateso (b) Kumam and Swahili.

Economic activity:

Agriculture is the main economic activity in the district. Crops grown include: Millet, Cassava, Peas, Potatoes, Beans, Onions, Tomatoes, Cabbages, Simsim, Sunflower, Cotton, Sweet Potatoes The produce is consumed locally and some is sold in the urban areas, particularly in Soroti Town.

1.4.2 Serere District:

Is a district also found in the Kyoga basin in Eastern Uganda It's named after its 'chief town Serere, where the district headquarters are located? Its weather is averagely 78°F (26°C), while the Wind is at 1 mph (2 km/h) and 63% humidity. Land coverage is at 1,965.4 km^2 (758.8 sq mi)

Location

Serere District is bordered by Soroti District to the north, Ngora District to the east, Pallisa District, and Kaliro District to the south. Kaberamaido lies to the west of Serere District. The district headquarters at Serere are located approximately 35 kilometers (22 mi), by road, south of Soroti, the largest town in the sub-region and approximately 205 kilometers (127 mi), by road, northeast of Kampala at:01 30N, 33 33E.

Serere District was created by Act of Parliament and became functional effective 1 July 2010. Prior to that, it was part of Soroti District. Serere District is part of the Teso sub-region, home to an estimated 2.5 million people of Iteso and Kumam ethnicities.

The districts that constitute the sub-region are: 1. Amuria District 2. Bukedea District 3. Kaberamaido District 4. Katakwi District 5. Kumi District 6. Ngora District 7. Serere District and 8. Soroti District. The sub-region is home to an estimated 2.5 million people of Iteso and Kumam ethnicities.

Population

In 1991 the national population census estimated the district population at about 90,400. The national census in 2002 estimated the population at about 176,500 (51% women), with an overwhelmingly rural population (80%), and a very high proportion of children (56%, or 46.5% if you consider only under 5 year-old children). In 2012, the population of Serere District was estimated at about 294,100. The major ethnicities in the district are: Itesot, Kumam and Bakenye while the Density 149.6/km^2 (387/sq mi)

1.4.3 Pallisa District:

This is also one of the districts also in the basin and in Eastern Uganda. Like most other Ugandan districts, it is named after its chief town, Pallisa, where the district headquarters are located.

Location:

Pallisa District is bordered to the north by (from west to east): Serere District, Ngora District, Kumi District, Bukedea District, Mbale District lies to the east while Budaka District to the southeast, Kibuku to the southwest and Kaliro District to the west. Pallisa the 'chief town' of the district, is located approximately 65 kilometers (40 mi), by road, west of Mbale the largest city in the sub-region.

Population:

In 2014, the population of Pallisa District was estimated at about 386, 074. The District covers an area of 1,487.7 km^2 (574.4 sq mi) of which 1,095.7 km^2 (423.1 sq mi) is land and 392 km^2 (151 sq mi) water with a population density of 330.9/km^2 (857/sq mi).

Economic activities:

Subsistence crop agriculture and animal husbandry are the two major economic activities in the district. To a lesser extent, fishing, fish farming and bee keeping are increasingly practiced in Pallisa District. The major crops include: Cassava, Millet, Sorghum, Maize, Ground nuts, Beans, Peas, Sweet Potatoes, Cotton, Sunflower, Soya beans, Banana, Matooke. Cattle, goats, sheep Poultry, and pigs are some of the animals raised in the district.

The district is further blessed with nine minor lakes that comprise part of the Lake Kyoga system. The following are the nine lakes: Lake Lemwa, Lake Kawi, Lake Nakwa, Lake Meito, Lake Geme, Lake Omunuo, Lake Nyanzala and Lake Nyaguo

There are nine stocked fish farms in the district. Fish farming offers a big potential to increase the supply of fish for the population and hence improve on the nutrition of the population.

1.4.4 Kibuku District:

Kibuku District was created by Act of the Uganda Parliament, on 1 July 2010. Prior to that the district was part of Pallisa District.

Kibuku District is bordered by Pallisa District to the north, Budaka District to the east, Butaleja District to the south, and Namutumba District to the west. The district headquarters at Kibuku, are located approximately 53 kilometers (33 mi), by road, west of Mbale, the largest city in the sub-region and on coordinates.

Population:

In the most recent census of 2014, the population of Kibuku District was estimated at approximately 202, 630.

Economic activity:

Agriculture (subsistence and commercial), is the mainstay of the district economy. crop agriculture involves the following crops: Matooke, Sweet bananas, Oranges, Pineapples, Maize, Sweet potatoes, Beans, Groundnuts, Cassava.

1.4.5 IGANGA:

This is a town in Eastern Uganda. It is the main municipal, administrative and commercial center of Iganga District and the district headquarters are located there. The district is named after the town Iganga.

Location:

Iganga is located in Uganda's Busoga sub-region. It lies approximately 45 kilometers (28 mi), by road, northeast of the city of Jinja, on the highway between Jinja and Tororo.

This location lies approximately 118 kilometers (73 mi), by road, southeast of Mbale, the largest city in Eastern Uganda and on coordinates:0°36'54.0"N, 33°29'06.0"E

The area cover by the district is 650.1 km^2 (251.0 sq mi)

Population:

In 2014, the national population census put Iganga's population at 506, 388 and hence a population density of 496.9/km^2 (1,039/sq mi)

Overview.

Iganga town has several Internet cafes, several guest houses, and a bustling market in the center of town beside the taxi park. Points of interest in the town include the Iganga Hospital, a 120-bed public hospital, administered by the Uganda Ministry of Health.

Iganga is served by a station on the Uganda Railways, the highway from the border with Kenya at Malaba, passes through Tororo and through Iganga, on the way to Jinja and on to Kampala, Uganda's capital and largest city.

1.4.6 LUUKA DISTRICT

Location:

Located at 1,200 m ASL (3,900 ft), Luuka District is bordered by Buyende District in the north, Kaliro District to the northeast, Iganga District to the southeast, Mayuge District to the south, Jinja District to the southwest and Kamuli District to the northwest.

Bulongo, where the district headquarters are located is approximately 33 kilometres (21 mi), by road, northwest of Iganga, the nearest large town. The coordinates of the district are: 00 42N, 33 18E.

Overview:

Luuka District was created by Act of Parliament and became functional on 1 July 2010. Prior to then, the district was *Luuka County* in Iganga District.

In Kisoga tradition, Luuka is one of the five traditional principalities of the Kingdom of Busoga. According to legend, Luuka was founded around 1737 A.D. and became a part of the British protectorate in Busoga in 1896 A.D. Its traditional ruler is known as the Tabingwa. The Luuka district is made up of 7 sub counties the following sub-counties namely: Bukanga, Bukooma, Bulongo, Ikumbya, Irongo, Nawampiti and Waibuga with 33 parishes and 17 villages.[1]

Population.

In 1991, the national population census estimated the district population at about 130,400. The national census in 2002 estimated the district population to be approximately 185,500. In 2012, the district population was estimated at about 260,900. The most recent census in 2014 put the population of Luuka at 241,453 with a density of 371.4.

CHAPTER TWO: METHODOLOGY

2.0 INTRODUCTION

In reference to the bid document received by PERT - DC and the subsequent contract signed concerning the project for Preparatory Survey for the Project for Rural Water Supply Phase III in Lake Kyoga Basin, Eastern Uganda in the Republic of Uganda, PERT - DC was expected to complete the study; the Survey of sixteen (16) RGCs in 14 days. The surveys commenced on June 1st, 2015 and field data collection ended on 12th June however data processing, analysis and report preparation took a few more days than planned hence a short delay in the submission of the report.

2.1 ACTIVITIES

The exercise was conducted in the six (6) project districts namely, Serere, Soroti, Kibuku, Pallisa, Iganga and Luuka. Professional business visits were made to District Authorities, Sub-county Chiefs, Parish Chiefs, and Local Council Leadership. The focus of this report therefore is the Village Survey of the 16 RGCs. The list of the surveyed RGCs is presented in the table below.

FIGURE 1.3 RGCS SURVEYED

RGC	RGC No.	District	County	Sub-county
NABITENDE	I-1	IGANGA	KIGULU NORTH	NAMBALE
NAMUNGALWE	I-2	IGANGA	KIGULU	NAMUNGALWE
NAMBALE	I-3	IGANGA	KIGULU	NAMBALE
LAMBALA	I-6	LUUKA	LUUKA	IRONGO
NAIGOBYA	I-7	LUUKA	LUUKA	BUKOOMA
BUSESA	I-8	IGANGA	BUGWERI	IBULANKU
KYANVUMA	I-9	LUUKA	LUUKA	IRONGO
NAKIVUMBI	I-10	IGANGA	BUGWERI	IBULANKU
NONDWE	I-11	IGANGA	BUGWERI	MAKUUTU
KASASSIRA	P-2	KIBUKU	KIBUKU	KASASSIRA
KAMEKE	P-3	PALLISA	AGULE	KAMEKE
KAPALA	P-4	PALLISA	PALLISA	GOGONYO
BUSETA	P-5	KIBUKU	KIBUKU	BUSETA
KIDETOK	S-1	SERERE	KASILO	PINGILE
TUBUR	S-2	SOROTI	SOROTI	TUBUR
ACUNA	S-3	SOROTI	SOROTI	TUBUR

The activities that were carried out in the Village Survey of Sixteen (16) RGCs are highlighted below:

Preparatory work and Training of Enumerators
As part of the training, enumerators were guided in a review of the background of the project and the Terms of Reference for the survey. They were then taken through the questionnaire and the meaning of each question was explained. Practice on interviewing was done. Enumerators were then shown how to use the equipment including the counters, cameras and GPS.

Trial Survey
Field practice was also undertaken in Soroti to test the questionnaire as well as to have a feel of how to carry out the interview and the kind of responses and probes that have to be used to get the desired answers. The outcome was fed into the final questionnaire. The experience was used to refine the technique and strategy of the interviewers.

Interview Survey of Sixteen (16) RGCs
At each of the RGCs the local leaders namely the village (local Council 1 Chairman) and where applicable the Parish (LC 2) and Sub-county (LC3) were interviewed. Opinion leaders consisting of business leaders, traditional and cultural leaders and influential faith based leaders were interviewed. In addition members of WSCs for water sources in the RGCs were also interviewed.

Photographic Documentation and GPS Coordinates
Water sources in the RGCs as well as the major institutions were photographed and their GPS locations as well as other details taken. The coordinates of the place considered as the centre of the RGC by the residents were also taken.

Reporting
The data thus gathered was edited and then processed. Some of it such as the photographs were coded and then organised and kept. The rest was entered into a computer data sheet which was subsequently used for analysis and production of this report.

2.2 ENUMERATORS

The Consultant – PERT - DC, deployed nine (9) enumerators for the Survey of the 16 RGCs who were directly accounting to the field supervisor. The field supervisor then reported to the team leader and lead consultant. Some of the enumerators are graduates from universities and other tertiary institutions with experience in research, supervision and monitoring. Team members were dispatched in three teams to each district and these were responsible for all the consultants' materials for data collection in addition to the supervisor who was in charge of quality assurance and overall supervision. All the enumerators were chosen on the basis

that they knew at least two of the languages in the study area and have also been in the area before and therefore know the geographical lay out of the same. These are people familiar with the area and could speak the local language.

The Consultant hired two (2) vehicles for the exercise. Motorcycles taxis were also hired on a day to day basis in line with the needs of the day.

2.3 KEY INFORMANTS

The key informants in the survey included; district officials, sub-county chiefs, sub-county chairmen, parish chiefs, local council leaders, WSC members and opinion leaders i.e. religious leaders, business leaders, the leaders of each RGC for the Village Survey of Sixteen (16) RGCs.

2.4 METHODS, TOOLS AND REPORTING

The main methods of data collection included; administration of Questionnaires, observations and discussions with Key informants. The contractor also collected data by use of Digital cameras and Geographical Positioning Systems (GPS).

Collected data was subjected to quality checks for consistency, validity and accuracy before entry. The data was entered in the database provided by the Client.

Before visiting each RGC a map of the RGC was reviewed with the team to become familiar with its boundaries and the features that mark this boundary on the ground. At the time of physical survey on the ground, members of the team checked for the boundary using the features marked on the map. The boundary was also explained to respondents at the time of collecting data so as to ensure that their responses particularly on population figures were consonant with the boundaries of the RGC.

Due to the fact that the RGC boundaries do not necessarily correspond with local administration boundaries on the ground, the team also counted households in each of the RGCs and used the most recent population figures for people per household in each of the RGCs. The population of each RGC was then derived by multiplying the counted households by the people per household according to the 2014 national population census results.

To effectively carry out the count of households, the RGC was divided into blocks based on the existing features such as roads or rivers. The enumerators then walked through each block, usually guided by a local person, while counting off the households using a counter. Two unique situations came to the attentions of the team.

A **household** usually consists of a number of persons who share a housing unit or part of a housing unit and share food and probably other essentials of living. Co-residence is a necessary condition though it is not sufficient. Individuals who share a housing unit but do not share food and other essentials for living are not a household[1]. In this study we adopted this definition of a household. In the urbanizing parts of the RGCs however you find premises consisting of a business premise in front and a home at the back. Often these are on one long building with several of them in line. Each of these was counted as a household if we noted that a family lives in the back. Then there are homesteads which consist of several houses in one compound, here the criteria was based on the above definition. Where any of the houses or huts prepared meals alone, that was considered as a household.

Significant institutions in the RGCs were also documented with photographs as well as GPS coordinates. These included schools, churches and hotels. Shops and business premised were also investigated.

An intersection of several roads in an area of dense population in each RGC was treated as the center of the RGC and was documented with photographs and its coordinates also taken.

[1] Franz Willekens "Family and Household Demography" in Demography Vol II, UNESCO, EOLSS.

CHAPTER THREE: PRESENTATION, OBSERVATION AND FINDINGS

3.0 INTRODUCTION

This section of the report has been broken down into the following themes:

- General Information and Location of the RGCS
- Population and Households
- Health, Sanitation and Hygiene in the RGC
- Schools and Commercial Facilities
- Basic Infrastructure
- Existing Water Sources

FIGURE 3.01: GENERAL INFORMATION AND LOCATION OF RGCS

No.	RGC	RGC No.	District	County	Sub-county	UTM - E	UTM - N	Altitude (m)
1	NABITENDE	I-1	IGANGA	KIGULU NORTH	NAMBALE	555650	93787	1090
2	NAMUNGALWE	I-2	IGANGA	KIGULU	NAMUNGALWE	554468	79607	1126
3	NAMBALE	I-3	IGANGA	KIGULU	NAMBALE	556076	86140	1109
4	LAMBALA	I-6	LUUKA	LUUKA	IRONGO	525712	79878	1077
5	NAIGOBYA	I-7	LUUKA	LUUKA	BUKOOMA	540456	91171	1073
6	BUSESA	I-8	IGANGA	BUGWERI	IBULANKU	566722	69529	1098
7	KYANVUMA	I-9	LUUKA	LUUKA	IRONGO	530321	84213	1129
8	NAKIVUMBI	I-10	IGANGA	BUGWERI	IBULANKU	567039	61252	1115
9	NONDWE	I-11	IGANGA	BUGWERI	MAKUUTU	566172	50708	1221
10	KASASSIRA	P-2	KIBUKU	KIBUKU	KASASSIRA	578281	121015	1080
11	KAMEKE	P-3	PALLISA	AGULE	KAMEKE	586003	139993	1123
12	KAPALA	P-4	PALLISA	PALLISA	GOGONYO	568421	137778	1067
13	BUSETA	P-5	KIBUKU	KIBUKU	BUSETA	583724	119623	1069
14	KIDETOK	S-1	SERERE	KASILO	PINGILE	546298	163480	1103
15	TUBUR	S-2	SOROTI	SOROTI	TUBUR	557636	216178	1091
16	ACUNA	S-3	SOROTI	SOROTI	TUBUR	552793	221674	1097

A general description of the districts in which the RGCs are located is provided in Section 1.4 of this report. In the table above, the precise location of each of the RGC in UTM Easting and Northing is stated. In addition the altitude of each of the RGCs is also indicated.

3.1 POPULATION AND HOUSEHOLDS

Households and families are basic units of analysis in demography. A household is composed of one or more people who occupy a housing unit (Jason & Lynne, 2001). In this study, information on Population and Households was collected. Figure 3.02 below presents a summary of the data on population and households in the different RGCs.

FIGURE 3.02: POPULATION AND HOUSEHOLDS

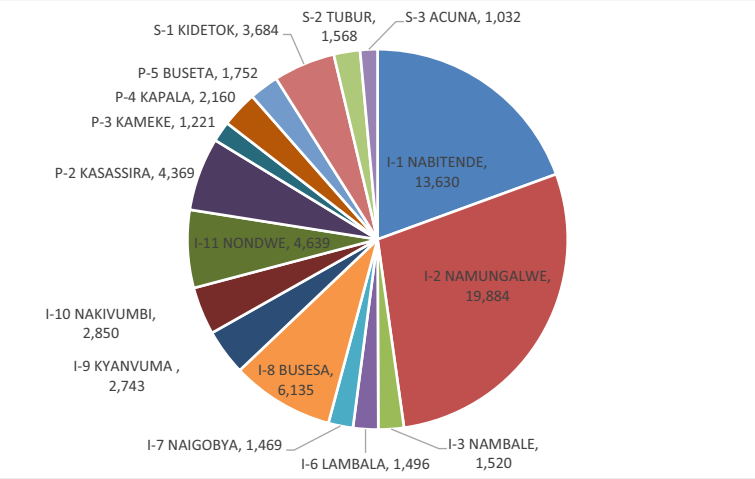
No.	RGC	RGC No.	District	Total No. of HHs Counted	Population Per HH*	Population of RGC
1	NABITENDE	I-1	IGANGA	2726	5	13,630
2	NAMUNGALWE	I-2	IGANGA	4058	4.9	19,884
3	NAMBALE	I-3	IGANGA	304	5	1,520
4	LAMBALA	I-6	LUUKA	277	5.4	1,496
5	NAIGOBYA	I-7	LUUKA	272	5.4	1,469
6	BUSESA	I-8	IGANGA	1227	5	6,135
7	KYANVUMA	I-9	LUUKA	508	5.4	2,772
8	NAKIVUMBI	I-10	IGANGA	570	5	2,850
9	NONDWE	I-11	IGANGA	859	5.4	4,369
10	KASASSIRA	P-2	KIBUKU	809	5.4	4,369
11	KAMEKE	P-3	PALLISA	197	6.2	1,221
12	KAPALA	P-4	PALLISA	360	6	2,160
13	BUSETA	P-5	KIBUKU	292	6	1,752
14	KIDETOK	S-1	SERERE	604	6.1	3,020
15	TUBUR	S-2	SOROTI	275	5.7	1,568
16	ACUNA	S-3	SOROTI	181	5.7	1,032

*Sub-county 2014 Uganda census results

It is important to note at this juncture that an RGC is not a political or administrative entity and it can fall within two administrative and or political divisions. At the same time there will be smaller units or villages that are within this entity while at the same time there will also be villages that are associated with the RGC in terms of being close to or sharing resources and in some cases having part of their population living within the RGCs. This is the reason behind specifying villages within and villages associated with the specific RGCs.

Figure 3.03 below, is a graphic illustration of the population in the RGCs. Namungalwe in Iganga District is the most populated RGC with the Population of 19,884.

FIGURE 3.03: POPULATION IN THE RGCS



The second most populated RGC is Nabitende Banada followed by Busesa, Nondwe, Kasassira Kidetok, Nakivumbi, Kyanvuma, Kapala, Buseta, Tubur, Nambale, Lambala, Naigobya, Kameke and Acuna in that order. Acuna is the least populated with a population of 1,032 people.

3.2 HEALTH, SANITATION AND HYGIENE IN THE RGC

The maintenance and promotion of health is achieved through repertoire of attitudinal and behavioural patterns. Health care providers deliver systematic activities to prevent or cure health problems and promote good health in humans in communities. A health care provider is an individual or an institution that provides preventive, curative, promotional or

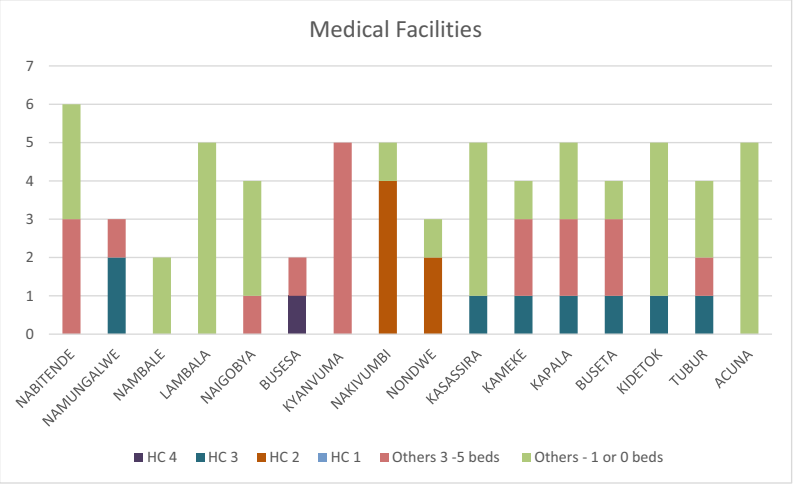
rehabilitative health care services in a systematic way to individuals, families or communities. In this study, institutions of note in the RGCs (also known as health facilities) included; hospitals, clinics, dispensaries and drug-shops.

3.2.1 HEALTH FACILITIES - HOSPITALS, CLINICS, DISPENSARIES AND DRUG SHOPS

All the RGCs reported one or the other of the above facilities. The largest RGCs by population also have the largest number of hospitals and clinics. Uganda, hospitals and health facilities are arranged in order of size and facilities. At the lower level are the village Health Teams (VHT) being the smallest unit that assists the population with advisory/counselling services and having only to handle minor cases. At the second level are the Health Centre II facilities with a capacity of 5 -10 beds. Level III is at sub county level with 10-15 beds while level IV is at county level with up 30 beds. Level V is at district level and beyond this are the referral hospitals at regional and national level being the largest among the systems of hospitals in Uganda.

Information on health facilities was obtained through interview augmented by observation by the survey team as they walked through the RGCs. In the interviews, the first 5 medical facilities mentioned by respondents unprompted were processed. Figure 3.04 below shows the results. There was one RGC with a level IV facility and that is Busesa.

FIGURE 3.04: HOSPITALS, CLINICS, DISPENSARIES AND DRUG SHOPS



Seven RGCs namely Namungalwe, Kasassira, Kameke, Kapala, Buseta, Kidetok and Tubur have Health Centre 3 facilities. All the RGCs had one type of facility or other with all having at least one drug shop or clinic. A casual look will suggest that the RGC in the worst position in terms of health facilities is Nambale where all the health facilities are one bed or less.

3.2.2 Latrine Coverage and Use.

Information on types of household latrines in use was collected as illustrated in Figure 3.05 below. Latrine coverage ranged from 50% in Lambala to 90% in Nabitende and Namungalwe. The two with the highest percentage are also the largest RGCs of the lot and the most urbanised. It is plausible to conclude that the urban nature of the RGCs compels the residents to construct latrines without which, there is nowhere to defecate.

Figure 3.05: Types of Household Latrine in use

ID.	RGC Name	District	Latrine Coverage rate in the RGC (%)	Ordinary Pit (%)	Improved Traditional P.T (%)	Eco San (%)	Others (Specify
I-1	NABITENDE	IGANGA	90	70	18	2	0
1-2	NAMUNGALWE	IGANGA	90	70	18	2	0
1-3	NAMBALE	IGANGA	75	50	25	0	0
1-6	LAMBALA	LUUKA	50	40	10	0	0
I-7	NAIGOBYA	LUUKA	80	75	5	0	0
I-8	BUSESA	IGANGA	80	70	10	0	0
I-9	KYANVUMA	LUUKA	75	60	9	1	0
1-10	NAKIVUMBI	IGANGA	56	50	4	1	0
I-11	NONDWE	IGANGA	70	60	7.5	2.5	0
P-2	KASASSIRA	KIBUKU	80	70	10	0	0
P-3	KAMEKE	PALLISA	70	60	9	1	0
P-4	KAPALA	PALLISA	80	70	10	1	0
P-5	BUSETA	KIBUKU	70	52	18	1	0
S-1	KIDETOK	SERERE	60	50	9	1	0
S-2	TUBUR	SOROTI	65	60	4	1	0
S-3	ACUNA	SOROTI	60	45	13	2	0

It was observed that the main type of household latrine in use was the Ordinary Pit Latrine. The ordinary pit latrine is just a pit of from about 3 to 9 metres deep which is then covered with a cement slab and then a small house is built on top for privacy. The slab has a rectangular hole where one squats to defecate. Besides the pit which is similar with every pit latrine, the nature of the privacy shelter at the top also varies and in some extreme cases there is just a sisal mat hanging on some poles. Sometimes instead of a cement slab some poles are lined on the pit. The various materials have implications in terms of ease of cleaning as well as potential for transfer of diseases. The ordinary pit latrine is the easiest to construct and to maintain. Therefore it is not surprising that it is the most prevalent of the latrine types. Health workers recommend that pit latrines be covered at all times to prevent the free

movement of flies from there to people. This prevents even the little air circulation that would take place.

An improvement on the ordinary pit latrine is the ventilated improved pit latrine otherwise known as the VIP. This is similar to the ordinary pit latrine but has a pipe that comes from the pit and goes through the roof to allow gasses and fumes emanating from the decomposing waster to escape into the atmosphere. In the ordinary pit, these gases all rise through the same opening where one squats to take nature's call. This makes the ordinary pit smelly and often fly infested. The VIP overcomes this problem to some extent. However the VIP is more expensive to construct which is why it is less prevalent. Moreover some people do not see the need for the extra cost.

Ecological Sanitation or Ecosan toilets attempt to overcome the challenge of digging deep pits which can become a problem in marshy and rocky places. At the same time they attempt to promote recycling of waste. In Ecosan, urine and solid waste are separated (see illustration in figure 3.06 below). The urine is then directly applied to plants as fertiliser. The solid waste is treated with ash and later also used as fertiliser. In many places in Uganda Ecosan toilets have been constructed by NGOs and other institutions but most of them have been rejected. There are many reasons for this not least being that in all cultures in Uganda, human waste is repulsive. Additionally the culture of compost and manure does not exist in most places in Uganda due to the fertile soils that exist naturally in the whole country.

Figure 3.06 Ecosan Latrine Technology with photo of Ecosan toilet near Kameke RGC centre

Ecosan toilets are rare showing up at a mere 2.5% in Nondwe which reported the highest use of Ecosan toilets. In the various RGCs visited, the team observed that most of the Ecosan Toilets had been constructed by NGOs and local governments and they were at public

facilities see (picture above). It was also noted that a number of them are not in use as evidenced by the grass growing all around them. The rejection by the community may be due to lack of sensitisation or even the fact that they involve some work in terms of the treatment of the solid waste.

Figures 3.07, 3.08 and 3.09 below show the various variables of latrine coverage rate arranged from best to worst as well as percentage of Ordinary pit latrine use in each of the RGCs

FIGURE 3.07 PERCENTAGE OF ORDINARY PIT LATRINES IN EACH RGC

Percentage of Ordinary Pit Latrines per RGC			
ID.	RGC Name	District	Ordinary Pit (%)
I-7	NAIGOBYA	LUUKA	75
I-1	NABITENDE	IGANGA	70
1-2	NAMUNGALWE	IGANGA	70
I-8	BUSESA	IGANGA	70
P-2	KASASSIRA	KIBUKU	70
P-4	KAPALA	PALLISA	70
I-9	KYANVUMA	LUUKA	60
I-11	NONDWE	IGANGA	60
P-3	KAMEKE	PALLISA	60
S-2	TUBUR	SOROTI	60
P-5	BUSETA	KIBUKU	52
1-3	NAMBALE	IGANGA	50
1-10	NAKIVUMBI	IGANGA	50
S-1	KIDETOK	SERERE	50
S-3	ACUNA	SOROTI	45
1-6	LAMBALA	LUUKA	40

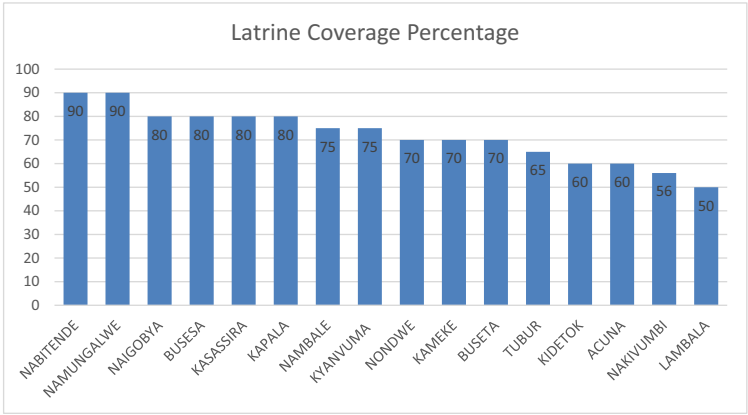
From the findings, Serere District had very low latrine coverage of (50%). Iganga district has indicated at least some advancement of using the Ecosan system as data from Nondwe, Nabitende and Namungalwe indicates.

FIGURES 3.08 AND 3.09 PERCENTAGE IMPROVED PIT AND ECOSAN TOILETS

Percentage of Improved Ordinary Pit Latrines per RGC			
ID.	RGC Name	District	Improved Traditional P.T (%)
1-3	NAMBALE	IGANGA	25
I-1	NABITENDE	IGANGA	18
2-Jan	NAMUNGALWE	IGANGA	18
P-5	BUSETA	KIBUKU	18
S-3	ACUNA	SOROTI	13
6-Jan	LAMBALA	LUUKA	10
I-8	BUSESA	IGANGA	10
P-2	KASASSIRA	KIBUKU	10
P-4	KAPALA	PALLISA	10
I-9	KYANVUMA	LUUKA	9
P-3	KAMEKE	PALLISA	9
S-1	KIDETOK	SERERE	9
I-11	NONDWE	IGANGA	7.5
I-7	NAIGOBYA	LUUKA	5
10-Jan	NAKIVUMBI	IGANGA	4
S-2	TUBUR	SOROTI	4

Percentage of Ecosan use per RGC			
ID.	RGC Name	District	Eco San (%)
I-11	NONDWE	IGANGA	2.5
I-1	NABITENDE	IGANGA	2
2-Jan	NAMUNGALWE	IGANGA	2
S-3	ACUNA	SOROTI	2
I-9	KYANVUMA	LUUKA	1
10-Jan	NAKIVUMBI	IGANGA	1
P-3	KAMEKE	PALLISA	1
P-4	KAPALA	PALLISA	1
P-5	BUSETA	KIBUKU	1
S-1	KIDETOK	SERERE	1
S-2	TUBUR	SOROTI	1
3-Jan	NAMBALE	IGANGA	0
6-Jan	LAMBALA	LUUKA	0
I-7	NAIGOBYA	LUUKA	0
I-8	BUSESA	IGANGA	0
P-2	KASASSIRA	KIBUKU	0

FIGURE 3.10: LATRINE COVERAGE,



The above findings generally indicate that most RGCs have an understanding on the importance of having latrines in place. However there is a lot of room for improvement. As the RGCs transit from rural to urban, there is going to be less space and bushed for those who do not have toilets. The likelihood is that there people will resort to the habit of defecating in plastic bags and throwing them anywhere as often happens in poorer parts of the main towns in Uganda.

There are places and culture in Uganda which are still opposed to the use of latrines with myths such as “going to a pit latrine will prevent you from giving birth and having children”

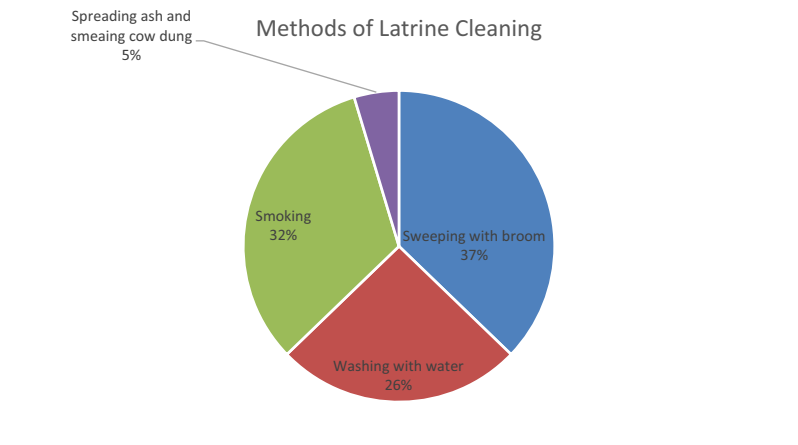
Effort of sensitisation on hygiene as well as the element of urbanisation like in Namungalwe and Nabitende Banada has made the percentage of latrine coverage to be high despite the increasing population in the mentioned areas. More effort is needed to make the percentage

of latrine coverage increase especially in the more rural RGCs like Kidetok in Serere District, Nakivumbi in Iganga district and Lambala in Luuka District

3.2.3 Latrine cleaning and Constraints against Latrine Construction.

In all the RGCs, the method of choice in cleaning latrines is sweeping with a broom. Most people also reported washing with water. Other methods mentioned included smoking, spraying ash and smearing with cow dung. Figure 3.10 below illustrates the findings on latrine cleaning.

Figure 3.11 Methods of Latrine Cleaning



Latrine cleaning is an essential part of appropriate sanitation and hygiene in homes. Its need is made even more vital by the fact that most of the latrines, being detached some distance from the main house (to avoid the smell) are poorly lit especially in the evening, resulting into mistakes where solid waste and urine may be found on the surface of the latrine. Children who do not know how to properly use latrines also frequently soil the floors of latrines.

Sweeping with a broom is convenient and easy and this is probably the reason why it is the most prevalent method. The effectiveness of this method may depend on the surface of the floor of the latrine. Earth surfaces may not withstand continuous washing with water, in which case, sweeping may be the method of choice especially if the earth is smeared with cow dung. Moreover earth surfaces absorb moisture which quickly dries up waste reducing its potency

as a disease carrier. Smearing of the walls and in some cases floor with cow dung helps to block the holes where insects like cockroaches that feed on faces may hide or hibernate in the day waiting to migrate to homes in the night.

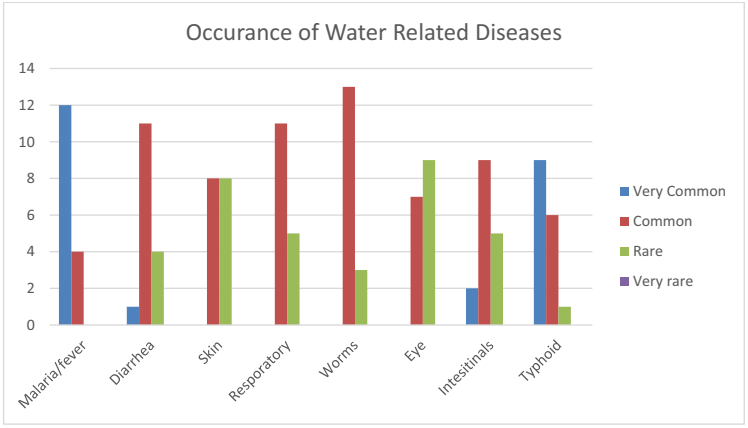
Washing with water is more appropriate for latrines that have a cement floor. In practice though, most people who use water in most cases don't use soap for proper cleaning of their hands and other parts of the body which actually accelerates the spread of the hygiene related problems.

The use of the smoking method has a long tradition in Uganda. The practice was the answer to the smell, fumes and flies emanating from the unventilated ordinary pit latrine. It is often combined with sweeping with a broom.

3.2.4 Water Borne Diseases

Waterborne diseases are caused by pathogenic microorganisms which are directly transmitted when contaminated fresh water is consumed. The occurrence of waterborne disease in the RGCs is illustrated in Figure 3.12.

Figure 3.12: Occurrence of Water Borne Diseases in the RGCs



The data shows that Malaria and Typhoid are very common all the RGCs. Malaria is transmitted by mosquitoes that breed in stagnant water. Where there is a shortage of sources of water, people may resort to ponds and stagnant water pools for a source of water. These are a breeding ground for mosquitoes. The use of rain water tanks, especially in RGCs like Tubur may also promote the multiplication of mosquitoes and the transmission of Malaria.

The ingestion of infected human faeces is the main source typhoid infection. Human faeces are also the main source of diarrhoeal pathogens including dysentery, cholera and typhoid. Typhoid proliferates in conditions of poor hygiene either due to ignorance, say of the need to wash hand with soap after toilet or due to lack of facilities such as safe water. At a number of RGCS, chlorine dispensers were seen. These, it was reported, were put in place by government officials to treat water so as to reduce the transmission of typhoid.

Worm infestations are also reported as common though not very common. The transmission of worms is often facilitated by poor disposal of human waste as well as poor hygiene. The prevalence of all these water borne diseases in the RGCs points to a need for better sanitation facilities of which safe water is a major part. Sensitisation is also critical.

The RGCs where malaria and typhoid are reported to be very common were sorted and the results a presented in tables 3.13 below.

FIGURE 3.13 RGCS REPORTING 'VERY COMMON' FOR MALARIA TYPHOID AND DIARRHOEA

	Malaria	Typhoid	Diarrhoea
1	NABITENDE	ACUNA	LAMBALA
2	LAMBALA	TUBUR	
3	NAIGOBYA	NABITENDE	
4	NAKIVUMBI	LAMBALA	
5	NONDWE	KIDETOK	
6	KASASSIRA	KASASSIRA	
7	KAMEKE	KAPALA	
8	KAPALA	KAMEKE	
9	BUSETA	BUSETA	
10	KIDETOK		
11	TUBUR		
12	ACUNA		

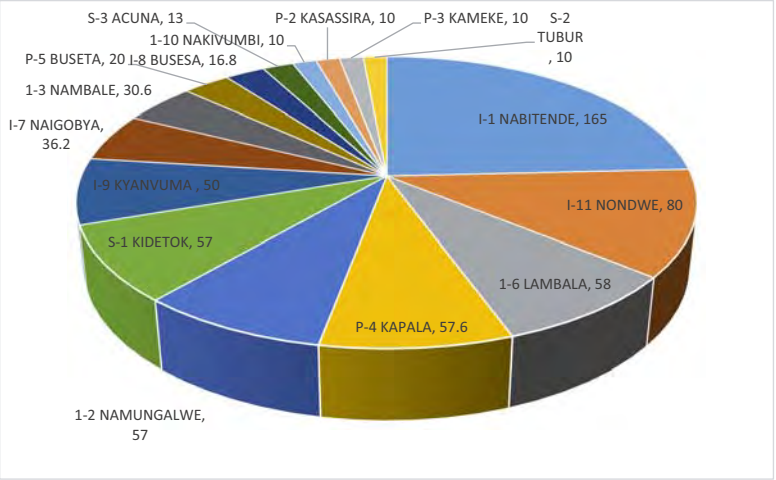
Note that the order does not present intensity however what is noteworthy here is the fact that in these RGCs each of the diseases presented on the table was reported as being very common. These are therefore the most affected by these diseases namely Malaria and Typhoid. Note that while typhoid is reported to be very common in some 9 RGCs, Diarrhoea is reported to be very common in only one place and that is Lambala.

3.2.5 INFANT MORTALITY RATE

Infant mortality rate in the RGCs is illustrated in Figure 3.14 below. Infant mortality rate is the number of children dying under one year of age for every one thousand births. Most of the respondents were found to be ignorant about infant mortality and they tended to report

figures based on the experience of infant death in their environment. The figures while casual, nevertheless reflect the feeling of the respondents on the issue of infant mortality. Because respondents even in the same RGC gave widely varying figures, the most recurring figure (mode) in the data set was selected. In a few places where there was no figure repeated, the average was used.

FIGURE 3.14 REPORTED INFANT MORTALITY RATE IN THE RGCS



Based on the data reported, the highest figures of infant mortality was in Nabitende at 165 deaths per 1,000 births followed by Nondwe with Tubur, Kameke and Kasassira and Nakivumbi at the bottom with just 10 death per 1,000 births. Uganda has carried out extensive immunisation against the six killer diseases namely polio, whooping cough, tetanus, diphtheria. Most infant deaths are therefore now caused by other common problems and infections. In a 2007 demographic and health survey, the leading causes of death in children under-five years in Uganda were found to be malaria, perinatal and early neonatal conditions, meningitis, pneumonia, and HIV/AIDS. Sanitation and safe water is a factor in all these diseases.

3.3 Schools and commercial facilities

3.3.1 Schools and Educational Institutions

Schools and educational facilities are both a mechanism for improving enabling children in the area to access education but they are also a form of business which attracts resources and provides market for various products such as stationery and uniforms. Educational institutions therefore attract lots of other businesses to supply their needs and with them people who increase the population in the surroundings of schools. Schools and educational institutions also present significant concentrations of people during day and also during night for boarding institutions. These people need water and other sanitation facilities. The density of institutions as the numbers of pupils in the institutions therefore present and indicator of the need for safe water sources and sanitary facilities. In this study respondents were named the major institutions in their RGC. Figure 3.15 below summarises the findings on educational institutions.

Figure 3.15: Educational Institutions in the RGCs

No.	RGC	Public School	Private School	Number of students/pupil	Number of Boarders
1	NABITENDE	3	5	7,000	530
2	NAMUNGALWE	3	5	5,950	462
3	NAMBALE	1	4	1,550	2
4	LAMBALA	1	3	2,270	-
5	NAIGOBYA	1	4	2,400	20
6	BUSESA	4	4	5,870	800
7	KYANVUMA	1	5	2,173	160
8	NAKIVUMBI	3	1	4,800	115
9	NONDWE	1	7	3,380	-
10	KASASSIRA	2	1	2,600	150
11	KAMEKE	0	4	3,620	450
12	KAPALA	3	4	3,030	44
13	BUSETA	0	5	2,270	80
14	KIDETOK	2	5	2,499	786
15	TUBUR	2	5	2,350	-
16	ACUNA	0	2	300	-
	TOTAL	27	64	52062	3599

The above table shows that all the RGCs have educational institution. Nabitende Namungalwe, Busesa, Nakivumbi, Kameke and Nondwe having the largest population in terms of the numbers of pupils/students. The same RGCs have been found to have the largest number of institutions and probably have the biggest demand for institutional sanitation services.

3.3.1 Public Offices

Public offices attract populations to locations due to the potential for business with them. Proximity to services is another reason why people locate near public offices. People who work with specific public offices will also in the long run locate close to those offices for convenience. Figure 3.16 below summarises the situation of public offices in the RGCs.

Figure 3.16: Public Offices

		Sub-county office	Parish office	LC1 office	Police Station/post	Other 1	Total
RGC	RGC No.	Number	Number	Number	Number	Number	
NABITENDE	I-1	0	1	2	1	0	4
NAMUNGALWE	I-2	1	1	3	1	0	6
NAMBALE	I-3	1	0	0	1	0	2
LAMBALA	I-6	0	0	1	0	0	1
NAIGOBYA	I-7	0	0	1	1	0	2
BUSESA	I-8	1	1	1	1	0	4
KYANVUMA	I-9	0	1	1	0	0	2
NAKIVUMBI	I-10	0	0	1	1	0	2
NONDWE	I-11	0	0	1	1	0	2
KASASSIRA	P-2	1	1	1	1	0	4
KAMEKE	P-3	1	0	0	1	0	2
KAPALA	P-4	1	1	1	1	0	4
BUSETA	P-5	0	1	1	0	0	2
KIDETOK	S-1	0	0	0	1	0	1
TUBUR	S-2	1	1	0	1	0	3
ACUNA	S-3	0	0	0	1	0	1

It can be seen that all RGCs have at least one public office; an LC office, a police post, a sub-county office or a parish office. Some of the RGCs have several offices of different types. The RGCs with highest number of offices are Namungalwe 6, Nabitende 4, Busesa 4, Kasassira 4 and Kapala 4. Those with 1 office only include Acuna, Kidetok and Lambala. Seven (7) RGCS namely Tubur, Kapala, Kameke, Kasassira, Busesa, Nambale and Namungalwe have Sub County offices.

3.3.2 Commercial Facilities

Figure 3.17 below summarises the data on commercial facilities, hotels, stores and restaurants.

Figure 3.17: Commercial Facilities

	C1 Commercial Facilities		Hotels and Motels		Other Facilities			
RGC	Public Markets	Shops, Store and Restaurants	No of Hotels	Total NO of Beds	Name	No	Name	No
NABITENDE	1	210	3	37	Mobile money	10	SACCOs	10
AMUNGALWE	2	274	3	60	Mobile money booths	10	SACCOS	12
NAMBALE	1	31	0	0	MOBILE MONEY POINTS	5	GRINDING MILL	1
LAMBALA	1	44	0	0	SACCO	3	0	0
NAIGOBYA	0	16	0	0	MOBILE MONEY BOOTHS	1	SACCOS	1
BUSESA	1	48	1	12	0	0	0	0
KYANVUMA	1	182	3	22	MAIZE MILLS	8	SACCOS	20
NAKIVUMBI	1	88	1	6	SALONS	12	BUTCHER	3
NONDWE	1	86	0	0	0	0	0	0
KASASSIRA	1	50	0	0	0	0	0	0
KAMEKE	1	36	0	0	Mobile money booths	2	SACCO	1
KAPALA	1	50	0	0	MOBILE MONEY	1	0	0
BUSETA	1	71	0	0	0	0	0	0
KIDETOK	1	50	0	0	ABATTOIR	1	MOBILE MONEY BOOTHS	3
TUBUR	1	61	0	0	SACCO	1	Mobile money business	1
ACUNA	1	19	1	0	0	0	0	0

Industrial facilities named included flour mills, rice hullers, abattoirs, metal workshops, timber mills and coffee processing factories. In one RGC a large cotton ginnery was seen.

3.3.3 Religious Facilities

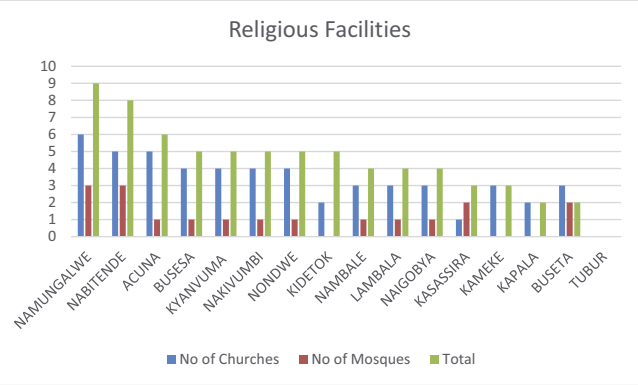
Places of worship are centres of communal action and are critical in the dissemination of health and hygiene messages. They are also critical agents for the mobilisation of resources for the establishment of communal facilities for water, sanitation and health. Figure 3.18 below summarises the data on religious facilities in the RGCs surveyed. The data is also graphically illustrated in Figure 3.19 that follows. All the RGCs except Tubur reported at least one religious facility. In terms of total numbers, Namungalwe had the highest number of facilities (9) followed by Nabitende (8) and then interestingly, Acuna (6). It should be noted that recently the trend if for Christian worshipers gathering in regular building like schools and even recreational halls for prayer on Sunday. Thus besides the building that are clearly marked as churches, there are sometimes churches operating in regular buildings. Some shrines for the worship of traditional gods were also named in some RGCs.

Due to the culture of ablution on the part of the Islamic faith, most mosques also have a source of water in the form of a borehole or a shallow well and this was also witnessed in this survey. Most of these are set up privately by the mosque and usually they have no numbers.

Figure 3.18: Religious Facilities

No.	RGC	No of Churches	No of Mosques	Total
1	NAMUNGALWE	6	3	9
2	NABITENDE	5	3	8
3	ACUNA	5	1	6
4	BUSESA	4	1	5
5	KYANVUMA	4	1	5
6	NAKIVUMBI	4	1	5
7	NONDWE	4	1	5
8	KIDETOK	2	0	5
9	NAMBALE	3	1	4
10	LAMBALA	3	1	4
11	NAIGOBYA	3	1	4
12	KASASSIRA	1	2	3
13	KAMEKE	3	0	3
14	KAPALA	2	0	2
15	BUSETA	3	2	2
16	TUBUR	0	0	0

Figure 3.19: Religious Facilities

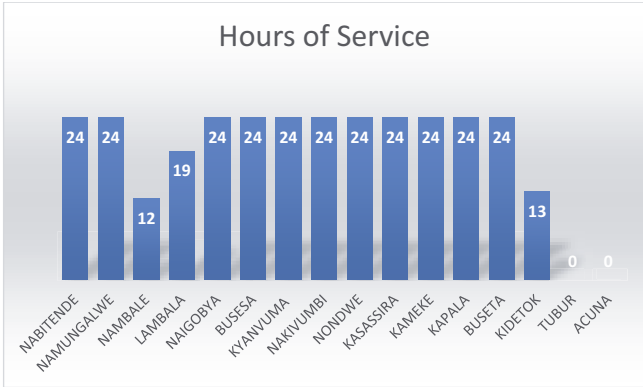


3.4 Basic Infrastructure

3.4.1 Electricity Supply

All except two RGCs have main power connection. The two places where no power was reported are Tubur and Acuna. Wherever single phase power was reported, there also three phase power was reported. The main difference therefore between the RGCs is the number of hours that power is estimated to be on. In Uganda, power interruptions and blackouts are the norm and people have learnt to ignore the power cuts. Therefore in many of the small towns and rural growth centres in the country, small industrial facilities such as grinding mills and grain hullers run mostly on diesel. Nevertheless access to power is one of the major predictors of growth as it enables access to information via TV and Radio, improves student performance as they are able to read even during the dark and makes possible business based on power. Figure3.20 below shows the reported average number of hours that power is on in every 24 hours. At most of the RGCs the report is that power is on for 24 hours. However at Nambale and Kidetok it is on for 12 and 13 hours respectively.

Figure 3.20: Electricity Supply to the RGCs



3.4.2 Accessibility to the RGCs

Figure 3.21 below shows the situation of access to the RGCs. Most of the RGCs are easily accessible by road during both the dry and the rainy seasons. The exception is Lambala RGC where most people feel that access is no good both during the dry and the wet season.

Not unexpectedly, access is more difficult during the wet season and during that season access is not so good for all except Nabitende, Naigobya, Busesa and Acuna. This therefore suggests that these are the RGCs with the best road access. There is at least a daily bus in 8 out of the 16 RGCs. (In Uganda a minibus is called a 'taxi'. For the purposes of this study, 'taxi' is treated as a bus. The government does not run any passenger transport service of any kind in the country)

Where there is no bus service, the most common mode of transportation is the motorcycle.

Figure 3.21: Accessibility to the RGCs

RGC	Dry season access	Wet season access	Transportation		Frequency of Daily Bus	Name Others
			Bus	Other means		
NABITENDE	Good	Good	Daily	Motorcycles	Once	0
NAMUNGALWE	Good	No good	Daily	Motor bikes	Three times	0
NAMBALE	Good	No good	Daily	Motorcycle	Three times	All means of transpor
LAMBALA	No good	No good	Daily	Taxis	Once	Bodaboda
NAIGOBYA	Good	Good	Motorcycle	0	None	Bodaboda
BUSESA	Good	Good	Daily	Motorcycles	None	0
KYANVUMA	Good	No good	Daily	Motorcycle, bycycles	Once	0
NAKIVUMBI	Good	No good	Motorcycle	Taxis and motorcycles	Once	0
NONDWE	Good	No good	Daily	0	Once	0
KASASSIRA	Good	No good	Motorcycle	Motorcycle -taxis	None	Trucks

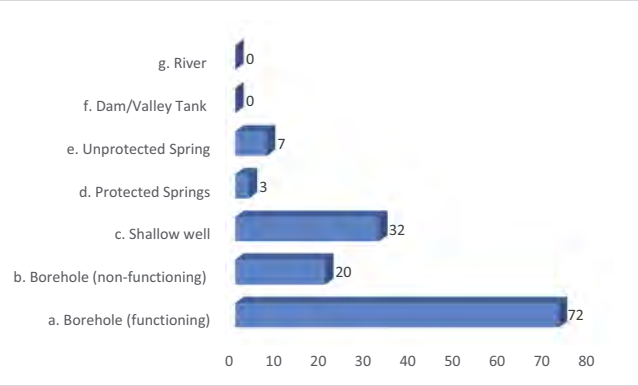
KAMEKE	Good	No good	Motorcycle	Motorcycles	None	0
KAPALA	Good	No good	Motorcycle	Motorcycle	None	Boda-boda
BUSETA	Good	No good	Motorcycle	Motorcycles and cabs	None	0
KIDETOK	Good	Good	Daily	0	Once	0
TUBUR	Good	No good	Motorcycle	Pick up trucks	None	0
ACUNA	Good	Good	Motorcycle	Taxis - These are mini vans that serve as buses.	Once	0

3.5 Existing Water Sources

The most prevalent water source in all the RGCs is the deep borehole. This is followed by the shallow well and the unprotected spring in that order. There was no river or valley tank reported in any of the RGCs. Most of the water sources are all season providing water both in the wet season and the dry season thought the quantity and quality may vary depending on the season. In the dry season the amount of water in springs and shallow wells reduces. In Acuna the study team was shown a pond that is sometimes used as a source of water. In almost all the RGCs there were rain water harvest tanks both at institutions and in homes. Although rainwater tanks are not a permanent source of water, they relieve the pressure on existing sources especially during the rainy season.

Figure 3.22 below shows the prevalence of different sources of water in the RGCs at present.

Figure 3.22 Sources of Water in the RGCs



3.5.1 Quality of Water

Most of the respondents felt that the quality of water from all the water sources was acceptable in general however quality was considered good with borehole water. Fewer people considered water from shallow wells to be good. Instead the number of people who felt that it is just fair was higher compared to the same category for borehole water. Protected and unprotected spring are clearly considered to have the worst water in terms of quality .

Figure 3.23 Sources of Water in the RGCs

At Kameke, Kapala and Buseta, water purification facilities were reported and seen. There were water purification facilities in the name of chlorine dispensers at boreholes and shallow wells. Perhaps relatedly, at both Kameke and Kapala, there were also reports of a high frequency of typhoid and other water borne diseases. Chlorine dispensers placed at the point of water collection to treat water are a means of reducing biological contamination so as to prevent the transmission of diseases like typhoid.

Besides the threat of contamination other problems reported were water being dirty. The biggest problem however is that there are insufficient water sources in the first place. At all the RGCs the response to the question of satisfaction with the existing water, was almost universally in the negative. All the respondents are not satisfied with the water available. Both quality and quantity are short of the desires of the residents in the RGCs

3.5.2 Functionality of Water sources

A significant fact is that of all the existing boreholes, 21.3% were reported as non-functional. Non functionality is one of the major obstacles to access to safe water. Functionality is greatly improved if the community based mechanisms for operation and maintenance of water sources function well. A lot of these depend on the existence and effectiveness of the water and sanitation committees that are set up for each water source. However when people were asked what has been done in the face of non-functional sources, only a few reported taking action such as collecting money for repair. Many said that the community has appealed to the government for help. Some reported resorting to rain water and others to just trekking further away to get safe water.

FIGURE 3.24 SOURCES OF WATER IN THE RGCS

	RGC	a. Borehole (functioning)	b. Borehole (non-functioning)	c. Shallow well	d. Protected Springs	e. Unprotected Spring	f. Dam/Valley Tank	g. River	h. Other
I-1	NABITENDE	10	3	4	0		0	0	0
1-2	NAMUNGALWE	13	4	8	0	1	0	0	1
1-3	NAMBALE	2	0	0	0	1	0	0	0
1-6	LAMBALA	2	2	3	0	2	0	0	0
I-7	NAIGOBYA	3	0	2	0	0	0	0	0
I-8	BUSESA	7	0	5	0	0	0	0	WHT
I-9	KYANVUMA	3	1	3	0	0	0	0	WHT
1-10	NAKIVUMBI	5	0	2	3	0	0	0	0
I-11	NONDWE	2	2	1	0	2	0	0	0
P-2	KASASSIRA	4	0	0	0	0	0	0	0
P-3	KAMEKE	4	0	0	0	0	0	0	0
P-4	KAPALA	2	0	2	0	0	0	0	0
P-5	BUSETA	4	1	1	0	0	0	0	0
S-1	KIDETOK	10	5	1	0	0	0	0	0
S-2	TUBUR	0	1	0	0	0	0	0	WHT
S-3	ACUNA	1	1	0	0	1	0	0	0

NB: WHT = Water Harvest Tanks

The two biggest RGCs namely Nabitende and Namungalwe also have the highest number of boreholes at 10 and 13 respectively. They are closely followed by Kidetok and Busesa which have 10 and 7 respectively. Kidetok is somewhat a surprise as it is smaller than several others in terms of the population.

The list of all the water sources in the RGCs is presented as attachment 5 of this report

3.5.3 OPERATION AND MAINTENANCE OF WATER FACILITIES

The approach to Operation and Maintenance of water facilities is key to their functionality. Recognising this, the government of Uganda has adopted and disseminated and advocated an approach known as Community Based Management System where the communities within which the facilities are found are encouraged to form organisations to operate, manage and maintain the water facilities. A critical factor in this approach is the sense of ownership of the facility. In this study some aspects of O and M were investigated. These include the people who mostly fetch water from facilities, the individuals or groups that are responsible for their O and M and repair and maintenance issues.

3.5.4 USE OF FACILITIES.

Although all the people in household use water, the burden of ensuring enough water for homes falls unfairly on women and girls. Figure 3.25 below shows the people who mostly fetch water from the different types of water sources. As the table demonstrates, it is mostly the women and girls who fetch water. Girls and women are therefore the people that are inconvenienced most when water source break down. This is why it is important for women and girls to be involved in decision making in both the location of the water sources and in the management of the sources. Women also carry the biggest responsibility in home making child care and, in some communities, domestic income generation. The time spend in fetching water therefore impinges on how much time they can put in the other livelihood activities mentioned above and on the welfare of whole communities.

FIGURE 3.25 MAIN PERSON TO FETCH WATER

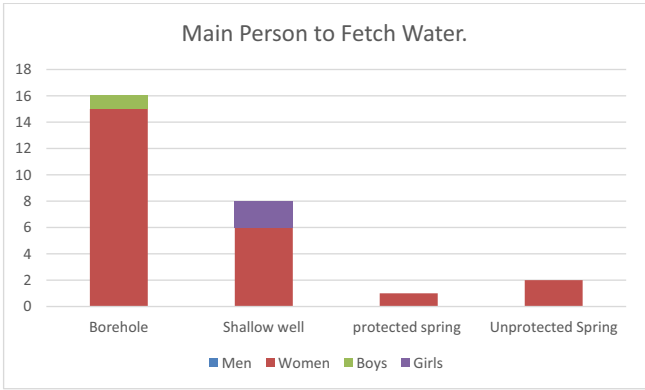
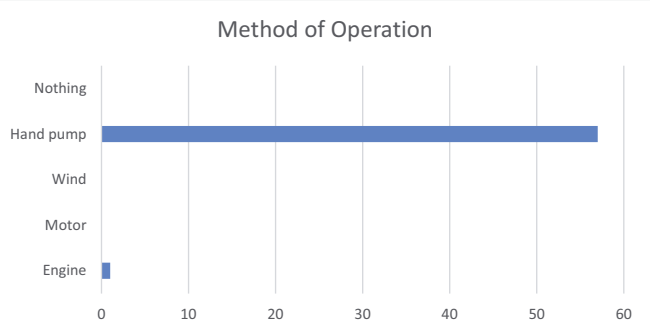


Figure 3.26 below shows the method of operation of deep boreholes the water sources (processed for the first seven sources of each type). The bulk of boreholes are operated with a hand pump. Only one of the facilities in the RGCs covered had a motor and that was in

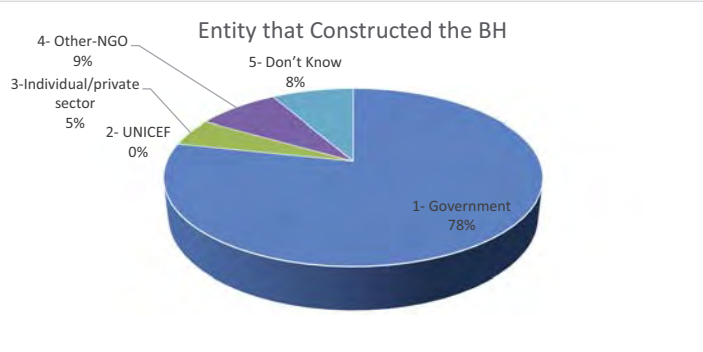
Kidetok RGC. This technology is practical, cost effective and sustainable but it puts a strain on the people who fetch the water and also lengthens the time needed to collect water

FIGURE 3.26 METHOD OF OPERATION OF WATER SOURCES



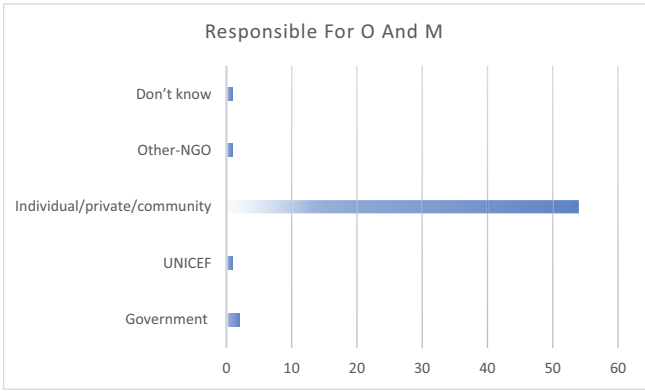
Regarding the entity responsible for the construction of the borehole, most of the boreholes, it was reported, were constructed by government. There are various programmes under which government constructs boreholes from time to time. However some donor funded boreholes are also some times regarded as government constructed by the local communities. NGOs are the second largest group responsible for the construction of boreholes. NGOs also include faith based institutions like churches and mosques. A few individuals have also constructed boreholes.

FIGURE 3.27 ENTITY RESPONSIBLE FOR CONSTRUCTION OF THE BH



While construction is mostly attributed to government, operation is mostly attributed to individuals, the private sector and the community. There are still a few facilities where people reported that responsibility for O and M of a certain facility was with government. When people acknowledge responsibility for O and M there is a greater likelihood of sustainable management of facilities as they do not have to use them carelessly in the hope that someone will come from outside of the community to maintain their facility.

FIGURE 3.28 RESPONSIBILITY FOR OPERATION AND MAINTENANCE



3.5.5 OPERATION AND MAINTENANCE FEE

One of the critical aspects of O and M for water facilities is the existence of a fund for maintenance and repair. This fund enables repairs to be effected rapidly so as to reduce down time. The collection approach and management of the fee is usually collectively decided by the community and this choice determines whether there will be funds for repair and maintenance when it is needed. 45% of the boreholes covered in this analysis reported that there was no clear fee for O and M. Most of those who reported a specific fee said that it is collected at household level and on a monthly basis. Understandably, this is more convenient than collecting at the water point which requires a person to be present all day and some hours of the night. This also implies that that person has to be paid. The average fee mentioned was 583 shillings while the mode was 1,000=. Most of the hand pumps were reported to have broken down at least twice and the main cause of break downs was "overuse" or "many users". People felt that the great number of people using each facility led to more frequent break down. The most frequently mentioned parts replaced were pipes and rods while rubbers, cylinder, chain and pump head were also mentioned. The mean value for the cost of repair (among those who mention a value) was 99,000 while the mode was 150,000=.

None of the villages reported satisfaction with existing water facilities. The RGCs have different reasons for the dissatisfaction however these can be grouped into six categories. Clearly the largest problems have to do with insufficient facilities. However to be noted are the problems to do with operation and maintenance such as broken down facilities which form the second largest category.

When asked what they do to deal with these problems respondents reported that the action taken most frequently is to report to authorities and ask for help. The action taken the least times is the one of contributing money or mobilizing the village to deal with the problem and this pattern of behaviour is problematic and points to a dependency attitude which needs to be changed through some mobilization and sensitization so as to change attitudes.

CHAPTER FOUR: ISSUES, CHALLENGES AND CONCLUSIONS

4.0 ISSUES AND CHALLENGES

One of the biggest challenges is the fact that the respondents did not have the concept of the boundaries of the RGCs in their minds. It was therefore very difficult for them to give precise information such as the population and even those who gave it quoted widely varying figures and they failed to agree with one another. This includes people that are in positions of responsibility such as LC chairmen and official of the sub counties.

There is also poor record keeping in the management of the water sources and there is minimal memory as individual with responsibility change from time to time and yet there are no written records. For this reason information on repair and maintenance is scanty. Therefore respondents struggled to give information on cost of repair and parts replaced. Perhaps this is aggravated by the fact the mechanics tend not to be transparent in their operations as a way of maintaining the advantage to charge for their services at will.

In the collection of data, the consultant's team took all necessary effort to ensure the collection of valid, consistent and coherent data. To this end, enumerators were trained to probe if data seemed to conflict or contradict at different points in the questionnaire and where necessary to check out the some of the information through observation. However, there are many challenges with data in this rural context where administrative arrangements for villages are still just being put in place in some cases. For that reason there are places where the consultant has had to check several times and with different people until a coherent picture of the situation of the RGC became clear. This was the situation particularly in the large RGCs including Namungalwe and Nabitende

The survey team faced a lot of logistical challenges in the execution of the assignment especially as the pace of the work was extremely high. However the study provided a vital learning experience from which all those that participated came away much more skilled and enlightened and for which the team is grateful to the client.

5.0 CONCLUSION

On a general note, the study team observed that access to water varies greatly from place RGC to RGC in the study area. There should be continuous investment in safe water sources by government and NGOs, however, government is constrained financially and many of the sources established are not well maintained and break down. RGCs are areas that are quickly changing from a rural lifestyle to an urban lifestyle and they tend to be characterised by a reduced sense of community spirit. This perhaps explains why many people confronted with failing facilities instead opt to turn to private rain water trapping as opposed to collecting

money to maintain communal facilities or even construct new ones. This suggest that there may be need to transit gradually from a community based model of water provision to a commercial model where users have to pay per unit used.

The relationship between safe water, good health and improved household welfare has been demonstrated and articulated repeatedly by various authorities. This underlines the need for provision of safe water to the areas surveyed. Moreover some of the RGCs are urbanising fast and this poses a danger to the safety of ground water particularly from shallow wells which can be contaminated by faecal material seeping from latrines. Many of the current water sources will therefore probably be in safe in the next few years given the current rate of population growth and urbanisation in the larger RGCs.

While the most common means of disposing off human faecal matter is pit latrines, this form of waste management is not compatible with urbanisation which comes with storied buildings. Even without storied building, the increasing scarcity of space in all these RGCs means that pit latrines are going to be outmoded in favour of more space economic sanitation methods. In a very short time, the need for water in all these RGCs is likely to spike as people adopt flash toilets and other sanitation technologies that use more water, hence the need for investment in water especially in the larger and more populated RGCs.

From the data relating to the reasons for failure to repair broken HPs and other facilities, it is clear that there is a reluctance to pay for water and water service. This implies that there is need for sensitisation of people in these RGCs to enable them embrace the reality that there is a cost associated with safe water and that government will not be able to sustain the provision of safe water for all at no cost, In any case, government already departed from the free water policy and now insists that communities must maintain their water sources. This kind message must be delivered effectively to all the resident of all the RGCs with every additional investment in water provision in the RGCs covered in this study and probably many others.

Household Survey in Selected 12 RGCs

Pre-requisite of respondent: Who has his/her family and live in the area within RGC

Date: / / 2016

Name of Enumerator

RGC RGC No. District County

Sub county Parish. Village (LC1)

Name of Respondent Age Gender 1. Male 2. Female

Occupation Religion Tribe Soc-class

GENARAL

A. Household Composition (Numbers) Men and Women: adult (over 18 years old), Boys and Girls: under 17 years old

Men Women Boys Girls

Total persons

B. Main role of each householed members

B1 What is the main role of each person in the household?

Men Women

Boys Girls

B2 Do your female householed members work to get money or any products ? 1. Yes 2. No

B3 (If the answer of B2 is "Yes",) What kind of works do they do? Specify

C. Literacy of householed members

C1 How many householed members can read and write in Vernacular ? Male Female

C2 How many householed members can read and write in English ? Male Female

WATER & HEALTH

D. Current Condition of Water Source

D1. **Water in Dry Season**

D1-a Main sources(s) of water in **Dry Season**

	a. Borehole	b. Shallow well /Dug well	c. Protected spring	d. Unprotected spring	e. Rain harvest	f. Dam/ Valley tank	g. River/ Stream
Number of roundtrips per day							
Distance (m)							
Time for one roundtrip (min)							
Method of water transport H: hand B: bycycle V: vehicle C: cart							
Person to fetch water	1	1	1	1	1	1	1
1=most ~ 4=least	2	2	2	2	2	2	2
M: men W: women	3	3	3	3	3	3	3
B: boy G: girl	4	4	4	4	4	4	4

D1-b Water Consumption in **Dry Season**

1. How many jerry cans of water do you fetch for your household? jerry cans/day
2. Water consumption (litres per capita per day) liter/capita/day
   (To be calculated by the Enumerator) *(No. of jerry cans x 20 / No. of household members)*

D2. **Water in Rainy Season**

D2-a Main sources(s) of water in **Rainy Season**

	a. Borehole	b. Shallow well /Dug well	c. Protected spring	d. Unprotected spring	e. Rain harvest	f. Dam/ Valley tank	g. River/ Stream
Number of roundtrips per day							
Distance (m)							
Time for one roundtrip (min)							
Method of water transport H: hand B: bycycle V: vehicle C: cart							
Person to fetch water	1	1	1	1	1	1	1
1=most ~ 4=least	2	2	2	2	2	2	2
M: men W: women	3	3	3	3	3	3	3
B: boy G: girl	4	4	4	4	4	4	4

D2-b Water Consumption in **Rainy Season**

1. How many jerry cans of water do you fetch for your household? jerry cans
2. Water consumption (litres per capita per day) liter/capita
   (To be calculated by the Enumerator) *(No. of jerry cans x 20 / No. of household members)*

D3. Water Sellers

D3-1 Have you bought water from water sellers? 1. Yes 2. No

a. (if Yes,) The in what situation did you have to buy this wat 1. Dry season 2. Specify

b. (if Yes,) How many times did you buy water in the last year? _____ times
c. (if Yes,) How many jerry cans did you buy at a time? _____ *jerry cans*
d. (if Yes,) How much did you pay for one jerry can? _____ *Ush/jerry can*

D4. Water Source for Washing and Bathing

D4-1 What is your water source for Washing Clothes?

a. Borehole	b. Shallow well /Dug well	c. Protected spring	d. Unprotected spring	e. Rain harvest	f. Dam/ Valley tank	g. River/ Stream	h. Other ( )

D4-2 What is your water source for bathing

a. Borehole	b. Shallow well /Dug well	c. Protected spring	d. Unprotected spring	e. Rain harvest	f. Dam/ Valley tank	g. River/ Stream	h. Other ( )

D5. Water-Borne Disease in the Household.

Disease	**Prevalence** 1. very common 2. common 3. rare 4. very rare	**Main Cause** (Why did they get sick?)	**Remedy/Coping Method** (What do you do when you get sick?)
a. Fever			
b. Diarrhoea			
c. Skin Disease			
d. Respiratory Disease			
e. Worms			
f. Eye Disease/Infection			
g. Other (Specify:			

E. Water and Health Problems of the household

E1 Circle (O) the ones that apply.

a. Water source is too far
b. Little water at the source in dry season
c. Little water at the source even in rainy season
d. Water quality is bad; 1. smell, 2. color, 3. taste, 4. other:(specify_____)
e. Too many people use the same water source
f. Poor water drainage
g. Broken / stolen handpump or water supply facilities
h. Many children are sick; 1. fever, 2. diarrhoea, 3. skin disease, 4. respiratory disease, 5. worm, 6. eye infection, 7. other: (specify_____)
i. Many adults are sick 1. fever, 2. diarrhoea, 3. skin disease, 4. respiratory disease, 5. worm, 6. eye infection, 7. other: (specify_____)
j. No / too few latrines
k. Clothes not clean
l. Water containers not clean
m. No drainage of domestic effluent
n. No water for Hand washing
p. Other; (specify _____)

E2 Which one is the most severe problem for you among those in the list above? For the ranking, put an alphabet from "a" to "p" presented in the above table..

Rank (1=biggest problem)	1	2	3

E3 How many times did your household buy medicines last year ? _____ times

E4 How many times did your household receive medical treatment in last year ? _____ times

F. Effects of Water Fetching

F1 Are there any adverse effects of water fetching on job opportunity of women?
Yes (Specify) _____ No _____

F2 Are there any adverse effects of water fetching on school attendance of children?
Yes (Specify) _____ No _____

INCOME AND EXPENDITURE

G. Household Income

G1 What are the sources of your household's income

a. Salary by working for offices, factories, etc.

Householed member 1:	Monthly	_____	Ush	_____	months/year
_____	Weekly	_____	Ush	_____	weeks/year
	Daily	_____	Ush	_____	days/year
			Annual Total:	_____	Ush
Householed member 2:	Monthly	_____	Ush	_____	months/year
_____	Weekly	_____	Ush	_____	weeks/year
	Daily	_____	Ush	_____	days/year
			Annual Total:	_____	Ush
Householed member 3:	Monthly	_____	Ush	_____	months/year
_____	Weekly	_____	Ush	_____	weeks/year
	Daily	_____	Ush	_____	days/year
			Annual Total:	_____	Ush
			Grand Total:	_____	Ush

b Selling and production, etc.

Source of Income	householed Member in Charge	Monthly Income (Ush)	Yearly Income (Ush)
selling animals (specify:_____)			
selling agricultural crops (specify:_____)			
selling labour (specify:_____)			
commercial activity (specify:_____)			
other 1 (specify:_____)			
other 2 (specify:_____)			

G2 Are there any seasonal changes of the Household income? 1. Yes 2. No

G3 (If the answer of the G2 is "Yes",) How much change does happen usually? Difference

for corresponding month Maximum _____Ush in _____ Minimum _____Ush in _____

G4 How many livestock does the Household have?

No. of Cattle		No. of Pigs		No. of Goats		Chicken/Ducks	

G5 Does the Household get Remittances from anyone in cities or abroad? 1. Yes 2. No.

G6 (If the answer of the G5 is "Yes",) How much remittances does your household get?

1. Monthly Remittances _____ Ush 2. Yearly Remittances _____ Ush

(If the answer of the G5 is "Yes",) Who remits the amount to your household?

1. One of the householed members 2. Relatives 3. Others

G7 Total Annual Income to be calculated by Enumerator _____ Ush

G8 Does the mother or the daughter have any role in increasing the income? 1. Yes 2. No.

(If the answer of the G8 is "Yes",) What is their role? 1. _____

2. _____

3. _____

H Expenditure

H1 How much does your Household spend for water? (O&M, water, jerrycan, etc.)

a Monthly contribution _____ Ush/month

b Water fee per jerry can _____ Ush/jerry can

Monthly ammount for water: _____ Ush/month

H2 Sanitation and hygiene-related issues/matters? (latrine expenses, soap, etc.) _____ Ush/month

H3 Health-related issues/matters? (medicine, hospital visit, etc.) _____ Ush/month (Check E3)

H4 Food _____ Ush/month

H5 Fuel for cooking _____ Ush/month

H6 Electricity (UMEME) _____ Ush/month

H7 Education _____ Ush/month

H8 Communication by mobile (Battery charge: _____Ush and Airtime _____Ush) _____ Ush/month

H9 Other main expenditure, if any (Specify, _____) _____ Ush/month

(Specify, _____) _____ Ush/month

H10 Total Annual Expenditure: _____ Ush/year

COOPERATIVE ORGANIZATION AND ACTIVITIES

I Water and Sanitation Committee (WSC) and Operation & Maintenance (O&M) Experience.

I1 Have you ever paid for water? 1. Yes 2. No

I2 How much money **did** you pay as an initial contribution for water supply? a. _____ Ush. b. None c. don't know

I3 How much money **did** you pay as water users' fee every month? a. _____ Ush. b. None c. don't know

I4 The new piped water supply facility will make water fetching easier under the management of the Water Authoriy to be established under the Sub-county. What is the maximum amount you are willing to pay for water?

a. _____ Ush/jerry can b. None c. don't know

I5 How many women are in charge of any roles in your WSC?

Circle (O) the ones that apply:. 1 2 3 4 5

I6 Women's opinions are taken well in any decision of WSC?

Circle (O) the ones that apply:. 1. Frequent 2. Sometimes 3. Ignored

J Other Cooperative Organization

J1 Are you participating in any cooperative activities in the RGC including WSC? 1. Yes 2. No

J2 If Yes; (Organization Name) _____ (Responsibility) _____

J3 If No; (Reason of not participating) _____

HYGIENE AND SANITATION

(please ask to see the facilities and items so that you can confirm what the respondent says)

K. Toilet

K1 Do you have a toilet in your house lot? 1. Yes 2. No

(If yes) When was it installed? 1. _____ years ago 2. don't know

(If no) Why does your householed not have a toilet? 1. No money 2. No space 3. Land is rocky 4. Swamp conditions 5. Other_____.

K1-a (If answer of K1 is yes) Is your toilet easy to use? 1. Yes 2. No

(If no) What is the problem in using your toilet? 1. _____ 2. _____ 3. _____

K1-b Type of Latrine/ toilet a) VIP b) Flush c) Ecosan d) Traditional Pit

K1-c Sanitation Status of latrine/toilet a) Clean b) Dirty

K1-d Availability of latrine/toilet cover/lid 1. Yes 2. No

L. Kitchen

L1 Presence of Kitchen 1. Available 2. Not Available

L2 Drying rack for dishes 1. Available 2. Not Available

L3 Animal shelter 1. Available 2. Not Available

L4 Fecal presence around compund 1. Yes 2. No

L5 Compost pit availability 1. Yes 2. No

L6 House hold drainage channel 1. Available 2. Not available

M. Hand washing

M1 When do you wash your hands? 1. After toileit 2. Before meals 3. Others _____

M2 Hand Washing Facitlity (HWF) availability 1. Yes 2. No

(if yes)

M2-a Type of hand wash facility. 1. Tippy tap 2. Faucet 3.Ordinary can 4. Other specify _____

M2-b If yes, does it always have water? 1. Yes 2. No

M2-c Does it have soap? 1. Yes 2. No

M2-d Facility is used by 1. Everyone 2. Adults only 3. Children only

M2-e Frequency of use of facility 1. Regularly 2. Periodically 3. Ocassionally 4. Rarely

M2-f If not used regularly, what is the problem 1. No water 2. No need 3. Other _____

M2-g If the answer of M2 is No, reason _____

N. Others

N1 Status of water collection containers 1. Clean 2. Dirty

N2 Bath shelter 1. Available 2. Not available

N3-a Covering of drinking water storage containers 1. Covered 2. Not covered

N3-b Cleanliness of water storage containers 1. Clean 2. Not clean

N3-c Drinking water storage treatment 1. Add chemica 2. Boiling 3. Prepacked 4. Filtering 5. No treatment

N4 Cattles such as cows, goats, etc. can get their drinking water at the same water source for human beings? 1. Yes 2. No

N4-a If "No", how do you water the cattle?

1. There is a cattle watering place that is separate from that of human beings
2. Use backet to convey water for animals away from that for human beings
3. Others (Specify: _____)

N5 If "Yes"., why don't you separate the watering of cattle from the source of water for human beings?

Reason: _____

Supplemental Data Collection (1) of Selected 12 RGCs

Pre-requisite of respondent: Representatives of the RGC (LC1 Leaders in RGC)

Date: / / 2016

Name of Enumerator

RGC RGC number District County

Sub county Parish

Villages

Name of Respondent Position Phone Number

GENERAL

A. Unemployment rate (the number of people ages 15 and older who are actively looking for a job as a percentage of the labour force)
(Purpose: Gender issue) 1. Male (%) 2. Female (%)

B. Literacy *(Purpose: Gender issue)*
A1 Rate of people who can write and read in Vernacular in the RGC Male (%) Female (%)
A2 Rate of people who can write and read in English in the RGC Male (%) Female (%)

C. School enrollment ratio *(Purpose: Gender issue)*
C1

Kind of schools	School enrollment ratio		Holdover ratio		Graduation ratio	
	Male	Female	Male	Female	Male	Female
Primary school						
Secondary school ordinary level						
Secondary school advanced level						

D. Commercial Electricity Supply (UMEME) *(Purpose: Current situation of commercial Electricity Supply)*
D1. Wherethe RGC has commercial electric power supply,
1. How many hours (daily average) is there any electricity supply? (hours/day)
2. How many days (weekly average) is there any electricity supply? (days/week)

WATER

E. Effects of Water Fetching *(Purpose: Gender issue)*
E1. Are there any adverse effects of water fetching on job opportunity of women?
Answer
E2. Are there any adverse effects of water fetching on school attendance of children?
Answer

F. Water Sellers *(Purpose: to know the existence or non-existence of water sellers)*
F1. Are there any Water Sellers in the RGC? 1. Yes 2.No
F1-a (if the answer of the F1 is "Yes",) How many water sellers are there ? persons
F1-b (if the answer of the F1 is "Yes",) From where do they fetch water ? Water source

INCOME AND EXPENDITURE *(Purpose: to know average figure in the RGC, and check & compare with HH survey results)*

G. Income
G1. Sources of Income:

Sources of Income	Villagers Getting the Income			
	Many	Some	A few	None
1. Selling animals (specify:)				
2. Selling agricultural crops (specify:)				
3. Selling labor (specify:)				
4. Forestry (specify:)				
5. Other (specify:)				
6. Other (specify:)				

Circle (〇) against the ones that apply in the above list

G2. Income per household (Average in the RGC)
1. Average monthly income per household Ush
2. Average yearly income per household Ush
3. Are there seasonal changes in income? Answer
4. Number of livestock per household No. of Cattle No. of sheep No. of goats
5. Remittances a. None b. Some c. Others (Specify:)

H. Expenditure

H1. Health and Sanitation Expenditure (Average in the RGC)

1. Payment for water of a jerry can a._____ Ush b. Nothing (Never pay)

2. Water consumption (liters per capita per day) 1. less than 5 2. 6 ~ 10 3. 11 ~ 15 4. 16 ~ 20 5. 21 ~ 30 6. 31 ~ 50 7. more than 50

3. Latrine cost including soap

Payment	Nothing	A little	in between a little and a lot	A lot
% of all the RGC household				

4. Payment for medicine and hospital

Payment	Nothing	A little	in between a little and a lot	A lot
% of all the RGC household				

COOPERATIVE ORGANIZATIONS AND ACTIVITIES

I. Organization and Activities other than Water and Sanitation Committee *(Purpose: to know the experience of collective activities in the RGC)*

I1. Organization and Activities

Organization / Group	Water-Related Activities	Other Activity	Comments (if any)
1. Women's Organization			
2. Youth Organization			
3. Other (Specify _____)			
4. Other (Specify _____)			

I2. Water-Related Collective Activities (if any)

Water-Related Activity	Participants
1	
2	

I3. Other Collective Activities (if any)

Activity	Participants
1	
2	

J Contribution to the construction of a new piped water supply facility and O&M (Purpose: Information for consideration of O&M of a new facility)

J1. What contribution can the RGC do for a new water facility construction?

a. Collecting water fee b. Operating the facility c. Simple repairing of the facility

d. Others (Specify:)

J2-a Do you think villagers are willing to pay money regularly for O&M of the facility? 1. Yes 2. No **3. Don't know**

J2-b Why do you think so? Answer _____

Supplemental Data Collection (3) of Selected 12 RGCs
(Questionnaire to Water and Sanitation Committee (WSC)

Pre-requisite of respondent: Member of the water and sanitation committee

Date: / / 2016
Name of Enumerator

RGC RGC number District County
Sub county Parishs Village(LC1)

Name of Respondent Position Phone Number

WATER SOURCE OF THE WATER AND SANITATION COMMITTEE (WSC)

A. What is the water source

Water Source	1. Borehole	2. Shallow well	3. Dug well	4. Protected spring	5. Others

Circle (○) agains the one that applies in the above list.

ESTABLISHMENT OF THE WSC

B. The WSC was 1. organized in (year) , and is still existing
2. organized in (year) , and lasted for (year). It does not exist now.

C. Specify the number of committee members in the below table.

Role of committee member	Gender		Full term of the Role	Method of the selection of the members
	Male	Female		
a. Chair person				
b. Vice chair person				
c. Accountant/Treasurer				
d. Secretary				
e. Care taker				
f. Mobiliser				
g. Other (Specify:				
h. Other (Specify:				
i. Other (Specify:				

MANAGEMENT OF THE WSC

D. Has the management of the WSC been going well? 1. Yes 2. No

D1. If the answer is "No", what is the problem?
1. No payment of water user fee 2. Insufficient activities of the WSC members
3. Insufficient enlightenment activities for users
4. Others (Specify:)

D1-a. (if the answer of D1 is "2",) What kind of activities of the WSC need for improvement?
Answer:

E. Did the WSC have any meetings in the past? 1. Yes 2. No

E1. (if "Yes",) How many times has the WSC had any meetings in the last year ?. times/year

E2. (if "Yes",) What was the purpose, agenda and frequency of the main meetings? And who could attend the meetings?

	Main Meeting 1	Main Meeting 2	Main Meeting 3	Main Meeting 4
Purpose				
Agenda				
Times/Year				
Participants	1. Committee member only 2. Male Union Members 3. Female Union Members 4. Special members only ( )	1. Committee member only 2. Male Union Members 3. Female Union Members 4. Special members only ( )	1. Committee member only 2. Male Union Members 3. Female Union Members 4. Special members only ( )	1. Committee member only 2. Male Union Members 3. Female Union Members 4. Special members only ( )

Participants: Circle (○) anyone that applies. If it is special members, specify.

E3. When female attendees participated, were there any opinions from them? 1. Yes 2. No

E3-a (if the answer to E3 is "Yes",) What kind of opinions did they have?.
Answer:

E3-b. (if the answer to E3 is"Yes",) Were the opinions of women treated the same way as those of men? 1. Yes 2. No

E4. Were there any motions/questions from the participants except the committee members? 1. Yes 2. No

E4-a (if the answer of E4 is "Yes",) what kind of motions/question came from the participants?
Answer:

E4-b (if the answer of E4 is "Yes",) Were there any improvements/changes of the activities of the WSC after the discussions?
1. Yes 2. No

E4-c (if the answer of E4-b is "Yes",) What kind of improvements/changes happened?
Answer: _____

E5. (if the answer of E is "No",) Why has the WSC not held meetings ?.
Reason: _____

F. Does/Did the WSC have records of incoming anc 1. Yes 2. No

F1 (if "No",) Please specify the reason. Reason: _____

F2 (if "Yes",) Who was in charge of keeping such records?.
Choose from the committee member role, or Specify (_____)

F3 (if "Yes",) Does/Did the WSC have any check system? 1. Yes 2. No

F4 (If the answer of F3 is "Yes",) What kind of check system does/did the WSC have?
Answer _____

G. Did the WSC conduct any other activities in years past? 1. Yes 2. No

G1. (if "Yes",) Select the contents of the activities.
1. Repair of the facility 2. Some request to sub-county/DWO (Specify:)
3. Other (Specify)

G2 Does the WSC have responsibilities to do the activities mentioned above? 1. Yes 2. No

H. How are decisions on important issues of the WSC are made.
1. Hold a meeting attended by all users 2. Hold a meeting attended by committee member and main users
3. The committee has the power to decide.
4. Other (Specify: _____)

I Operation and Maintenance

I1 How much did a household pay as an initial contribution? 1._____Ush 2. None 3. don't know

I2-a How much does/did each household pay regularly for O&M? 1._____Ush/jerry can (20 litters
2._____Ush/month 3. None
4. Other (Specify)

I2-b How often does/did each household pay the above amount? 1. monthly 2. weekly 3. Other (Specify)

I2 -c What other method of payment for O and M has been used if any? _____

I3. (If money is collected regularly) How is it collected?
1. Collection at water source 2. Collection at each household
3. Other (Specify _____)

I4. (If money is collected regularly) Who collects the money for the WSC? Answer _____

I5. (If money is collected regularly) Where is the money kept? 1. Bank 2. Other (Specify)

I6. What kind of repair did the WSC do on the water supply facilities? Answer _____

I7. Does the RGC have by-laws? 1. Yes 2. No

I8. (if the by-laws exist) Are they in operation? 1. Yes 2. No

I9. Does the WSC receive any service of O&M from the Government? 1. Yes 2. No

I9-a (If received) What service does the WSC receive?
Answer 1 (Hardware services): _____
Answer 2 (Softwater services): _____

I10. Do you think villagers will be willing to pay money or in-kind regularly for O&M? 1. Yes 2. No 3. Don't know

I11 Are there any members who do not pay water user fee? 1. Yes 2. No

I1-a (if the answer of I11 is "Yes",) Why they do not pay water user fee?. Reason: _____

I11-b (if the answer of I11 is "Yes",) What kind of efforts does the WSC take to collect the unpaid of water user fee?
1. Press the relevant members who do not pay the water user fee.
2. Do not press the relevant members.
3. Other (Specify: _____)

I11-c (if the answer of the I11-b is "2",) Why doesn't the WSC press the relevant members?
Answer: _____

I11-d Did the WSC explain the reason why the payment of the water user fee is/was necessary to the users? 1. Yes 2. No

I12 If the WSC has not collected water user fee, specify the reason.
Answer: _____

I13. When the water supply facility breaks down and the WSC does not have enough savings, how is the facility repaired?
1. Temporary collection of necessary repair expense from users
2. Request of necessary repair expense from local leaders
3. Make a request for repair to the local government
4. Other (Specify: _____)

INCOME AND EXPENDITURE OF THE WSC

J. Income and expenditure of the WSC (Year: _____)

Income_____ Ush Expenditure _____ Ush

JK.. The breakdown

Income			Expenditure		
Water revenue		Ush	Manpower cost		Ush
		Ush	Fuel cost		Ush
		Ush	Maintenance		Ush
		Ush	Other cost		Ush

If the the WSC has other incomes, please specify in the above table.

Supplemental Data Collection (2) of Selected 12 RGCs

(Questionnaire to Health Center/Health Post/Sub-county)

Pre-requisite of respondent: Representatives of the Health Center/Health Post/Sub-county

Date: / /

Name of Enumerator

RGC RGC number District County

Sub county Parishs Village(LC1)

Part 1: Pre-requisite of respondent: Representatives of the Health Center/Health Post/Sub-county

Name of Respondent Position **Phone Number**

HEALTH

A Health in the RGC

A1 Water-Borne Diseases in RGCs (**Total**)

Disease	Prevalence common 2. Common 3. Rare 4. Very Rare	the Number of patients per year (year _____) Total	Adults	Children	Infants	Notes
a. Malaria/fever						
b. Diarrhea						
c. Skin Disease						
d. Respiratory Disease						
e. Worms						
f. Eye Disease/Infection						
g. Intestinal Infection						
h. Typhoid						
i. Other (Specify:						

A2 Difference of Prevalence between Rainy Season and Dry Season

Disease	the Number of patients of Each Season		the Total number of patients per year
	Rainy Season	Dry Season	
a. Malaria/fever			
b. Diarrhea			
c. Skin Disease			
d. Respiratory Disease			
e. Worms			
f. Eye Disease/Infection			
g. Intestinal Infection			
h. Typhoid			
i. Other (Specify:			

WATER

B. Water consumption

B1 How much water does the Health Centre/Health Post use every day? Number of jerry cans

Litres per capita per day

B2 Is the water supply enough for the Health Centre/Health Post ? 1. Yes 2. No

B3 (if the answer of the B2 is "No", How much water does the Health Center/Post need every day?

Number of jerry can

Litres per capita per day

Part 2: Pre-requisite of respondent: Sub county Chief/Health Assistant/Community Development Assistant

Name of Respondent Position Phone Number

Enlightenment Activities on Water, Sanitation and Hygiene

C. What kind of enlightenment activities you were able to do easily in the target RGC? Circle (○) the one that apply.

1. Promotion of Water, Sanitation and Hygiene development	2. Pre-planning of implementation of a project
3. Mobilization and training of communities	4. Standardization of systems and procedures
5. Effective operation and maintenance	6. Monitoring and adaptation to ensure sustainability
7. Establishment of an institutional framework and capacity building	8 Specify if any,

D. D1. What kind of enlightenment activities you were **not** able to do easily in the target RGC? Circle (○) the one that apply.

1, Promotion of Water, Sanitation and Hygiene development	2. Pre-planning of implementation of a project
3. Mobilization and training of communities	4. Standardization of systems and procedures
5. Effective operation and maintenance	6. Monitoring and adaptation to ensure sustainability
7. Establishment of an institutional framework and capacity building	8 Specify if any,

D2. If there were some difficulties in the activities listed above, what were the reasons?

Answer:

OYO INTERNATIONAL CORPORATION IN ASSOCIATION WITH TEC INTERNATIONAL CO., LTD.

THE SOCIO-ECONOMIC CONDITION SURVEY FOR THE PREPARATORY SURVEY FOR THE PROJECT FOR RURAL WATER SUPPLY PHASE III IN LAKE KYOGA BASIN, EASTERN UGANDA IN THE REPUBLIC OF UGANDA

FINAL REPORT FOR THE SOCIO ECONOMIC SURVEY IN THE 12 SELECTED RGCS

MARCH 2016

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Steven Nkumbi Mukiibi - for the project team.

The Socio-Economic Condition Survey for the Preparatory Survey for the Project for Rural Water Supply Phase III in Lake Kyoga Basin, Eastern Uganda in the Republic of Uganda.

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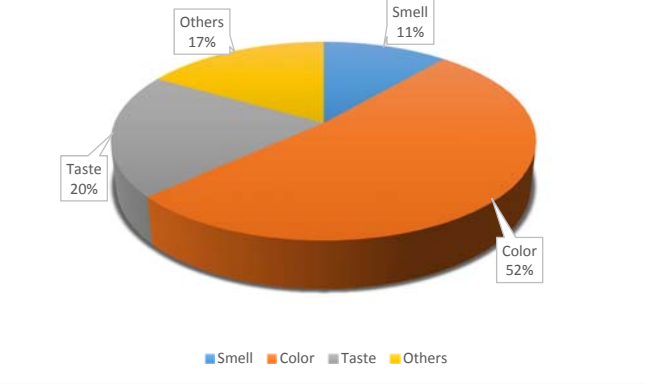


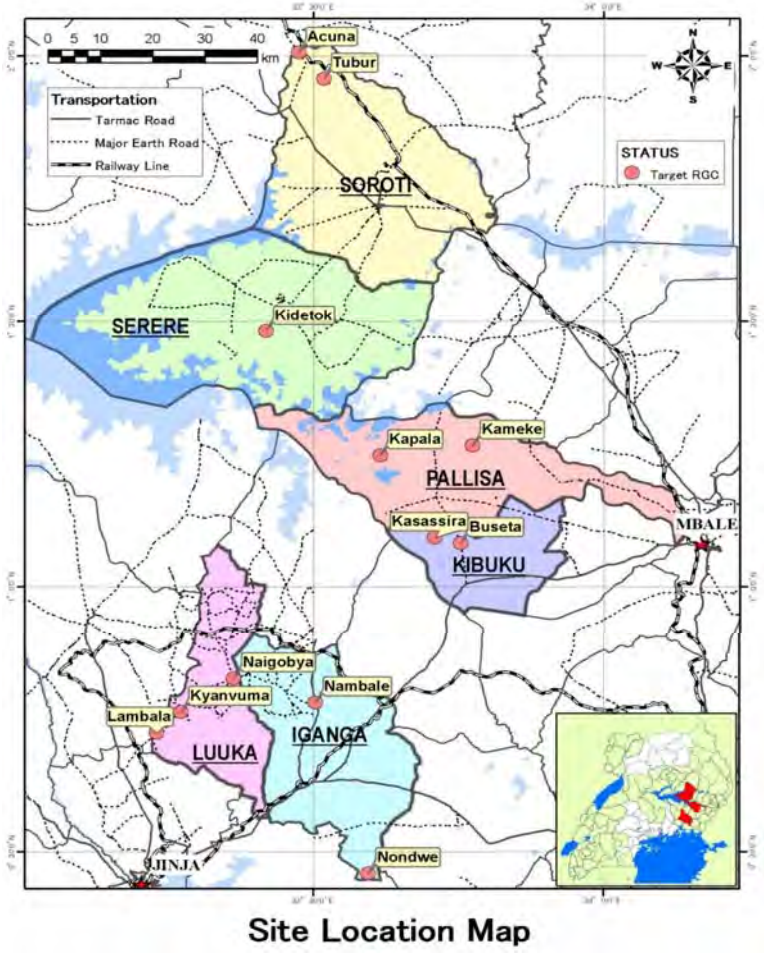
List of Acronyms

BH	Borehole
CDA	Community Development Assistant
CVs	Curriculum Vitae
DWO	District Water Officer
FB	Functioning Borehole
Gov't	Government
HA	Health Assistant
HCs	Health Centres
HH/HHs	Household/Households
HHQ	Household Questionnaire
JICA	Japan International Cooperation Agency
LC1	Local Council One (village council)
MDG	Millennium Development Goals
MoWE/MWE	Ministry Of Water and Environment
NFB	Non-Functioning Borehole
NGOs	Non-Government Organizations
NPHC	National Population and Housing Census
O and M	Operation and Maintenance
PERT DCC	PERT Development Consult ltd
RGC No	Rural Growth Centre Number
RGCs	Rural Growth Centres
SACCOs	Savings and Credit Cooperative Organisations
TOR	Terms of Reference
UBOS	Uganda Bureau of Statistics
UNDP	United Nations Development Programme
UNICEF	United Nations Children Fund
UPE	Universal Primary Education
USD	United States Dollar
WB	World Bank
WHO	World Health Organisation
WSCs	Water and Sanitation Committees

List of attachments

1. Questionnaire - HH survey
2. Questionnaire - Survey of village leaders
3. Questionnaire- Survey of WSC officials
4. Questionnaire – Survey of Health Centres in the RGCs
5. Detailed Field Deployment Plan
6. Directory of Gender Aspects in the Study

Map of the study area.



Site Location Map

NB. RGCs Kadama, Nakalama, Nakabugu, Nakivumbi, Busesa, Namungalwe, Nabitende Banada, and Mugarema were taken out of the scope of survey work.

CHAPTER 1 - BACKGROUND AND PROJECT AREA DESCRIPTION

1.1 Introduction and Background to the Assignment

The Socio-Economic Condition Survey for the Preparatory Survey for the Project for Rural Water Supply Phase III in Lake Kyoga Basin, Eastern Uganda in the Republic of Uganda was commissioned by a consortium consisting of OYO INTERNATIONAL CORPORATION IN ASSOCIATION WITH TEC INTERNATIONAL CO., LTD (OYO-TECI) on behalf of the Japan International Cooperation Agency (JICA). The two companies were appointed by JICA as the consultants to carry out initial studies to guide the preparation and planning of the project.

The study code named **Survey B** is one of the two social studies, namely Survey A and Survey B. It is one of the initial studies to guide the preparation and planning of the project.

The OYO- TECI consortium contracted PERT Development Consult ltd - (PERT DCC), a Ugandan Registered Development Consulting Firm to carry out the "The Socio-Economic Condition Survey for the Preparatory Survey for the Project for Rural Water Supply Phase III in Lake Kyoga Basin, Eastern Uganda in the Republic of Uganda (Survey B)".

Survey B consists of the household survey and the supplementary surveys for the representatives of RGCs including village (LC1) Leaders, WSCs and Health Centers. This report is the final report of Survey B that was carried out between 1st January 2016 and 15th March 2016. In this report, PERT DCC gives the background and objectives of the study, the methodology as well as the strategy and work plan for the execution of the assignment and the results and findings from the study.

1.2 Justification for the study

This study has collected data on a range of variables including household characteristics, water consumption and demand, health knowledge and practices and operation and maintenance culture and practices in the selected RGCs. A clear understanding of these variables is critical for the proper design of the water supply systems so as to ensure that they serve effectively for their design life time. Moreover it is important to understand the O and M behaviours of the recipient communities and the existence of systems and structures for effective operation and maintenance for the installed facilities. Where gaps in structures and systems exist, it is important to understand their nature so as to design intervention measures to eliminate them. To achieve all these aims, it was critical to carry out a socio –economic condition survey in the selected RGCs.

1.3 The Objectives of the Assignment

The objectives of the Socio-economic Condition Survey are:

a. To grasp actual social and economic condition of the selected RGCs, and
b. To obtain the basic data for designing water supply facilities and the formulation of efficient operation and maintenance plan for the Project.

1.4 Description of the Project Area

1.4.1 Location

As of December 2015, the proposed Kyoga Basin project area included the six districts of Iganga, Luuka, Palisa, Kibuku, Soroti and Serere. These district lie on the eastern and southern parts of Lake Kyoga which is found in the centre of the Ugandan Territory. The lake is part of the river Nile which flows from Lake Victoria and on through West Nile to South Sudan and eventually to Egypt. Figure 1.3-1 below shows the location of the region in Uganda (coloured brown) and Figure 1.3-2 the detail of the region with the location of the RGCs that have been covered in the study.

Figure 3.1-1 Location of Kyoga Region.

1.4.2 Relief

Kyoga Basin lies at an altitude between 1,000m to 1800m ASL. The topography is hilly flat with wetlands and forested areas.

Lake Kyoga has undergone some changes in its old pattern. The older Kyoga was a larger lake than the present body of water. It is a shallow depression consisting of a number of arms, many of which are filled with swamp vegetation. The lake has a basin 7,500km2 in area including 6,720 km2 which form the areas occupied by the lake arms and enclosing high land up to an elevation of 1,030 metres. The depth of the lake at its western end is from 3 to 5m. The maximum recorded depth is 7m.

The drainage basin of Lake Kyoga is characterised with a series of low hills and flat valleys with impeded drainage.

1.4.3 Vegetation

The vegetation is typical savannah type mainly characterized by grass cover. Perennial trees normally shed their leaves during the dry season. Much of the natural vegetation has been felled down for economic activities including charcoal burning and farming.

1.4.4 Geology and soils

The soil types vary from place to place but are generally well drained sandy loams and clay. Clay loams occupy areas along the rivers and streams. The soils are fertile, with potential for high productivity and especially suitable for agriculture. In some places the following soil exists: Foresails, Gleysols, Nitrosols, Reyasols and Cilhosols. The soils along major rivers in Kyoga Basin Region constitute mostly of Reyasols and Cilhosols which are poorly developed and prone to water logging.

The soil of a greater part of Kyoga Basin Region consists of ferruginous soil with a high percentage of sandy soils and therefore susceptible to erosion. Due to its sandy nature, the soil has low water retention capacity and high rate of water infiltration. The soils are usually deep with little differentiation into clearly defined zones and possess fine granular structure, others moulded into large, weak coherent clods that are very porous.

1.4.5 Climate

In general, the Kyoga Basin Region gets average rainfall of between 1200 to 1450 mm a year. The monthly average rainfall varies between 14 mm in January and 230 mm in August. Temperature ranges from 15 to 39 degrees Centigrade. The climate is hot throughout the year with two marked rainy seasons from March to June and August to November.

It is hot, dry and windy from December to mid-March. The southern part is part of the lake Vitoria watershed and its climate is moderated by the lake. Both rainy and dry seasons are therefore less marked as there is some rain even in the dry season. The maximum temperature is about 31.8˚C and the annual minimum temperature is about 17.3˚C giving a mean annual temperature of 24.6˚C.

1.4.6 Water Resources

The water resources of the area are heavily influenced by the rainfall pattern, topography and geological formation. The immediate response to rainfall is the runoff which finds its way to the streams and gradually into the groundwater system. The relatively dry and windy conditions mean that most of the rainfall is lost through evaporation.

Surface water is dominated by the marginally perennial rivers which essentially form the boundaries of districts, counties and sub-counties at times. Smaller streams can also be found within the vicinity of some RGCs. None of these streams are gauged and therefore there is no data on stream flows to inform planning.

These surface sources are used by the community for non-culinary purposes. The growing population, coupled with lack of enforcement of environment laws and regulations and a lack of alternative energy sources have had a serious impact on the quality of the water in the streams. The streams are heavily polluted.

Groundwater is the main source of drinking water although the geology of the area does not lend it to high expansive productive aquifers. Groundwater is found in valleys and in isolated pockets of the decomposed Precambrian rocks that form most of the geological stratum.

1.5 General Information and Location of RGCs

The Preparatory Survey for the Project for Rural Water Supply Phase III in Lake Kyoga Basin in Uganda covered the 6 selected districts namely: Soroti, Serere, Pallisa, Kibuku, Iganga and Luuka in Eastern Uganda. Below is a brief about each of the selected districts.

1.5.1 Soroti District

This is found in the Eastern region and it's named after its chief municipal, administrative and commercial headquarters, Soroti, where the district headquarters are located. Soroti District is bordered by Amuria District to the north, Katakwi District to the east, Ngora District to the south east, Serere District to the south, and Kaberemaido District to the west. The Soroti district headquarters is located approximately 116 kilometres (72 mi), by road, northwest of Mbale, the nearest large city.

Population:
According to the 2014 population and housing census, Soroti District has some 297,154 people. The district has one of the highest levels of poverty in the country. In February 2009, it was estimated that 53% of the population in the district (an estimated 124,300 people), live on less than US1.00 per day. The two predominant ethnicities in the district are the Iteso, and the Kumam. The main languages spoken in the district are: (a) Ateso (b) Kumam and Swahili.

Economic activity:
Agriculture is the main economic activity in the district. Crops grown include: Millet, Cassava, Peas, Potatoes, Beans, Onions, Tomatoes, Cabbages, Simsim, Sunflower, Cotton and Sweet Potatoes. The produce is consumed locally and some is sold in the urban areas, particularly in Soroti Town.

1.5.2 Serere District:

Is a district also found in the Kyoga basin in Eastern Uganda It's named after its 'chief town Serere, where the district headquarters are located? Temperature is on average 78°F (26°C), while the Wind is at 1 mph (2 km/h) and 63% humidity. Land coverage is at 1,965.4 km^2 (758.8 sq mi)

Location
Serere District is bordered by Soroti District to the north, Ngora District to the east, Pallisa District, and Kaliro District to the south. Kaberamaido lies to the west of Serere District. The district headquarters at Serere are located approximately 35 kilometers (22 mi), by road, south of Soroti, the largest town in the sub-region and approximately 205 kilometers (127 mi), by road, northeast of Kampala at:01 30N, 33 33E.

Serere District was created by Act of Parliament and became functional effective 1 July 2010. Prior to that, it was part of Soroti District. Serere District is part of the Teso sub-region, home to an estimated 2.5 million people of Iteso and Kumam ethnicities.

Population
According to the 2014 population census, Serere District has a population of 283,630 people, of who 137,657 are male and 145,973 female constituting 49 and 51 percent respectively. Population density is put at 149.6/km^2 (387/sq mi). The 2002 census reported an overwhelmingly rural population (80%), and a very high proportion of children (56%, or 46.5% if you consider only under 5 year-old children). The major ethnicities in the district are: Itesot, Kumam and Bakenye.

1.5.3 Pallisa District:

This is also one of the districts in the Kyoga basin in Eastern Uganda. Like most other Uganda districts, it is named after its chief town, Pallisa, where the district headquarters are located.

Location:
Pallisa District is bordered to the north by (from west to east): Serere District, Ngora District, Kumi District and Bukedea District. Mbale District lies to the east while Budaka District to the southeast, Kibuku to the southwest and Kaliro District to the west. Pallisa the 'chief town' of the district, is located approximately 65 kilometers (40 mi), by road, west of Mbale the largest city in the sub-region.

Population:
In 2014, the population of Pallisa District was estimated at about 386, 074. The District covers an area of 1,487.7 km^2 (574.4 sq mi) of which 1,095.7 km^2 (423.1 sq mi) is land and 392 km^2 (151 sq mi) water with a population density of 330.9/km^2 (857/sq mi).

Economic activities:
Subsistence crop agriculture and animal husbandry are the two major economic activities in the district. To a lesser extent, fishing, fish farming and bee keeping are increasingly practiced in Pallisa District. The major crops include: Cassava, Millet, Sorghum, Maize, Ground nuts, Beans, Peas, Sweet Potatoes, Cotton, Sunflower, Soya beans, Banana, Matooke. Cattle, goats, sheep, Poultry, and pigs are some of the animals raised in the district.

The district is further blessed with nine minor lakes that comprise part of the Lake Kyoga system. The following are the nine lakes: Lake Lemwa, Lake Kawi, Lake Nakwa, Lake Meito, Lake Geme, Lake Omunuo, Lake Nyanzala and Lake Nyaguo. Due to the abundance of suitable conditions, fish farming is one of the

activities that is on the rise. Fish farming offers a big potential to increase the supply of fish for the population and hence improve on the nutrition of the population.

1.5.4 Kibuku District:

Kibuku District was created by Act of the Uganda Parliament, on 1 July 2010. Prior to that the district was part of Pallisa District.

Location
Kibuku District is bordered by Pallisa District to the north, Budaka District to the east, Butaleja District to the south, and Namutumba District to the west. The district headquarters at Kibuku, are located approximately 53 kilometers (33 mi), by road, west of Mbale, the largest city in the sub-region.

Population:
In the most recent census of 2014, the population of Kibuku District was estimated at approximately 202, 630 consisting of 97,008 women and 105,622 men.

Economic activity:
Agriculture (subsistence and commercial), is the mainstay of the district economy. Crop agriculture involves the following crops: Matooke, Sweet bananas, Oranges, Pineapples, Maize, Sweet potatoes, Beans, Groundnuts, Cassava.

1.5.5 Iganga:

Location:
Iganga District is located in central-Eastern Uganda in Uganda's Busoga sub-region. It lies approximately 45 kilometers (28 mi), by road, northeast of the city of Jinja, on the highway between Jinja and Tororo. Iganga town is the main municipal, administrative and commercial center of Iganga District and the district headquarters are located there. The district is named after the town Iganga. The district covers an area of 650.1 km^2 (251.0 sq mi)

Population:
In 2014, the national population census put Iganga's population at 506,388 consisting of 242,023 men and 264,365 women and hence a population density of 496.9/km^2 (1,039/sq mi)

Economic activities
Like its neighbouring districts, the mainstay of Iganga district is agriculture with both food crops such as maize beans cassava and bananas and cash crops like coffee and sugarcane being grown.

Iganga town has several Internet cafes, several guest houses, and a bustling market in the center of town beside the taxi park. Points of interest in the town include the Iganga Hospital, a 120-bed public hospital, administered by the Uganda Ministry of Health.

Iganga is served by a station on the Uganda Railways, the highway from the border with Kenya at Malaba, passes through Tororo and through Iganga, on the way to Jinja and on to Kampala, Uganda's capital and largest city.

1.5.6 Luuka District

Location:
Located at 1,200 m ASL (3,900 ft), Luuka District is bordered by Buyende District in the north, Kaliro District to the northeast, Iganga District to the southeast, Mayuge District to the south, Jinja District to the southwest and Kamuli District to the northwest.

Bulongo, where the district headquarters are located is approximately 33 kilometres (21 mi), by road, northwest of Iganga, the nearest large town. The coordinates of the district are: 00 42N, 33 18E.

Population.
In 1991, the national population census estimated the district population at about 130,400. The national census in 2002 estimated the district population to be approximately 185,500. In 2012, the district population was estimated at about 260,900. The most recent census in 2014 put the population of Luuka at 241,453 with a density of 371.4.

Economic activities
In Kisoga tradition, Luuka is one of the five traditional principalities of the Kingdom of Busoga. According to legend, Luuka was founded around 1737 A.D. and became a part of the British protectorate in Busoga in 1896 A.D. Its traditional ruler is known as the Tabingwa. Luuka district is made up of 7 sub counties the following sub-counties namely: Bukanga, Bukooma, Bulongo, Ikumbya, Irongo, Nawampiti and Waibuga with 33 parishes.

CHAPTER TWO - METHODOLOGY

2.1 The Household Survey

The target respondents for the HH survey were the heads of the households in the selected RGCs. For the purpose of this study a household was defined as “one or more people living in the same dwelling, house or residence who also share at meals and may consist of a single family or some other grouping of people”. A single dwelling was considered to contain multiple households if either meals or living space are not shared. Homesteads and Manyatas were considered as separate household if the different groupings inside do not share meals. The household survey was done using the Household Questionnaire which is attached to this report as **Attachment 1.**

2.1.1 Sampling approach.

Sample size

The survey protocol specified a total number of 400 household surveyed in all the RGCs. This approximates to some 34 households per RGC. However, some RGCs have many more households than others. Therefore, to take the size of the RGC in account the number of households selected from each of the RGCs was based on the total number of households in the RGC. The formula used to arrive at the proportionate sample size in each household was; Number of HH in the RGC divided by the Total Number of HH in all the RGCs and multiplied by the total specified sample of 400 households. The results of the first survey i.e. Survey A indicated a total of 4,938 households in all the 12 RGCs that have been selected

for this survey. Based on this total number of households, a proportionate sample size was calculated for each of the RGCs as indicated in Table 2 below.

TABLE 2.1-1 HOUSEHOLDS AND SAMPLE SIZE FOR EACH RGC

No.	RGC	RGC No.	District	Total No. of HHs Counted	Sample Size
1	NAMBALE	I-3	IGANGA	304	25
2	LAMBALA	I-6	LUUKA	277	22
3	NAIGOBYA	I-7	LUUKA	272	22
4	KYANVUMA	I-9	LUUKA	508	41
5	NONDWE	I-11	IGANGA	859	70
6	KASASSIRA	P-2	KIBUKU	809	66
7	KAMEKE	P-3	PALLISA	197	16
8	KAPALA	P-4	PALLISA	360	29
9	BUSETA	P-5	KIBUKU	292	24
10	KIDETOK	S-1	SERERE	604	49
11	TUBUR	S-2	SOROTI	275	22
12	ACUNA	S-3	SOROTI	181	15
					401

Sample selection

The terms of the study specified that the sampling approach for household respondents should be scientific covering the whole spectrum of social classes so that at the point of analysis, it will be possible to cluster the respondents into three main social classes consisting of about 33% from the high social class, about 33% from the middle social class and about 33% from the low social class in the RGC. The sample of respondents should also meet another criteria namely that about 50% of the respondent should be women.

To achieve the gender criteria, interviewers were instructed to interview the female spouse in every second household selected.

To achieve the social class objective, a random sampling approach was adopted for this survey. In order to adopt random sampling approach with wider social class representation, the actual condition of the social class was confirmed by the LC1 Leader. According to the condition, the field coordinator then allocated the households with wider social class to interviewers.

The field coordinator explained the demarcations of the RGC as stipulated by the project to the village leader so that only the households in the RGC area were included in the sample. Where the RGC has more than one village, respondents were selected from each of the villages in proportion to the size of the village as represented in the RGC area.

Interviewers were then deployed to go to the selected households for interview with specific instructions to interview female or male adults. Female respondents were interviewed by female interviewers and

vise-versa. At the analysis stage, the criteria for each social class for each RGC was set and the different categories identified accordingly.

Interviewers were placed in teams of two people each as they were deployed so that there was mutual support. Interviewers in the same team moved in the same direction and monitored and supported one another.

Besides the HH respondents, other respondents such as Village leaders (LC1) and members of the Water and Sanitation Committees (WSCs) could be included in the relevant samples even if they were resident in areas outside of the demarcated RGC zone as long as their responsibilities as WSC or village leaders or health workers related to the demarcated area of the RGC.

Interview procedure

Once at the selected household, the interviewer was introduced by the village leader or his/he assistant. However in some cases where interviewers moved without the assistant, they introduced themselves. The interviewers then explained the purpose of the visit and the purpose of the survey. The interviewers also requested for the right respondent – female or male. Before beginning the interview, the interviewer assured the respondent of confidentiality and how the data collected is to be used. He/she informed the respondent that answers would be noted down on the questionnaire. The interviewer then proceeded to carry out the interview with the full consent of the respondent.

2.2 The Survey of LC 1 Village Leaders.

The target respondent for this was one member of the village council executive for each village. This person could be any of the nine members of the village council but preferably the Chairperson, the Secretary and Treasurer or the Secretary for Women. The purpose of this survey was to collect views on the availability of water and the factors that affect this availability, operation and maintenance practices as well as sanitation and hygiene in the village. The role of leaders and other village actors in the promotion of sanitation and hygiene was also of interest in this survey. The questionnaire used in the survey of LC1 leader is included in this report as **Attachment 2**. Table 3 below shows the number of villages in each RGC as shown on the survey maps as well as the expected number of respondents planned for and those finally interviewed in each of the RGCs. All LC1 villages in each RGC were covered in the survey.

TABLE 2.2-2 NUMBER OF VILLAGES AND PROJECTED NUMBER OF VILLAGE LEADER RESPONDENTS

No.	District	Sub-county	Code	RGC	Number of Villages	Projected Number of Respondents	Number of respondents actually interviewed
1	Iganga	Nambale	I-3	Nambale	1	1	1
2	Luuka	Irongo	I-6	Lambala	2	2	2
3	Luuka	Bukooma	I-7	Naigobya	3	3	3
4	Luuka	Irongo	I-9	Kyanvuma	2	2	2
5	Iganga	Makuutu	I-11	Nondwe	2	2	2
6	Kibuku	Kasassira	P-2	Kasassira	4	4	6
7	Pallisa	Kameke	P-3	Kameke	2	2	2
8	Pallisa	Gogonyo	P-4	Kapala	3	3	3
9	Kibuku	Buseta	P-5	Buseta	2	2	3
10	Serere	Pingire	S-1	Kidetok	2	2	3
11	Soroti	Tubur	S-2	Tubur	2	2	1
12	Soroti	Tubur	S-3	Acuna	1	1	2
	TOTAL				26	26	30

2.3 The Survey of the Water and Sanitation Committees

The respondents in this survey were members of the water and sanitation committees of the main water sources in the RGC. The questionnaire used in the survey of WSCs is attached to this report as **Attachment 3.**

According to the results of survey A (the simple socio economic condition survey) carried out in May, there is a total of 69 different water sources consisting of 37 functioning boreholes, 13 non-functioning boreholes, 13 shallow wells, and 6 unprotected springs in the selected RGCs. Table 4 below shows the RGCs along with the water sources located in them. The last column on the right shows the actual number of WSCs that were included in this study in each of the RGCs.

TABLE 2.2-3: RGCS AND WATER SOURCES.

No		*RGC*	a. Borehole (functioning)	b. Borehole (non-functioning)	c. Shallow well	d. Protected Springs	e. Unprotected Spring	Total	No of WSCs covered
1	I-3	NAMBALE	2	0	0	0	1	3	3
2	I-6	LAMBALA	2	2	3	0	2	9	2
3	I-7	NAIGOBYA	3	0	2	0	0	5	7
4	I-9	KYANVUMA	3	1	3	0	0	7	4
5	I-11	NONDWE	2	2	1	0	2	7	5
6	P-2	KASASSIRA	4	0	0	0	0	4	6
7	P-3	KAMEKE	4	0	0	0	0	4	3
8	P-4	KAPALA	2	0	2	0	0	4	2
9	P-5	BUSETA	4	1	1	0	0	6	7
10	S-1	KIDETOK	10	5	1	0	0	16	6
11	S-2	TUBUR	0	1	0	0	0	1	2
12	S-3	ACUNA	1	1	0	0	1	3	2
			37	13	13	0	6	69	49

Some of the water sources, especially those that occur naturally as unprotected spring did not have any WSCs. The biggest contrast was at Kidetok where 16 water sources had been documented in survey A but

where only 6 of them were found to have a functioning WSC. In this survey, one member of each of the WSCs with a preference for the Chairperson, the Secretary or the Treasurer was interviewed**.** Where a woman was among these, she was chosen as the views and activities of women are considered important in the operation and maintenance of water sources. Where there was a new water source established since the survey in May 2015, the WSC associated with this water source was also covered in this survey.

2.4 The Survey of health centre 3 and 4 in the RGCs

At each RGC, the respondent in this was one leader or official in the health centre 3. In Uganda, Health Facilities are classified as Health centres 2 up to 4 with Health Centre 2 at Parish Level, Health Centre 3 at Sub-county Level, and Health Centre 4 at County level.

Since most of the RGCS are located near the sub-county headquarters, the most likely facilities to be located there are HC 3. Private/NGO institutions approximating to HC 2 and HC3 were also included in the survey but their characteristics were clearly indicated in the questionnaire responses. The leaders in the RGCs were approached to assist in the identification of the Health Centres where they are not obvious. Where there were no HCs within the RGC, the HC 3 where most residents in the RGC go for treatment (most probably the nearest to the RGC) was located for the interview. Where it happened that this HC3 was in another sub-county, clearance was sought from the client before an interview and data collection is carried out there.

According to the results of survey A carried out in May 2015, Health Centres are to be found in the various RGCs as in table 5 below. Table 2.2-5 shows the HCs that were covered in the survey.

TABLE 2.2-4: NUMBER OF HEALTH CENTRES IN DIFFERENT RGCS.

No.	RGC	RGC No.	District	HC4	HC3	HC2	Total
1	NAMBALE	I-3	IGANGA	0	0	0	0
2	LAMBALA	I-6	LUUKA	0	0	0	0
3	NAIGOBYA	I-7	LUUKA	0	0	1	0
4	KYANVUMA	I-9	LUUKA	0	0	0	0
5	NONDWE	I-11	IGANGA	0	0	2	2
6	KASASSIRA	P-2	KIBUKU	0	1	0	1
7	KAMEKE	P-3	PALLISA	0	1	0	1
8	KAPALA	P-4	PALLISA	0	1	0	1
9	BUSETA	P-5	KIBUKU	0	1	0	1
10	KIDETOK	S-1	SERERE	0	1	0	1
11	TUBUR	S-2	SOROTI	0	1	0	1
12	ACUNA	S-3	SOROTI	0	0	0	0

TABLE 2.2-5: NUMBER OF HEALTH CENTRES COVERED IN THE STUDY.

ID	RGC	HC
I-3	Nambale	1
I-6	Lambala	1
I-7	Naigobya	1
I-9	Kyanvuma	0
I-11	Nondwe	1
P-2	Kasassira	1
P-3	Kameke	1
P-4	Kapala	1
P-5	Buseta	1
S-1	Kidetok	1
S-2	Tubur	1
S-3	Acuna	0
TOTAL		10

The purpose of including the Health Centres was to assess their influence on the promotions of sanitation and hygiene in the RGCs and how they impact and are impacted by the available supply of safe water for household use. The questionnaire used for the HC survey is attached to this report as **Attachment 4.**

2.5 Total Number of Respondents of Each Category in all the RGCs

TABLE 2.2-6: NUMBER OF RESPONDENTS OF EACH CATEGORY IN THE SURVEY.

No.	RGC	RGC No.	District	Respondents HH Survey	Respondents Village leaders	Respondents WSCs	Respondents HCs (including HC3 at sub-county)	Total Projected No of Respondents
1	NAMBALE	I-3	IGANGA	30	1	3	1	35
2	LAMBALA	I-6	LUUKA	22	2	2	1	27
3	NAIGOBYA	I-7	LUUKA	22	3	7	1	33
4	KYANVUMA	I-9	LUUKA	44	2	4	0	50
5	NONDWE	I-11	IGANGA	70	2	5	1	78
6	KASASSIRA	P-2	KIBUKU	66	6	6	1	79
7	KAMEKE	P-3	PALLISA	16	2	3	1	22
8	KAPALA	P-4	PALLISA	29	3	2	1	35
9	BUSETA	P-5	KIBUKU	24	3	7	1	35
10	KIDETOK	S-1	SERERE	49	3	6	1	59
11	TUBUR	S-2	SOROTI	22	1	2	1	26
12	ACUNA	S-3	SOROTI	15	2	2	0	
Total				409	30	49	10	479

Where an RGC did not have a Health Centre, a respondent was selected from the HC3 in the same sub-county where the RGC is located.

2.6 Tasks and outputs of the Survey

From the above, the assignment therefore involved a series of tasks including

a) Recruiting, training and equipping several teams of interviewers to carry out the survey as described above.

b) Developing a deployment plan for the implementation of the field data collection.

c) Making all necessary logistical arrangements for the mobility and maintenance of the interview team.

d) Selecting household respondents in each of the RGCs for interviewing.

e) Identifying the Villages in each of the RGCs and selecting a member from each of the village councils for inclusion in the survey as respondents.

f) Identifying WSCs where they exist in the RGC and selecting an official from each of the WSC for interviewing as part of the survey.

g) Identifying HC3s in the RGC or at the relevant RGC where the HC questionnaire was administered.

h) Carrying out interviews with selected individuals as listed in 3 above.

i) Processing, analysing and interpreting the results of the surveys to prepare a report of the survey.

The main output of this survey is this report with its observations, conclusions and recommendations.

2.7 Method for the execution of the assignment

2.7.1 Selection and Training of teams

The main qualifications for being selected on the team of interviewers were: past experience in similar assignment, integrity and a commendable work ethic and ability to speak one and preferably two of the languages in the region of the survey was another critical attribute. Nine (9) people were selected on the basis of this criteria and they were trained to ensure that they are able to carry out the tasks in the assignment with minimal errors. The team of interviewers was supported by two other people, one for administrative functions and the other for overall direction of the survey. In the final analysis, the team of personnel on this study consisted of 13 people whose brief profiles are also attached to this report as **Attachment 6.**

In terms of the training, the selected interviewers were taken through 2 days of training consisting of:

a) Review of the details of the assignment and technical specifications to have a full understanding of the rationale and the demands of the assignment.

b) A careful study of the questionnaire with role plays and rehearsals to make sure that it is clearly understood.

c) Familiarization and practice with the materials and any equipment.

d) A pre-test in the field to ensure that the interviewers are able to handle circumstances in the field.

2.7.2 Procedure for the collection of data

On arrival at each of the RGCs, the team reported to the leadership of the RGCs namely the sub-county and the LC1s to inform the leaders about the work being carried out. Contact was also made with the village leaders (LC1) who would help in the establishment and selection of household respondents and in guiding on the best walk routes. The survey team embarked on the work as planned for each RGC.

The RGCs were surveyed one by one according to the deployment plan attached to this report as Attachment 5. In each RGC teams were constituted according to the number of villages in the RGC. However in some of the RGCs all the interviewers worked as one team with a team leader allocating households, individuals and institutions for interviews. All the interviewers were trained to be able to carry out interviews with any of the four questionnaires being used in this study however in the final analysis some individuals became better at some of the questionnaires out of experience and these were asked to do those questionnaires again and again in different locations. The emphasis was on quality and tasks were evaluated on RGC to RGC basis and deployment of interviewers was varied from time to time.

2.7.3 Deployment and action plan for the assignment

The 12 RGCs surveyed are presented in the table 2.1-1 above. The detailed deployment for the assignment is outlined in attachment 5 of this report. At the planning stage, the basis of the deployment plan was the estimated time that it would take one interviewer to carry out one interview with the different types of questionnaires. The projected time for one interview originally put at 45 minutes included travel from one respondent to another as well as the time for identifying the respondent. The estimate of the number of days to be spent in each RGC was based on 36hrs of work a day turned in by 7 interviewers working 6 hours a day each. Though interviewers were working 8 hours a day, the rest of the time was reserved for editing and other data cleaning and processing work as quality was considered paramount in this study.

2.8 Personnel

Besides the interviewers, the team of personnel on this study included one data entry clerk, two data analysts and one sanitation specialist. All these came with the requisite competences and their profiles are attached to this report. The team was headed by two people with extensive experience in social research and social investigations.

2.9 Handling of data

The work load of the interviewers was planned to include editing of all questionnaires at the end of the day so as to be able to correct any mistakes while the memory of the interviewers was still fresh. A full time data entry clerk was recruited as part of the team and did the data entry as the questionnaires were delivered. Although it was planned that the data sheets would be submitted to the client RGC by RGC as soon as entry and cleaning was finished, it turned out to be extremely difficult to do this due to both logistical and planning reasons. The challenges associated with this development are outlined in a separate section in this report.

It was also planned that data would be analysed RGC by RGC and submitted as soon as analysis for an RGC is done. Analysis involved the production of frequencies, bivariate and multivariate tables. A full time data analyst was hired for this purpose. It was not possible to meet the planned schedule for the submission of analysis however eventually all analysed sheets were submitted.

2.9.1 Methods, tools and reporting

The following reports and records are to be submitted.

1) Preparation and Planning report
2) Draft Final Report
3) Final Report of the assignment (outline attached as attachment 6)

CHAPTER THREE - FINDINGS

3.1 THE HOUSEHOLD SURVEY

3.1.1 Introduction

A total of 409 HH were surveyed in the HH survey in this study. The purpose of the HH survey was to understand HH knowledge and practices on health, water and sanitation as well as to document other characteristics that have implications for water consumption and operation and maintenance of installed water facilities. The survey therefore investigated among others the sources of water used currently by the HHs, daily water consumption, water borne diseases and their prevalence, other health problems related to water, income and expenditure dynamics of HHs, collective community activities and hygiene and sanitation in homes. The number of respondents from each of the RGC has already been given in the preceding sections.

3.1.1a Characteristics of the respondents

Gender

Of the total number of 409 respondents, 202 constituting 49.4% are male while 207 constituting 50.6% are female. The sample is therefore split almost 50% into male and female. This however is not necessarily representative of the reality in the population from which the sample was selected. It was the intention of this survey to have at least 50% of the respondents as female.

Age

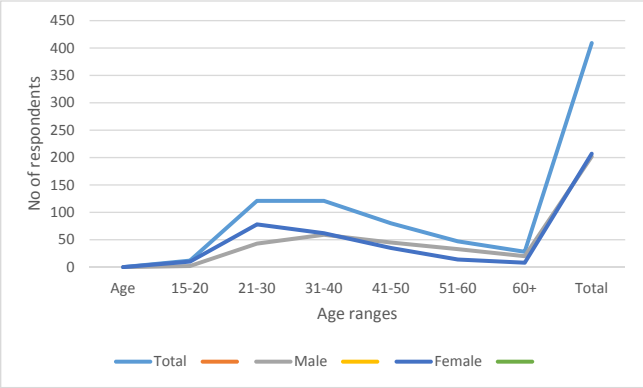
Overall the greatest number of respondents were in the age range 21 to 40 years. This group constituted 59.2% of the total number of respondents. A comparison of the age distribution of the respondents is shown in table 3.1-1.

TABLE 3.1-1. AGE AND SEX CHARACTERISTICS OF RESPONDENTS

	Total		Male		Female	
Age	Number	%	Number	%	Number	%
15-20	12	2.9	2	1.0	10	4.8
21-30	121	29.6	43	21.3	78	37.7
31-40	121	29.6	59	29.2	62	30.0
41-50	80	19.6	45	22.3	35	16.9
51-60	47	11.5	33	16.3	14	6.8
60+	28	6.8	20	9.9	8	3.9
Total	409	100	202	100	207	100

It can be seen that the age distribution of both male and female respondents is similar with slight differences in the age bracket 21-30 where there are more women than men and 51-60 where there are slightly more men than women.

Figure 3.1-2 Age and sex distribution of the respondents



Occupation

Regarding occupation, the data shows that the greatest number of respondents fall into two related categories namely farmer and peasant. Both the farmer and the peasant till the land or raise livestock using various methods and techniques as their primary occupation.

TABLE 3.1-2.OCCUPATION OF RESPONDENTS

	RGC wide					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	115	28.1	66	32.7	49	23.7
Farmers	113	27.6	44	21.8	69	33.3
Trader	67	16.4	32	15.8	35	16.9
Housewife	29	7.1	1	0.5	28	13.5
Teacher	35	8.6	23	11.4	12	5.8
Health worker	19	4.6	9	4.5	10	4.8
Technician	6	1.5	6	3.0	0	0.0
Police Personnel	5	1.2	4	2.0	1	0.5
Student	2	0.5	1	0.5	1	0.5
Religious worker	2	0.5	2	1.0	0	0.0
Driver	3	0.7	3	1.5	0	0.0
Others	13	3.2	11	5.4	2	1.0
Total	**409**	**100**	**202**	**100**	**207**	**100.0**

A farmer was defined as one who produces primarily for sale, while a peasant is one who produces primarily for consumption. Traders also constituted a significant portion of the respondents at 16% while teachers were about half of traders at 8.6% of the respondents. Those whose primary engagement is taking care of home and family- "housewife"– constituted another significant proportion at 7.1%.

RGC wise, the leading categories of occupation remain similar namely Peasant, Farmer, Trader, and Housewife with minor alterations from RGC to RGC. Significant deviations from this pattern occur in Kidetok, Tubur, Kapala, Kameke, Kasasira, Naigobya and Lambala. In these RGCs, while Housewife is one of the major occupational categories, the occupational category Teacher surpasses it. In Buseta Health worker at 12.5% exceeds Trader - 8.3%, Housewife – 8.3% and Teacher – 4.2%! In Kapala, Technician constituting 6.9% of the respondents exceeds housewife at 3.4% while in Tubur Health Worker and Teacher, both at 9.1% exceed Housewife at 4.5%. The tables presenting the occupation profile of the respondents in each of the 12 RGCs are presented below.

Table 3.1-2b. Occupation of respondents in the different RGCs

	Kidetok					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	10	20.4	7	30.4	3	11.5
Farmers	11	22.4	2	8.7	9	34.6
Trader	10	20.4	4	17.4	6	23.1
Housewife	3	6.1	0	0.0	3	11.5
Teacher	8	16.3	4	17.4	4	15.4
Health worker	3	6.1	2	8.7	1	3.8
Technician	1	2.0	1	4.3	0	0.0
Police Personnel	1	2.0	1	4.3	0	0.0
Student	0	0.0	0	0.0	0	0.0
Religious worker	0	0.0	0	0.0	0	0.0
Driver	1	2.0	1	4.3	0	0.0
Others	1	2.0	1	4.3	0	0.0
Total	**49**	**100**	**23**	**100**	**26**	**100**

Table 3.1-2c.

	Acuna					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	7	46.7	5	71.4	2	25.0
Farmers	3	20.0	0	0.0	3	37.5
Trader	4	26.7	2	28.6	2	25.0
Housewife	0	0.0	0	0.0	0	0.0
Teacher	0	0.0	0	0.0	0	0.0
Health worker	1	6.7	0	0.0	1	12.5
Technician	0	0.0	0	0.0	0	0.0
Police Personnel	0	0.0	0	0.0	0	0.0
Student	0	0.0	0	0.0	0	0.0
Religious worker	0	0.0	0	0.0	0	0.0
Driver	0	0.0	0	0.0	0	0.0
Others	0	0.0	0	0.0	0	0.0
Total	**15**	**100**	**7**	**100**	**8**	**100**

Table 3.1-2d.

	Tubur					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	6	27.3	5	45.5	1	9.1
Farmers	4	18.2	2	18.2	2	18.2
Trader	7	31.8	2	18.2	5	45.5
Housewife	1	4.5	0	0.0	1	9.1
Teacher	2	9.1	1	9.1	1	9.1
Health worker	2	9.1	1	9.1	1	9.1
Technician	0	0.0	0	0.0	0	0.0
Police Personnel	0	0.0	0	0.0	0	0.0
Student	0	0.0	0	0.0	0	0.0
Religious worker	0	0.0	0	0.0	0	0.0
Driver	0	0.0	0	0.0	0	0.0
Others	0	0.0	0	0.0	0	0.0
Total	**22**	**100**	**11**	**100**	**11**	**100**

Table 3.1-2e.

	Kapala					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	7	24.1	4	26.7	3	21.4
Farmers	9	31.0	4	26.7	5	35.7
Trader	5	17.2	1	6.7	4	28.6
Housewife	1	3.4	0	0.0	1	7.1
Teacher	3	10.3	2	13.3	1	7.1
Health worker	1	3.4	1	6.7	0	0.0
Technician	2	6.9	2	13.3	0	0.0
Police Personnel	0	0.0	0	0.0	0	0.0
Student	0	0.0	0	0.0	0	0.0
Religious worker	0	0.0	0	0.0	0	0.0
Driver	0	0.0	0	0.0	0	0.0
Others	1	3.4	1	6.7	0	0.0
Total	**29**	**100**	**15**	**100**	**14**	**100**

Table 3.1-2f.

	Kameke					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	5	31.3	4	50.0	1	12.5
Farmers	3	18.8	1	12.5	2	25.0
Trader	3	18.8	1	12.5	2	25.0
Housewife	1	6.3	0	0.0	1	12.5
Teacher	4	25.0	2	25.0	2	25.0
Health worker	0	0.0	0	0.0	0	0.0
Technician	0	0.0	0	0.0	0	0.0
Police Personnel	0	0.0	0	0.0	0	0.0
Student	0	0.0	0	0.0	0	0.0
Religious worker	0	0.0	0	0.0	0	0.0
Driver	0	0.0	0	0.0	0	0.0

Others	0	0.0	0	0.0	0	0.0
Total	**16**	**100**	**8**	**100**	**8**	**100**

Table 3.1-2g.

	Kasasira					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	24	36.4	10	30.3	14	42.4
Farmers	21	31.8	12	36.4	9	27.3
Trader	4	6.1	0	0.0	4	12.1
Housewife	3	4.5	0	0.0	3	9.1
Teacher	4	6.1	3	9.1	1	3.0
Health worker	2	3.0	1	3.0	1	3.0
Technician	1	1.5	1	3.0	0	0.0
Police Personnel	3	4.5	2	6.1	1	3.0
Student	0	0.0	0	0.0	0	0.0
Religious worker	1	1.5	1	3.0	0	0.0
Driver	0	0.0	0	0.0	0	0.0
Others	3	4.5	3	9.1	0	0.0
Total	**66**	**100**	**33**	**100**	**33**	**100**

Table 3.1-2h.

	Buseta					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	5	20.8	3	25.0	2	16.7
Farmers	9	37.5	3	25.0	6	50.0
Trader	2	8.3	2	16.7	0	0.0
Housewife	2	8.3	0	0.0	2	16.7
Teacher	1	4.2	1	8.3	0	0.0
Health worker	3	12.5	1	8.3	2	16.7
Technician	0	0.0	0	0.0	0	0.0
Police Personnel	0	0.0	0	0.0	0	0.0
Student	0	0.0	0	0.0	0	0.0
Religious worker	0	0.0	0	0.0	0	0.0
Driver	0	0.0	0	0.0	0	0.0
Others	2	8.3	2	16.7	0	0.0
Total	**24**	**100**	**12**	**100**	**12**	**100**

Table 3.1-2i.

	Naigobya					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	7	31.8	4	40.0	3	25.0
Farmers	8	36.4	3	30.0	5	41.7
Trader	3	13.6	2	20.0	1	8.3
Housewife	1	4.5	0	0.0	1	8.3
Teacher	2	9.1	1	10.0	1	8.3
Health worker	1	4.5	0	0.0	1	8.3
Technician	0	0.0	0	0.0	0	0.0

Police Personnel	0	0.0	0	0.0	0	0.0
Student	0	0.0	0	0.0	0	0.0
Religious worker	0	0.0	0	0.0	0	0.0
Driver	0	0.0	0	0.0	0	0.0
Others	0	0.0	0	0.0	0	0.0
Total	**22**	**100**	**10**	**100**	**12**	**100**

Table 3.1-2j.

	Kyanvuma					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	6	13.6	4	18.2	2	9.1
Farmers	13	29.5	3	13.6	10	45.5
Trader	7	15.9	4	18.2	3	13.6
Housewife	6	13.6	0	0.0	6	27.3
Teacher	5	11.4	5	22.7	0	0.0
Health worker	1	2.3	1	4.5	0	0.0
Technician	0	0.0	0	0.0	0	0.0
Police Personnel	0	0.0	0	0.0	0	0.0
Student	1	2.3	1	4.5	0	0.0
Religious worker	1	2.3	1	4.5	0	0.0
Driver	1	2.3	1	4.5	0	0.0
Others	3	6.8	2	9.1	1	4.5
Total	**44**	**100**	**22**	**100**	**22**	**100**

Table 3.1-2k.

	Lambala					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	5	22.7	2	18.2	3	27.3
Farmers	6	27.3	2	18.2	4	36.4
Trader	5	22.7	5	45.5	0	0.0
Housewife	2	9.1	0	0.0	2	18.2
Teacher	3	13.6	2	18.2	1	9.1
Health worker	1	4.5	0	0.0	1	9.1
Technician	0	0.0	0	0.0	0	0.0
Police Personnel	0	0.0	0	0.0	0	0.0
Student	0	0.0	0	0.0	0	0.0
Religious worker	0	0.0	0	0.0	0	0.0
Driver	0	0.0	0	0.0	0	0.0
Others	0	0.0	0	0.0	0	0.0
Total	**22**	**100**	11	**100**	**11**	**100**

Table 3.1-2l.

	Nondwe					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	22	31.4	13	37.1	9	25.7
Farmers	21	30.0	8	22.9	13	37.1
Trader	11	15.7	5	14.3	6	17.1

Housewife	5	7.1	1	2.9	4	11.4
Teacher	3	4.3	2	5.7	1	2.9
Health worker	2	2.9	2	5.7	0	0.0
Technician	2	2.9	2	5.7	0	0.0
Police Personnel	1	1.4	1	2.9	0	0.0
Student	1	1.4	0	0.0	1	2.9
Religious worker	0	0.0	0	0.0	0	0.0
Driver	0	0.0	0	0.0	0	0.0
Others	2	2.9	1	2.9	1	2.9
Total	**70**	**100**	**35**	**100**	**35**	**100**

Table 3.1-2m.

	Nambale					
	Total		**Male**		**Female**	
Occupation	Number	%	Number	%	Number	%
Peasant	5	16.7	4	26.7	1	6.7
Farmers	6	20.0	4	26.7	2	13.3
Trader	4	13.3	0	0.0	4	26.7
Housewife	11	36.7	5	33.3	6	40.0
Teacher	2	6.7	0	0.0	2	13.3
Health worker	0	0.0	0	0.0	0	0.0
Technician	0	0.0	0	0.0	0	0.0
Others	1	3.3	1	6.7	0	0.0
Police Personnel	0	0.0	0	0.0	0	0.0
Student	0	0.0	0	0.0	0	0.0
Religious worker	0	0.0	0	0.0	0	0.0
Driver	0	0.0	0	0.0	0	0.0
Tailor	1	3.3	1	6.7	0	0.0
Total	**30**	**100**	**15**	**100**	**15**	**100**

An examination of the gender break down of the different occupations shows that there are more females among the farmers and more male among the peasants. These are self-described titles and it may be that women see themselves more as producing for the market while many men in agriculture see themselves as producing for consumption in the home. As one would expect the occupation category housewife is dominated by women though there are some male home keepers as well. Drivers, Technicians and Religious workers are only male. These are occupations where women still have to make a break through. In the case of religious worker, this may be more difficult as many Holy Books strictly proscribe the role of women as religious leaders.

Figure 3.1-3 Comparison of occupation across gender – RGC wide

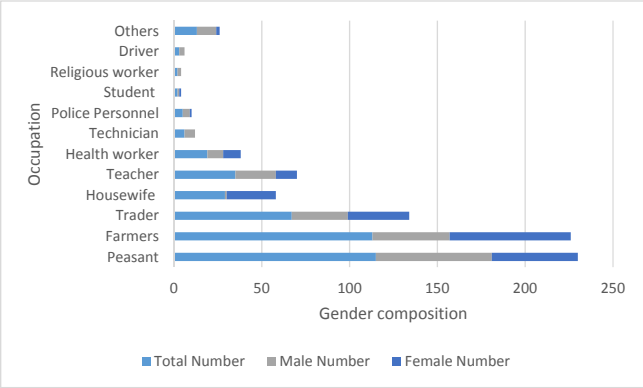


TABLE 3.1-3A CHARACTERISTICS OF RESPONDENTS - AGE

	TOTAL BY GENDER – RGC Wide				TOTAL COMBINED – RGC Wide	
GENDER	MALE		FEMALE			
AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	2	0.99	10	4.83	12	2.9
21-30	43	21.3	78	37.7	121	30
31-40	58	28.7	63	30.4	121	30
41-50	45	22.3	35	16.9	80	20
51-60	33	16.3	14	6.76	47	11
61+	21	10.4	7	3.38	28	6.8
TOTAL	202	100	207	100	409	100

When the respondents are put into age categories as above, the results show that the two age categories of 21-30 and 31-40 dominate the respondents with each of the two constituting 30% of the respondents. Together they add up to 60% of the respondents.

RGC wise, the pattern is similar except in Acuna where 41-50 amounting to 26.7% exceeds the group 21-30 and in Nambale where the group 41-50 at 43.3% is more than the combined categories of 21-30 and 31 to 40. It would appear that the age structure in both these RGCs has more middle aged people indicating that it is an ageing population in comparison to the rest of the RGCs. Aging populations tend to be in locations where birth rates are falling or where young people are emigrating. Emigration may itself be an indicator of hard living conditions including a difficult economic situation. The details of the age of respondents RGC wise are presented in table *3.1-3* b to m below.

Table 3.1-3b **Kidetok**

	TOTAL BY GENDER				TOTAL COMBINED	
GENDER	MALE		FEMALE			
AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	0	0.0	2	7.7	2	4.1
21-30	6	26.1	5	19.2	11	22.4
31-40	6	26.1	11	42.3	17	34.7
41-50	1	4.3	5	19.2	6	12.2
51-60	6	26.1	2	7.7	8	16.3
61+	4	17.4	1	3.8	5	10.2
TOTAL	**23**	**100**	**26**	**100**	**49**	**100**

Table 3.1-3c **Tubur**

	TOTAL BY GENDER				TOTAL COMBINED	
GENDER	MALE		FEMALE			
AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	0	0.0	0	0.0	0	0.0
21-30	4	36.4	4	36.4	8	36.4
31-40	5	45.5	3	27.3	8	36.4
41-50	1	9.1	4	36.4	5	22.7
51-60	0	0.0	0	0.0	0	0.0
61+	1	9.1	0	0.0	1	4.5
TOTAL	**11**	**100**	**11**	**100**	**22**	**100**

Table 3.1-3d **Acuna**

	TOTAL BY GENDER				TOTAL COMBINED	
GENDER	MALE		FEMALE			
AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	0	0.0	0	0.0	0	0.0
21-30	0	0.0	2	25.0	2	13.3
31-40	2	28.6	4	50.0	6	40.0
41-50	2	28.6	2	25.0	4	26.7
51-60	0	0.0	0	0.0	0	0.0
61+	3	42.9	0	0.0	3	20.0
TOTAL	**7**	**100**	**8**	**100**	**15**	**100**

Table 3.1-3e **Kapala**

	TOTAL BY GENDER				TOTAL COMBINED	
GENDER	MALE		FEMALE			
AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	0	0.0	2	14.3	2	6.9
21-30	3	20.0	4	28.6	7	24.1
31-40	3	20.0	6	42.9	9	31.0
41-50	5	33.3	2	14.3	7	24.1
51-60	2	13.3	0	0.0	2	6.9
61+	2	13.3	0	0.0	2	6.9
TOTAL	**15**	**100**	**14**	**100**	**29**	**100**

Table 3.1-3f **Kameke**

	TOTAL BY GENDER				TOTAL COMBINED	
GENDER	MALE		FEMALE			
AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	0	0.0	0	0.0	0	0.0
21-30	3	37.5	5	62.5	8	50.0
31-40	3	37.5	1	12.5	4	25.0
41-50	1	12.5	2	25.0	3	18.8
51-60	1	12.5	0	0.0	1	6.3
61+	0	0.0	0	0.0	0	0.0
TOTAL	**8**	**100**	**8**	**100**	**16**	**100**

Table 3.1-3g **Kasasira**

	TOTAL BY GENDER				TOTAL COMBINED	
GENDER	MALE		FEMALE			
AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	0	0.0	0	0.0	0	0.0
21-30	4	12.1	15	45.5	19	28.8
31-40	10	30.3	12	36.4	22	33.3
41-50	11	33.3	4	12.1	15	22.7
51-60	6	18.2	2	6.1	8	12.1
61+	2	6.1	0	0.0	2	3.0
TOTAL	**33**	**100**	**33**	**100**	**66**	**100**

Table 3.1-3h **Buseta**

	TOTAL BY GENDER				TOTAL COMBINED	
GENDER	MALE		FEMALE			

AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	0	0.0	1	8.3	1	4.2
21-30	2	16.7	5	41.7	7	29.2
31-40	6	50.0	3	25.0	9	37.5
41-50	0	0.0	0	0.0	0	0.0
51-60	4	33.3	2	16.7	6	25.0
61+	0	0.0	1	8.3	1	4.2
TOTAL	**12**	**100**	**12**	**100**	**24**	**100**

Table 3.1-3i **Naigobya**

	TOTAL BY GENDER				TOTAL COMBINED	
GENDER	MALE		FEMALE			
AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	0	0.0	0	0.0	0	0.0
21-30	2	20.0	5	41.7	7	31.8
31-40	3	30.0	3	25.0	6	27.3
41-50	2	20.0	3	25.0	5	22.7
51-60	2	20.0	1	8.3	3	13.6
61+	1	10.0	0	0.0	1	4.5
TOTAL	**10**	**100**	**12**	**100**	**22**	**100**

Table 3.1-3j **Kyanvuma**

	TOTAL BY GENDER				TOTAL COMBINED	
GENDER	MALE		FEMALE			
AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	1	4.5	3	13.6	4	9.1
21-30	6	27.3	9	40.9	15	34.1
31-40	7	31.8	7	31.8	14	31.8
41-50	1	4.5	1	4.5	2	4.5
51-60	1	4.5	2	9.1	3	6.8
61+	6	27.3	0	0.0	6	13.6
TOTAL	**22**	**100**	**22**	**100**	**44**	**100**

Table 3.1-3k **Lambala**

	TOTAL BY GENDER				TOTAL COMBINED	
GENDER	MALE		FEMALE			
AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	0	0.0	0	0.0	0	0.0

21-30	3	27.3	4	36.4	7	31.8
31-40	4	36.4	2	18.2	6	27.3
41-50	2	18.2	4	36.4	6	27.3
51-60	2	18.2	0	0.0	2	9.1
61+	0	0.0	1	9.1	1	4.5
TOTAL	**11**	**100**	**11**	**100**	**22**	**100**

Table 3.1-3l **Nondwe**

	TOTAL BY GENDER				**TOTAL COMBINED**	
GENDER	MALE		FEMALE			
AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	1	2.9	2	5.7	3	4.3
21-30	8	22.9	16	45.7	24	34.3
31-40	5	14.3	9	25.7	14	20.0
41-50	12	34.3	2	5.7	14	20.0
51-60	7	20.0	4	11.4	11	15.7
61+	2	5.7	2	5.7	4	5.7
TOTAL	**35**	**100**	**35**	**100**	**70**	**100**

Table 3.1-3m **Nambale**

	TOTAL BY GENDER				**TOTAL COMBINED**	
GENDER	MALE		FEMALE			
AGE GROUP	COUNT	%	COUNT	%	COUNT	%
15-20	0	0.0	0	0.0	0	0.0
21-30	2	13.3	4	26.7	6	20.0
31-40	4	26.7	2	13.3	6	20.0
41-50	7	46.7	6	40.0	13	43.3
51-60	2	13.3	1	6.7	3	10.0
61+	0	0.0	2	13.3	2	6.7
TOTAL	**15**	**100**	**15**	**100**	**30**	**100**

Religion

Table 3.1-4a below shows the characteristics of the respondents in terms of their religion. Most people in semi urban settings feel a strong link to their religious faiths and many stay close to the dictates of their faiths in terms of behaviour and practices. For instance the Muslim faith recommends regular ablution during the day just before prayers done five times a day. Moslem homes therefore tend to have decent toilets and ablution facilities and many mosques also have boreholes for this purpose. The facilities at mosques tend to be used by all people.

Most of the respondents identified themselves as Christians, consisting of Protestant or Anglican at 33.3%, Catholic at 27.9% and Born Again or Pentecostal at 11%. Of these three, the biggest single category are the Anglicans or Protestants constituting 33.3 % of the total number of respondents. This was followed in size by Catholics at 27.9%. Born again Christians are generally people who became disillusioned with the complacency and permissiveness in the Anglican/protestant church and have increasingly identified themselves as born again indicating and reawakening of vibrancy and fidelity to biblical values and practices. Muslims constitute 25.9% of the respondents and this is not a small figure by any means.

Uganda is in most literature described as being 90% Christian. The 25.9% representing Muslims is therefore a significant finding and shows a growing presence of people of this faith in the sub region. The growth in the proportion of Muslims is most likely the result of natural growth rather than any significant population movements and it indicates a trend that could continue.

Both the Christian and Muslim god faiths have invested in water facilities to enhance their influence in the communities so as to get converts and also to improve the welfare of the communities. However unlike the Christian faith where issues of personal hygiene are generally not strictly prescribed, the Islamic faith prescribes a strict personal hygiene and ritualistic cleansing that makes water and personal hygiene essential to its practice. For that reason a water source is normally part of the infrastructure at a mosque and most of these are open to people of all faiths in the neighbourhood. These facilities are usually well maintained by the mosques providing a constant source of water. However they may not serve an effective demonstration effect for Community Based Operation and Maintenance since the cost of maintenance is usually met by the mosque. Nevertheless, sanitation and hygiene practices recommended by the Islamic faith are likely to keep growing and Operation and Maintenance plans need to take this into account.

TABLE 3.1-4A. RELIGION OF RESPONDENTS – RGC WIDE

	Total		**Male**		**Female**	
Religion	Number	%	Number	%	Number	%
Catholic	114	27.9	53	26.2	61	29.5
Protestant or Anglican	135	33.0	63	31.2	72	34.8
Moslem	106	25.9	54	26.7	52	25.1
Born again or Pentecostal	45	11.0	27	13.4	18	8.7
Others	9	2.2	5	2.5	4	1.9
Total	**409**	**100.0**	**202**	**100**	**207**	**100**

TABLE 3.1-4B SERIES -RELIGION OF RESPONDENTS – RGC WIDE

Table 3.1-4b **Kidetok**

	Total		**Male**		**Female**	
Religion	Number	%	Number	%	Number	%
Catholic	32	65.3	17	73.9	15	57.7
Protestant or Anglican	14	28.6	5	21.7	9	34.6
Moslem	0	0.0	0	0.0	0	0.0
Born again or Pentecostal	3	6.1	1	4.3	2	7.7
Others	0	0.0	0	0.0	0	0.0
Total	**49**	**100.0**	**23**	**100**	**26**	**100**

Table 3.1-4b **Acuna**

	Total		Male		Female	
Religion	Number	%	Number	%	Number	%
Catholic	6	40.0	3	42.9	3	37.5
Protestant or Anglican	4	26.7	0	0.0	4	50.0
Moslem	1	6.7	1	14.3	0	0.0
Born again or Pentecostal	4	26.7	3	42.9	1	12.5
Others	0	0.0	0	0.0	0	0.0
Total	**15**	**100.0**	**7**	**100**	**8**	**100**

Table 3.1-4b **Tubur**

	Total		Male		Female	
Religion	Number	%	Number	%	Number	%
Catholic	8	36.4	2	18.2	6	54.5
Protestant or Anglican	6	27.3	3	27.3	3	27.3
Moslem	0	0.0	0	0.0	0	0.0
Born again or Pentecostal	8	36.4	6	54.5	2	18.2
Others	0	0.0	0	0.0	0	0.0
Total	**22**	**100.0**	**11**	**100**	**11**	**100**

Table 3.1-4b **Kapala**

	Total		Male		Female	
Religion	Number	%	Number	%	Number	%
Catholic	10	34.5	4	26.7	6	42.9
Protestant or Anglican	18	62.1	10	66.7	8	57.1
Moslem	1	3.4	1	6.7	0	0.0
Born again or Pentecostal	0	0.0	0	0.0	0	0.0
Others	0	0.0	0	0.0	0	0.0
Total	**29**	**100.0**	**15**	**100**	**14**	**100**

Table 3.1-4b **Kameke**

	Total		Male		Female	
Religion	Number	%	Number	%	Number	%
Catholic	9	56.3	5	62.5	4	50.0
Protestant or Anglican	2	12.5	0	0.0	2	25.0
Moslem	0	0.0	0	0.0	0	0.0
Born again or Pentecostal	5	31.3	3	37.5	2	25.0
Others	0	0.0	0	0.0	0	0.0
Total	**16**	**100.0**	**8**	**100**	**8**	**100**

Table 3.1-4b **Kasasira**

	Total		Male		Female	
Religion	Number	%	Number	%	Number	%
Catholic	15	22.7	8	24.2	7	21.2
Protestant or Anglican	19	28.8	7	21.2	12	36.4
Moslem	20	30.3	10	30.3	10	30.3
Born again or Pentecostal	11	16.7	7	21.2	4	12.1
Others	1	1.5	1	3.0	0	0.0
Total	**66**	**100.0**	**33**	**100**	**33**	**100**

Table 3.1-4b **Buseta**

	Total		Male		Female	
Religion	Number	%	Number	%	Number	%
Catholic	9	37.5	4	33.3	5	41.7
Protestant or Anglican	4	16.7	2	16.7	2	16.7
Moslem	8	33.3	4	33.3	4	33.3
Born again or Pentecostal	3	12.5	2	16.7	1	8.3
Others	0	0.0	0	0.0	0	0.0
Total	**24**	**100.0**	**12**	**100**	**12**	**100**

Table 3.1-4b **Naigobya**

	Total		Male		Female	
Religion	Number	%	Number	%	Number	%
Catholic	6	27.3	0	0.0	6	50.0
Protestant or Anglican	8	36.4	6	60.0	2	16.7
Moslem	6	27.3	3	30.0	3	25.0
Born again or Pentecostal	1	4.5	0	0.0	1	8.3
Others	1	4.5	1	10.0	0	0.0
Total	**22**	**100.0**	**10**	**100**	**12**	**100**

Table 3.1-4b **Kyanvuma**

	Total		Male		Female	
Religion	Number	%	Number	%	Number	%
Catholic	10	22.7	6	27.3	4	18.2
Protestant or Anglican	14	31.8	10	45.5	4	18.2
Moslem	17	38.6	5	22.7	12	54.5
Born again or Pentecostal	3	6.8	1	4.5	2	9.1
Others	0	0.0	0	0.0	0	0.0
Total	**44**	**100.0**	**22**	**100**	**22**	**100**

Table 3.1-4b **Lambala**

	Total		Male		Female	
Religion	Number	%	Number	%	Number	%
Catholic	1	4.5	1	9.1	0	0.0
Protestant or Anglican	12	54.5	6	54.5	6	54.5
Moslem	5	22.7	2	18.2	3	27.3
Born again or Pentecostal	2	9.1	1	9.1	1	9.1
Others	2	9.1	1	9.1	1	9.1
Total	**22**	**100.0**	**11**	**100**	**11**	**100**

Table 3.1-4b **Nondwe**

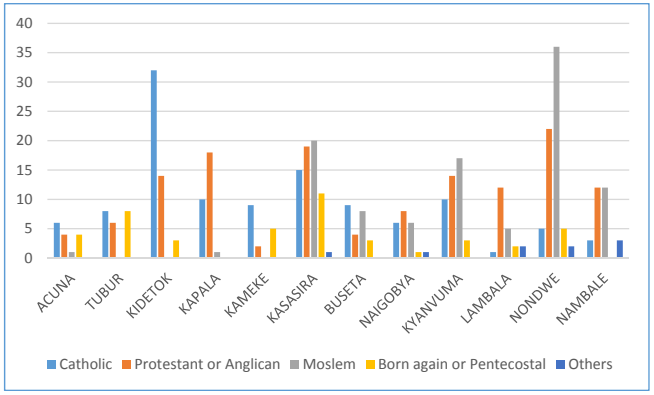
	Total		Male		Female	
Religion	Number	%	Number	%	Number	%
Catholic	5	7.1	3	8.6	2	5.7
Protestant or Anglican	22	31.4	7	20.0	15	42.9
Moslem	36	51.4	21	60.0	15	42.9
Born again or Pentecostal	5	7.1	3	8.6	2	5.7
Others	2	2.9	1	2.9	1	2.9
Total	**70**	**100.0**	**35**	**100**	**35**	**100**

Table 3.1-4b **Nambale**

	Total		Male		Female	
Religion	Number	%	Number	%	Number	%
Catholic	3	10.0	0	0.0	3	20.0
Protestant or Anglican	12	40.0	7	46.7	5	33.3
Moslem	12	40.0	7	46.7	5	33.3
Born again or Pentecostal	0	0.0	0	0.0	0	0.0
Others	3	10.0	1	6.7	2	13.3
Total	**30**	**100.0**	**15**	**100**	**15**	**100**

Analysis of the religious distribution in the individual RGCs shows that people of the Moslem faith predominate in Nondwe, Kyanvuma and Kasasira while Catholics predominate in Kidetok, Tubur, Acuna, Kameke and Buseta. Protestant form the largest single religion in Kapala only.

Figure 3.1-4 Religious profile in the different RGCs



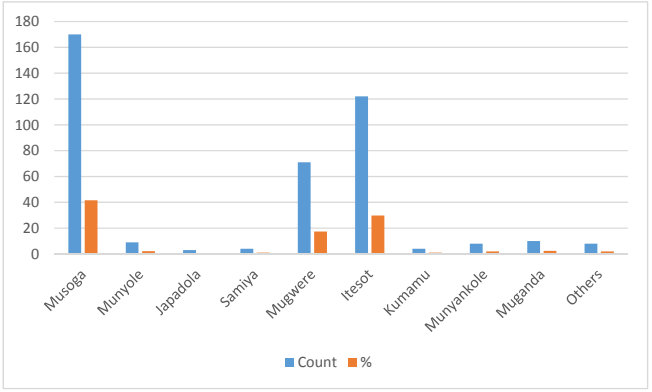
Tribe

Most of the respondents are Basoga (plural for Musoga) - 41.6% followed by Atesot (plural for Itesot) at 29.8%. These are followed by "Mugwere" and "Muganda" at 17.4% and 2.4% respectively. The proportion of Baganda (plural for Muganda) 2.4% though small, is significant due to the fact that this sub region has not traditionally been inhabited by Baganda. While urbanisation and education tend to mellow the influence of tribe in terms of sanitation and hygiene practices, some traditional practices die slowly and the tribal characteristics of the respondents are important for planning relating to the use of the new water facilities. Historically, Busoga and Buganda have not differed much in traditional practices in child rearing and sanitation and hygiene. However lately Busoga has been endemic with infestations such as jiggers that are associated with poor hygiene perhaps indicating a retardation in or a break down in the traditional sanitation and hygiene practices.

TABLE 3.1-5A. TRIBE OF RESPONDENTS – RGC WIDE

Tribe	Count	%
Musoga	170	41.6
Munyole	9	2.2
Japadola	3	0.7
Samiya	4	1.0
Mugwere	71	17.4
Itesot	122	29.8
Kumamu	4	1.0
Munyankole	8	2.0
Muganda	10	2.4
Others	8	2.0
Total	**409**	**100**

Figure 3.1-5. Tribe of respondents



As would be expected, RGC wise, the proportions of the different tribes change according to the location with Atesot dominating in the RGCs in the Teso Region while Basoga dominate in the RGCs located in the Busoga Region. Kapala and Kameke in Palisa are also dominated by Ateso while Buseta and Kasasira in Kubuku are dominated by Bagwere (plural for Mugwere)

TABLE 3.1-5B. TRIBE OF RESPONDENTS – RGC WISE

Tribe	Kidetok		Acuna		Tubur		Kapala		Kameke		Kasasira	
	Count	%	Count	%	Count	%	count	%	count	%	count	%
Musoga	0	0.0	0	0.0	0	0.0	1	3.4	1	6.3	2	3.0
Munyole	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.5
Japadola	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.5
Samiya	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mugwere	0	0.0	0	0.0	0	0.0	1	3.4	1	6.3	52	78.8
Itesot	45	91.8	13	86.7	20	90.9	25	86.2	13	81.3	3	4.5
Kumamu	1	2.0	2	13.3	1	4.5	0	0.0	0	0.0	0	0.0
Munyankole	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	4.5
Muganda	1	2.0	0	0.0	1	4.5	0	0.0	1	6.3	2	3.0

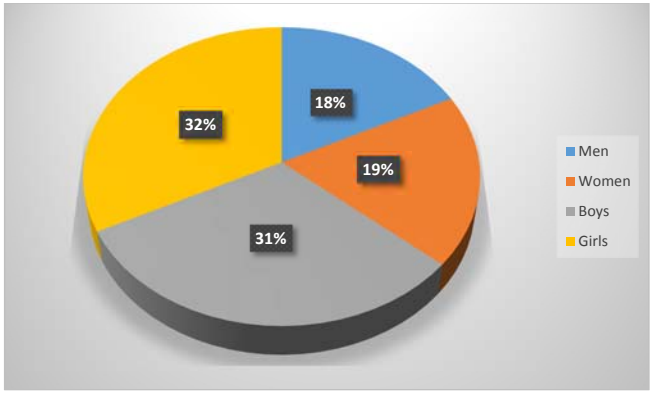
Others	2	4.1	0	0.0	0	0.0	2	6.9	0	0.0	2	3.0
Total	**49**	**100**	**15**	**100**	**22**	**100**	**29**	**100**	**16**	**100**	**66**	**100**

Tribe	Buseta		Naigobya		Kyanvuma		Lambala		Nondwe		Nambale	
	Count	%	Count	%	Count	%	count	%	count	%	count	%
Musoga	0	0.0	21	95.5	40	90.9	20	90.9	58	82.9	27	90.0
Munyole	0	0.0	0	0.0	0	0.0	0	0.0	7	10.0	1	3.3
Japadola	0	0.0	0	0.0	0	0.0	0	0.0	2	2.9	0	0.0
Samiya	1	4.2	0	0.0	0	0.0	0	0.0	2	2.9	1	3.3
Mugwere	16	66.7	0	0.0	0	0.0	0	0.0	1	1.4	0	0.0
Itesot	2	8.3	0	0.0	1	2.3	0	0.0	0	0.0	0	0.0
Kumamu	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Munyankole	3	12.5	0	0.0	0	0.0	1	4.5	0	0.0	1	3.3
Muganda	1	4.2	1	4.5	3	6.8	0	0.0	0	0.0	0	0.0
Others	1	4.2	0	0.0	0	0.0	1	4.5	0	0.0	0	0.0
Total	**24**	**100**	**22**	**100**	**44**	**100**	**22**	**100**	**70**	**100**	**30**	**100**

3.1.1b Household compositions

Figure 3.1-6 below shows the household composition in the survey area in terms of gender as well as age (adult or child). The figure shows that women (19%) are more than men (18%) and girls (32%) are more than boys (31%) in the households. These finding parallel those in the general population where the National Population and Housing Census (NPHC) of 2014 (Uganda Bureau of Statistics 2014) established a sex ratio of 94.5 males per 100 females. Put another way, for every 100 people in Uganda, 52.7 will be women.

Figure 3.1-6 Household composition



The data on HH compositions is presented in tables 3.1-6A and B. In general women exceed men in all the RGCs except Kasasira and Lambala. An examination of the proportion constituted by the combination of women and girls shows that again that combination exceeds that of men and boys in all the RGCs except

Tubur, Kapala, Kasasira, Kyanvuma and Lambala. This implies that in Tubur, Kapala and Kyanvuma, Girls significantly exceed boys. It is normal for women to be more than men in a home due to the fact that polygamy is legal and moderately practiced particularly in the rural and semirural areas. Islam allows each man to marry up to four wives if he has the resources to look after them well. However, the excess of women over men in specific RGCs does **not** appear to be related to the predominant religion. Islam is the predominant religion in Kasasira, Kyanvuma and Nondwe. In Kasasira, men actually exceed women in homes while in Kyanvuma and Nondwe, the proportions by which women exceed men are not that significantly different from the proportions by which women exceed men in the other RGCs where this is the case.

In general in Uganda, the unique situation is where men exceed women in a home. In many communities men are supposed to leave their parents homes and set up their own homes soon as they are adults – from 20 years onwards. On the other hand girls may not leave the home of their parents until they are married as it is traditionally frowned upon for a women to set up home on her own without a husband. For that reason, it is normal for women to exceed men in homes but not the other way round. Not surprisingly there are just two RGCs - Kasasira and Lambala – where men exceed women. The reason for this is not clear yet.

TABLE 3.1-6A.HH COMPOSITION – RGC WISE

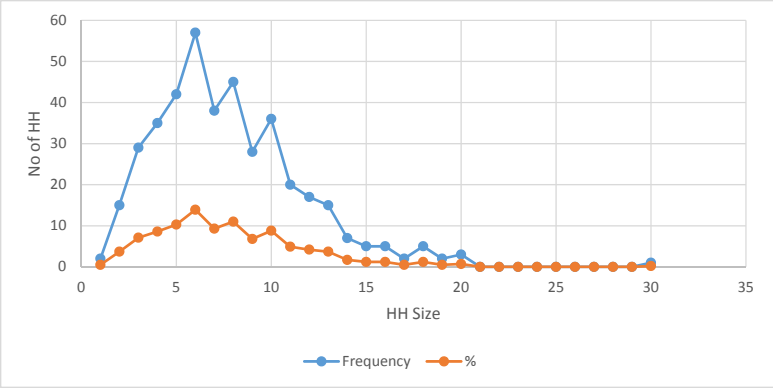
HH Member	Kidetok		Acuna		Tubur		Kapala		Kameke		Kasasira	
	Count	**%**	**Count**	**%**	**Count**	**%**	**count**	**%**	**Count**	**%**	**count**	**%**
Men	33	19.9	23	18.7	83	19.4	48	18.3	18	17.1	103	18.7
Women	35	21.1	23	18.7	85	19.9	51	19.5	18	17.1	90	16.3
Boys	44	26.5	34	27.6	133	31.1	93	35.5	27	25.7	181	32.8
Girls	54	32.5	43	35.0	126	29.5	70	26.7	42	40.0	177	32.1
Total	**166**	**100**	**123**	**100**	**427**	**100**	**262**	**100**	**105**	**100**	**551**	**100**

TABLE 3.1-6B.HH COMPOSITION – RGC WISE

HH Member	Buseta		Naigobya		Kyanvuma		Lambala		Nondwe		Nambale	
	Count	**%**	**Count**	**%**	**Count**	**%**	**count**	**%**	**Count**	**%**	**count**	**%**
Men	36	19.5	23	14.0	48	16.2	30	22.6	80	15.3	34	14.4
Women	40	21.6	33	20.1	54	18.2	27	20.3	86	16.4	47	19.9
Boys	50	27.0	50	30.5	105	35.5	45	33.8	168	32.1	67	28.4
Girls	59	31.9	58	35.4	89	30.1	31	23.3	190	36.3	88	37.3
Total	**185**	**100**	**164**	**100**	**296**	**100**	**133**	**100**	**524**	**100**	**236**	**100**

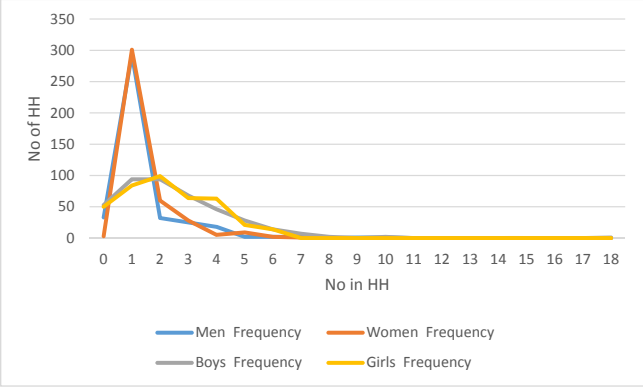
The HH size ranged from a minimum of 1 person to a maximum of 30 people. The average household size was 7.8 people and the most frequent family size was 6 people. Figure 3.1-7 below shows the distribution of the HH size among the HH in the survey. Most of the HH have between 3 and 10 members. There is only one HH which is larger than 21 and it has 30 members. In general, the larger the household, the greater the total amount of water that the HH uses though the increase in the total amount of water used will not be necessarily proportional to the increase in the number of members.

Figure 3.1-7 Household size



The number of men in each HH ranged from 0 for households without a man at all to 10 with the majority -71.6% of HHs having only one man. The average number of men in HH is 1.3 and the mode is 1 as well. On the side of women, the range is 0 to 7 with most HHs - 73.6% having only one woman. The average number of women in a HH is 1.4 and the mode is 1. For boys, the lowest is 0 while the highest is 18. The mean number of boys in a home is 2.4 while the mode is still 1.The lowest number of girls in a home is 0 while the largest is 6. The average is 2.5 and the mode is 2 girls. Figure 3.1-8 below is a graphic comparing the number of men, women, boys and girls in the HH is the survey area.

Figure 3.1-8. Composition of HHs



From the chart it appears that in general the number of men and women at the HH balances with neither of the gender greatly exceeding the other in number. In the same way the number of boys and girls is almost balanced. But most homes have more children and youth than the adults.

3.1.1c Main role of each HH member

Table 3.1-7a below summarises the main role of each HH members in the HH survey. For men the predominant role is "providing basic needs" 68.7% followed by the role of "Providing security for the family". For women it is "cooking" 68% followed by "looking after children or babies" 13.0%. The main role of boys in the HH according to the findings is "fetching water" 36.4% followed by "looking after the livestock of the household" 17.8%. Boys also present significantly at 15.6% in the role of "cleaning home and compound". The main role of girls in a HH according to the data is "fetching water" 34.2% followed by "Preparing of cooking food" 15.9%. All members in the HH have some responsibility for fetching water but the biggest responsibility based on the data falls on the boys followed by the girls then the women and lastly the men. But it is also important to mention that girls and women are charged with most of the domestic chores like washing clothes, cleaning utensils and cooking among others. To effect these roles, girls and women will require significant amounts of water and this turns them into main agents of water and sanitation. It is therefore important that boys and girls get to make an input in the planning for O and M of water facilities. Moreover sensitisation activities and software for O and M of water facilities must ensure the participation of boys and girls. One challenge is that these boys and girls also go to school and this makes it difficult for them to participate in software sensitisation activities that take place in the course of the week.

Owing to the fact that women are expected to be cooking and taking care of children, the expectation of wage employment is limited and even pursuits in that direction may be stifled. Moreover due to this role expectation, the aspirations of girls may be limited which also means that many girls may not even exert themselves to the maximum in school since they know that they are supposed to end up in the kitchen and looking after children. This critical roles in the home do not attract any financial pay and in fact most community members put 0 financial value on them. Women therefore cannot benefit financially from this labour and they are therefore not able to accumulate any financial capital or even to acquire property and other resources from the proceeds of their work. There are increasing calls for women's domestic work to be recognised and financial value attached to it. This goal may be long coming in the semi-rural communities of Uganda but it is important to begin now to create awareness about the value of the work that women do at home in terms of cooking, looking after children and fetching water.

The significant role of boys and girls also amplifies the impact that the quality of water sources will have on school attendance, school performance and in some cases the potential for early pregnancies. Where boys and girls are very busy in school or are few, there are implications for sanitation and hygiene and diseases as well as for the sale of water.

TABLE 3.1-7A MAIN ROLE OF EACH PERSON IN THE HH

	All RGCs			
Roles	**Men %**	**Women %**	**Boys %**	**Girls %**
Cleaning home and compound	0.0	0.0	15.6	0.0
Digging, gardening, cultivation	0.0	0.0	1.2	0.0
Grazing animals	0.0	0.0	0.0	0.0
Home and compound cleaning	0.0	0.0	0.0	8.3
Looking after children or babies	0.0	13.0	0.0	1.7
Looking after the livestock of the household	1.5	0.0	17.8	0.0
Meeting the financial needs of the family	1.7	0.0	0.0	0.0
Physical care of family members and general household	7.8	6.6	0.0	0.0
Preparing food or cooking	0.0	68.0	0.0	15.9
Providing basic needs for the family	68.7	8.8	0.0	0.0

	All RGCs			
Roles	**Men %**	**Women %**	**Boys %**	**Girls %**
Providing leadership in the home	0.2	0.0	0.0	0.0
Providing security for the family	9.0	0.0	0.0	0.0
Collecting firewood	0.0	0.0	0.7	3.7
Fetching water	0.0	1.5	36.4	34.2
Washing clothes	0.0	1.2	0.7	3.2
Washing utensils	0.0	0.0	4.9	15.6
None	7.6	0.7	21.5	16.9
Others	3.4	0.2	1.0	0.5
Total	**100.0**	**100.0**	**100.0**	**100.0**

In line with the specifications of the study, the tables for the role of each HH member for each of the RGCs are also reproduced below. There is no significant difference the roles of the different members of the HH in the individual RGCs.

TABLE 3.1-7B MAIN ROLE OF EACH PERSON IN THE HH - RGC WISE

	Kidetok				Acuna				Tubur			
Roles	**Men %**	**Women %**	**Boys %**	**Girls %**	**Men %**	**Women %**	**Boys %**	**Girls %**	**Men %**	**Women %**	**Boys %**	**Girls %**
Cleaning home and compound	0.0	0.0	14.3	0.0	0.0	0.0	40.0	0.0	0.0	0.0	27.3	0.0
Digging, gardening, cultivation	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0
Grazing animals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Home and compound cleaning	0.0	0.0	0.0	12.2	0.0	0.0	0.0	6.7	0.0	0.0	0.0	13.6
Looking after children or babies	0.0	14.3	0.0	0.0	0.0	20.0	0.0	0.0	0.0	22.7	0.0	0.0
Looking after the livestock of the household	2.0	0.0	26.5	0.0	0.0	0.0	20.0	0.0	0.0	0.0	9.1	0.0
Meeting the financial needs of the family	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Physical care of family members and general household	8.2	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preparing food or cooking	0.0	67.3	0.0	12.2	0.0	60.0	0.0	13.3	0.0	72.7	0.0	9.1
Providing basic needs for the family	69.4	12.2	0.0	0.0	80.0	20.0	0.0	0.0	86.4	4.5	0.0	0.0
Providing leadership in the home	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Providing security for the family	14.3	0.0	0.0	0.0	6.7	0.0	0.0	0.0	13.6	0.0	0.0	0.0
Collecting firewood	0.0	0.0	2.0	2.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	4.5
Fetching water	0.0	0.0	34.7	30.6	0.0	0.0	20.0	40.0	0.0	0.0	31.8	31.8
Washing clothes	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Washing utensils	0.0	0.0	2.0	20.4	0.0	0.0	0.0	33.3	0.0	0.0	4.5	22.7
None	4.1	0.0	20.4	16.3	13.3	0.0	13.3	0.0	0.0	0.0	27.3	18.2
Others	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

TABLE 3.1-7B MAIN ROLE OF EACH PERSON IN THE HH - RGC WISE

	Kapala				Kameke				Kasasira			
Roles	**Men %**	**Women %**	**Boys %**	**Girls %**	**Men %**	**Women %**	**Boys %**	**Girls %**	**Men %**	**Women %**	**Boys %**	**Girls %**
Cleaning home and compound	0.0	0.0	10.3	0.0	0.0	0.0	12.5	0.0	0.0	0.0	10.6	0.0
Digging, gardening, cultivation	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	1.5	0.0
Grazing animals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Home and compound cleaning	0.0	0.0	0.0	3.4	0.0	0.0	0.0	12.5	0.0	0.0	0.0	15.2
Looking after children or babies	0.0	27.6	0.0	0.0	0.0	31.3	0.0	6.3	0.0	9.1	0.0	4.5
Looking after the livestock of the household	3.4	0.0	37.9	0.0	6.3	0.0	6.3	0.0	0.0	0.0	22.7	0.0
Meeting the financial needs of the family	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Physical care of family members and general household	10.3	13.8	0.0	0.0	6.3	12.5	0.0	0.0	12.1	7.6	0.0	0.0
Preparing food or cooking	0.0	55.2	0.0	10.3	0.0	50.0	0.0	18.8	0.0	66.7	0.0	22.7
Providing basic needs for the family	82.8	0.0	0.0	0.0	75.0	6.3	0.0	0.0	68.2	7.6	0.0	0.0
Providing leadership in the home	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0
Providing security for the family	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0
Collecting firewood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5
Fetching water	0.0	0.0	41.4	24.1	0.0	0.0	18.8	50.0	0.0	4.5	34.8	18.2
Washing clothes	0.0	0.0	0.0	13.8	0.0	0.0	6.3	0.0	0.0	4.5	1.5	3.0
Washing utensils	0.0	0.0	0.0	31.0	0.0	0.0	6.3	0.0	0.0	0.0	7.6	15.2
None	0.0	3.4	10.3	17.2	0.0	0.0	37.5	12.5	7.6	0.0	21.2	13.6
Others	0.0	0.0	0.0	0.0	12.5	0.0	6.3	0.0	6.1	0.0	0.0	3.0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

TABLE 3.1-7B MAIN ROLE OF EACH PERSON IN THE HH - RGC WISE

	Buseta				Naigobya				Kyanvuma			
Roles	**Men %**	**Women %**	**Boys %**	**Girls %**	**Men %**	**Women %**	**Boys %**	**Girls %**	**Men %**	**Women %**	**Boys %**	**Girls %**
Cleaning home and compound	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0	15.9	0.0
Digging, gardening, cultivation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grazing animals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Home and compound cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.6	0.0	0.0	0.0	2.3
Looking after children or babies	0.0	16.7	0.0	0.0	0.0	9.1	0.0	0.0	0.0	13.6	0.0	4.5
Looking after the livestock of the household	12.5	0.0	16.7	0.0	0.0	0.0	13.6	0.0	0.0	0.0	18.2	0.0

Meeting the financial needs of the family	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0
Physical care of family members and general household	4.2	20.8	0.0	0.0	4.5	4.5	0.0	0.0	6.8	9.1	0.0	0.0
Preparing food or cooking	0.0	62.5	0.0	20.8	0.0	63.6	0.0	13.6	0.0	65.9	0.0	20.5
Providing basic needs for the family	70.8	0.0	0.0	0.0	63.6	18.2	0.0	0.0	61.4	9.1	0.0	0.0
Providing leadership in the home	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Providing security for the family	0.0	0.0	0.0	0.0	9.1	0.0	0.0	0.0	15.9	0.0	0.0	0.0
Collecting firewood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0
Fetching water	0.0	0.0	33.3	45.8	0.0	4.5	40.9	31.8	0.0	0.0	38.6	34.1
Washing clothes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0
Washing utensils	0.0	0.0	4.2	16.7	0.0	0.0	13.6	13.6	0.0	0.0	6.8	9.1
None	4.2	0.0	41.7	16.7	13.6	0.0	27.3	18.2	6.8	0.0	20.5	29.5
Others	0.0	0.0	4.2	0.0	9.1	0.0	0.0	0.0	6.8	0.0	0.0	0.0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

TABLE 3.1-7B MAIN ROLE OF EACH PERSON IN THE HH - RGC WISE

	Lambala				Nondwe				Nambale			
Roles	**Men %**	**Women %**	**Boys %**	**Girls %**	**Men %**	**Women %**	**Boys %**	**Girls %**	**Men %**	**Women %**	**Boys %**	**Girls %**
Cleaning home and compound	0.0	0.0	13.6	0.0	0.0	0.0	20.0	0.0	0.0	0.0	26.7	0.0
Digging, gardening, cultivation	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	3.3	0.0
Grazing animals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Home and compound cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	13.3
Looking after children or babies	0.0	9.1	0.0	4.5	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0
Looking after the livestock of the household	0.0	0.0	13.6	0.0	0.0	0.0	8.6	0.0	0.0	0.0	0.0	0.0
Meeting the financial needs of the family	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Physical care of family members and general household	18.2	9.1	0.0	0.0	7.1	2.9	0.0	0.0	0.0	0.0	0.0	0.0
Preparing food or cooking	0.0	63.6	0.0	13.6	0.0	80.0	0.0	17.1	0.0	80.0	0.0	6.7
Providing basic needs for the family	50.0	4.5	0.0	0.0	67.1	7.1	0.0	0.0	63.3	20.0	0.0	0.0
Providing leadership in the home	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Providing security for the family	22.7	0.0	0.0	0.0	8.6	0.0	0.0	0.0	6.7	0.0	0.0	0.0
Collecting firewood	0.0	0.0	0.0	9.1	0.0	0.0	1.4	5.7	0.0	0.0	3.3	3.3
Fetching water	0.0	0.0	31.8	27.3	0.0	2.9	41.4	47.1	0.0	0.0	46.7	43.3
Washing clothes	0.0	4.5	0.0	0.0	0.0	0.0	1.4	4.3	0.0	0.0	0.0	3.3
Washing utensils	0.0	0.0	0.0	9.1	0.0	0.0	7.1	10.0	0.0	0.0	0.0	16.7
None	4.5	9.1	36.4	36.4	11.4	0.0	18.6	11.4	20.0	0.0	3.3	13.3
Others	4.5	0.0	4.5	0.0	1.4	0.0	0.0	0.0	3.3	0.0	3.3	0.0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

The study investigated whether female members of the HH also work to get money for the HH. Findings indicate that women in 64.3% of the HH do actually work to get money. Table 3.1-8A below, summarises the main kinds of work they do and the relative proportions of women engaged in those types of work. Because they are engaged in domestic chores as seen in 3.1.1c, there is only a minimum percentage of women (13.7) who work for wages or salaries. The situation is exacerbated by the low literacy levels of women compared to men as seen in 3.1.1d. The other types of work that are less frequently named are summarised in table 3.1-6B below. From this data, most of the female HH members that work do trading – 48.3% with farming a close second at 32.3%.

TABLE 3.1-8 A AND B. KIND OF WORK THEY DO TO GET MONEY. (N=263)

Kind of work they do	**(%)**
Business or trading	37.3
Farming - selling farm produce	44.9
Selling manual labour	2.7
Professional services - teacher etc	12.2
Skilled work - tailor, hair dressing, mechanic etc	3.0
Total	**100**

TABLE 3.1-8 B. FEMALE WORKING TO GET MONEY AND KIND OF WORK THEY DO TO GET MONEY.

		All RGCs (N=409)	**Nambale (N=30)**	**Lambala (N=22)**	**Naigobya (N=22)**	**Kyanvuma (N=44)**	**Nondwe (N=70)**	**Kasassira (N=66)**	**Kameke (N=16)**	**Kapala (N=29)**	**Buseta (N=24)**	**Kidetok (N=49)**	**Tubur (N=22)**	**Acuna (N=15)**
Female working to get money (%)		64.3	70.0	59.1	72.7	59.1	64.3	48.5	68.8	69.0	50.0	77.6	77.3	80.0
Kind of work (%)	Business or trading	37.3	19.0	38.5	50.0	46.2	28.9	46.9	9.1	35.0	66.7	47.4	23.5	25.0
	Farming - selling farm produce	44.9	61.9	38.5	43.8	34.6	48.9	34.4	63.6	55.0	25.0	36.8	41.2	75.0
	Selling manual labour	2.7	0.0	7.7	0.0	7.7	4.4	0.0	9.1	0.0	0.0	0.0	5.9	0.0
	Professional services - teacher etc	12.2	14.3	15.4	6.3	7.7	13.3	12.5	18.2	10.0	8.3	15.8	17.6	0.0
	Skilled work - tailor, hair dressing, mechanic etc	3.0	4.8	0.0	0.0	3.8	4.4	6.3	0.0	0.0	0.0	0.0	11.8	0.0

3.1.1d Literacy of HH members

Table 3.1-9a below summarises the literacy of HH members. It shows that in vernacular, 45.2% of males are literate compared to 37.4% for women. The difference is significant and may be an indication of the fact that boys have better opportunities for school attendance compared to the girls. In English, the men still fare better with 45.8% of men literate in English compared to 38.6% of women. In general, both men and women are more literate in English than in vernacular. Perhaps this is due to the fact that written material in vernacular is less common compared to English. Many newspapers are now in English and so are information posters and information leaflets. In general, in Uganda, when budgets are limited, English

precedes in the production of brochures and leaflets. Most instructions on products such as soap and sanitary materials are also in English.

While the differences are still significant, there has been an improving trend with nationwide literacy rates for male and female 15 to 24 years rising from 80.3 and 69.4 respectively in 1997[1] to 89.6 and 85.5 respectively in 2015[2] according to the Uganda Bureau of Statistics. Literacy is key in employability as well as in providing opportunities for all types of income generating activities and being less literate limits the chances of women. Exposure through reading various types of materials enables the absorption and adoption of new practices in health, sanitation and hygiene and the fact that women are slightly less literate may undermine the welfare of households in that respect as women have a great impact on hygiene and sanitation practices in the HH. It also constrains their employment potential and relegates them to domestic chores. It's even worse for the girl child, as many of them end up being married off at an early age.

The literacy advantage that men have over women gives them an edge in employment and income generation. The literacy gap of the future can be closed with programmes which encourage parents to keep girls in school. But the literacy gap of today may be closed with programmes that target adults in adult literacy programmes. Either approach requires some amount of sensitisation to the communities concerned targeting particularly the men who need to let their wives and daughters to get into the literacy programmes.

TABLE 3.1-9A LITERACY OF HH MEMBERS

	All RGCs			
	Vernacular	%	English	%
Male	703	45.2	713	45.8
Female	604	37.4	627	38.76
Total	**1307**	41.2	**1337**	**42.2**

Tables 3.1-9b and c give details on literacy rates in each HH in vernacular - 13a) and English - 13b).

TABLE 3.1-9B AND C. LITERACY OF HH MEMBERS

b) Literacy of HH members in vernacular

Literacy Rate in each HH (Vernacular) (%)	Total	Male		Female	
		Count	**%**	**Count**	**%**
Less than 10	15.2	13	1.8	3	0.5
Between 11 to 20	11.2	40	5.7	17	2.8
Between 21 to 30	13.2	56	8.0	55	9.1
Between 31 to 40	16.9	102	14.5	93	15.4
Between 41 to 50	12.2	90	12.8	86	14.2
Between 51 to 60	7.6	84	11.9	85	14.0
Between 61 to 70	9.0	115	16.3	82	13.6
Between 71 to 80	5.9	73	10.4	60	9.9
Between 81 to 90	3.2	45	6.4	50	8.3
Between 91 to 100	5.6	86	12.2	70	11.6
Total	100	704	100	605	100

[1] Uganda national HH Survey 1997.
[2] Population census 2014

Data in *3.1-9a* shows that in most households, between 21% and 50% of the members are literate in vernacular. The single category with the highest percentage of vernacular literate people is 31-40%. This pattern is equally representative of the situation of men and women in the HHs. In the same way, data in 3.1-7b shows that in most households, the highest proportion of members literate in English is between 11% and 50% with a low at 21 to 30%. The single category with the highest percentage of English literate people is 41% to 50%.

TABLE 3.1-9C LITERACY OF HH MEMBERS IN ENGLISH

Literacy Rate in each HH (English) (%)	Total	Male		Female	
		Count	**%**	**Count**	**%**
Less than 10	14.4	7	1.0	1	0.2
Between 11 to 20	15.2	50	7.0	29	4.6
Between 21 to 30	9.5	43	6.0	39	6.2
Between 31 to 40	15.2	99	13.9	83	13.2
Between 41 to 50	15.6	113	15.8	120	19.1
Between 51 to 60	6.4	66	9.3	70	11.2
Between 61 to 70	8.3	96	13.5	70	11.2
Between 71 to 80	5.1	76	10.7	70	11.2
Between 81 to 90	4.9	80	11.2	78	12.4
Between 91 to 100	5.4	83	11.6	67	10.7
Total	100	713	100	627	100

To compare the literacy rates in the different RGCs we worked out the average number of literate people per household by taking the total number of literate people in the RGC and dividing by the number of HHs in the RGC. The outcome is presented in 3.1-10a and b below. From the table, it is evident that when literacy in English is considered, Kidetok has the best average rate per HH followed by Kapala. The RGC that seems to be in the worst situation is Nondwe where the average English literacy per HH stands at 2.5 persons. In all but three RGCs the number of literate men in English exceeds that of women. The three RGCs that are the exception are Kapala, Buseta and Naigobya. In these three, the number or women who are literate in English exceeds that of men. The double comparison is further illustrated in the two subsequent charts.

TABLE 3.1-10A. A COMPARISON OF THE LITERACY (IN ENGLISH) OF MEN AND WOMEN IN THE DIFFERENT RGCS

RGC	ACUNA	TUBUR	KIDETOK	KAPALA	KAMEKE	KASASIRA	BUSETA	NAIGOBYA	KYANVUMA	LAMBALA	NONDWE	NAMBALE	TOTAL
MALE	29	46	137	68	27	108	32	27	63	38	94	44	713
FEMALE	15	39	123	69	25	79	44	30	54	23	80	43	624
TOTAL	44	85	260	137	52	187	76	57	117	61	174	87	1,337
NO OF HH	15	22	49	29	16	66	24	22	44	22	70	30	409
AVERAGE RATE PER HH	2.9	3.9	5.3	4.7	3.3	2.8	3.2	2.6	2.7	2.8	2.5	2.9	

Figure 3.1-9a Literacy in English across the RGCs

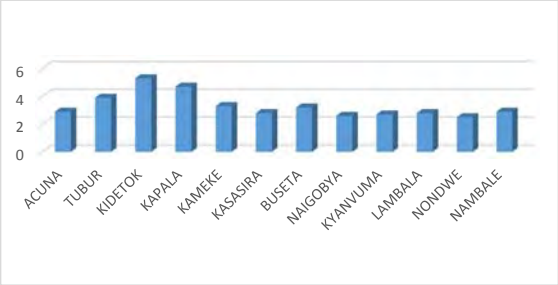
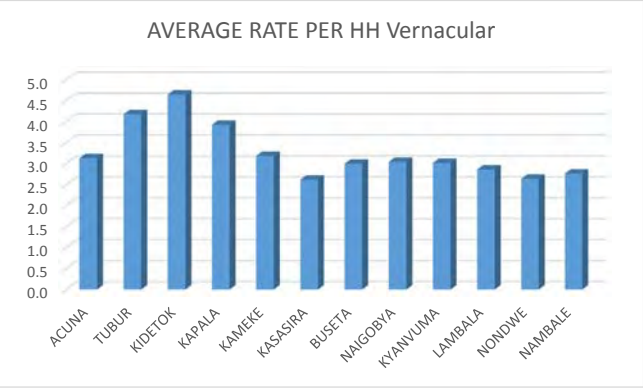


TABLE 3.1-10B. A COMPARISON OF THE LITERACY (IN VERNACULAR) OF MEN AND WOMEN IN THE DIFFERENT RGCS

RGC	ACUNA	TUBUR	KIDETOK	KAPALA	KAMEKE	KASASIRA	BUSETA	NAIGOBYA	KYANVUMA	LAMBALA	NONDWE	NAMBALE
MALE	27	48	121	63	28	98	30	34	71	37	105	42
FEMALE	20	44	107	51	23	75	42	33	62	26	80	41
TOTAL	47	92	228	114	51	173	72	67	133	63	185	83
NO OF HH	15	22	49	29	16	66	24	22	44	22	70	30
AVERAGE	3.1	4.2	4.7	3.9	3.2	2.6	3.0	3.0	3.0	2.9	2.6	2.8

Figure 3.1-9b Literacy in vernacular across all the RGCs

Data shows that when it comes to vernacular, literacy is highest in Kidetok, followed by Nondwe. Thus



Kidetok tops the literacy rates in both English and vernacular. However, while Nondwe as at the bottom when it comes to literacy in English, it is next to the best when it comes to vernacular. This strange turn of events for Nondwe is difficult to explain but could be the result of a high dropout rate at early primary since early primary has traditionally been taught in the local language and English is taken up from primary 2 onwards.

3.1.2 Water and Health

3.1.2 Current Condition of Water Sources

3.1.2a Water sources in dry season

Table *3.1-11a* below summarises the main sources of water in the dry season and indicates that 92.9% or respondents indicated that their main source is borehole. This is followed by unprotected spring 13.4% and the shallow or dug well 11.0% and protected spring 10.8%. The sources least used are rain harvest and the dam and valley tank. As the rain water tanks and some of the shallow wells dry up in the dry season, the choice of water sources reduces leading people to resort to less safe sources such as unprotected spring and dug well. A lot of pressure will be exerted on these stable sources with the result that in the case of boreholes, chances of a break down are higher during this season.

TABLE 3.1-11A MAIN SOURCES OF WATER IN THE DRY SEASON - RGC WIDE

Yes	**BH**			**Shallow well/Dug well**			**Protected Spring**			**Unprotected Spring**		
%	92.91			11.00			11.00			13.45		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	24	4.78	1	18	5.16	1	15	3.76	1	12	3.73
Distance for round trip(m)	5	3,000	282.51	0	1,200	286.78	60	3,000	720.44	20	1,500	503.45
Time for round trip(min)	3	480	112.70	1	240	41.07	2	240	72.93	10	420	76.18

Yes %	Rain harvest			Dam/Valley tank			River/Stream		
	0.2			0.2			1.5		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	1	1	1.00	1	20	7
Distance for round trip(m)	0	0	0	200	200	200	50	2,000	892
Time for round trip(min)	0	0	0	5	5	5.00	20	240	123

The tables for "Main source of water in the dry season" for each of the RGCs are also presented below. The pattern that emerges does not differ much from the RGC wide table above. The main source of water for all RGCs in the dry season is still the borehole though sources like protected spring have varying prominence in different RGCs in the dry season.

TABLE 3.1-11B MAIN SOURCES OF WATER IN THE DRY SEASON - RGC WISE

Acuna

Yes	BH			Shallow well/Dug well			Protected Spring			Unprotected Spring		
%	100.00			0.00			0.00			13.33		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	2	12	5.60	0	0	0	0	0	0	2	2	2.00
Distance for round trip(m)	60	400	179.33	0	0	0	0	0	0	300	1,000	650.00
Time for round trip(min)	10	130	78.00	0	0	0	0	0	0	30	120	75.00

Yes %	Rain harvest			Dam/Valley tank			River/Stream		
	0.00			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	0	0	0	0	0	0
Distance for round trip(m)	0	0	0	0	0	0	0	0	0
Time for round trip(min)	0	0	0	0	0	0	0	0	0

Tubur

Yes	BH			Shallow well/Dug well			Protected Spring			Unprotected Spring		
%	100.00			0.00			0.00			4.55		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	10	4.77	0	0	0	0	0	0	3	3	3.00
Distance for round trip(m)	50	500	270.45	0	0	0	0	0	0	1,000	1,000	1000.00
Time for round trip(min)	30	300	110.45	0	0	0	0	0	0	180	180	180.00

Yes %	Rain harvest			Dam/Valley tank			River/Stream		
	0.00			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	0	0	0	0	0	0
Distance for round trip(m)	0	0	0	0	0	0	0	0	0

Time for round trip(min)	0	0	0	0	0	0	0	0	0

Kidetok

Yes	BH			Shallow well/Dug well			Protected Spring			Unprotected Spring		
%	93.88			4.08			18.37			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	20	5.41	10	18	14.00	1	15	5.33	0	0	0
Distance for round trip(m)	50	1,000	264.13	100	100	100.00	400	3,000	1344.44	0	0	0
Time for round trip(min)	10	240	76.52	30	120	75.00	20	120	70.56	0	0	0

Yes %	Rain harvest			Dam/Valley tank			River/Stream		
	0.00			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	0	0	0	0	0	0
Distance for round trip(m)	0	0	0	0	0	0	0	0	0
Time for round trip(min)	0	0	0	0	0	0	0	0	0

Kapala

Yes	BH			Shallow well/Dug well			Protected Spring			Unprotected Spring		
%	96.55			34.48			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	16	5.61	2	8	5.00	0	0	0	0	0	0
Distance for round trip(m)	20	500	292.50	5	700	149.50	0	0	0	0	0	0
Time for round trip(min)	15	300	120.89	2	60	28.70	0	0	0	0	0	0

Yes %	Rain harvest			Dam/Valley tank			River/Stream		
	0.00			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	0	0	0	0	0	0
Distance for round trip(m)	0	0	0	0	0	0	0	0	0
Time for round trip(min)	0	0	0	0	0	0	0	0	0

Kameke

Yes	BH			Shallow well/Dug well			Protected Spring			Unprotected Spring		
%	100.00			0.00			6.25			6.25		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	12	4.25	0	0	0	8	8	8.00	1	1	1.00
Distance for round trip(m)	100	3,000	420.63	0	0	0	500	500	500.00	500	500	500.00

Time for round trip(min)	30	300	159.38	0	0	0	30	30	30.00	60	60	60.00

Yes	**Rain harvest**			**Dam/Valley tank**			**River/Stream**		
%	0.00			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	0	0	0	0	0	0
Distance for round trip(m)	0	0	0	0	0	0	0	0	0
Time for round trip(min)	0	0	0	0	0	0	0	0	0

Kasasira

Yes	**BH**			**Shallow well/Dug well**			**Protected Spring**			**Unprotected Spring**		
%	100.00			12.12			0.00			22.73		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	12	4.44	2	6	4.00	0	0	0	1	6	3.20
Distance for round trip(m)	50	900	224.39	300	1,000	442.50	0	0	0	20	1,500	768.00
Time for round trip(min)	3	360	142.70	30	240	69.38	0	0	0	30	420	116.00

Yes	**Rain harvest**			**Dam/Valley tank**			**River/Stream**		
%	0.00			0.00			6.06		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	0	0	0	1	20	9
Distance for round trip(m)	0	0	0	0	0	0	800	2,000	1,200
Time for round trip(min)	0	0	0	0	0	0	120	240	175

Buseta

Yes	**BH**			**Shallow well/Dug well**			**Protected Spring**			**Unprotected Spring**		
%	100.00			0.00			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	12	5.38	0	0	0	0	0	0	0	0	0
Distance for round trip(m)	50	600	204.17	0	0	0	0	0	0	0	0	0
Time for round trip(min)	5	360	86.46	0	0	0	0	0	0	0	0	0

Yes	**Rain harvest**			**Dam/Valley tank**			**River/Stream**		
%	0.00			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	0	0	0	0	0	0
Distance for round trip(m)	0	0	0	0	0	0	0	0	0
Time for round trip(min)	0	0	0	0	0	0	0	0	0

Naigobya

Yes	**BH**			**Shallow well/Dug well**			**Protected Spring**			**Unprotected Spring**		
%	100.00			0.00			0.00			22.73		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	15	4.68	0	0	0	0	0	0	1	9	4.00
Distance for round trip(m)	5	700	321.14	0	0	0	0	0	0	100	800	400.00
Time for round trip(min)	30	300	101.59	0	0	0	0	0	0	15	120	49.00

Yes	**Rain harvest**			**Dam/Valley tank**			**River/Stream**		
%	0.00			0.00			4.55		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	0	0	0	3	3	3
Distance for round trip(m)	0	0	0	0	0	0	500	500	500
Time for round trip(min)	0	0	0	0	0	0	20	20	20

Kyanvuma

Yes	**BH**			**Shallow well/Dug well**			**Protected Spring**			**Unprotected Spring**		
%	95.45			6.82			20.45			2.27		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	24	4.50	4	10	6.33	1	7	3.89	1	1	1.00
Distance for round trip(m)	10	800	174.05	100	500	266.67	200	1000	866.67	600	600	600.00
Time for round trip(min)	30	480	117.38	20	80	43.33	30	240	93.33	180	180	180.00

Yes	**Rain harvest**			**Dam/Valley tank**			**River/Stream**		
%	0.00			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	0	0	0	0	0	0
Distance for round trip(m)	0	0	0	0	0	0	0	0	0
Time for round trip(min)	0	0	0	0	0	0	0	0	0

Lambala

Yes	**BH**			**Shallow well/Dug well**			**Protected Spring**			**Unprotected Spring**		
%	68.18			31.82			0.00			22.73		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	8	3.20	1	12	3.86	0	0	0	3	8	4.40
Distance for round trip(m)	100	3000	660.67	0	200	67.14	0	0	0	80	400	154.00
Time for round trip(min)	20	180	74.67	1	60	25.00	0	0	0	10	60	38.00

Yes %	Rain harvest			Dam/Valley tank			River/Stream		
	0.00			4.55			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	1	1	1.00	0	0	0
Distance for round trip(m)	0	0	0	200	200	200.00	0	0	0
Time for round trip(min)	0	0	0	5	5	5.00	0	0	0

Nondwe

Yes	BH			Shallow well/Dug well			Protected Spring			Unprotected Spring		
%	80.00			21.43			17.14			34.29		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	15	3.54	2	10	5.07	1	8	3.25	1	12	4.25
Distance for round trip(m)	5	1500	358.70	100	1200	426.67	200	1000	508.33	100	1000	395.83
Time for round trip(min)	15	360	126.70	6	120	36.73	30	180	100.00	10	180	58.96

Yes %	Rain harvest			Dam/Valley tank			River/Stream		
	0.00			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	0	0	0	0	0	0
Distance for round trip(m)	0	0	0	0	0	0	0	0	0
Time for round trip(min)	0	0	0	0	0	0	0	0	0

Nambale

Yes	BH			Shallow well/Dug well			Protected Spring			Unprotected Spring		
%	93.33			0			46.67			3.33		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	18	6.86	0	0	0	1	6	2.79	4	4	4
Distance for round trip(m)	10	1500	270.00	0	0	0	60	1000	422.86	500	500	500
Time for round trip(min)	3	240	103.54	0	0	0	2	120	41.21	30	30	30

Yes %	Rain harvest			Dam/Valley tank			River/Stream		
	0.00			0.00			3.333		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	0	0	0	0	0	0	2	2	2
Distance for round trip(m)	0	0	0	0	0	0	50	50	50
Time for round trip(min)	0	0	0	0	0	0	20	20	20

3.1.2b Number of trips a day – dry season

Round trips refer to a journey from home to water source and then back home. Table 3.1-12 below compares the roundtrips to the different water sources.

TABLE 3.1-12 COMPARISON OF NUMBER OF ROUND TRIPS FOR DIFFERENT SOURCES

	Min	Max	Average
Borehole	1	24	4.77
Shallow/dug well	2	18	5.18
Protected spring	1	15	3.82
Unprotected spring	1	12	3.73
Rain water harvest	0	0	0
Dam/valley tank	1	1	1
River/Stream	1	20	7

It is clear from the table that the source where the highest number of round trips was reported is the borehole. This is also the source which is used by the highest number of people 92.9%. Both the distance to and the number of round trips to borehole are therefore quite important in water access in any location in the region.

3.1.2c Distance to source – dry season

The most important determinants of the round trips are the water demand in the household and the distance to the source. When average distance for a round trip is compared across the different water sources, it is clear that the longest average distance is with the river/stream which stands at 892 metres or nearly a km. Next is 720 to protected spring, then 503 to unprotected spring and then 282 for borehole. Springs occur naturally and no one determines that they will be located near the community. Moreover springs tend to occur near the bottom of valleys whereas traditionally people have preferred to live at the top of the hills due to the infestation of swamps in the low lands with mosquitoes. This may explain the longer average distance. On the other hand, BHs are normally located with population locations in mind and this may explain the shorter average distance. Average distance to rain water harvest is the smallest at 0 metres. This is not surprising as most of the rain water harvest tanks are located next to the main house in the compound and the rainwater is trapped from the roof of the house.

The UN Development Programme (UNDP)'s defines access as the proportion of the population using any of the following 'improved' water sources: piped water; public tap; borehole with a pump; protected well; springs; or rainwater. The World Bank specifies further that: in urban areas a safe water source should be located not more than 200 m away; in rural areas access implies that householders should not spend a disproportionate part of the day fetching water. The latter definition can be quite vague as it does not specify what constitutes a 'disproportionate part of the day' (Aiga. H, 2003).

In MWE documents, the terms access and coverage are often used interchangeably to refer to the percentage of people with access to an improved water source. The golden indicator for urban areas is ***"% of people within 200m of an improved water source"*** (MoWE, 2014). (RGCs are classified as urban areas) By these standards, access to safe water is still a challenge in all the RGCs in the area surveyed as most of the water sources are more than 200metres from the household.

Sphere standards – Key indicators for water access.

- *Average water use for drinking, cooking and personal hygiene in any household is at least 15 litres per person per day (see guidance notes 1–7).*
- *The maximum distance from any household to the nearest water point is 500 metres*
- *Queuing time at a water source is no more than 30 minutes*

3.1.2d Time for round trip

The time for a round trip ranges from a low of 1 minute at a shallow well to a high of 480 mins or 8 hours for a borehole

***TABLE 3.1-13A* TIME FOR ROUND TRIP- MINUTES – DRY SEASON – RGC WIDE**

	Min	Max	Average
Borehole	3	480	112.70
Shallow/dug well	1	240	41.07
Protected spring	2	240	72.93
Unprotected spring	10	420	76.18
Rain harvest	0	0	0
Dam/Valley tank	5	5	5.00
River/stream	20	240	123

The average time for a round trip to the BH is the second highest at 112.7 minutes. This is approximately 2 hours. This is a long time to spend collecting one or two jerry cans of water if one is using hand. Such a person needing 6 jerry cans a day will use up 12 hours a day in collecting water and this leaves little room for other domestic chores and limits productivity and income generation.

On the ground, several factors inform the time for a round trip. These include the distance to the source, the number of people at the source (long line or short line) and the strategy that the family adopt to fetch water. In some HH, one person will carry about five jerry cans to the source and fill them over a period of fifteen minutes to several hours, then he she will carry one home and come back for another and so on till all are finished. Another strategy is for one to go and line up for the water with say five jerry cans and then take one filled one home and call the rest of the family each to carry one home. Another strategy still is to take say five empty jerry cans to the source by hand or bicycle, place them in line (perhaps even before the borehole is opened) and then go and do other chores. When the person determines that the jerry cans have been filled, he/she will then go and fetch them one by one or even three at a time depending on whether he/she is using hand or bicycle.

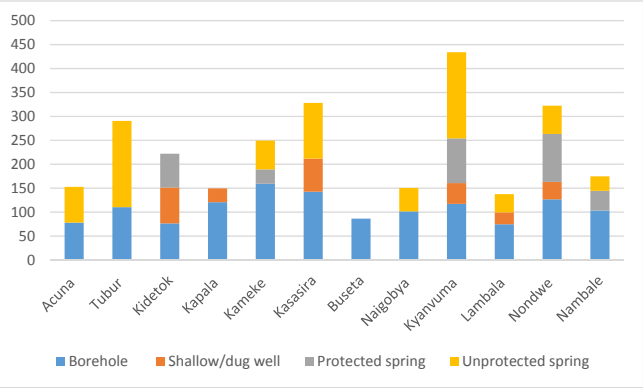
Because of all these variables, the time for a round trip can vary greatly between one HH and another and some refinement has to be taken in account when calculating the total amount of time that people spend fetching water.

In table 3.1-13B below the time for a round trip in the dry season is compared in the different RGCs. The same data for the four main sources is illustrated in the chart below

***TABLE 3.1-13B* TIME FOR ROUND TRIP- MINUTES – DRY SEASON – RGC WISE**

Average time for a round trip (Minutes) by RGC												
	Acuna	Tubur	Kidetok	Kapala	Kameke	Kasasira	Buseta	Naigobya	Kyanvuma	Lambala	Nondwe	Nambale
Borehole	78	110.45	76.52	120.89	159.38	142.7	86.46	101.59	117.38	74.67	126.7	103.54
Shallow/dug well	0	0	75	28.7	0	69.38	0	0	43.33	25	36.73	0
Protected spring	0	0	70.56	0	30	0	0	0	93.33	0	100	41.21
Unprotected spring	75	180	0	0	60	116	0	49	180	38	58.96	30
Rain harvest	0	0	0	0	0	0	0	0	0	0	0	0
Dam/Valley tank	0	0	0	0	0	0	0	0	0	5	0	0
River/stream	0	0	0	0	0	175	0	20	0	0	0	20

Figure 3.1-10 Time for round trip RGC wise – dry season



It becomes clear from the chart that the time for a round trip for Borhole is highest in Kameke and then Kasasira and it is lowest in Lambala and Kidetok. Some water sources are not represented in some RGCs. For instance in Buseta they only use Borehole. The higher the time for a round trip, the greater the need for alternative sources of water.

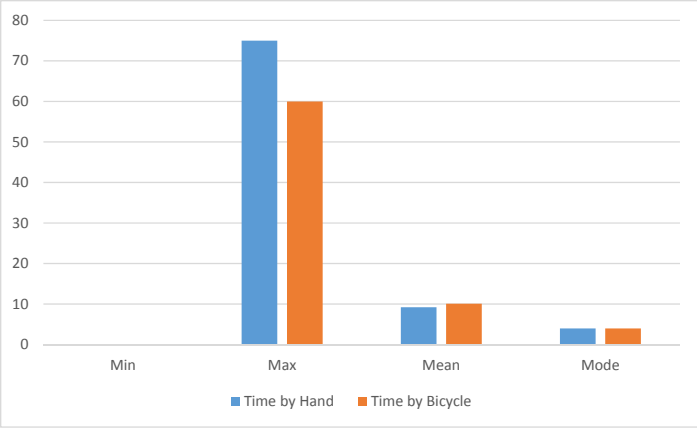
3.1.2e Time spent fetching water

TABLE 3.1-14 TIME SPENT FETCHING WATER AT THE BH.

	Time by Hand	Time by Bicycle
Min	0.0	0.1
Max	75.0	60.0
Mean	9.2	10.1
Mode	4.0	4.0

In table 3.1-14 to the left, time spent in fetching water at the borehole is calculated for people who use hand as a method and those who use bicycle. It can be seen that the average time is about the same at about 10 hours but the maximum time is higher for those using hand possibly because of the method. That a HH can spend 75 hours a day fetching water is not realistic and in this case. For those using hand, it was due to the strategy discussed above where they take several jerry cans to the source and leave them there for a number of hours and then they go back and collect them after some chores or even after returning from the garden. As can be seen from the same table the most frequently occurring figure in the time spent a day for those using hand is 4 hours and it is the same for those who use bicycle. Since bicycle tends to be faster than hand in transferring from one place to another, the fact that average time by hand and by bicycle are the same means that the largest contributor to the time spent fetching water is not the transit from home to source and back but what happens at the BH such as time of lining up and time of filling the jerry can. In general many projects make effort to locate boreholes near population centres and in good walking distance. However, this may come with crowding so that those who use bicycle may then go to more distant sources that are less crowded but by so doing they may spend more time in transit even if they spend less at the source itself.

Figure 3.1-11 Time spend fetching water at the BH – dry season



3.1.2f Method of water transport in dry season

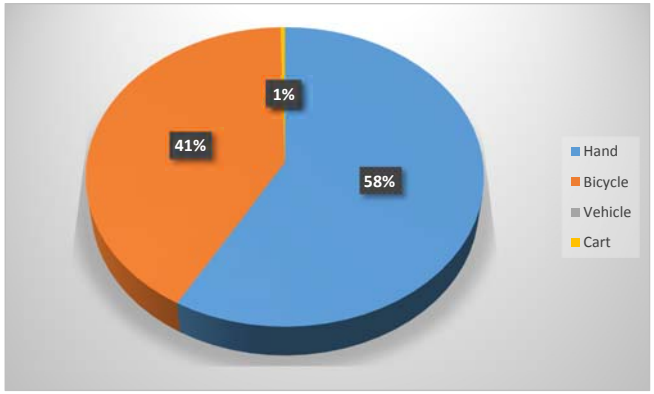
The preferred method of water transport is clearly hand as 218 or 57.5% of all people fetching from borehole reported that they use hand while 42.2% reported that they use bicycle. Only one or 0.3% reported the use of a cart. No HH reported the use of a vehicle. The same preference for hand is seen with respect to "Shallow well" and "unprotected spring". However, those who report fetching from protected spring showed a greater reliance on bicycle. The information on the method of carrying water is summarised in table 3.1-15 and figure 3.1-12. In Figure 3.1-12 the percentage of all users who use a specific method (last column to the right on table below) is calculated and is the basis for the chart.

For the most part this reliance on hand is explained by the lack of a bicycle to use to fetch water. However, the terrain and bad roads factor in. In many homes, it is the children who fetch the water and parents may also be reluctant to send their girls and boys with a bicycle to fetch water because of the risks involved to the safety of the child and the bicycle. The size of almost all the bicycles in the survey area is large – suited for adults.

TABLE 3.1-15. METHOD OF WATER TRANSPORT- DRY SEASON

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/ Valley tank	River/ stream	Total (most used)	%
Hand	218	39	17	31	0	1	3	309	58.3
Bicycle	160	4	28	24	0	0	3	219	41.3
Vehicle	0	0	0	0	0	0	0	0	0.0
Cart	1	1	0	0	0	0	0	2	0.4

Figure 3.1-12. Method of water transport- dry season



3.1.2g Person to fetch water in the dry season

When respondents were asked to rank the person to fetch water in the dry season, the ranking was as in table 3.1-16a below. Clearly the woman takes the first place followed by the girls, the boy and the man in that order. It appear therefore that the responsibility for water provision in the home is mostly on the female gender in the home. Indeed fetching water is one of the main roles listed against the woman, boys and girls. But boys also play a significant role. This pattern of responsibilities seems to be deeply ingrained in the culture and practices in all homes. When it comes to children, fetching water is one of the ways of training children to be hard working. However, children also like as it often gives them the opportunity to meet friends and play as they walk to and from the water source.

It should be noted that there are also risks associated with the children fetching water. Most important of these is teenage pregnancy especially where there are long lines at the source which provide opportunities for boys to entice girls into sexual activity. Secondly with children manning the operation of boreholes, operation and maintenance is more difficult as they have little care about proper operation and maintenance of the facility for long term sustainability. This means that programmes for sensitisation on O and M should also involve children.

Water fetching has far reaching impacts particularly on the female gender. It is already demonstrated that the females fetch water more often than their male counterparts. In the event, a lot of productive time is lost and this limits production and income generation on the part of females. It is demonstrated later on this study that the reliance on the woman for fetching water has impact on her other responsibilities and roles. Women reported arriving late to for work, losing customers and business as well as suffering poor health due to the duty of fetching water. Respondents also reported that fetching water has an impact on the education of boys and girls and is associated with poor performance due to reporting later for school, missing some lessons, having little time for home work, untidiness, fatigue leading to poor concentration in class and in some cases even sickness due to the work load.

The person who plays the least role in the fetching of water is the man. Probably this is due to the fact that the man is supposed to focus on income generation for the meeting of the basic needs of the home.

Because women and girls are the main persons to fetch water, it is important that they are involved in the O and M plans for all water facilities and that their voices and decisions on such issues get heard. The situation of each of the RGCs is shown in tables 3.1-16B and the data from the different RGCs is consistent in confirming the man as the one that is least likely to be fetching water. Out of the 12 RGCs, six (Kameke, Kasasira, Buseta, Kyanvuma, Lambala, Nondwe) put the Woman as first in fetching water and this if followed by the boy (Kidetok, Kapala, Naigobya) and girl (Tubur, Acuna, Nambale) each being named as the person to fetch water most frequently in three RGCs.

TABLE 3.1-16A. PERSON TO FETCH WATER IN THE DRY SEASON- RGC WIDE

Person to fetch water (1=Most, 4= Least)	1	2	3	4
Man	34	55	122	241
Woman	192	142	157	24
Boy	133	146	124	43
Girl	173	175	76	34

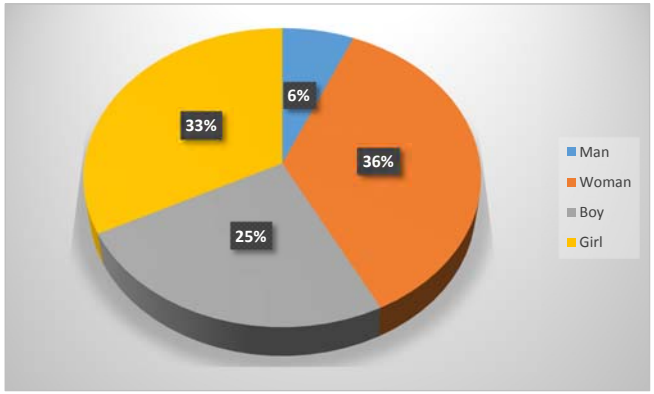
TABLE 3.1-16B. PERSON TO FETCH WATER IN THE DRY SEASON- RGC WISE

	Acuna				Tubur				Kidetok				Kapala				Kameke				Kasasira			
Person to fetch water (1=Most, 4= Least)	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Man	0	1	4	9	1	1	11	10	5	3	13	35	2	3	8	24	0	4	5	7	4	12	25	42
Woman	6	3	8	1	6	5	8	4	12	12	27	5	10	18	9	0	10	7	1	0	45	18	25	5
Boy	4	6	4	1	7	7	3	1	23	14	9	4	14	5	13	4	0	3	5	2	11	42	21	14
Girl	7	7	1	1	9	10	0	2	17	28	4	0	12	12	5	4	8	4	5	0	33	20	20	8

TABLE 3.1-16B. PERSON TO FETCH WATER IN THE DRY SEASON- RGC WISE

	Buseta				Naigobya				Kyanvuma				Lambala				Nondwe				Nambale			
Person to fetch water (1=Most, 4= Least)	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Man	2	6	5	8	3	1	5	14	6	3	14	23	5	3	10	7	4	16	12	40	2	2	10	22
Woman	10	8	6	1	8	9	10	0	17	17	17	3	12	7	3	1	49	26	23	2	7	12	20	2
Boy	4	4	6	5	10	8	3	1	16	21	8	3	5	6	6	0	22	20	35	4	17	10	11	4
Girl	8	6	7	2	7	9	7	1	16	11	10	4	6	8	2	1	32	41	15	7	18	19	0	4

Figure 3.1-13 Person to fetch water most – combined sources based on priority 1



3.1.2h Person to fetch water by source –dry season

In table 3.1-17a and b below we have juxtaposed the people reported as priority number one in fetching water with respect to the different water sources. It can be seen that for the three sources, borehole, shallow/dug well and unprotected spring, the burden is mostly on the woman followed by the girl, then the boys and finally man. For protected spring, this pattern changes a little with boy being the priority followed by girl and then woman and man. In all cases, the burden falls least on man while in only one case does it fall mostly on the boy. Generally therefore the burden in on the woman and girl.

TABLE 3.1-17A PERSON TO FETCH WATER BY SOURCE – RGC WIDE

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	27	1	3	1	0	1	1
Woman	136	25	6	23	0	0	2
Boy	91	9	21	11	0	0	1
Girl	126	10	15	20	0	0	2

TABLE 3.1-17B PERSON TO FETCH WATER BY SOURCE – RGC WISE

Acuna

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	0	0	0	0	0	0	0
Woman	5	0	0	1	0	0	0

Boy	4	0	0	0	0	0	0
Girl	6	0	0	1	0	0	0

Tubur

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	1	0	0	0	0	0	0
Woman	6	0	0	0	0	0	0
Boy	7	0	0	0	0	0	0
Girl	8	0	0	1	0	0	0

Kidetok

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	4	0	1	0	0	0	0
Woman	11	0	1	0	0	0	0
Boy	16	1	6	0	0	0	0
Girl	15	1	1	0	0	0	0

Kapala

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	2	0	0	0	0	0	0
Woman	7	3	0	0	0	0	0
Boy	11	3	0	0	0	0	0
Girl	8	4	0	0	0	0	0

Kameke

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	0	0	0	0	0	0	0
Woman	9	0	0	1	0	0	0
Boy	0	0	0	0	0	0	0
Girl	7	0	1	0	0	0	0

Kasasira

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	3	0	0	0	0	0	1
Woman	33	5	0	6	0	0	1
Boy	6	1	0	4	0	0	0
Girl	24	2	0	5	0	0	2

Buseta

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	2	0	0	0	0	0	0
Woman	10	0	0	0	0	0	0
Boy	4	0	0	0	0	0	0
Girl	8	0	0	0	0	0	0

Naigobya

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	2	0	0	1	0	0	0
Woman	6	0	0	1	0	0	0
Boy	9	0	0	1	0	0	0
Girl	5	0	0	2	0	0	0

Kyanvuma

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	5	0	1	0	0	0	0
Woman	16	1	0	0	0	0	0
Boy	8	2	5	1	0	0	0
Girl	13	0	3	0	0	0	0

Lambala

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	3	1	0	0	0	1	0
Woman	5	3	0	4	0	0	0
Boy	3	2	0	0	0	0	0
Girl	4	1	0	1	0	0	0

Nondwe

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	4	0	0	0	0	0	0
Woman	24	13	2	10	0	0	0
Boy	12	0	5	5	0	0	0
Girl	16	2	5	9	0	0	0

Nambale

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	1	0	1	0	0	0	0
Woman	4	0	3	0	0	0	0
Boy	11	0	5	0	0	0	1
Girl	12	0	5	1	0	0	0

3.1.2i Water consumption in the dry season.

TABLE 3.1-18A PER-CAPITA WATER CONSUMPTION IN THE DRY SEASON

	Min	Max	Mean	Mode
Jerry cans/ per day	1	30	7.23	4
litres/cap/day	5	80	20.27	20

Water consumption in the dry season ranged from 20 litres HH per day to 600 litres per HH per day. Per-capita water consumption ranged from 5 litres to 80 litres. The highest average per-capita water consumption was in Nambale RGC at 80 litres, while the smallest was in Kasasira RGC with 5 Litres. Data on per capita water consumption in the different RGCs is presented below.

Figure 3.1-14 Average per-capita water consumption – Dry Season RGC Wise

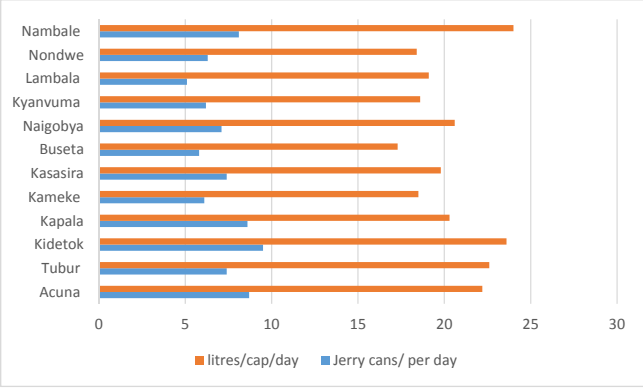


TABLE 3.1-18B SERIES - PER CAPITA WATER CONSUMPTION IN THE DRY SEASON RGC WISE

b) Acuna	Min	Max	Mean	Mode
Jerry cans/ per day	3	20	8.7	4
litres/cap/day	8	40	22.2	20.0

b) Tubur	Min	Max	Mean	Mode
Jerry cans/ per day	4	12	7.4	5
litres/cap/day	10	40	22.6	40.0

b) Kidetok	Min	Max	Mean	Mode
Jerry cans/ per day	2	24	9.5	10
litres/cap/day	7.5	66.6	23.6	30.0

b) Kapala	Min	Max	Mean	Mode
Jerry cans/ per day	2	16	8.6	15
litres/cap/day	6.7	50	20.3	20.0

b) Kameke	Min	Max	Mean	Mode
Jerry cans/ per day	3	13	6.1	5
litres/cap/day	8	34.2	18.5	20.0

b) Kasasira	Min	Max	Mean	Mode
Jerry cans/ per day	1	20	7.4	4
litres/cap/day	5	60	19.8	20.0

b) Buseta	Min	Max	Mean	Mode
Jerry cans/ per day	2	12	5.8	8
litres/cap/day	6.3	33.3	17.3	20.0

b) Naigobya	Min	Max	Mean	Mode
Jerry cans/ per day	3	15	7.1	3
litres/cap/day	10	50	20.6	20.0

b) Kyanvuma	Min	Max	Mean	Mode
Jerry cans/ per day	2	30	6.2	10
litres/cap/day	10	50	18.6	20.0

b) Lambala	Min	Max	Mean	Mode
Jerry cans/ per day	2	15	5.1	4
litres/cap/day	6.7	40	19.1	26.7

b) Nondwe	Min	Max	Mean	Mode
Jerry cans/ per day	2	20	6.3	4
litres/cap/day	5	40	18.4	20.0

b) Nambale	Min	Max	Mean	Mode
Jerry cans/ per day	4	20	8.1	6
litres/cap/day	8.3	80	24.0	33.3

Per capita water consumption and international water access standards.

The World Health Organisation (WHO) and UNICEF provide the UN system's monitoring of progress on MDG target 10. They define safe drinking water and basic sanitation as follows:

- *Drinking water* is water used for domestic purposes, drinking, cooking and personal hygiene;
- Access to drinking water means that the source is less than 1 kilometer away from its place of use and that it is possible to reliably obtain at least 20 litres per member of a household per day;
- Safe drinking water is water with microbial, chemical and physical characteristics that meet WHO guidelines or national standards on drinking water quality;
- Access to safe drinking water is the proportion of people using improved drinking water sources: household connection; public standpipe; borehole; protected dug well; protected spring; rainwater.

Basic sanitation is the lowest-cost technology ensuring hygienic excreta and sullage disposal and a clean and healthful living environment both at home and in the neighborhood of users. Access to basic sanitation includes safety and privacy in the use of these services. Coverage is the proportion of people using improved sanitation facilities: public sewer connection; septic system connection; pour-flush latrine; simple pit latrine; ventilated improved pit latrine.

It is not confirmed in this study that the people consuming less than 20 litres per person per day are doing it due to access problems. However it is clear that many households as still falling below the recommended per-capita water access and this underlines the need for improving water supply in the selected areas. Data indicates that some 205 HH use less than 20 litres per capita per day in dry season and 152 HH use less than 20 litres per capita per day in rainy season. We isolated the number of HH that fall below the 20 litres per person per day indicator in the survey area and the data is presented in table 3.1-18 below.

TABLE 3.1-19 HH USING LESS THAN 20 LITRES PER PARSON PER DAY IN THE RGCS.

RGC	ACUNA	TUBUR	KIDETOK	KAPALA	KAMEKE	KASASIRA	BUSETA	KYANVUMA	NAIGOBYA	LAMBALA	NONDWE	NAMBALE	TOTAL
HH Living on less than 20ltrs per capita per day	5	11	17	12	7	31	16	26	10	10	37	12	194
No of HH in RGC	15	22	49	29	16	66	24	44	22	22	70	30	409
% Living on less than 20ltrs per capita per day	33.3	50.0	34.7	41.4	43.8	47.0	66.7	59.1	45.5	45.5	52.9	40.0	47.4

The data shows that a total of 47.4% of the HH in the survey area are living on less than 20litres per capita per day with Buseta having the greatest proportion of these while Acuna has the least.

3.1.3 Water sources in rainy season

3.3.3a Main water sources in the rainy season

Table 3.1-20a and b below summarises the main sources of water in the rainy season and indicates that 86.6% of all respondents indicated that their main source is borehole. This is followed by rain harvest at 74.8% and the shallow or dug well 6.8% and protected spring 5.1%. The sources least used in the rainy season are the Dam/valley tank and the river/stream, both of which score only 0.2% (only one person reported using them in the rainy season) This may be due to the high turbidity in those sources during the rainy season as runoff carries soil along with it. During the rainy season therefore the prominence of rain harvest as a source of water rises and many people resort to this convenient source dropping other sources such as shallow/dug well that took priority 2 in the dry season. While pressure on these sources reduces during this season, it does not necessarily mean that they will be better maintained. Negligence may set in for some and some may become overgrown with grass. That means that O and M activities need to be emphasised equally in dry and wet seasons.

TABLE 3.1-20A MAIN SOURCES OF WATER IN THE RAINY SEASON – RGC WIDE

D2. Main sources of water in the rainy season

Yes %	BH			Shallow/dug well			Protected spring			Un-protected Spring		
	86.6			6.8			4.4			5.1		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	20	3.55	1	18	5.29	1	15	3.06	1	8	2.86
Distance for round trip(m)	5	3000	278	0	1200	267	100	2000	683	0	800	367
Time for round trip(min)	1	240	48.4	0	120	27.9	2	150	48.2	3	300	64.4

Yes %	Rain harvest			Dam/Valley			River/Steam		
	74.8			0.2			0.2		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	20	4.86	2	2	2	2	2	2
Distance for round trip(m)	0	300	4.7	200	200	200	50	50	50
Time for round trip(min)	0	40	2.2	5	5	5	20	20	20

Figure 3.1-15 Main sources of water in the rainy season.

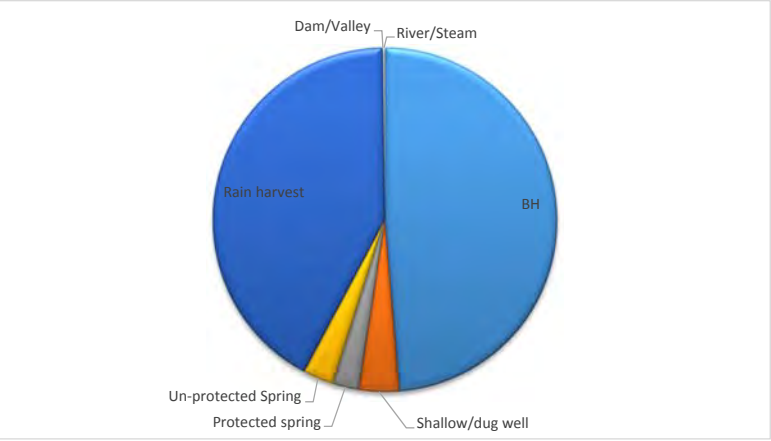


TABLE 3.1-20B SERIES - MAIN SOURCES OF WATER IN THE RAINY SEASON – RGC WISE

Acuna

Yes %	BH			Shallow/dug well			Protected spring			Un-protected Spring		
	100.00			0.00			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	10	4.5	0	0	0	0	0	0	0	0	0
Distance for round trip(m)	60	400	172.7	0	0	0	0	0	0	0	0	0
Time for round trip(min)	10	60	30.7	0	0	0	0	0	0	0	0	0

Yes %	Rain harvest			Dam/Valley			River/Steam		
	53.33			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	2	14	5.38	0	0	0	0	0	0
Distance for round trip(m)	0	10	1.25	0	0	0	0	0	0
Time for round trip(min)	0	10	3.00	0	0	0	0	0	0

Tubur

Yes %	BH			Shallow/dug well			Protected spring			Un-protected Spring		
	95.45			0.00			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	12	3.9	0	0	0	0	0	0	0	0	0
Distance for round trip(m)	60	500	260.0	0	0	0	0	0	0	0	0	0
Time for round trip(min)	20	120	50.2	0	0	0	0	0	0	0	0	0

Yes %	Rain harvest			Dam/Valley			River/Steam		
	63.64			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	2	8	3.64	0	0	0	0	0	0
Distance for round trip(m)	0	100	8.86	0	0	0	0	0	0
Time for round trip(min)	0	30	3.86	0	0	0	0	0	0

Kidetok

Yes %	BH			Shallow/dug well			Protected spring			Un-protected Spring		
	79.59			4.08			14.29			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	20	4.6	11	18	14.5	1	15	3.6	0	0	0
Distance for round trip(m)	50	1,000	271.5	100	100	100.0	300	2,000	1128.6	0	0	0
Time for round trip(min)	10	120	31.1	30	30	30.0	5	60	45.7	0	0	0

Yes %	Rain harvest			Dam/Valley			River/Steam		
	69.39								
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	20	6.91	0	0	0	0	0	0
Distance for round trip(m)	0	50	3.44	0	0	0	0	0	0
Time for round trip(min)	0	10	1.79	0	0	0	0	0	0

Kapala

Yes %	BH			Shallow/dug well			Protected spring			Un-protected Spring		
	96.55			13.79			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	8	3.6	2	12	7.0	0	0	0	0	0	0
Distance for round trip(m)	20	500	282.9	0	10	3.8	0	0	0	0	0	0
Time for round trip(min)	10	240	52.9	0	5	3.0	0	0	0	0	0	0

Yes %	Rain harvest			Dam/Valley			River/Steam		
	65.52			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	10	4.63	0	0	0	0	0	0
Distance for round trip(m)	0	300	17.37	0	0	0	0	0	0
Time for round trip(min)	0	10	3.21	0	0	0	0	0	0

Kameke

Yes %	BH			Shallow/dug well			Protected spring			Un-protected Spring		
	93.75			6.25			0.00			6.25		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	12	4.1	6	6	6.0	0	0	0	2	2	2.0

Distance for round trip(m)	100	2,000	368.7	80	80	80.0	0	0	0	500	500	500.0
Time for round trip(min)	20	120	43.3	30	30	30.0	0	0	0	60	60	60.0

Yes %	Rain harvest			Dam/Valley			River/Steam		
	62.50			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	11	4.20	0	0	0	0	0	0
Distance for round trip(m)	0	100	11.80	0	0	0	0	0	0
Time for round trip(min)	0	40	4.80	0	0	0	0	0	0

Kasasira

Yes %	BH			Shallow/dug well			Protected spring			Un-protected Spring		
	89.39			7.58			0.00			4.55		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	10	3.8	2	4	3.4	0	0	0	2	4	3.3
Distance for round trip(m)	50	900	234.9	300	1,000	488.0	0	0	0	10	800	436.7
Time for round trip(min)	3	150	52.0	30	30	30.0	0	0	0	3	60	24.3

Yes %	Rain harvest			Dam/Valley			River/Steam		
	72.73			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	15	4.88	0	0	0	0	0	0
Distance for round trip(m)	0	10	1.35	0	0	0	0	0	0
Time for round trip(min)	0	10	1.42	0	0	0	0	0	0

Buseta

Yes %	BH			Shallow/dug well			Protected spring			Un-protected Spring		
	100.00			0.00			0.00			4.17		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	9	3.2	0	0	0	0	0	0	2	2	2.0
Distance for round trip(m)	50	600	204.2	0	0	0	0	0	0	0	0	0.0
Time for round trip(min)	3	60	26.2	0	0	0	0	0	0	5	5	5.0

Yes %	Rain harvest			Dam/Valley			River/Steam		
	62.50			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	2	8	4.33	0	0	0	0	0	0
Distance for round trip(m)	0	10	1.73	0	0	0	0	0	0
Time for round trip(min)	0	3	0.73	0	0	0	0	0	0

Naigobya

Yes %	BH	Shallow/dug well	Protected spring	Un-protected Spring
	100.00	0.00	0.00	0.00

Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	6	2.5	0	0	0	0	0	0	0	0	0
Distance for round trip(m)	5	700	316.6	0	0	0	0	0	0	0	0	0
Time for round trip(min)	5	60	37.5	0	0	0	0	0	0	0	0	0

Yes	Rain harvest			Dam/Valley			River/Steam		
%	95.45			0			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	14	5.38	0	0	0	0	0	0
Distance for round trip(m)	0	20	2.38	0	0	0	0	0	0
Time for round trip(min)	0	5	1.48	0	0	0	0	0	0

Kyanvuma

Yes	BH			Shallow/dug well			Protected spring			Un-protected Spring		
%	81.82			4.55			0.00			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	12	3.3	5	8	6.5	0	0	0	0	0	0
Distance for round trip(m)	10	800	172.5	200	500	350.0	0	0	0	0	0	0
Time for round trip(min)	6	240	57.3	20	60	40.0	0	0	0	0	0	0

Yes	Rain harvest			Dam/Valley			River/Steam		
%	90.91			0			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	15	4.08	0	0	0	0	0	0
Distance for round trip(m)	0	20	2.75	0	0	0	0	0	0
Time for round trip(min)	0	10	2.20	0	0	0	0	0	0

Lambala

Yes	BH			Shallow/dug well			Protected spring			Un-protected Spring		
%	63.64			27.27			0.00			9.09		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	4	1.9	1	12	4.0	0	0	0	2	3	2.5
Distance for round trip(m)	100	3000	615.0	0	500	170.0	0	0	0	90	100	95.0
Time for round trip(min)	10	240	58.9	1	60	24.2	0	0	0	20	50	35.0

Yes	Rain harvest			Dam/Valley			River/Steam		
%	77.27			4.55			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	2	7	4.24	2	2	2.00	0	0	0
Distance for round trip(m)	0	10	2.35	200	200	200.00	0	0	0
Time for round trip(min)	0	5	2.24	5	5	5.00	0	0	0

Nondwe

Yes	BH	Shallow/dug well	Protected spring	Un-protected Spring

%	77.14			10.00			10.00			20.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	15	3.2	1	7	3.4	1	4	2.3	1	8	2.9
Distance for round trip(m)	5	1500	343.9	200	1200	415.7	300	600	428.6	100	800	407.1
Time for round trip(min)	10	180	68.1	10	120	42.9	10	150	65.7	10	300	81.8

Yes	Rain harvest			Dam/Valley			River/Steam		
%	87.14			0			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	2	10	4.34	0	0	0	0	0	0
Distance for round trip(m)	0	200	6.39	0	0	0	0	0	0
Time for round trip(min)	0	30	2.49	0	0	0	0	0	0

Nambale

Yes	BH			Shallow/dug well			Protected spring			Un-protected Spring		
%	90.00			3.33			13.33			0.00		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	1	12	4.1	7	7	7	2	5	3.5	0	0	0
Distance for round trip(m)	10	1500	268.9	100	100	100	100	500	350	0	0	0
Time for round trip(min)	1	120	46.8	4	4	4	2	40	21.75	0	0	0

Yes	Rain harvest			Dam/Valley			River/Steam		
%	63.33			0.0			3.33		
Yes	Min	Max	Average	Min	Max	Average	Min	Max	Average
No of trips /day	2	14	6.05	0	0	0	2	2	2
Distance for round trip(m)	0	15	2.35	0	0	0	50	50	50
Time for round trip(min)	0	5	1.47	0	0	0	20	20	20

3.1.3b Number of trips a day – rainy season

Table *3.1-21a* below compares the roundtrips to the different water sources. The data shows that in the rainy season, the highest number of round trips is to the borehole and rain harvest. In comparison to the dry season, the prominence of the shallow/dug is supplanted by rain harvest. Understandably, during the rainy season it is possible to trap rain water and many people do it. In the rainy season the average number of round trips to the borehole fall from 4.77 to 3.55 while those to water harvest rise from 1 to 4.86. Average number of trips to river/stream also fall significantly from 7 to 2. The changes in the other sources of water are relatively small.

TABLE 3.1-21A NUMBER OF ROUND TRIPS A DAY – RAINY AND DRY SEASONS – RGC WIDE

	Min Dry	Min Rainy	Max Dry	Max Rainy	Average Dry	Average Rainy
Borehole	1	1	24	20	4.77	3.55
Shallow/dug well	2	1	18	18	5.18	5.29
Protected spring	1	1	15	15	3.82	3.06
Unprotected spring	1	1	12	8	3.73	2.86
Rain water harvest	1	1	1	20	1	4.86

Dam/valley tank	1	2	1	2	1	2
River/stream	1	2	20	2	7	2

For the purpose of comparison the figures for the dry season are also reproduced in these tables. To guide the reader, the average figures for the rainy season are shaded. Round trips give an idea of the amount of water needed but by themselves are not sufficient to tell the exertion and resources committed to obtaining the water needed for HH use. The full story is given by the number of round trips and the time per round trip as well as the distance to the source.

TABLE 3.1-21B NUMBER OF ROUND TRIPS A DAY – RAINY SEASON – RGC WISE

Acuna	**Min Dry**	**Min Rainy**	**Max Dry**	**Max Rainy**	**Average Dry**	**Average Rainy**
Borehole	2	1	12	10	5.6	4.5
Shallow/dug well	0	0	0	0	0	0
Protected spring	0	0	0	0	0	0
Unprotected spring	2	0	2	0	2	0
Rain water harvest	0	2	0	14	0	5.38
Dam/valley tank	0	0	0	0	0	0
River/stream	0	0	0	0	0	0

Tubur	**Min Dry**	**Min Rainy**	**Max Dry**	**Max Rainy**	**Average Dry**	**Average Rainy**
Borehole	1	1	10	12	4.77	3.9
Shallow/dug well	0	0	0	0	0	0
Protected spring	0	0	0	0	0	0
Unprotected spring	3	0	3	0	3	0
Rain water harvest	0	2	0	8	0	3.64
Dam/valley tank	0	0	0	0	0	0
River/stream	0	0	0	0	0	0

Kidetok	**Min Dry**	**Min Rainy**	**Max Dry**	**Max Rainy**	**Average Dry**	**Average Rainy**
Borehole	1	1	20	20	5.41	4.6
Shallow/dug well	10	11	18	18	14	14.5
Protected spring	1	1	15	15	5.33	3.6
Unprotected spring	0	0	0	0	0	0
Rain water harvest	0	1	0	20	0	6.91
Dam/valley tank	0	0	0	0	0	0
River/stream	0	0	0	0	0	0

Kapala	**Min Dry**	**Min Rainy**	**Max Dry**	**Max Rainy**	**Average Dry**	**Average Rainy**
Borehole	1	1	16	12	5.61	4.2
Shallow/dug well	2	2	8	12	5	7
Protected spring	0	0	0	0	0	0
Unprotected spring	0	0	0	0	0	0
Rain water harvest	0	1	0	10	0	4.63
Dam/valley tank	0	0	0	0	0	0
River/stream	0	0	0	0	0	0

Kameke	**Min Dry**	**Min Rainy**	**Max Dry**	**Max Rainy**	**Average Dry**	**Average Rainy**
Borehole	1	1	12	8	4.25	3.6
Shallow/dug well	0	6	0	6	0	6
Protected spring	8	0	8	0	8	0

Unprotected spring	1	2	1	2	1	2
Rain water harvest	0	1	0	11	0	4.2
Dam/valley tank	0	0	0	0	0	0
River/stream	0	0	0	0	0	0

Kasasira	**Min Dry**	**Min Rainy**	**Max Dry**	**Max Rainy**	**Average Dry**	**Average Rainy**
Borehole	1	1	12	10	4.44	3.8
Shallow/dug well	2	2	6	4	4	3.4
Protected spring	0	0	0	0	0	0
Unprotected spring	1	2	6	4	3.2	3.3
Rain water harvest	0	1	0	15	0	4.88
Dam/valley tank	0	0	0	0	0	0
River/stream	1	0	20	0	9	0

Buseta	**Min Dry**	**Min Rainy**	**Max Dry**	**Max Rainy**	**Average Dry**	**Average Rainy**
Borehole	1	1	12	9	5.38	3.2
Shallow/dug well	0	0	0	0	0	0
Protected spring	0	0	0	0	0	0
Unprotected spring	0	2	0	2	0	2
Rain water harvest	0	2	0	8	0	4.33
Dam/valley tank	0	0	0	0	0	0
River/stream	0	0	0	0	0	0

Naigobya	**Min Dry**	**Min Rainy**	**Max Dry**	**Max Rainy**	**Average Dry**	**Average Rainy**
Borehole	1	1	15	6	4.68	2.5
Shallow/dug well	0	0	0	0	0	0
Protected spring	0	0	0	0	0	0
Unprotected spring	1	0	9	0	4	0
Rain water harvest	0	1	0	14	0	5.38
Dam/valley tank	0	0	0	0	0	0
River/stream	3	0	3	0	3	0

Kyanvuma	**Min Dry**	**Min Rainy**	**Max Dry**	**Max Rainy**	**Average Dry**	**Average Rainy**
Borehole	1	1	24	12	4.5	3.3
Shallow/dug well	4	5	10	8	6.33	6.5
Protected spring	1	0	7	0	3.89	0
Unprotected spring	1	0	1	0	1	0
Rain water harvest	0	1	0	15	0	4.08
Dam/valley tank	0	0	0	0	0	0
River/stream	0	0	0	0	0	0

Lambala	**Min Dry**	**Min Rainy**	**Max Dry**	**Max Rainy**	**Average Dry**	**Average Rainy**
Borehole	1	1	8	4	3.2	1.9
Shallow/dug well	1	1	12	12	3.86	4
Protected spring	0	0	0	0	0	0
Unprotected spring	3	2	8	3	4.4	2.5
Rain water harvest	0	2	0	7	0	4.24
Dam/valley tank	1	2	1	2	1	2
River/stream	0	0	0	0	0	0

Nondwe	**Min Dry**	**Min Rainy**	**Max Dry**	**Max Rainy**	**Average Dry**	**Average Rainy**
Borehole	1	1	15	15	3.54	3.2

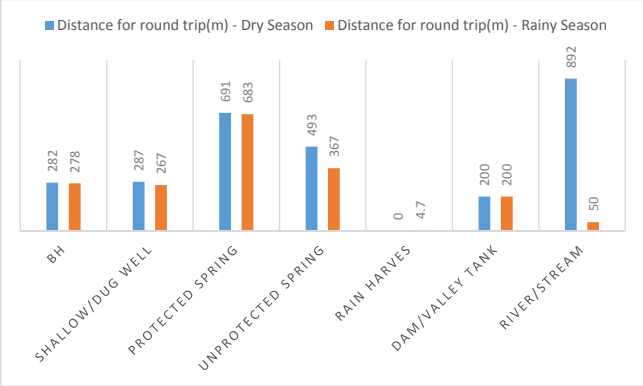
Shallow/dug well	2	1	10	7	5.07	3.4
Protected spring	1	1	8	4	3.25	2.3
Unprotected spring	1	1	12	8	4.25	2.9
Rain water harvest	0	2	0	10	0	4.34
Dam/valley tank	0	0	0	0	0	0
River/stream	0	0	0	0	0	0

Nambale	**Min Dry**	**Min Rainy**	**Max Dry**	**Max Rainy**	**Average Dry**	**Average Rainy**
Borehole	1	1	18	12	6.86	4.1
Shallow/dug well	0	7	0	7	0	7
Protected spring	1	2	6	5	2.79	3.5
Unprotected spring	4	0	4	0	4	0
Rain water harvest	0	2	0	14	0	6.05
Dam/valley tank	0	0	0	0	0	0
River/stream	0	2	0	2	0	2

3.1.3c Distance to source – rainy season

Data shows that during the rainy season, the longest average distance is with the protected spring which stands at 683metres. A comparison of the distance to the source in the dry and rainy season is done in figure 3.1-16 below. For borehole, the distance falls lightly indicating that HHs may have better access to boreholes that are near them as the population at the boreholes decreases. The same appeared to be the case for Shallow/dug well as well as for protected spring the same which is understandable. The most significant change is the distance to the river/stream which falls drastically. This may be due to the fact that streams spring up everywhere in the rainy season. There is also significant change from 493 to 365 metres for the unprotected spring. This may also point to the fact that more springs become available in the rainy season.

Figure 3.1-16 average distance to source dry and rainy season.



Some springs dry up during the dry season and they spring back forth during the rainy season becoming available for people to use.

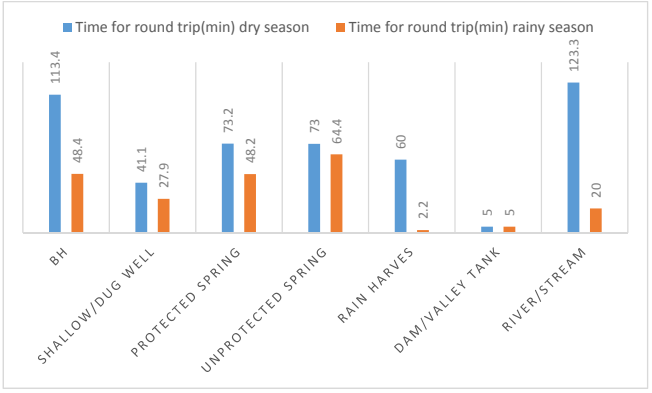
3.1.3d Time for round trip – rainy season

The average time for a round trip in the rainy season ranges from a minimum of 0 minutes at the shallow/dug well and rain harvest, to a high of 300 minutes for unprotected spring. The average ranges from a low of 2 minutes for the rain harvest to a high of 64 minutes for unprotected spring. In general time for a roundtrip falls all around but the most significant fall is with rive/stream where it falls by some 103. 3 minutes or about 1hour and 43 minutes. At rain harvest the time also falls by some 57 minutes, while at the borehole, the time falls by some 65 minutes or about an hour.

The fall in time for a round trip can be attributed to the reduced numbers of people at the sources as people have more sources including rain harvest and some springs that have come to life in the rainy season. When the numbers are low at the sources it takes a shorter time to fetch a jerry can of water as there is no line. Additionally the flow from many sources such as springs improves. Moreover people can resort to sources that are closer to home as the crowding at the sources reduces.

This reduction in time for a round trip is significant especially as the borehole is named as the main source of water for the majority of the respondents. The time saved from the responsibility fetching water in the rainy season can be diverted to other chores and for groups like women and children, it can result into better health, more income and better school performance. New and stable water sources will effectively contribute to the reduction of this time leading to gains in the areas named.

Figure 3.1-17 Time for round trip – rainy season and dry season



3.1.3e Access to safe water in the rainy season

As noted in section 3.1.4d above, access dynamics include the distance to source and queuing time. Both dynamics change in the rainy season and this impacts access significantly. However, since access is not the result of new safe sources, the improvement in access to safe water is debatable.

3.1.3f Method of water transport in the rainy season

The preferred method of fetching water in the rainy season still remains "hand". 207 or 59% of all people fetching from borehole reported that they use hand while 41% reported that they use bicycle. Only one

person reported the use of a cart. No one reported the use of a vehicle. The same preference for hand is seen with respect to "Shallow well" and "unprotected spring" as well as rain harvest where it is nearly the only method.

The information on the method of carrying water is summarised in table *3.1-22a below*. The factors determining the preference for these methods are likely the same as those mentioned in section 3.1.4d above namely, the lack of a bicycle to use to fetch water as well as the terrain which is amplified by the muddy conditions in the rainy season.

The situation in the respective RGCs does not change very much as seen in table 3.1-22b series below.

TABLE 3.1-22A METHOD OF WATER TRANSPORT –RAINY SEASON RGC WIDE

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)
Hand	207	26	11	15	304	1	1	565
Bicycle	145	2	7	5	1	0	0	160
Vehicle	0	0	0	0	0	0	0	0
Cart	1	0	0	0	0	0	0	1

TABLE 3.1-22B METHOD OF WATER TRANSPORT –RAINY SEASON –RGC WISE

Acuna

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)
Hand	8	0	0	0	8	0	0	16
Bicycle	7	0	0	0	0	0	0	7
Vehicle	0	0	0	0	0	0	0	0
Cart	0	0	0	0	0	0	0	0

Tubur

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)
Hand	6	0	0	0	14	0	0	20
Bicycle	15	0	0	0	0	0	0	15
Vehicle	0	0	0	0	0	0	0	0
Cart	0	0	0	0	0	0	0	0

Kidetok

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)
Hand	19	2	2	0	34	0	0	57
Bicycle	20	0	5	0	0	0	0	25
Vehicle	0	0	0	0	0	0	0	0
Cart	0	0	0	0	0	0	0	0

Kapala

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)
Hand	12	4	0	0	19	0	0	35
Bicycle	15	0	0	0	0	0	0	15
Vehicle	0	0	0	0	0	0	0	0
Cart	1	0	0	0	0	0	0	1

Kameke

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)
Hand	8	1	0	0	10	0	0	19
Bicycle	7	0	0	1	0	0	0	8
Vehicle	0	0	0	0	0	0	0	0
Cart	0	0	0	0	0	0	0	0

Kasasira

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)
Hand	39	4	0	3	48	0	0	94
Bicycle	20	1	0	0	0	0	0	21
Vehicle	0	0	0	0	0	0	0	0
Cart	0	0	0	0	0	0	0	0

Buseta

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)
Hand	16	0	0	1	15	0	0	32
Bicycle	8	0	0	0	0	0	0	8
Vehicle	0	0	0	0	0	0	0	0
Cart	0	0	0	0	0	0	0	0

Naigobya

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)
Hand	13	0	0	0	21	0	0	34
Bicycle	9	0	0	0	0	0	0	9
Vehicle	0	0	0	0	0	0	0	0
Cart	0	0	0	0	0	0	0	0

Kyanvuma

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)

Hand	21	2	0	0	40	0	0	63
Bicycle	15	0	0	0	0	0	0	15
Vehicle	0	0	0	0	0	0	0	0
Cart	0	0	0	0	0	0	0	0

Lambala

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)
Hand	7	6	0	2	17	1	0	33
Bicycle	7	0	0	0	0	0	0	7
Vehicle	0	0	0	0	0	0	0	0
Cart	0	0	0	0	0	0	0	0

Nondwe

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)
Hand	38	6	6	9	60	0	0	119
Bicycle	15	1	1	4	1	0	0	22
Vehicle	0	0	0	0	0	0	0	0
Cart	0	0	0	0	0	0	0	0

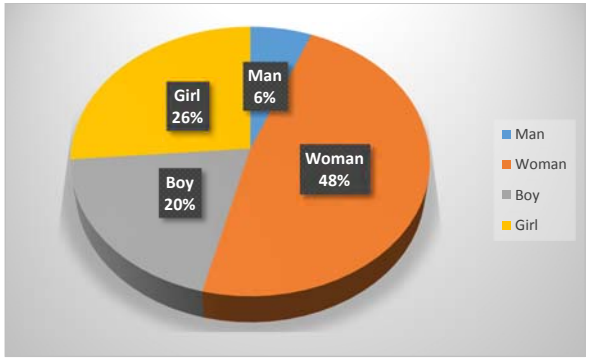
Nambale - Method of water transport

Method	BH	Shallow well/Dug well	Protected spring	Unprotected spring	Rain harvest	Dam/Valley tank	River/stream	Total (most used)
Hand	20	1	3	0	18	0	1	43
Bicycle	7	0	1	0	0	0	0	8
Vehicle	0	0	0	0	0	0	0	0
Cart	0	0	0	0	0	0	0	0

3.1.3g Person to fetch water in the rainy season

The ranking of the person to fetch water in the rainy season does not differ much from the ranking in the dry season. The woman still takes the first place followed by the girls, the boy and the man in that order. Weather does not therefore appear to have any impact on who fetches water in the household. The graphic below shows the number of times that each parson was ranked first.

Figure 3.1-18 Person to fetch water most- rainy season – combined sources



Just like in the dry season, the person who plays the least role in the fetching of water in the rainy season is the man. Tables 3.1-23A and B series present the data on the person to fetch water in the rainy season.

TABLE 3.1-23A PERSON TO FETCH WATER IN THE RAINY SEASON – RGC WIDE

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	44	81	140	313
Woman	349	164	158	30
Boy	142	172	219	55
Girl	192	274	109	40

TABLE 3.1-23B PERSON TO FETCH WATER IN THE RAINY SEASON – RGC WISE

Acuna

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	0	1	3	17
Woman	10	2	10	1
Boy	7	6	7	1
Girl	6	14	3	0

Tubur

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	3	1	14	17
Woman	13	6	10	5
Boy	11	7	9	3
Girl	8	21	1	3

Kidetok

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	6	6	20	46
Woman	31	15	26	10
Boy	24	17	24	7

Girl	21	44	7	0

Kapala

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	3	5	12	28
Woman	21	21	9	0
Boy	13	10	18	9
Girl	14	15	9	7

Kameke

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	1	5	7	12
Woman	17	10	0	0
Boy	0	2	11	2
Girl	9	10	7	0

Kasasira

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	5	19	24	41
Woman	70	16	22	6
Boy	11	40	37	15
Girl	29	33	22	12

Buseta

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	4	6	7	13
Woman	16	14	5	1
Boy	5	6	10	4
Girl	14	9	9	2

Naigobya

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	20	13	9	0
Woman	11	12	6	2
Boy	9	13	11	1
Girl	20	13	9	0

Kyanvuma

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	6	8	17	24
Woman	45	16	13	2
Boy	11	24	20	7
Girl	16	26	15	4

Lambala

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	3	8	12	11
Woman	20	7	7	1

Boy	9	11	8	1
Girl	8	9	4	2

Nondwe

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	9	20	6	55
Woman	73	29	26	3
Boy	23	26	48	3
Girl	37	58	21	5

Nambale – person to fetch water rainy season

Person to fetch water (1=Most, 4=Least)	1	2	3	4
Man	1	2	7	30
Woman	13	15	21	1
Boy	17	11	21	1
Girl	21	22	0	4

3.1.3h Person to fetch water by source –rainy season

In table *3.1-24a and b b*elow we have juxtaposed the people reported as priority number one in fetching water with respect to the different water sources in the rainy season. It can be seen that for the four sources, borehole, shallow/dug well, unprotected spring and rain harvest, the burden is mostly on the woman. The burden then falls next on the girl with respect to Borehole, Shallow/dug well and Rain Harvest and these are the main sources in the rainy season. As in the dry season, the burden therefore falls mostly on the woman followed by the girl then the boy and lastly the man.

TABLE 3.1-24A PERSON TO FETCH WATER BY SOURCE – RAINY SEASON RGC WIDE.

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	29	0	2	0	12	1	0
Woman	120	14	4	12	198	0	0
Boy	94	6	8	5	30	0	1
Girl	110	8	4	4	65	0	0

TABLE 3.1-24B SERIES - PERSON TO FETCH WATER BY SOURCE – RAINY SEASON - RGC WISE.

Acuna

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	0	0	0	0	0	0	0
Woman	5	0	0	0	5	0	0
Boy	5	0	0	0	2	0	0
Girl	5	0	0	0	1	0	0

Tubur

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	1	0	0	0	2	0	0
Woman	4	0	0	0	9	0	0
Boy	9	0	0	0	2	0	0
Girl	7	0	0	0	1	0	0

Kidetok

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	4	0	1	0	1	0	0
Woman	10	0	1	0	20	0	0
Boy	14	0	4	0	6	0	0
Girl	11	2	1	0	7	0	0

Kapala

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	2	0	0	0	1	0	0
Woman	7	2	0	0	12	0	0
Boy	11	1	0	0	1	0	0
Girl	8	1	0	0	5	0	0

Kameke

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	0	0	0	0	1	0	0
Woman	10	0	0	1	6	0	0
Boy	0	0	0	0	0	0	0
Girl	5	1	0	0	3	0	0

Kasasira

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	3	0	0	0	2	0	0
Woman	28	4	0	2	36	0	0
Boy	8	0	0	0	3	0	0
Girl	20	1	0	1	7	0	0

Buseta

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	3	0	0	0	1	0	0
Woman	7	0	0	1	8	0	0

Boy	4	0	0	0	1	0	0
Girl	9	0	0	0	5	0	0

Naigobya

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	2	0	0	0	1	0	0
Woman	8	0	0	0	12	0	0
Boy	8	0	0	0	3	0	0
Girl	4	0	0	0	5	0	0

Kyanvuma

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	5	0	0	0	1	0	0
Woman	15	0	0	0	30	0	0
Boy	5	2	0	0	4	0	0
Girl	11	0	0	0	5	0	0

Lambala

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	2	0	0	0	0	1	0
Woman	4	2	0	2	12	0	0
Boy	3	3	0	0	3	0	0
Girl	5	1	0	0	2	0	0

Nondwe

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	6	0	1	0	2	0	0
Woman	18	6	1	6	42	0	0
Boy	13	0	3	5	2	0	0
Girl	16	1	2	3	15	0	0

Nambale - person to fetch water by source - rainy season

Person to fetch water most to least	Borehole	Shallow/Dug well	Protected Spring	Unprotected Spring	Rain Harvest	Dam/Valley Tank	River/Stream
Man	1	0	0	0	0	0	0
Woman	4	0	2	0	7	0	0
Boy	12	0	1	0	3	0	1
Girl	10	1	1	0	9	0	0

3.1.3i Water consumption in the rainy season.

TABLE 3.1-25A PER-CAPITA WATER CONSUMPTION IN THE RAINY SEASON –RGC WIDE

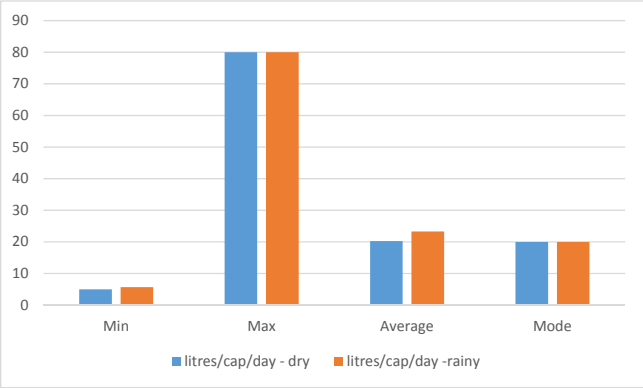
	Min	Max	Mean	Mode

Jerry cans/ per day	2	27	8.1	10
litres/cap/day	5.7	80	23.3	20

Water consumption in the rainy season ranged from 40 litres per HH per day to 540 litres per HH per day. Per-capita water consumption ranged from 5.7 litres to 80 litres.

When water consumption in the rainy season is compared to that in the dry season, the rates do not differ very much. Below is a graphic comparison of water consumption in the dry season compared to the wet season.

Figure 3.1-19 comparison of per capita water consumption –dry season and rainy season.



It can be seen that average per-capita water consumption in the rainy season is slightly higher than in the dry season but the difference is really quite small. Moreover most people report the same amount of per-capita water consumption in both the dry and in the rainy season i.e. 20 litres per day. Therefore it can be concluded that water consumption does not change much between the dry season and the rainy season.

TABLE 3.1-25B SERIES - PER-CAPITA WATER CONSUMPTION IN THE RAINY SEASON –RGC WISE

	Acuna				**Tubur**				**Kidetok**			
	Min	Max	Mean	Mode	Min	Max	Mean	Mode	Min	Max	Mean	Mode
Jerry cans/ per day	3	18	8.67	10	2	12	8.14	8	2	24	10.59	10
litres/cap/day	10	40	21.97	20	10	50	24.78	40	9	73.3	27.57	20

	Kapala				**Kameke**				**Kasasira**			
	Min	Max	Mean	Mode	Min	Max	Mean	Mode	Min	Max	Mean	Mode
Jerry cans/ per day	2	20	9.14	10	3	15	6.94	7	2	18	7.98	6
litres/cap/day	6.7	50	21.54	20	13	35	21.76	20	6.7	48	21.42	30

	Buseta				**Naigobya**				**Kyanvuma**			
	Min	Max	Mean	Mode	Min	Max	Mean	Mode	Min	Max	Mean	Mode
Jerry cans/ per day	2	11	6.46	9	2	18	8.18	5	2	27	7.00	4
litres/cap/day	5.7	44	19.95	15	6.7	60	23.37	20	6.7	56	21.64	20

	Lambala				**Nondwe**				**Nambale**			
	Min	Max	Mean	Mode	Min	Max	Mean	Mode	Min	Max	Mean	Mode
Jerry cans/ per day	2	15	6.18	7	3	22	7.71	7	4	16	8.53	8
litres/cap/day	6.7	60	23.32	20	9.2	60	23.80	20	10	80	25.88	16

3.1.3j Conclusion on water sources and water consumption

It is clear from the data above that the main source of water, both in the rainy season and the dry season is the borehole. In the dry season the second most important water source is the unprotected spring. In the rainy season, the second most important source changes to rain harvest.

The 'preferred' method of water transport both in the dry season and in the rainy season is by far 'hand' followed by bicycle.

The person to fetch water is in both the dry and rainy season reported to be the woman followed by the girl and the boy with the man coming last.

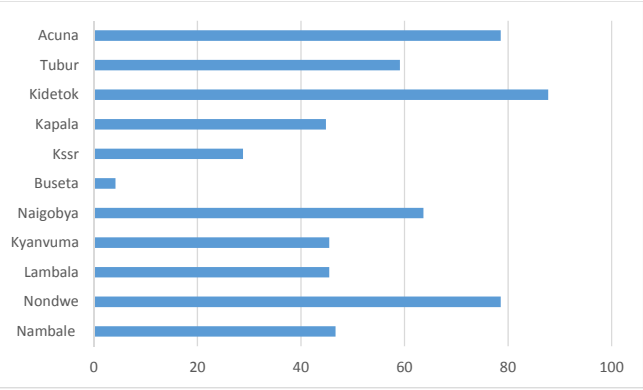
Water consumption differs very little in the dry and the rainy season with average consumption in the rainy season exceeding consumption in the dry season by only about 2.8 litres per person per day. The most frequently named per capita consumption is 20 litres per day and this remains the same in the dry and the rainy seasons.

3.1.4 Water sellers

3.1.4a Existence and use of water sellers.

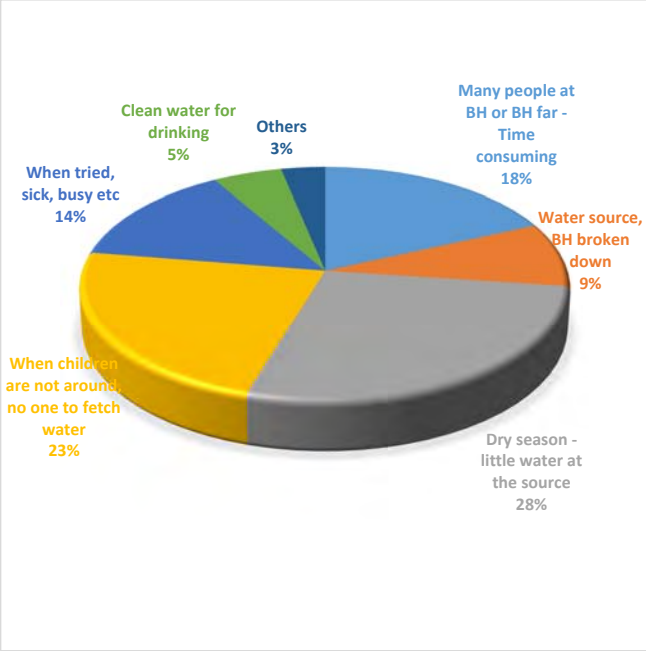
Water sellers are an important part of the water supply arrangement is all urban areas. In most cases they run their businesses using bicycles or hand carts which they use to deliver water to various homes where they are paid by the jerry can. When asked whether they had bought water from water sellers, 52.3% of the respondents said that they had done so while 47.7% said that they had not done so. When analysed by RGC it was noted that people who have bought from water sellers (as a proportion of the sample) are more heavily present in Kidetok, Nondwe and Acuna RGCs and absent or minimally present in Buseta and Kasasira RGCs. This is demonstrated in table figure 3.1-20 below.

Figure 3.1-20 Water sellers in different RGCs



The reasons for buying water from water sellers were also investigated. The reasons given by respondents are summarised in figure 3.1-21 below.

Figure 3.1-21 Reasons for buying water



The main reasons given for buying water were "Dry Season" 28%, Children away" 23% and "Many people at the borehole" 18 % .

While the reasons above are valid, water stressed locations tend to have more water sellers than those where access to water is easier. However the presence of water sellers may also point to relative affluence of the community with more affluent communities able to afford the services of water sellers while poorer communities will be less able to afford the services of water sellers.

3.1.4b Frequency of buying water in the last year?

For those who reported buying water, the average number of times they bought water in the last year was 77.5. This comes to about 6 or 7 time a month. Some people reported to have bought water some 500 times in the previous year this translated to between 1 and 2 jerry cans a day. The person who reported buying the least amount of water is in Kameke RGC while the one who reported the most jerry cans is in Naigobya RGC

The number of jerry cans bought at a single time ranged from 1 to 12. While the price per jerry can ranged from Shs 30 to Shs 500 with an average of Shs 263. Again here, the lowest reported was in Nondwe RGC while the highest was in Acuna RGC.

TABLE 3.1-26A BUYING WATER FROM WATER SELLERS – RGC WIDE

	Min	Max	Mean	Mode
Times bought water	0	500	77.5	20
No of jerry cans	0	12	3.5	2
Pay per jerry can	30	500	263.0	200

While water sellers thrive in water scarce areas, it is not likely that the construction of the new water facilities will eliminate the business opportunities of water seller. First, the proposed water supply systems will not use house connections. Therefore people will still need to get the water from the various points to the houses. Secondly the population and business operations in the RGCs are likely to grow and so is the population and this will create additional demand for the services of the water sellers. The RGC wise data on water sellers is presented in table 3.1-26b series below.

TABLE 3.1-26B SERIES - BUYING WATER FROM WATER SELLERS – RGC WISE

	Acuna				Tubur				Kidetok			
	Min	Max	Mean	Mode	Min	Max	Mean	Mode	Min	Max	Mean	Mode
Times bought water	20	120	55.0	-	5	300	75.5	50	2	360	65.7	20
No of jerry cans	2	4	3.3	4	2	12	4.8	5	1	12	4.2	4
Pay per jerry can	100	500	266.7	-	300	500	389.2	400	200	500	358.1	400

	Kapala				Kameke				Kasasira			
	Min	Max	Mean	Mode	Min	Max	Mean	Mode	Min	Max	Mean	Mode
Times bought water	3	240	40.2	20	1	300	58.6	60	2	360	58.1	6
No of jerry cans	3	6	4.1	4	2	5	3.3	3	2	6	3.1	2
Pay per jerry can	100	400	215.4	200	200	400	244.4	200	100	300	205.3	200

	Buseta				Naigobya				Kyanvuma			
	Min	Max	Mean	Mode	Min	Max	Mean	Mode	Min	Max	Mean	Mode
Times bought water	270	270	270.0	-	10	500	122.8	10	5	360	89.2	60
No of jerry cans	3	3	3.0	-	1	10	3.6	3	1	10	3.6	4
Pay per jerry can	200	200	200.0	-	200	300	221.4	200	200	400	220.0	200

	Lambala				Nondwe				Nambale			
	Min	Max	Mean	Mode	Min	Max	Mean	Mode	Min	Max	Mean	Mode
Times bought water	40	120	79.7	90	3	365	100.5	144	0	60	25.9	10
No of jerry cans	1	10	2.8	2	1	8	2.6	2	0	12	4.1	3
Pay per jerry can	100	500	280.0	300	30	500	227.8	200	200	300	221.4	200

3.1.4c Conclusion on water sellers

The buying of water is common enough in the survey area with 52.3% reporting that they have bought water from water sellers. The average number of jerry cans bough at one time is 3.5 while the average

price per jerry can is Shs 263. The practice of buying water is more prevalent in Kidetok (87.8%) followed by Nondwe (78.6%) RGCs and least prevalent in Buseta where (4.2%) RGC. Where the practice is more prevalent, it may be due to a greater water scarcity or perhaps relative affluence and where the practice is minimal it may be that there is good access to safe water or it may be that the people are relative less affluent or perhaps a measure of both. It is not likely that the establishment of the new water facilities will eliminate the business of water sellers. In fact it might promote it as they will have more reliable sources for safe water.

Water sources for washing and bathing.

TABLE 3.1-27A WATER SOURCES FOR WASHING OR BATHING - RGC WIDE

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %
Washing	79.2	13.4	9.3	12.5	44.0	0.5	1.5	0.0
Bathing	81.2	11.7	8.6	11.0	45.5	0.7	1.5	0.0

The sources of water for washing and bathing are summarised in the table above. The data for the respective RGCs is also presented in tables 3.1-27b series below. The source named by most respondents for washing is borehole at 79.2% followed by rain harvest at 44%. Both Shallow well and unprotected spring also feature well at 13.4% and 12.5% respectively. Note that in this question, people could give multiple answers thus all the people can report borehole leading to 100% score while at the same time they also use other sources leading to those sources also having a score.

The same pattern is observed with water for bathing with the percentages in the table above.

The least used sources for both bathing and washing are the “river/stream” and the “Dam/valley tank”. These are relatively unsafe water sources and are last resort sources in case one cannot get water from the more safe sources.

Bathing and washing are considered less risky to the user if unsafe water is used. However both uses are sensitive to turbidity and colour which may be the reason people still opt for the safe and clean BH water. The use of the new water source for both these functions will therefore depend on convenience and price. If the price of the new water sources is comparable to that at the BH then people will resort to the new sources for washing and bathing. Should the price be higher and locations more inconvenient, the likelihood is that people will continue with their current sources of water for bathing and washing.

TABLE 3.1-27B WATER SOURCES FOR WASHING OR BATHING - RGC WISE

Acuna

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %
Washing	100.00	0.00	0.00	20.00	13.33	0.00	0.00	0.00
Bathing	100.00	0.00	0.00	13.33	20.00	0.00	0.00	0.00

Tubur

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %

Washing	100.00	0.00	0.00	4.55	45.45	0.00	0.00	0.00
Bathing	100.00	0.00	0.00	4.55	45.45	0.00	0.00	0.00

Kidetok

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %
Washing	93.88	4.08	10.20	0.00	40.82	0.00	0.00	0.00
Bathing	93.88	4.08	12.24	0.00	40.82	0.00	0.00	0.00

Kapala

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %
Washing	82.76	37.93	3.45	0.00	34.48	0.00	0.00	0.00
Bathing	89.66	31.03	3.45	0.00	37.93	0.00	0.00	0.00

Kameke

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %
Washing	100.00	6.25	6.25	6.25	43.75	0.00	0.00	0.00
Bathing	100.00	6.25	6.25	6.25	43.75	0.00	0.00	0.00

Kasasira

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %
Washing	75.76	12.12	0.00	21.21	39.39	0.00	7.58	0.00
Bathing	80.30	10.61	0.00	18.18	39.39	0.00	7.58	0.00

Buseta

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %
Washing	87.50	4.17	4.17	0.00	41.67	0.00	0.00	0.00
Bathing	95.83	0.00	0.00	0.00	54.17	0.00	0.00	0.00

Naigobya

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %
Washing	95.45	0.00	0.00	22.73	68.18	0.00	4.55	0.00
Bathing	95.45	0.00	0.00	18.18	59.09	4.55	4.55	0.00

Kyanvuma

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %
Washing	93.18	6.82	20.45	0.00	61.36	0.00	0.00	0.00
Bathing	90.91	6.82	18.18	0.00	63.64	0.00	0.00	0.00

Lambala

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %
Washing	50.00	54.55	0.00	4.55	54.55	4.55	0.00	0.00
Bathing	50.00	50.00	0.00	4.55	54.55	4.55	0.00	0.00

Nondwe

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %
Washing	47.14	21.43	15.71	35.71	48.57	0.00	0.00	0.00
Bathing	48.57	20.00	17.14	32.86	51.43	0.00	0.00	0.00

Nambale

	BH %	Shallow Water %	Protected spring %	Unprotected spring %	Rain harvest %	Dam/valley tank %	River/Stream %	Other %
Washing	80.00	6.67	33.33	3.33	23.33	3.33	0.00	0.00
Bathing	83.33	3.33	23.33	3.33	23.33	3.33	0.00	0.00

3.1.5 Water and Health

3.1.5a Water Bourne Diseases in the Household

Prevalence of water borne diseases.

Table 3.1-28a below summarises the information on the prevalence of water borne diseases while tables 3.1-26b series present the data from the respective RGCs. Data shows that the disease mentioned as 'very common' most times is fever 61.4% and this is followed by "others" at 33.3% and then "diarrhoea" at 7.3%. Fever is a common symptom for many diseases, however it is most commonly associated with malaria.

Among the diseases named as 'common' are Diarrhoea" 39.9%, "Fever" 28.4% and "Respiratory disease" 26.7%.

TABLE 3.1-28A PREVALENCE OF WATER BORNE DISEASES – RGC WIDE

Diseases	Very common %	Common %	Rare %	Very rare %
Fever	61.4	28.4	7.8	2.4
Diarrhoea	7.3	39.9	31.1	21.8
Skin Disease	0.7	16.7	27.7	54.9
Respiratory disease	2.2	26.7	20.8	50.4
Worms	3.7	31.1	25.2	40.1
Eye disease/infection	1.0	10.5	17.6	70.8
Others	33.3	38.7	22.7	5.3

Among the least common, the highest percentage is scored by respiratory diseases and eye diseases. While fever may be a general symptom for many diseases including malaria, diarrhoea is closely related to unsafe water. The fact that these diseases are pointed out as common means that there are frequent

opportunities for transmission of these diseases via contaminated water and it is important that people get access to safe water.

It can therefore be concluded that improving access to safe water will reduce the incidence of these diseases and their debilitating effects and enhance families' livelihoods and incomes.

TABLE 3.1-28B SERIES - PREVALENCE OF WATER BORNE DISEASES – RGC WISE

Tubur

Diseases	Very common %	Common %	Rare %	Very rare %
Fever	59.1	40.9	0.0	0.0
Diarrhoea	9.1	36.4	36.4	18.2
Skin Disease	0.0	9.1	27.3	63.6
Respiratory disease	0.0	27.3	31.8	40.9
Worms	9.1	40.9	22.7	27.3
Eye disease/infection	4.5	0.0	18.2	77.3
Others	33.3	0.0	33.3	33.3

Kidetok

Diseases	Very common %	Common %	Rare %	Very rare %
Fever	57.1	32.7	10.2	0.0
Diarrhoea	10.2	44.9	28.6	16.3
Skin Disease	0.0	10.2	24.5	65.3
Respiratory disease	2.0	32.7	22.4	42.9
Worms	2.0	34.7	30.6	32.7
Eye disease/infection	0.0	6.1	14.3	79.6
Others	35.7	57.1	0.0	7.1

Kapala

Diseases	Very common %	Common %	Rare %	Very rare %
Fever	65.5	34.5	0.0	0.0
Diarrhoea	3.4	44.8	34.5	17.2
Skin Disease	3.4	17.2	20.7	58.6
Respiratory disease	3.4	27.6	17.2	51.7
Worms	0.0	34.5	20.7	44.8
Eye disease/infection	0.0	6.9	17.2	75.9
Others	44.4	44.4	0.0	11.1

Kameke

Diseases	Very common %	Common %	Rare %	Very rare %
Fever	62.5	12.5	25.0	0.0
Diarrhoea	6.3	37.5	18.8	37.5
Skin Disease	0.0	31.3	25.0	43.8
Respiratory disease	0.0	25.0	12.5	62.5
Worms	0.0	31.3	25.0	43.8
Eye disease/infection	0.0	6.3	18.8	75.0
Others	20.0	0.0	80.0	0.0

Kasasira

Diseases	Very common %	Common %	Rare %	Very rare %
Fever	62.1	31.8	6.1	0.0
Diarrhoea	4.5	45.5	36.4	13.6
Skin Disease	1.5	24.2	25.8	48.5

Respiratory disease	4.5	43.9	9.1	42.4
Worms	3.0	25.8	27.3	43.9
Eye disease/infection	0.0	21.2	7.6	71.2
Others	50.0	35.7	14.3	0.0

Buseta

Diseases	Very common %	Common %	Rare %	Very rare %
Fever	66.7	20.8	12.5	0.0
Diarrhoea	8.3	29.2	41.7	20.8
Skin Disease	0.0	4.2	25.0	70.8
Respiratory disease	0.0	12.5	16.7	70.8
Worms	0.0	33.3	29.2	37.5
Eye disease/infection	0.0	0.0	29.2	70.8
Others	40.0	20.0	40.0	0.0

Naigobya

Diseases	Very common %	Common %	Rare %	Very rare %
Fever	63.6	27.3	9.1	0.0
Diarrhoea	9.1	31.8	27.3	31.8
Skin Disease	0.0	18.2	22.7	54.5
Respiratory disease	0.0	13.6	22.7	63.6
Worms	9.1	18.2	18.2	54.5
Eye disease/infection	0.0	9.1	27.3	63.6
Others	0.0	66.7	0.0	33.3

Kyanvuma

Diseases	Very common %	Common %	Rare %	Very rare %
Fever	63.6	22.7	4.5	9.1
Diarrhoea	0.0	38.6	29.5	31.8
Skin Disease	2.3	6.8	18.2	72.7
Respiratory disease	0.0	20.5	25.0	54.5
Worms	4.5	25.0	18.2	52.3
Eye disease/infection	0.0	11.4	6.8	81.8
Others	14.3	42.9	28.6	14.3

Lambala

Diseases	Very common %	Common %	Rare %	Very rare %
Fever	54.5	31.8	4.5	9.1
Diarrhoea	9.1	31.8	22.7	36.4
Skin Disease	0.0	4.5	36.4	59.1
Respiratory disease	0.0	36.4	22.7	40.9
Worms	0.0	27.3	18.2	54.5
Eye disease/infection	0.0	9.1	13.6	77.3
Others	66.7	0.0	33.3	0.0

Nondwe

Diseases	Very common %	Common %	Rare %	Very rare %
Fever	67.1	18.6	8.6	5.7
Diarrhoea	8.6	42.9	28.6	20.0
Skin Disease	0.0	17.1	34.3	48.6
Respiratory disease	1.4	20.0	28.6	50.0
Worms	4.3	35.7	25.7	34.3
Eye disease/infection	1.4	10.0	27.1	60.0

Others	0.0	50.0	50.0	0.0

Nambale – prevalence of water borne diseases

Diseases	Very common %	Common %	Rare %	Very rare %
Fever	50.0	36.7	13.3	0.0
Diarrhoea	10.0	26.7	43.3	20.0
Skin Disease	0.0	36.7	26.7	36.7
Respiratory disease	3.3	10.0	23.3	63.3
Worms	3.3	30.0	33.3	33.3
Eye disease/infection	3.3	20.0	23.3	53.3
Others	0.0	50.0	50.0	0.0

Main cause of diseases.

Unsafe water was most highly associated with Diarrhoea. This association is accurate scientifically and shows a high level of awareness of the relationship between the diseases and unsafe water. Fever was also highly associated with mosquitoes and this correlation is accurate as well.

TABLE 3.1-29 MAIN CAUSE OF DISEASES

Disease	Cause 1	Frequency	Cause 2	Frequency	Cause 3	Frequency
Fever	Mosquitoes or Mosquito bites	335	Dirty or unsafe water	33	Others	7
Diarrhea	Unsafe, dirty, bad water	176	Dirty environment, Poor sanitation at home	47	Contaminated, dirty food	89
Skin Disease	Contact with infected person or Sharing clothes	39	Unsafe or Contaminated water	97	Work done e.g. Rice growing, grazing etc.	6
Respiratory diseases	Contaminated water and food	30	Malaria	39	Smoking (cigarettes)	7
Worms	Using dirty, Contaminated or Unsafe water	123	Eating contaminated food, fruits	67	Poor personal hygiene and sanitation	30
Eye disease/infection	Smoke, dust, contaminated air	186	Using dirty or contaminated water	22	Flies	4

While these figures may not give an indication of the absolute levels of accurate information in the communities, they give an indication that people are in general aware about the relationship between unsafe water and unhygienic practices with sickness and are likely therefore to appreciate and value safe water. Moreover with this level of awareness, the introduction of safe water will lead to improvements in health and hygiene.

But there were some strange associations as well. For instance the people associated respiratory diseases with malaria

Remedies for diseases

Table 3.1-30 below shows the most frequently named remedies in connection with the water borne diseases in the survey area.

When the remedies to the various diseases are examined, it is clear that the first line remedy for almost all diseases is to seek medication from a health facility. However coming a close second for most diseases

is the preventive measures which include the use of mosquito nets for malaria, and safe water and good hygiene practices. This level of awareness of the fact that use of safe water and hygienic practices will reduce the incidence of diseases means that improving access to safe water will quickly lead to benefits in health and welfare. Moreover it also means that with a premium on safe water, there will be motivation for effective O and M including the regular payment of user fees.

TABLE 3.1-30 REMEDIES TO DISEASES.

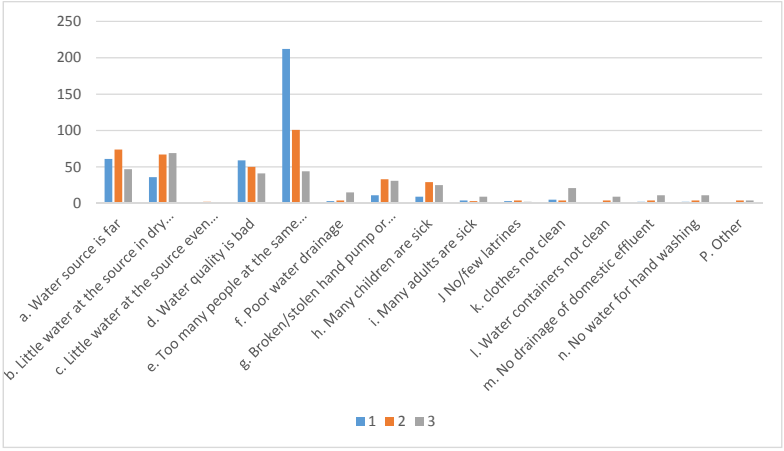
Disease	Remedy 1	Frequency	Remedy 2	Frequency	Remedy 3	Frequency
Fever	Go to hospital or buy medicine	192	Sleep under mosquito net	181	Clear compound of grass or Stagnant water	14
Diarrhea	Go to hospital or health centre	71	Buy or take medicine	99	Use safe or treated water	99
Skin Disease	Go to hospital or Clinic	85	Buy medicine or smear with Creams	58	Improve personal and general hygiene	114
Respiratory diseases	Go to hospital or Health centre	120	Buy or use medicine	67	Use safe, clean, treated water	29
Worms	Go to health centre, Hospital or Clinic	42	Buy medicine and Deworm	79	Avoid contaminated, uncooked, raw foods or fruits	187
Eye disease/infection	Go to health centre, clinic or hospital	75	Buy, use medicine or eye drops	64	Wash face and eyes regularly with soap	111

3.1.5b Water and Health Problems in the HH

This study sought to establish the most felt water and health problem in the HHs. Overall the problem that most people gave the highest priority is “too many people at the same water source”. The problem that was named most frequently in the second priority is “water source is too far”. The pattern of ranking was generally similar in almost all the RGCs.

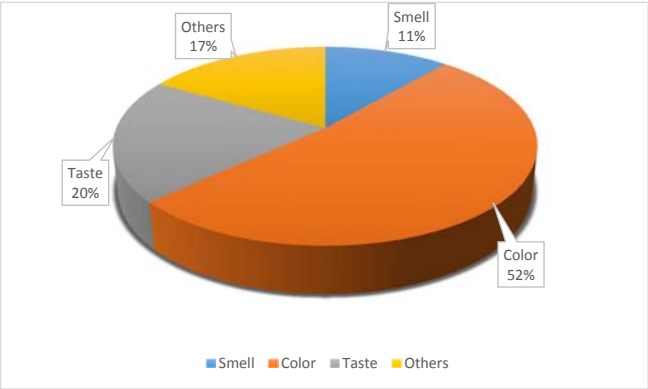
The graph below shows the ranking of the frequency with which specific problems were named at the different priorities in the study area. It can be seen that the problem “Water source is too far” also has a high number of mentions in priority 2.

Figure 3.1-22 problems with HH water supply



Where the respondents indicated that the water quality is bad, the study sought to understand what they meant by bad. Figure 3.1-23 below shows the relative priority of each of the water problems based on the number of people who mentioned it.

Figure 3.1-23 Problem with water quality

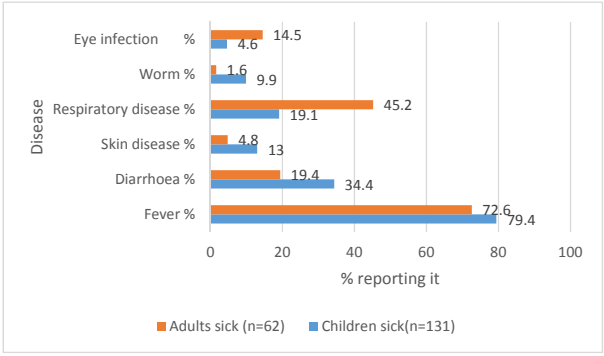


"Colour" was named at the top problem. This was followed by "taste 20% and then "othes"-17% Smell was mentioned the fewest times at 11%. (Smell is usually associated with brackish water. Members of the study team examined one such a borehole in Lambala RGC and noted that although the water had been proved fit for human consumption, its smell and taste were really bad. Sparkling particles in water are usually associated with silica which should not be a problem except in cases where the development of the borehole was faulty or where there has been a caving in.) Among the other problems mentioned are visible living organisms and algae as well as the fact that the water is hard – does not foam easily.

3.1.5c Details on sickness of children and adults

Where the problem of "Children are sick" was named, the study sought to find out the maladies that the respondent were talking about. Figure 3.1-24 below show the sicknesses that were named and their priority based on the number of times that they were named.

Figure 3.1-24 Sicknesses of children and adults.



It can be seen from the graph that with respect to children, fever is the most pressing sickness followed by skin diseases. As noted before, while fever is a symptom for many different diseases, in Uganda it is mostly associated with Malaria. Both malaria and skin diseases are linked to water although the more direct link to dirty water is with skin disease.

Unlike with children where diarrhoea then features as the second most significant sickness, the second most significant disease for adults is respiratory disease. Eye infections and respiratory diseases are prominent among adults while fever, diarrhoea, skin diseases and worms are more prominent among children. Diarrhoea and worms are frequent in conditions of unsafe water combined with ignorance, paving the way for transmission. This may explain why they are more prevalent among children who are more ignorant about their transmission than adults.

3.1.5d Purchase of medicine and receiving treatment

Responses in this study indicated that the main reaction to all sicknesses is going to hospital or taking medicine. While this trend is positive, the guidelines from the ministry of health may differ from disease to disease. For fever, self-medication with recommended malaria drugs is recommended especially where hospitals are far. For diarrhoea, self-medication is recommended as a first aid but treatment should be at a hospital or a medical facility. Thus for some ailments, self-medication may not be a recommended practice.

Respondents reported that they bought medicine an average of 44 times in the last year. This comes to between three times to four times a month. Respondents also reported that they received medical treatment an average of 10.6 times. This is about once a month. Both indicate a fairly high level of frequency of ailments. Although such ailments may be small, given that the most frequently named diseases are fever and diarrhoea/respiratory infections, it appears that a lot of time may be lost in debilitation and health seeking for the residents.

TABLE 3.1-31A PURCHASE OF MEDICINE AND RECEIVING TREATMENT IN LAST YEAR – RGC WIDE

	Min	Max	Mean	mode
Times bought medicine	0	720	44.4	20
Times received treatment	0	14	10.6	10

TABLE 3.1-31B PURCHASE OF MEDICINE AND RECEIVING TREATMENT IN LAST YEAR – RGC WISE

	Acuna				Tubur				Kidetok			
	Min	Max	Mean	mode	**Min**	**Max**	**Mean**	**mode**	**Min**	**Max**	**Mean**	**mode**
Times bought medicine	10	120	36.60	30	5	120	34.36	15	0	84	28.67	20
Times received treatment	2	18	6.60	3	0	28	10.09	10	0	72	9.98	5

	Kapala				Kameke				Kasasira			
	Min	**Max**	**Mean**	**mode**	**Min**	**Max**	**Mean**	**mode**	**Min**	**Max**	**Mean**	**mode**
Times bought medicine	0	99	36.28	20	3	100	26.38	30	0	720	56.45	10
Times received treatment	1	70	12.14	3	0	25	8.44	10	0	144	8.55	0

	Buseta				Naigobya				Kyanvuma			
	Min	**Max**	**Mean**	**mode**	**Min**	**Max**	**Mean**	**mode**	**Min**	**Max**	**Mean**	**mode**
Times bought medicine	3	120	27.83	10	2	192	43.36	20	1	360	68.73	20
Times received treatment	0	48	9.50	3	0	20	4.77	0	0	96	10.25	4

	Lambala				Nondwe				Nambale			
	Min	**Max**	**Mean**	**mode**	**Min**	**Max**	**Mean**	**mode**	**Min**	**Max**	**Mean**	**mode**
Times bought medicine	6	100	37.29	20	3	300	57.28	20	0	90	27.67	20
Times received treatment	0	90	13.09	10	0	90	13.06	3	0	60	15.63	10

3.1.5e Conclusion on water and health problems of the household.

The biggest water problem for households is "too many people use the same source" This speaks to the congestion at the water sources in particular the boreholes which are the source used by most of the respondents. "Water source is too far" and "water quality is bad" also featured fairly prominently.

With regard to quality mentioned above, the biggest problem is colour, while the least is smell.

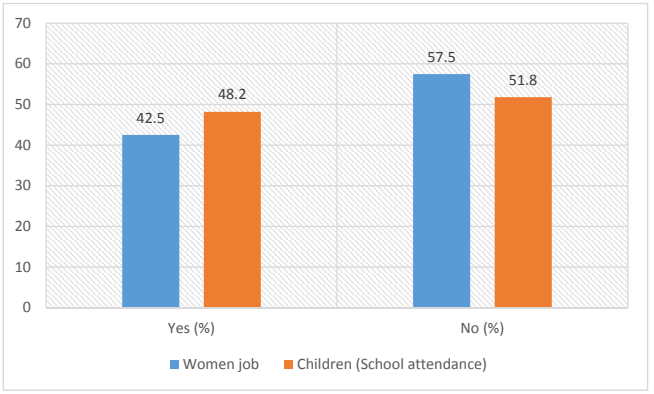
The most prevalent sickness among adults and children is fever, but the second most prominent for adults is respiratory infections while for children it is diarrhoea.

In reaction to sickness, respondents reported that they bought medicine about 3 times a month and they received treatment about once a month in the previous year. This is a high frequency and may be associated with limited safe water supplies. This frequency of sickness will potentially affect production, productivity, income generation and livelihood.

3.1.6 Effects of water fetching

Figure 3.1-25 below compares the people who agree that water fetching has an impact on women and children and those who do not.

Figure 3.1- 25 Effects of water fetching.



The 42.5% feel that water fetching has adverse effects on job opportunities for women while 48.2% feel that it has adverse effects on school attendance for children. Though slightly less than a half of the respondents, the proportion which agrees is significant and shows that taken together as a region, the impact could be big in terms of both household welfare and school performance for children. Table 3.1-32a below shows the adverse effects as presented by the respondents.

A range of impacts on children's school attendance were mentioned. Most of the people felt that water fetching leads children to get to school late thus losing valuable time. For women, the same effect of getting late to work was named most frequently. Other impacts named in relation to women included limited time for the work at home. The impact, both for women and children are shown in the tables 3.1-32a and 3.1-32b below. Most of these effects stem from the fact the women and girls, followed by boys fetch water most and spend considerable amount of time doing the same.

Effects on job opportunity for women

TABLE 3.1-32A ADVERSE EFFECTS OF WATER FETCHING ON JOB OPPORTUNITY OF WOMEN (N=174) RGC WIDE

Item (effect)	Frequency	Percentage
Reporting late for work, opening business late	43	25.0
Loss of customer or business while fetching water	45	26.2
Other work suffers due to time spent collecting water	12	7.0
Carrying water affects a woman's health	8	4.7
Takes time for other domestic work	64	37.2
Total	**172**	**100**

TABLE 3.1-32B ADVERSE EFFECTS OF WATER FETCHING ON JOB OPPORTUNITY OF WOMEN - RGC WISE

	Acuna		**Tubur**	
Item (effect)	Frequency	Percentage	Frequency	Percentage
Reporting late for work, opening business late	0	0.0	3	30.0
Loss of customer or business while fetching water	2	28.6	6	60.0
Other work suffers due to time spent collecting water	0	0.0	0	0.0

Carrying water affects a woman's health	0	0.0	1	10.0
Takes time for other domestic work	5	71.4	0	0.0
Total	**7**	**100**	**10**	**100**

	Kidetok		**Kapala**	
Item (effect)	Frequency	Percentage	Frequency	Percentage
Reporting late for work, opening business late	10	34.5	6	42.9
Loss of customer or business while fetching water	11	37.9	3	21.4
Other work suffers due to time spent collecting water	2	6.9	0	0.0
Carrying water affects a woman's health	1	3.4	0	0.0
Takes time for other domestic work	5	17.2	5	35.7
Total	**29**	**100**	**14**	**100**

	Kameke		**Kasasira**	
Item (effect)	Frequency	Percentage	Frequency	Percentage
Reporting late for work, opening business late	4	40.0	8	26.7
Loss of customer or business while fetching water	1	10.0	8	26.7
Other work suffers due to time spent collecting water	0	0.0	3	10.0
Carrying water affects a woman's health	1	10.0	3	10.0
Takes time for other domestic work	4	40.0	8	26.7
Total	**10**	**100**	**30**	**100**

	Buseta		**Naigobya**	
Item (effect)	Frequency	Percentage	Frequency	Percentage
Reporting late for work, opening business late	1	14.3	1	20.0
Loss of customer or business while fetching water	1	14.3	3	60.0
Other work suffers due to time spent collecting water	0	0.0	1	20.0
Carrying water affects a woman's health	0	0.0	0	0.0
Takes time for other domestic work	5	71.4	0	0.0
Total	**7**	**100**	**5**	**100**

	Kyanvuma		**Lambala**	
Item (effect)	Frequency	Percentage	Frequency	Percentage
Reporting late for work, opening business late	4	28.6	1	25.0
Loss of customer or business while fetching water	4	28.6	0	0.0
Other work suffers due to time spent collecting water	2	14.3	0	0.0
Carrying water affects a woman's health	0	0.0	0	0.0
Takes time for other domestic work	4	28.6	3	75.0
Total	**14**	**100**	**4**	**100**

Water fetching on job opportunity of women	**Nondwe**		**Nambale**	
Item (effect)	Frequency	Percentage	Frequency	Percentage
Reporting late for work, opening business late	1	3.8	4	30.8
Loss of customer or business while fetching water	3	11.5	0	0.0
Other work suffers due to time spent collecting water	2	7.7	2	15.4
Carrying water affects a woman's health	1	3.8	1	7.7
Takes time for other domestic work	19	73.1	6	46.2
Total	**26**	**100**	**13**	**100**

Effects on school attendance for children

Besides the main responses included in the table below for children, parents also mentioned that children often have to walk to school in dirty uniforms due to the fact that they get wet and muddy when they go to fetch water in the morning.

TABLE 3.1-33A. ADVERSE EFFECT OF WATER FETCHING ON SCHOOL ATTENDANCE FOR CHILDREN (N=195)

Item (effect)	**Frequency**	**Percentage**
Reach school late or miss some lessons	165	84.6
Poor attendance, can't focus due to fatigue	11	5.6
They get seduced at water source resulting into early pregnancy	4	2.1
Poor performance in class due to poor attendance	15	7.7
Total	**195**	**100**

This attracts ridicule on them. Children fail to do their homework due to delaying at the water source and sometimes sheer fatigue after carrying jerry cans of water. Cases were mentioned where children were noted to deliberately delay at school so as to avoid the work of fetching water. Cases of poor health associated with carrying heavy jerry cans of water were also mentioned. Clearly the impact of fetching water on women and school going children is significant and the new water facilities have the potential to reduce these impacts and to improve the welfare of women and children in the target area.

TABLE 3.1-33B SERIES - ADVERSE EFFECT OF WATER FETCHING ON SCHOOL ATTENDANCE FOR CHILDREN – RGC WISE.

	Acuna		**Tubur**	
Item (effect)	Frequency	Percentage	Frequency	Percentage
Reach school late or miss some lessons	8	100.0	13	81.3
Poor attendance, can't focus due to fatigue	0	0.0	1	6.3
They get seduced at water source resulting into early pregnancy	0	0.0	0	0.0
Poor performance in class due to poor attendance	0	0.0	2	12.5
Total	**8**	**100**	**16**	**100**

	Kidetok		**Kapala**	
Item (effect)	Frequency	Percentage	Frequency	Percentage
Reach school late or miss some lessons	23	85.2	16	100.0
Poor attendance, can't focus due to fatigue	2	7.4	0	0.0
They get seduced at water source resulting into early pregnancy	0	0.0	0	0.0
Poor performance in class due to poor attendance	2	7.4	0	0.0
Total	**27**	**100**	**16**	**100**

	Kameke		**Kasasira**	
Item (effect)	Frequency	Percentage	Frequency	Percentage
Reach school late or miss some lessons	8	88.9	33	94.3
Poor attendance, can't focus due to fatigue	1	11.1	1	2.9
They get seduced at water source resulting into early pregnancy	0	0.0	0	0.0
Poor performance in class due to poor attendance	0	0.0	1	2.9
Total	**9**	**100**	**35**	**100**

	Buseta		Naigobya	
Item (effect)	Frequency	Percentage	Frequency	Percentage
Reach school late or miss some lessons	7	70.0	4	50.0
Poor attendance, can't focus due to fatigue	0	0.0	1	12.5
They get seduced at water source resulting into early pregnancy	0	0.0	2	25.0
Poor performance in class due to poor attendance	3	30.0	1	12.5
Total	**10**	**100**	**8**	**100**

	Kyanvuma		Lambala	
Item (effect)	Frequency	Percentage	Frequency	Percentage
Reach school late or miss some lessons	15	93.8	6	85.7
Poor attendance, can't focus due to fatigue	0	0.0	0	0.0
They get seduced at water source resulting into early pregnancy	0	0.0	0	0.0
Poor performance in class due to poor attendance	1	6.3	1	14.3
Total	**16**	**100**	**7**	**100**

Adverse Effect of water fetching on school attendance for children	Nondwe		Nambale	
Item (effect)	Frequency	Percentage	Frequency	Percentage
Reach school late or miss some lessons	15	62.5	17	89.5
Poor attendance, can't focus due to fatigue	5	20.8	0	0.0
They get seduced at water source resulting into early pregnancy	0	0.0	2	10.5
Poor performance in class due to poor attendance	4	16.7	0	0.0
Total	**24**	**100**	**19**	**100**

3.1.7 Income and Expenditure of Households

3.1.7a Formal Employment Income

This study also sought to establish the level of formal employment among the different members of the households, both men and women in the RGCs. Overall the responses show that more men report formal employment than women. In most of the wage employment the reason for the predominance of men are both domestic and work place based. At home men prefer that their spouses stay at home to look after the home and the children and even take care of the garden, animals and children – what one could call the home economy. This study has already revealed that female household members are charged with domestic chores and just a handful of them (13.7%) work for wages or salaries. Besides, the low literacy rate of women also negates their quest for formal employment compared to men. It is not surprising therefore that outside the domestic chores, many women are engaged in farming. At work, men tend to be more reliable due to the fact that they have no child bearing duties. Moreover being the head of the family, the man can report on time and even leave after time if work demands since he does not have to answer to anyone about this. Table 3.1-34 below shows the HH members that are in formal employment.

TABLE 3.1-34 HH MEMBERS IN SALARIED/WAGE EMPLOYMENT

Salary/wage earner	Times mentioned	Yearly wage		
		Min	Max	Average n=116
Father	90	360,000	22,840,000	5,098,066
Mother	43			
Daughter	8			
Son	6			

The majority of HH members in salaried employment are men. In fact the number of men –including the sons nearly doubles that of women. It is now widely believed that women's income has a greater

effect on HH welfare per unit for income than men (Jane Hopkins 1994). However it is encouraging to note that the number of daughters exceeds that of sons which may point to a trend where more women will be in salaried employment in the next ten years.

A small proportion of these, i.e. 15.6 % of all the women that report formal employment are named as daughters. This is understandable since the norm is that by the time girls start formal employment, they are also ready to set up homes of their own.

The incomes from this employment varied from a minimum of Shs 360,000 per year to a maximum of Shs 22,840,000 per year.

TABLE 3.1-35 DETAILS ON WAGE/SALARY EMPLOYMENT HH

No of salaried members	Count	% of all HH	Total income	Average income per HH
0	285	71.6	-	-
1	87	21.3	350,808,600	4,032,283
2	28	6.6	31,800,000	1,177,778
3	2	0.5	31,800,000	15,900,000

A total of 116 HH or 28.6% reported having one or more members in wage employment. Table 3.1-35 shows some details on HH which reported someone in wage employment. From the table is can be seen that the majority of HH in the sample have no one in wage employment. It can also be see that the total wage income increases with the number of people in wage employment with the average for HH with a single employed members being Shs 4,032,283 while the average for HH with three employed members is Shs 15,900,000.

3.1.7b Contribution of wage income to total HH income

When the proportion that wage income contributes to HH income is analysed, the results show that where household have both wage and non-wage income, wage income tends to contribute a higher proportion to the HH income. This is illustrated in the table below

TABLE 3.1-36 CONTRIBUTION OF WAGE INCOME TO HH INCOME.

	Wage income	Non-wage income	Total income from salary and sale of items
Min	360,000	20,000	-
Maximum	22,840,000	24,000,000	24,000,000
Average	5,098,066	2,960,621	4,232,798
Mode	4,800,000	1,800,000	1,200,000

All homes that reported wage and salary income also reported earning income from the production and sale of items. However the majority of HH earn their income entirely from the production and sale of items.

Analysis was undertaken to establish if women headed HHs fare worse in terms of income in comparison with HH with both man and woman. The analysis shows that the average income of female headed HH is 2,616,364 which is slightly over half of the average income of the typical HH with both man and woman. By implication, the welfare of residents of female headed HHs is likely to be at a lower level than that in HH that have both spouses.

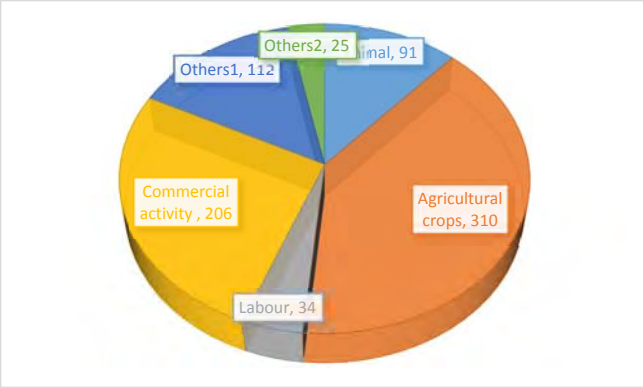
3.1.7c Production and selling of items

Significance of different sources

Analysis of the different sources of income indicates that most people reported the selling of agricultural crops as a source of income. This was followed by the "selling of animals" which was mentioned as many times as "commercial activity". The source mentioned least was selling of labour.

When the production and selling of different items is examined by gender, data shows that the income of women is much less than that of men when it comes to the sale of animals and agricultural crops by almost 50%. However the average income of women from the sale of labour is higher than that of men by about 200% with the average income for women being 1,644,100 while that of men from the same source is at 561,100. Average income from commercial activity is nearly the same for both men and women.

Figure 3.1- 26 HH involved in different activities for income generation



The average income of HH members from production and selling of items was UShs 2,960,698 = (excluding those who did not report any income from this source at all). A comparison of the average income from the production and sale of items with income from wage employment shows that wage employment has a higher average annual income Shs 5,054,492 =, than production and sale of items. However only 117 respondents out of the 409 reported any income from wage employment.

TABLE 3.1-37 COMPARISON OF INCOMES OF WAGE EARNERS AND THOSE WHO PRODUCE AND SELL ITEMS

	Wage	Produce sales
Min	360,000	20,000
Max	22,840,000	24,000,000
Average	5,098,066	2,960,698
	n-116	n-385

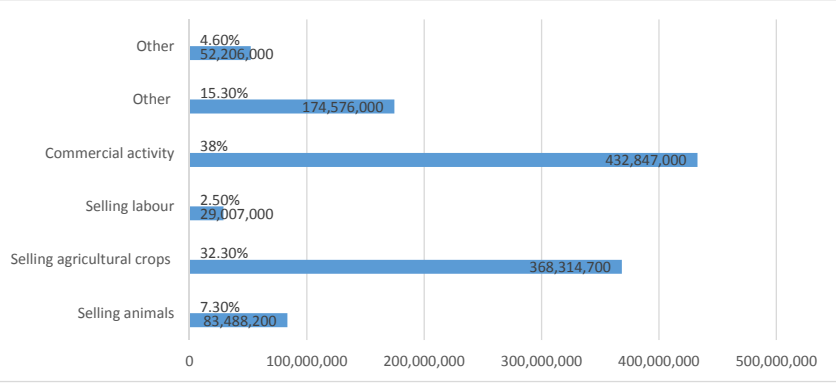
Thus while more people are earning from production and sale of items, the average income of people involved in wage employment is higher by about Shs 2,093,794 or 70.7 % of the average income of those who report sale of produce.

TABLE 3.1-38 COMPARISON OF AVERAGE INCOME FROM SALE OF DIFFERENT ITEMS PRODUCED.

Income from other activities	Annual selling and production income		
	Min	Max	Mean
Animal	40,000	12,000,000	204,128
Agricultural crops	16,000	24,000,000	900,525
Labour	45,000	14,400,000	70,922
Commercial activity	25,000	18,000,000	1,058,306
Other 1	20,000	14,400,000	426,836
Other 2	84,000	21,600,000	127,643

The items that appears to be bringing in the highest income is "commercial activity" which is mostly trading and conducting businesses of different kinds. Commercial activity had the advantage of not being subject to conditions such as the weather and the cycles of dry and wet season. These are a major cause of fluctuation of incomes with harvest season being a time of selling and getting income and planting seasons being one of financial scarcity since there is nothing to sell to get money. The contribution of the different items is shown graphically in figure 3.1-27 below.

Figure 3.1- 27 Production and sale of items – contribution of different sources



One of the categories under production and sale of items is "others". The main items mentioned in this category are listed in table 3.1-38 below.

TABLE 3.1-39 ACTIVITIES MENTIONED IN "OTHERS"

Others 1	Frequency	Others 2	Frequency
Technical or Mechanical work	16	Fishing	1
Renting or Real Estate	18	Pension earner	1
Professional services	11	Renting	5
Others	5	Stone quarrying	1

The item mentioned most frequently is renting or real estate followed by mechanical worker.

Household member in charge

Examination of the HH member in charge shows that for most of the activity, it is the father/husband or man that is in charge. The mother comes second in all the activities except "other". Just like in wage income therefore, most of the income from the production and sale of items is generated by the man. One of the reasons for this is that in all the communities surveyed, the man is often the one who controls the land and therefore has a say on what is produced and how it is sold. However, it should also be noted that there is a division of roles in homes which lays the responsibility of providing for the family squarely on the man and this may provide an impetus for the man to manage most of the cultivation and production with the other members of the family technically "providing labour".

When the gap between the man and the woman is examined. It can be seen that it is smallest with commercial activities. This may point to the greater skill and prowess of women in business or it may be that this is the area where women have more freedom to control resources and earnings. Many women run small businesses near home from where they earn income to supplement that which comes from the sale of agricultural produce. But this cannot be discussed in isolation of the fact that women are supposed to accomplish most of the household chores including taking care of the young ones. Therefore by running small businesses near their homes, they are able to attend to all their domestic roles and also bring home extra income.

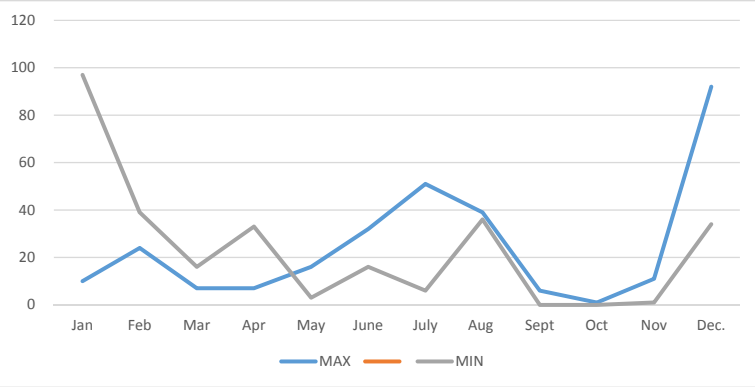
TABLE 3.1-40 HOUSEHOLD MEMBERS IN CHARGE

	Father %	Mother %	Son %	Daughter %	Father and mother %
Animals	73.6	17.6	0.0	0.0	8.8
Agricultural production	55.3	27.5	0.0	0.3	16.8
Labour	60.6	24.2	3.0	0.0	12.1
Commercial activity	52.9	39.3	0.5	1.9	4.4
Other 1	52.3	38.7	1.8	0.9	5.4
Other 2	40.0	48.0	4.0	0.0	4.0

3.1.7d Seasonality of incomes

Respondents were asked if there was a seasonality to incomes i.e. a time of low income and a time of high income in the course of the year. 75% indicated that there is a time of low income and a time of high income. An analysis of the low income times and high time seasons shows that the month that is reported by the majority as a high income month is December while the one reported most as a low income month January.

Figure 3.1- 28 Seasonality of incomes



July is also reported as high income month by a significant number of people while August is also reported by a significant number of people as a low income month. It is significant that the low income months are juxtaposed with the high income months though given the nature of agricultural crop sales, it may not be surprising. Once the crop for the season is sold, the next month may be completely without income. These are dictated by the rain cycle. Not surprisingly these periods coincide with the periods of high income and low income respectively.

3.1.7e Livestock in the HHs

An examination of the data on livestock shows that most HHs do not have pigs. On average, each HH has one cow and one goat and 6 fowl including chicken and ducks. This is not surprising as pigs are highly sensitive in communities where there are people of the Muslims faith – and the religious profile of the survey area as seen in section 3.1.1a shows that Muslims constitute a significant proportion of the population especially in Iganga district. Cows are also labour intensive if they have to be kept in confined spaces (zero grazing) as those available in a typical home in any of the RGCs. The most convenient to keep are the chicken and duck and the data shows that on average each HH has some 6 of them.

TABLE 3.1-41 LIVESTOCK IN THE HHS

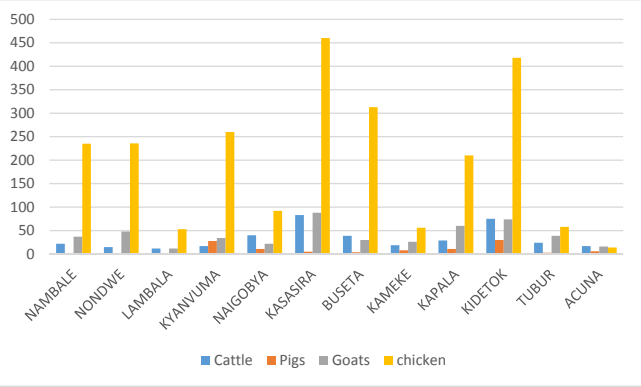
Livestock	Total	Min	Max	Mean
Cattle	392	0	30	1
Pigs	108	0	20	0.3
Goats	486	0	12	1
chicken	2,405	0	200	5.94

However, while fowl may be s source of income, most times, in setting such as those in the RGCs, they are kept for eating and not for sale. People who keep chicken and duck (fowl) for sale usually have 30 or more fowl. Table 3.1-42 and figure 3.1-29 below compare the livestock in the different RGCs and it can be seen from the table that when it comes to cows, Kasasira has the highest while Lambala has the fewest. Pigs are not existent in Nondwe and Lambala and Kidetok has the highest number of pigs. Kasasira also has the highest number of goats while Lambala has the fewest. In terms of total number of livestock, Kasasira has the highest number while Acuna and Lambala have the fewest.

TABLE 3.1-42 LIVESTOCK IN THE DIFFERENT RGCS

RGC	NAMBALE	NONDWE	LAMBALA	KYANVUMA	NAIGOBYA	KASASIRA	BUSETA	KAMEKE	KAPALA	KIDETOK	TUBUR	ACUNA
Cattle	22	15	12	17	40	83	39	19	29	75	24	17
Pigs	2	0	0	28	11	5	4	8	11	30	3	6
Goats	37	48	12	34	22	88	30	26	60	74	39	16
chicken	235	236	53	260	92	460	313	56	210	418	58	14

Figure 3.1- 29 Number of livestock in the different RGCs



3.1.3f Remittances to the HHs

Remittances to HH can be a major source of income for some homes. Remittances can be from relatives living in the city or those working in developed economies in Europe or America, who send back money periodically to take care of their relatives. Out of the 409 respondents, only 93 or 23.5% report receiving any remittances. The amount ranged from Shs 20,000 per year to Shs 11,400,000/= per year on the high side. Compared to the other sources of income namely wage income and sale of produce, remittances constitute a smaller proportion of the income of the HH in the survey area. Nevertheless they are not an insignificant source. The comparison of the proportions that each of the sources roughly contributes to HH is given in table 3.1-43 below.

TABLE 3.1-43 COMPARISON OF THE DIFFERENT SOURCES OF INCOME

	Wage	Produce sales	Remittances (annual)
Min	360,000	-	20,000
Max	22,840,000	24,000,000	11,400,000
Average	5,098,066	2,968,409	735,988
	n-115	n-384	n-96

3.1.7g Total annual incomes of HHs

The total annual incomes of HH ranges from a minimum of Shs 100,000 (USD 29.8) to a maximum of Shs 30,000,000/= (USD 8,955). The average total income for all respondents stands at UShs 4,448,072. (USD 1,327.7) This comes to USD 3.6 a day for a household. Note that the average HH size is 8 people in this study.

TABLE 3.1-44 TOTAL ANNUAL INCOME

Min	Max	Mean	Mode
100,000	30,000,000	4,448,072	1,800,000

According to the World Bank anyone living on less than USD1.90 a day is living in poverty. This threshold converts to a total annual income of Ushs 2,323,225 per person. Data shows that 184 HH or 44.9% receive less income than this threshold. Given an average of 8 people per household, a typical household would need USD 5,548 or Shs 18,585,800 annually just to meet the threshold above. Only 8 HH are earning enough to meet this criteria in the study area meaning that technically some 401HH or 92% are living in abject poverty.

Of course these hard statistics have to be interpreted with context in mind. Many people in semi urban setting live semi subsistence lives and money assumes a less significant role in their lives. Nevertheless with these levels of poverty the cost associated with accessing safe water needs to be kept as low as possible.

3.1.7h Role of mother or daughter in increasing income

The task of increasing household income is not exclusively tied on the shoulders of male members of the households alone. Directly or indirectly, women have contributed to the stability or increment in the incomes of many households. In this survey, 80.4% of the respondents pointed out that the mother and the daughter play part in increasing the income of the HH. What the mothers and daughters do to increase the HH income is summarised in table 3.1-44a below. The data relating to the respective RGCs is in table 3.1-45B series.

TABLE 3.1-45A WHAT MOTHERS AND DAUGHTERS DO TO INCREASE HH INCOME – RGC WIDE

(If mother or daughter has role in increasing income) the role	
Role	**%**
Farming and selling agricultural products or livestock	48.63
Earns salary in wage employment	8.51
Runs a personal business to earn money	41.64
Selling manual labour	0.61
Does domestic duties to allow man to focus on his paid work	0.91

TABLE 3.1-45B WHAT MOTHERS AND DAUGHTERS DO TO INCREASE HH INCOME – RGC WISE

(If mother or daughter has role in increasing income) the role	Acuna	Tubur	Kidetok	Kapala
Role	%	%	%	%
Farming and selling agricultural products or livestock	61.54	50.00	40.00	50.00
Earns salary in wage employment	0.00	15.00	13.33	7.69
Runs a personal business to earn money	38.46	35.00	46.67	42.31
Selling manual labour	0.00	0.00	0.00	0.00
Does domestic duties to allow man to focus on his paid work	0.00	0.00	0.00	0.00

(If mother or daughter has role in increasing income) the role	Kameke	Kasasira	Buseta	Naigobya
Role	**%**	**%**	**%**	**%**
Farming and selling agricultural products or livestock	73.33	50.00	57.89	50.00
Earns salary in wage employment	6.67	10.87	5.26	5.56
Runs a personal business to earn money	20.00	34.78	36.84	44.44
Selling manual labour	0.00	4.35	0.00	0.00
Does domestic duties to allow man to focus on his paid work	0.00	0.00	0.00	0.00

(If mother or daughter has role in increasing income) the role	Kyanvuma	Lambala	Nondwe	Nambale
Role	**%**	**%**	**%**	**%**
Farming and selling agricultural products or livestock	28.13	50.00	48.21	54.17
Earns salary in wage employment	6.25	6.25	3.57	16.67
Runs a personal business to earn money	59.38	43.75	46.43	29.17
Selling manual labour	0.00	0.00	0.00	0.00
Does domestic duties to allow man to focus on his paid work	6.25	0.00	1.79	

3.1.7i Expenditure of Households

Expenditure on various household needs

In figure 3.1-30 below, monthly and annual expenditure on various household needs is presented. From the graph it is evident that the highest expenditure item is education followed by food. The least expenditure is on charging the phone battery as well as on electricity. Water is one of the items where expenditure is quite small, in fact smaller than air time for the phone. However, it is notable that expenditure on sanitation is a little higher than that of water.

Figure 3.1- 30 Expenditure on various HH items

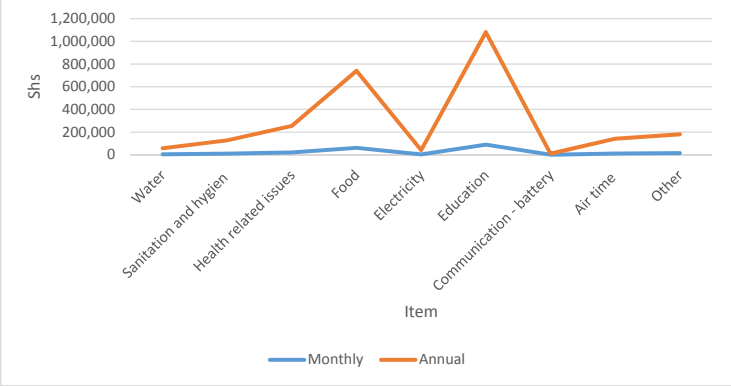


TABLE 3.1-46A EXPENDITURE ON WATER – RGC WIDE

	Monthly expenditure	Annual expenditure
Min	0	0
Max	120,000	1,440,000
Mean	4,793	57,512

Water is one of the basic items in life and it is essential for life. However as noted above the expenditure on water in the population surveyed is quite small. When compared to total annual expenditure, total expenditure on water amounts to just 2.1% of total annual expenditure. Data on expenditure for the individual RGCs is shown in table 3.1-46B series.

TABLE 3.1-46B EXPENDITURE ON WATER-RGC WISE

	Acuna		**Tubur**		**Kidetok**	
	Monthly expenditure	Annual expenditure	Monthly expenditure	Annual expenditure	Monthly expenditure	Annual expenditure
Min	0	0	0	0	0	0
Max	10,000	120,000	52,000	624,000	52,000	624,000
Mean	1,850	22,200	8,635	103,618	8,896	106,751

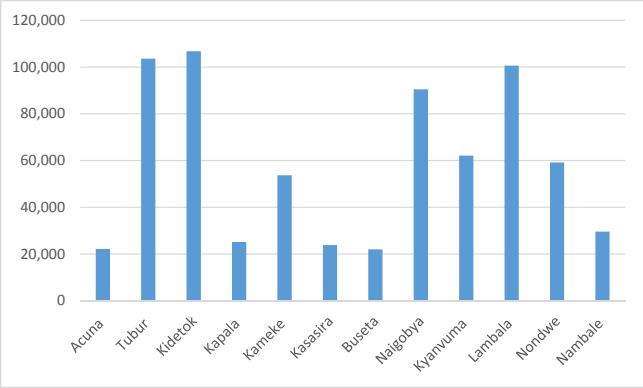
	Kapala		**Kameke**		**Kasasira**	
	Monthly expenditure	Annual expenditure	Monthly expenditure	Annual expenditure	Monthly expenditure	Annual expenditure
Min	0	0	0	0	0	0
Max	20,500	246,000	25,500	306,000	25,000	300,000
Mean	2,097	25,166	4,478	53,738	2,019	23,861

	Buseta		**Naigobya**		**Kyanvuma**	
	Monthly expenditure	Annual expenditure	Monthly expenditure	Annual expenditure	Monthly expenditure	Annual expenditure
Min	0	0	0	0	0	0
Max	14,500	174,000	45,000	540,000	52,000	624,000
Mean	1,833	22,000	7,542	90,500	5,177	62,127

	Lambala		**Nondwe**		**Nambale**	
	Monthly expenditure	Annual expenditure	Monthly expenditure	Annual expenditure	Monthly expenditure	Annual expenditure
Min	0	0	0	0	0	0
Max	120,000	1,440,000	24,208	290,496	9,500	114,000
Mean	8,389	100,664	4,931	59,176	2,464	29,564

To compare the expenditure on water in the different RGCs, the average annual expenditure is graphed in figure 3.1-31 below. From the graph it is evident that average annual expenditure on water is highest in the RGCs of Kidetok, Tubur, Lambala and Naigobya and lowest in Buseta and Acuna. Expenditure on water may indicate a situation of scarcity of water sources, a greater commercialisation of the supply of water or a greater affluence on the part of some RGCs, Whatever the case, the people that are already spending significantly on water are likely to be more receptive to the concept of paying for water than those that are spending nearly nothing.

Figure 3.1- 31 Average annual expenditure on water for the different RGCS



The proportion of expenditure taken by other items is shown in table 3.1-47a below. The subsequent tables i.e 3.1-47b show the situation in the individual RGCs. It is evident from the table that food tend to take a lion's share of the expenditure in most of the RGCs and this is followed by education. Health is roughly in the third place.

TABLE 3.1-47A ITEMS AS A PERCENTAGE OF TOTAL ANNUAL EXPENDITURE – RGC WIDE

Water	Sanitation	Health	Food	Fuel	Electricity	Education	Battery	Airtime	Total communication
2.1	4.5	9.1	26.6	4.9	1.5	38.2	0.4	5.1	5.7

TABLE 3.1-47B ITEMS AS A PERCENTAGE OF TOTAL ANNUAL EXPENDITURE – RGC WISE

	Water	Sanitation	Health	Food	Fuel	Electricity	Education	Battery	Airtime	Total communication
Acuna	0.9	5.1	12.0	42.9	3.6	0.0	30.5	0.5	2.5	2.9
Tubur	3.1	3.8	7.6	41.5	7.0	0.0	22.8	0.3	5.8	6.0
Kidetok	1.2	3.7	4.3	29.7	4.3	1.4	46.0	0.2	3.6	3.8
Kapala	0.6	3.6	8.2	18.7	2.2	0.3	58.6	0.3	5.0	5.4
Kameke	2.1	3.3	7.9	32.3	3.8	3.5	26.0	0.4	5.7	0.4
Kasasira	0.9	3.8	9.3	27.4	3.5	0.8	34.1	0.4	3.8	4.1
Buseta	0.7	7.4	7.9	29.7	4.1	4.7	37.0	0.3	5.8	6.1
Naigobya	3.6	4.5	10.8	12.2	6.2	2.9	44.8	0.4	6.9	7.3
Kyanvuma	2.6	6.2	9.6	29.7	6.2	1.8	31.2	0.3	6.6	6.9
Lambala	5.4	6.0	12.1	29.7	3.2	4.5	23.0	0.9	5.9	6.8
Nondwe	3.0	5.5	16.2	20.3	8.3	0.4	33.2	0.6	6.9	7.5
Nambale	1.6	6.1	7.9	13.2	7.7	2.1	41.4	0.8	2.1	2.9

Most of the expenditure on water goes to paying a monthly fee for operation and maintenance. For those households that buy water, some of the money goes to paying for the water in jerry cans. The average monthly fee spent on the monthly O and m fee is Shs 1,268. That spent on buying water is Shs 138 while the combined total of both comes to Shs 4,911=(USD 1.5). There are indicators that for many HH, it is possible to increase the fee they spend on water if the people in charge of collecting it do their job effectively and consistently.

The total monthly expenditure ranged from a minimum of Shs 4,750 to a maximum of Shs 2,496,600. Average monthly expenditure stood at Shs 233,636. Total annual expenditure ranged from Shs 57,000 to a maximum of Shs 29,959,200= with average annual expenditure at Shs 2,803,635.

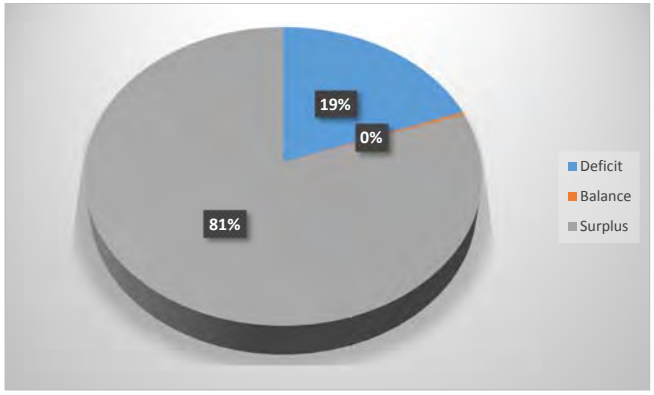
These figures were compared to the same figures for income and the output is presented in table 3.1-48 below.

TABLE 3.1-48 COMPARING INCOME AND TOTAL ANNUAL EXPENDITURE.

	Annual Income	Annual expenditure
Min	100,000	57,000
Max	30,000,000	29,959,200
Mean	4,448,072	2,803,635

Total annual income exceeds total annual expenditure in all respects. This means that on average, individuals are able to make a small saving. In reality however there were many people that were living beyond their means and some admitted to borrowing money or physical items regularly. Analysis of the individual incomes and expenditures showed that 19% of the respondents reported a deficit 0.2 (one person) reported a balance while the rest 81% reported a surplus.

Figure 3.1- 32 Comparison of income and expenditure at HH level



3.1.7j Income levels and social class

At the design stage, a decision was made to include as wide a spectrum of income levels as possible. Eventually the sample would be representative of the income levels in the communities in the survey area. Based on the data on income, the survey sample has been divided into three groups to reflect the three income levels namely low income, middle income and high income. Note that these classification are

specific to the survey area and have no applicability outside of the survey area. Moreover due to the different income levels in the different RGCs, even the income ranges for the different classes differ from one RGC to another.

In table 3.1-49 below, the thresholds for each income based social class in each of the RGCs is presented. In the subsequent table 3.1-50 an average is calculated for each of the social classes in each of the RGCs. This average is illustrated in figure 3.1- 33. The high income group's average is highest in Buseta and lowest in Lambala and the data shows that there is significant disparity between the high classes in the different RGCs so that the average for the high class in Lambala is Shs 6million while the average for the high class in Buseta is Shs 16 million. The situation is however a little different with the middle and low class where the disparities in the averages of each social class is not so great.

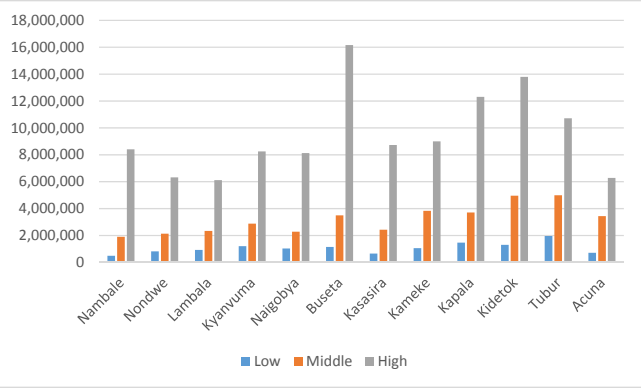
TABLE 3.1-49 CLASSIFICATION OF INCOME BASED SOCIAL CLASSES IN THE RGCS (IN 000 SHS)

	RGC											
Class	Nambale	Nondwe	Lambala	Kyanvuma	Naigobya	Buseta	Kasasira	Kameke	Kapala	Kidetok	Tubur	Acuna
Low	180, - 795	140 - 1,320	520 - 1,336	610 - 1,920	340 - 1,510	600 - 1,665	100 - 1,220	600 - 1,455	480 - 2,750	216 - 2,440	1,300 - 2,460	200 - 1,200
Middle	840, - 3,800	1,360 - 3,000	1,480 - 3,816	1,998 - 3,840	1,620 - 3,500	1,680 - 6,792	1,260 - 4,080	1,540 - 5,880	2,860 - 4,800	2,520 - 7,560	3,000 - 7,000	1,800 - 4,600
High	5,040 - 12,500	3,120 - 15,540	4,800 - 8,160	4,200 - 17,480	3,840 - 20,880	7,999 - 24,700	4,700 - 21,600	6,750 - 11,570	7,920 - 22,840	7,800 - 30,000	7,900 - 16,392	4,980 - 7,230

TABLE 3.1-50 AVERAGE INCOMES BY SOCIAL CLASS BY RGC

	Average incomes per social class per RGC											
	RGC											
Class	Nambale	Nondwe	Lambala	Kyanvuma	Naigobya	Buseta	Kasasira	Kameke	Kapala	Kidetok	Tubur	Acuna
Low	491,500	815,043	932,286	1,212,500	1,032,143	1,141,875	655,382	1,057,000	1,476,350	1,301,625	1,957,143	716,000
Middle	1,907,636	2,135,775	2,341,950	2,882,320	2,278,000	3,492,125	2,430,909	3,833,800	3,710,000	4,957,059	4,992,500	3,438,000
High	8,402,222	6,324,809	6,118,571	8,258,077	8,128,571	16,159,900	8,723,727	8,994,800	12,308,222	13,794,038	10,717,429	6,278,000

Figure 3.1- 33 Average income for each social class for each RGC



Data also shows that there is a great disparity in incomes within each RGC especially between middle and high class with extremes evident in Buseta, Nambale, Kasasira, Kapala and Kidetok.

3.1.8 Cooperative/communal Organisations and Activities

3.1.8a Payment for water

Some 90.2% of the respondents indicated that they had ever paid for water. The amount paid as **initial contribution** ranged from Shs 500 to a maximum of Shs 40,000-. The average amount was Shs 2,356 and the figure most frequently quoted is Shs 2,000.

When it comes to **water user fee**, the number of people who reported paying is much less-only 85 people or 20.7%. They were paying an average of Shs 944 per month. This pattern is not surprising; people tend to be eager to pay initial contribution as they are eager to get the water facility constructed. However, once the facility is constructed, they tend to relax and not pay the user fee regularly as they know that the facility is already there and no one is going to take it away. This data is summarised in table 3.1-50A and b below. The late series of tables present the situation in the individual RGCs.

TABLE 3.1-51A PAYMENT – INITIAL CONTRIBUTION, USER FEE AND NEW FACILITY

	Initial Contribution	User Fee	New Facility
Min	500	167	10
Max	40,000	5,000	300
Mean	2,356	944	87
Mode	2,000	2,000	100

TABLE 3.1-51B PAYMENT – INITIAL CONTRIBUTION, USER FEE AND NEW FACILITY – RGC WISE

Acuna	Initial Contribution	User Fee	New Facility
Min	1,000	1000	20
Max	2,000	2000	100
Mean	733	1033	58
Mode	1,000	1000	50

Tubur	Initial Contribution	User Fee	New Facility
Min	1,000	1,000	10
Max	5,000	5,000	300
Mean	1,455	1,818	105
Mode	2,000	2,000	100

Kidetok	Initial Contribution	User Fee	New Facility
Min	1,000	1,000	10
Max	10,000	5,000	200
Mean	1,571	1,633	101
Mode	2,000	2,000	100

Kapala	Initial Contribution	User Fee	New Facility
Min	500	500	20
Max	2,000	2,000	200
Mean	569	334	106
Mode	1,000	1,000	100

Kameke	Initial Contribution	User Fee	New Facility
Min	2,000	167	10
Max	7,000	3,000	200
Mean	2,125	1,385	94
Mode	2,000	2,000	100

Kasasira	Initial Contribution	User Fee	New Facility
Min	500	200	20
Max	30,000	5,000	200
Mean	2,727	491	34
Mode	2,000	2,000	100

Buseta	Initial Contribution	User Fee	New Facility
Min	500	1,000	15
Max	10,000	3,000	200
Mean	1,771	667	83
Mode	1,000	1,000	100

Naigobya	Initial Contribution	User Fee	New Facility
Min	1,000	500	20
Max	40,000	2,000	200

Mean	5,682	386	69
Mode	5,000	2,000	100

Kyanvuma	Initial Contribution	User Fee	New Facility
Min	500	500	30
Max	6,000	5,000	200
Mean	2,034	659	75
Mode	3,000	1,000	100

Lambala	Initial Contribution	User Fee	New Facility
Min	2,000	500	25
Max	10,000	3,000	200
Mean	2,568	516	76
Mode	2,000	2,000	50

Nondwe	Initial Contribution	User Fee	New Facility
Min	1,000	500	10
Max	20,000	5,000	200
Mean	2,686	1,150	74
Mode	1,000	1,000	100

Nambale	Initial Contribution	User Fee	New Facility
Min	1,000	500	35
Max	35,000	5,000	300
Mean	3,717	1,365	96
Mode	5,000	2,000	100

When respondents were asked how much money they are willing to pay for a jerry can of water from the proposed new water facility, the number who respondent in the affirmative was 364 or 89% of the respondents. The amount those who are willing to pay mentioned ranged from Shs 10 to Shs 300 with a mean of Shs 97. In general, the fee that they are willing to pay, at 97 is lower than what they are already paying at an average of Shs 263 per jerry can as seen in section 3.1.5 of this report. The fact that they are willing to pay less than they are already paying may show a feeling that they feel that they are already paying too much. Alternatively, once people perceive that there is a donor involved in a proposed project, they tend to understate what they are willing to pay in order to let the donor take the heaviest burden since they are convinced that donors have the money. This may underline the need for sensitisation prior to the project to cement the need for people to recognise that even though the project is donor supported, they have a central role to play in its establishment and maintenance.

Due to the central role of women in water fetching and provision in the home as noted in this study, women and children have to be involved in the O and M of water facilities and their opinions need to be

heard. When asked how many women are in charge of any roles in the WSC, the answers given by respondents are summarised in the table and graph below.

TABLE 3.1-52A NO OF WOMEN WITH ROLES IN THE WSC – RGC WIDE

No of women	Count	% of respondents
1	50	18.6
2	113	42.0
3	69	25.7
4	27	10.0
5	10	3.7
Total	269	100.0

Most of the respondents who acknowledge that there are women on the WSC 42% mentioned 2 women. The next most frequent figure is 3 women, then 1 woman. A WSC usually has 5 people and under the guidelines of the ministry, women should constitute a half of all the members. However in many cases this is ignored not only by the men but also by the women who often shun the roles in what they feel are male dominated communities

TABLE 3.1-52B NO OF WOMEN WITH ROLES IN THE WSC – RGC WISE

	Acuna			Tubur			Kidetok	
No of women	Count	% of respondents	No of women	Count	% of respondents	No of women	Count	% of respondents
1	0	0.0	1	0	0.0	1	7	16.7
2	2	50.0	2	10	62.5	2	14	33.3
3	1	25.0	3	5	31.3	3	12	28.6
4	0	0.0	4	1	6.3	4	8	19.0
5	1	25.0	5	0	0.0	5	1	2.4
Total	4	100	Total	16	100	Total	42	100

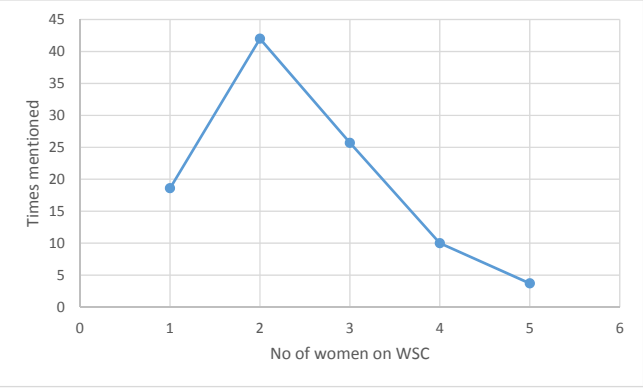
	Kapala			Kameke			Kasasira	
No of women	Count	% of respondents	No of women	Count	% of respondents	No of women	Count	% of respondents
1	7	41.2	1	2	16.7	1	8	15.4
2	7	41.2	2	2	16.7	2	22	42.3
3	3	17.6	3	4	33.3	3	18	34.6
4	0	0.0	4	3	25.0	4	3	5.8
5	0	0.0	5	1	8.3	5	1	1.9
Total	17	100	Total	12	100	Total	52	100

	Buseta			Naigobya			Kyanvuma	
No of women	Count	% of respondents	No of women	Count	% of respondents	No of women	Count	% of respondents
1	3	23.1	1	4	28.6	1	13	41.9
2	5	38.5	2	8	57.1	2	13	41.9
3	3	23.1	3	1	7.1	3	3	9.7
4	0	0.0	4	1	7.1	4	0	0.0
5	2	15.4	5	0	0.0	5	2	6.5

Total	13	100	Total	14	100	Total	31	100

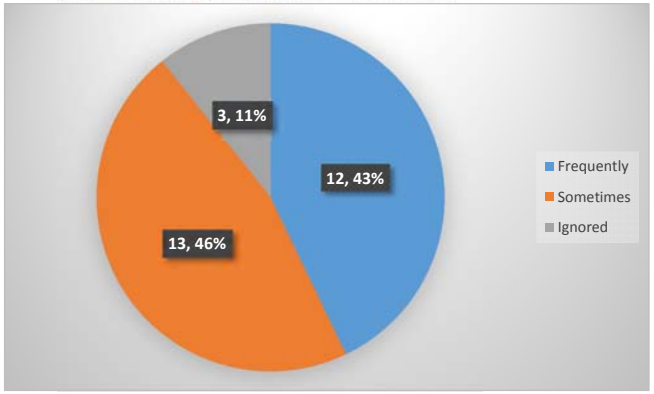
	Lambala			Nondwe			Nambale	
No of women	**Count**	**% of respondents**	**No of women**	**Count**	**% of respondents**	**No of women**	**Count**	**% of respondents**
1	1	6.3	1	3	11.1	1	2	8.0
2	7	43.8	2	14	51.9	2	9	36.0
3	6	37.5	3	8	29.6	3	5	20.0
4	1	6.3	4	2	7.4	4	8	32.0
5	1	6.3	5	0	0.0	5	1	4.0
Total	16	100	Total	27	100	Total	25	100

Figure 3.1- 34 No of women with roles in the WSC



When asked if women's opinions are taken well in WSC decisions, 32.2% of the respondents said that they do not know or that they are not sure. However the rest i.e. 67.7% gave various opinions as shown in the chart below. Those who felt that women's opinions are ignored are in the minority and this is a good indicator of the trend of taking seriously the participation and the opinions of women. However the proportion of those who say that women's opinions are taken well frequently and those who say that they are sometimes not taken well are almost equal and this means that there is room for improvement with the right sensitisation as well as exposure.

Figure 3.1- 35 Women's opinions taken in WSC decisions.

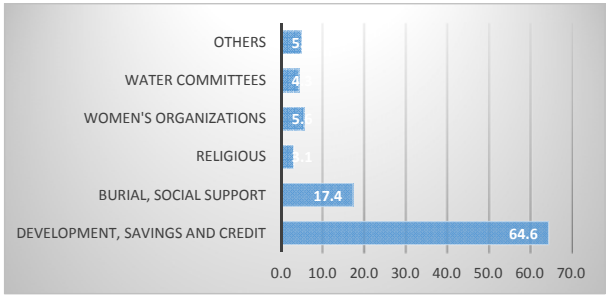


Other cooperative organisations

When asked whether they were involved in any cooperative organisation, 60.4% of the respondents said yes while 39.6% said no. Clearly many more people are involved in cooperative organisations than those who are not and it appears that the spirit of cooperation and joint activities is alive and well. This augers well for collective water facility O and M activities.

Those involved in cooperative activities named the organisations that they are involved in. When analysed, these fell into the following categories. Most of the people are involved in some form of development organisations including savings and credit (SACCOS) or those set up by NGOs. Burial and social support groups are also significant. These pool resources to come to the aid of those that have experienced a death in the family. They operate like insurance companies on a community level. All these cooperative organisations form a good basis for the exposure of the community to community and cooperative activities that can enhance the work of the WSCs.

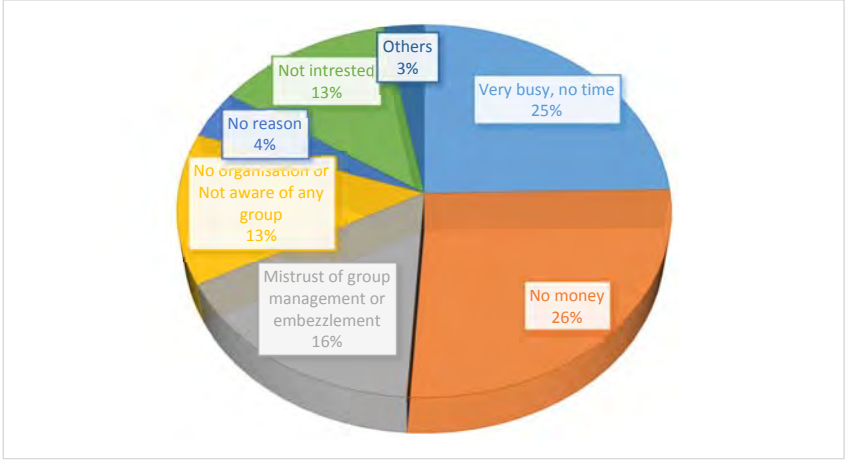
Figure 3.1- 36 Nature of cooperative organisations involved in.



Reason was sought from those who said that they are not involved in cooperative activities for their lack of participation. The reasons given are as in the chart below.

The three main reasons for not participating in cooperative activities are being busy, having no money to pay for membership or to make the necessary contributions and mistrust of the leadership and management of the organisations.

Figure 3.1- 37 Reasons for not participating in cooperative organisations



These become critical issues in any interventions to promote WSC activities and need to be taken into account in the software activities of the project. Indeed there are repeated concerns about embezzlement and poor management of finances and this discourages not only participation but regular contributions to O and M.

3.1.9 Hygiene and Sanitation.

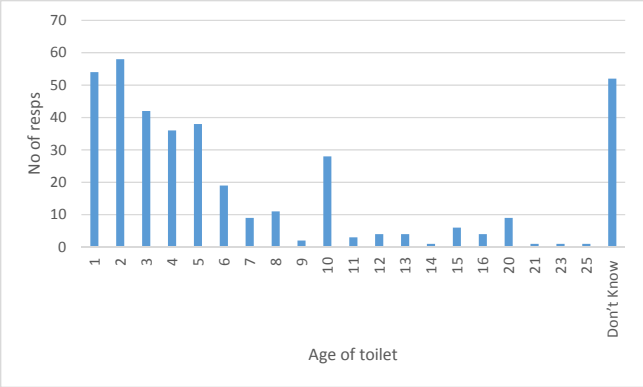
3.1.9a Introduction

Water is a critical element in improving health and welfare in household. But for this to happen HH must adopt appropriate hygiene and sanitation practices. The hygiene and sanitation practices of the HH in the survey area were also investigated. Interviewer asked questions on various hygiene and sanitation practices and also inspected homes according to set guidelines to confirm presence and quality of specific installations.

3.1.9b Toilet and other infrastructure for household cleanliness

94.1% of the respondents had toilets of varying types in their house lot, 5.87 did not have any toilet. While some 52 or 13.6% did not know when these toilets were built, those who knew said that they ranged from 1 to 25 years ago. This data is summarised in figure 3.1-38 below.

Figure 3.1- 38 Age or number of years since toilet was constructed.



For the minority who did not have a toilet, the reasons given are summarised in the table below.

TABLE 3.1-53A REASONS FOR NOT HAVING A TOILET – RGC WIDE

Count	Reason
8	No money
4	No space
2	Land is rocky
0	Swamp conditions
9	other

But having a toilet and using it are two different things. Some toilets exist only in name and are so old and risky that people prefer to go in the bush. Asked if the toilets are easy to use, 81% of those with toilets said yes while some 18.8% admitted that they are not easy to use. Asked why they are not easy to use, respondents gave a range of answers including "too short", "has no door", "almost collapsing", "has no wall", "has no roof", "floor/slab is cracked", "too many people using the toilet so that it is very dirty", and that "it has no shelter"

The predominant reasons given in the different RGCs for not having a toiled are shown in table 3.1-53B below. The reasons vary somewhat from RGC to RGC. In Kidetok and Kasasira, the problem is not having the money to construct a toilet. In Kameke, Nondwe and Tubur, it is "other" reasons.

TABLE 3.1-53B REASONS FOR NOT HAVING A TOILET-RGC WISE

Reason	Acuna	Tubur	Kidetok	Kapala	Kameke	Kasasira
No money	0	0	3	0	0	4
No space	0	0	1	0	2	1
Land is rocky	1	1	0	0	0	0
Swamp conditions	0	0	0	0	0	0
other	0	2	1	0	2	1

Reason	Buseta	Naigobya	Kyanvuma	Lambala	Nondwe	Nambale
No money	0	1	0	0	0	0
No space	0	0	0	0	0	0

Land is rocky	0	0	0	0	0	0
Swamp conditions	0	0	0	0	0	0
other	0	0	0	0	3	0

On the type of latrine, the data is summarised in the table below.

TABLE 3.1-54A CONDITION OF TOILET/LATRINE – RGC WIDE

Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	85	22.1	Clean	309	80.3	Available	78	20.3
Flash	1	0.3	Dirty	76	19.7	Not available	307	79.7
Eco-san	0	0.0						
Traditional pit	299	77.7						
Total	385	100.0		385	100.0		385	100.0

The predominant type of latrine is the traditional pit latrine. On the sanitary state of the toilet, 80.3% of the existing toilets were clean while 19.7% were dirty. On the availability of a cover most of the toilets 79.7% did not have a cover. Covering toilets is one of the ways of preventing flies from bringing contamination from the toilet to the HH and this practice needs to be promoted in the communities. The respective data from the different RGCs is presented in table 3.1-54B below.

TABLE 3.1-54B CONDITION OF TOILET/LATRINE – RGC WISE

Acuna

Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	1	7.1	Clean	11	78.6	Available	0	0
Flash	0	0.0	Dirty	3	21.4	Not available	14	100.0
Eco-san	0	0.0						
Traditional pit	13	92.9						
Total	14	100		14	100.0		14	100.0

Tubur

Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	3	15.8	Clean	12	63.2	Available	2	10.5
Flash	1	5.3	Dirty	7	36.8	Not available	17	89.5
Eco-san	0	0.0						
Traditional pit	15	78.9						
Total	19	100.0		19	100.0		19	100.0

Kidetok

Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	18	40.9	Clean	41	93.2	Available	11	25.0
Flash	0	0.0	Dirty	3	6.8	Not available	33	75.0
Eco-san	0	0.0						
Traditional pit	26	59.1						
Total	44	100.0		44	100.0		44	100.0

Kapala

Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	6	20.7	Clean	22	75.9	Available	5	17.2
Flash	0	0.0	Dirty	7	24.1	Not available	24	82.8
Eco-san	0	0.0						
Traditional pit	23	79.3						
Total	29	100.0		29	100.0		29	100.0

Kameke

Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	0	0.0	Clean	11	91.7	Available	2	16.7
Flash	0	0.0	Dirty	1	8.3	Not available	10	83.3
Eco-san	0	0.0						
Traditional pit	12	100.0						
Total	12	100.0		12	100.0		12	100.0

Kasasira

Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	8	13.3	Clean	42	70	Available	13	21.7
Flash	0	0.0	Dirty	18	30	Not available	47	78.3
Eco-san	0	0.0						
Traditional pit	52	86.7						
Total	60	100.0		60	100.0		60	100.0

Buseta

Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	3	12.5	Clean	19	79.2	Available	3	12.5
Flash	0	0.0	Dirty	5	20.8	Not available	21	87.5
Eco-san	0	0.0						
Traditional pit	21	87.5						
Total	24	100.0		24	100.0		24	100.0

Naigobya

Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	12	57.1	Clean	16	76.2	Available	4	19.0
Flash	0	0.0	Dirty	5	23.8	Not available	17	81.0
Eco-san	0	0.0						

Traditional pit	9	42.9						
Total	21	100.0		21	100.0		21	100.0

Kyanvuma

Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	11	25.6	Clean	36	83.7	Available	6	14.0
Flash	0	0.0	Dirty	7	16.3	Not available	37	86.0
Eco-san	0	0.0						
Traditional pit	32	74.4						
Total	43	100.0		43	100.0		43	100.0

Lambala

Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	3	13.6	Clean	16	72.7	Available	4	18.2
Flash	0	0.0	Dirty	6	27.3	Not available	18	81.8
Eco-san	0	0.0						
Traditional pit	19	86.4						
Total	22	100.0		22	100.0		22	100.0

Nondwe

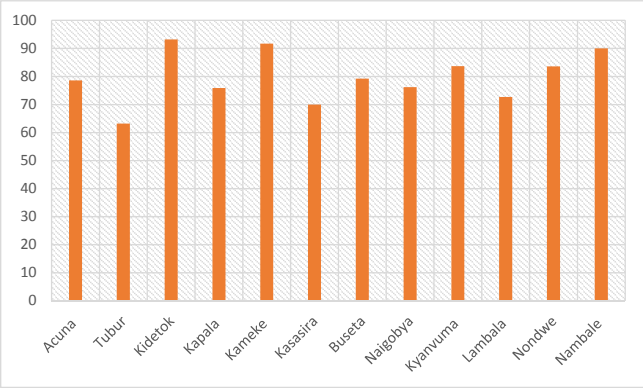
Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	15	22.4	Clean	56	83.6	Available	19	28.4
Flash	0	0.0	Dirty	11	16.4	Not available	48	71.6
Eco-san	0	0.0						
Traditional pit	52	77.6						
Total	67	100.0		67	100.0		67	100.0

Nambale – Condition of toilet

Type	Count	%	Sanitary condition		%	Cover available	%	
VIP	5	16.7	Clean	27	90.0	Available	9	30.0
Flash	0	0.0	Dirty	3	30.0	Not available	21	70.0
Eco-san	0	00						
Traditional pit	25	83.0						
Total	30	100.0		30	100.0		30	100.0

For illustration, the proportion of toilets that are reported as clean in each of the RGCs is isolated and presented in the graphic below. In general the state of toilets in terms of cleanliness is good in all the RGCs as only one RGC namely Tubur is below 60%. Kidetok, Kameke and Nambale have the best ratings.

Figure 3.1- 39 Proportion of toilets assessed as clean in each RGC.



3.1.9c Condition of the Kitchen

The details of the condition of the kitchen and home are summarised in the table below.

TABLE 3.1-55 CONDITION OF KITCHEN AND HOME

	Presence of Kitchen	%	Availability of drying rack	%	Presence of animal shelter	%	Fecal Presence around the compound	%	Availability of compost pit	%	Availability of HH drainage channel	%
Yes	301	73.6	181	44.3	86	21.0	85	20.8	155	37.9	97	23.8
No	108	26.4	228	55.7	323	79.0	323	79.2	254	62.1	310	76.2
	409		409		409		408		409		407	

It can be seen from the data that the majority of HH – 73.6 have kitchens however only 44.3% have drying racks. Some 79.0% do not have an animal shelter and therefore there is a risk that animals will share the same house as the people, if there are animals. In 20.8% of the homes, faecal materials could be observed around the home and in 23.8% of the homes, there was no drainage channels (though it is possible that they are not needed in some of these homes. These data indicate that there is a lot of room for the improvement of sanitation and hygiene and some of these aspects need to be included in the software programme of the project. At the same time it has to be understood that the impact of the new water project will be tampered by these characteristics on the ground.

3.1.9d Hand Washing

Most of the respondents reported that they wash hands after toilet and before meals.

TABLE 3.1-56A SITUATIONS WHEN RESPONDENTS WASH HANDS

When do you wash hands	After toilet %	Before meals %	Others
	87.5	92.0	54.5

Other conditions under which they wash hands are summarised in the table below. These answers are not mutually exclusive. 32.8% reported that they wash hands after an activity that makes their hands dirty and this includes when they have been to the garden or perhaps if their work makes their hands dirty. This kind of washing hand is compelled more by the visible dirt than by the consciousness of potential infection and may not be a good indicator of awareness of hygiene and sanitation. 13.9% also wash hands after eating. Again this is more about visible dirt and smell.

TABLE 3.1-56B OTHER SITUATIONS NAMED WHEN RESPONDENTS WASH HANDS

Others	Frequency	%
After eating	57	13.9
After any activity that makes hands dirty	134	32.7
Before any activity that requires clean hands	15	3.7
Before prayers	7	1.7
Morning after waking up	7	1.7
Anytime	3	0.7

The frequency with which people wash hand may also be influenced by the presence of a hand washing facility. Among the respondents, some 77.5% had a hand washing facility. The nature of the hand washing facility is summarised in table below.

TABLE 3.1-57 TYPE OF HAND WASHING FACILITY

Tippy tap %	Faucet %	Ordinary can %	Others (Jerry cans) %
2.19	0.31	61.88	35.63

In addition to availability and nature it is important that a facility has water and soap. Sanitation experts have confirmed that soap must be used for hand washing to be effective in properly and hygienically cleaning hands. In table 3.1-58a below, other related aspect of the hand washing facility were also investigated. It is encouraging to note that 97.8% reported that the facility is used regularly. Also the 65.8% where soap was available is a positive sign. Nevertheless there is room for improvement in ensuring the presence of a hand washing facility which has water and soap as well as in the regularity of washing hands. Moreover people need to understand that beyond having hands that look clean, it is important to wash hand to ensure that they are free of dangerous organisms that can transmit disease and for this hands must be washed with soap.

TABLE 3.1-58A CONDITION OF HAND WASHING FACILITY

Condition of hand washing facility	Yes %	No %
M2-b. Facility has water	76.1	23.9
M2-c. Facility has soap	65.8	34.2

M2-d. Facility used by everyone	86.5	13.5
Facility used by adult only	13.5	86.5
Facility used by children only	0.0	100.0
Facility used regularly	97.8	2.2

TABLE 3.1-58B CONDITION OF HAND WASHING FACILITY – RGC WISE

	Acuna		Tubur		Kidetok	
Condition of hand washing facility	Yes %	No %	Yes %	No %	Yes %	No %
M2-b. Facility has water	66.7	33.3	80.0	20.0	84.4	15.6
M2-c. Facility has soap	55.6	44.4	53.3	46.7	81.8	18.2
M2-d. Facility used by everyone	100.0	0.0	86.7	13.3	90.9	9.1
Facility used by adult only	0.0	100.0	13.3	86.7	9.1	90.9
Facility used by children only	0.0	100.0	0.0	100.0	0.0	100.0
Facility used regularly	100.0	0.0	100.0	0.0	100.0	0.0

	Kapala		Kameke		Kasasira	
Condition of hand washing facility	Yes %	No %	Yes %	No %	Yes %	No %
M2-b. Facility has water	65.0	35.0	62.5	37.5	68.4	31.6
M2-c. Facility has soap	80.0	20.0	62.5	37.5	61.4	38.6
M2-d. Facility used by everyone	90.0	10.0	100.0	0.0	73.7	26.3
Facility used by adult only	10.0	90.0	0.0	100.0	26.3	73.7
Facility used by children only	0.0	100.0	0.0	100.0	0.0	100.0
Facility used regularly	100.0	0.0	100.0	0.0	100.0	0.0

	Buseta		Naigobya		Kyanvuma	
Condition of hand washing facility	Yes %	No %	Yes %	No %	Yes %	No %
M2-b. Facility has water	60.0	40.0	78.9	21.1	84.2	15.8
M2-c. Facility has soap	65.0	35.0	68.4	31.6	60.5	39.5
M2-d. Facility used by everyone	85.0	15.0	84.2	15.8	84.2	15.8
Facility used by adult only	15.0	85.0	15.8	84.2	15.8	84.2
Facility used by children only	0.0	100.0	0.0	100.0	0.0	100.0
Facility used regularly	95.0	5.0	89.5	10.5	100.0	0.0

	Lambala		Nondwe		Nambale	
Condition of hand washing facility	Yes %	No %	Yes %	No %	Yes %	No %
M2-b. Facility has water	93.3	6.7	73.2	26.8	89.7	10.3
M2-c. Facility has soap	73.3	26.7	62.5	37.5	65.5	34.5
M2-d. Facility used by everyone	80.0	20.0	91.1	8.9	96.6	3.4
Facility used by adult only	20.0	80.0	8.9	91.1	3.4	96.6
Facility used by children only	0.0	100.0	0.0	100.0	0.0	100.0
Facility used regularly	100.0	0.0	94.6	5.4	96.6	3.4

One of the critical factors in the safe water chain are the storage containers for the water. These too need to be clean. Table 3.1-59 summarises the condition of the water storage containers in the HHs surveyed. Conditions of water collection/storage containers. In general the rating for all the HH surveyed on these conditions was good with all of them scoring over 78%.

TABLE 3.1-59A CONDITION OF WATER STORAGE CONTAINERS – RGC WIDE

N1 to N3-b. Conditions of water collection/storage containers		
	Yes %	**No %**
Water collection containers clean	78.97	21.03
Bath shelter available	87.29	12.71
Drinking water containers covered	95.11	4.89
Storage containers clean	86.80	13.20

In water stressed situations, humans and livestock may be forced to share sources of water. The findings from this study show that there are still a few places (4.2% of respondents) where humans and animals get water from the same source. In other places, measures have been taken to separate animals from people using the techniques in table 3.1-60 below.

TABLE 3.1-59B CONDITION OF WATER STORAGE CONTAINERS – RGC WISE

N1 to N3-b. Conditions of water collection/storage containers	**Acuna**		**Tubur**		**Kidetok**	
	Yes %	**No %**	**Yes %**	**No %**	**Yes %**	**No %**
Water collection containers clean	73.33	26.67	86.36	13.64	81.63	18.37
Bath shelter available	80.00	20.00	81.82	18.18	93.88	6.12
Drinking water containers covered	93.33	6.67	95.45	4.55	97.96	2.04
Storage containers clean	93.33	6.67	86.36	13.64	85.71	14.29

N1 to N3-b. Conditions of water collection/storage containers	**Kapala**		**Kameke**		**Kasasira**	
	Yes %	**No %**	**Yes %**	**No %**	**Yes %**	**No %**
Water collection containers clean	68.97	31.03	87.50	12.50	80.30	19.70
Bath shelter available	82.76	17.24	93.75	6.25	92.42	7.58
Drinking water containers covered	96.55	3.45	93.75	6.25	100.00	0.00
Storage containers clean	93.10	6.90	75.00	25.00	80.30	19.70

N1 to N3-b. Conditions of water collection/storage containers	Buseta		Naigobya		Kyanvuma	
	Yes %	**No %**	**Yes %**	**No %**	**Yes %**	**No %**
Water collection containers clean	70.83	29.17	68.18	31.82	77.27	22.73
Bath shelter available	91.67	8.33	100.00	0.00	86.36	13.64
Drinking water containers covered	83.33	16.67	86.36	13.64	97.73	2.27
Storage containers clean	70.83	29.17	86.36	13.64	88.64	11.36

N1 to N3-b. Conditions of water collection/storage containers	Lambala		Nondwe		Nambale	
	Yes %	No %	Yes %	No %	Yes %	No %
Water collection containers clean	77.27	22.73	78.57	21.43	93.33	6.67
Bath shelter available	90.91	9.09	78.57	21.43	80.00	20.00
Drinking water containers covered	100.00	0.00	92.86	7.14	93.33	6.67
Storage containers clean	95.45	4.55	92.86	7.14	90.00	10.00

How to water cattle

Livestock is part of the people in some of the RGCs especially in Soroti and Serere Districts. Water is critical for the wellbeing of livestock and where sources are scarce animals and people are forced to share a source. Such sharing if not done in a proper way can lead to the transmission of diseases from animals to people and vise-versa. But of course the concern is more with the people. There are however ways in which such sharing of resources can be done safely. Respondents were asked how they water their cattle especially where they have to share a source. The responses RGC wide and RGC wise are summarised in tables 3.1-60A and 3.1-60B respectively. The most common method named is the use of a bucket to carry water from the source to some distance away where the cattle are watered. An average of 28.4 across all the RGCs indicated that they have a separate watering place.

TABLE 3.1-60A HOW TO WATER CATTLE – RGC WIDE

How to water cattle	%
There is a separate watering place	28.4
Use bucket to convey water for animals from that of human beings	58.9
Others	6.6

TABLE 3.1-60B HOW TO WATER CATTLE – RGC WISE

	Acuna	Tubur	Kidetok	Kapala	Kameke	Kasasira
How to water cattle	%	%	%	%	%	%
There is a separate watering place	26.7	13.6	24.5	20.7	18.8	42.4
Use bucket to convey water for animals from that of human beings	66.7	81.8	67.3	75.9	75.0	53.0
Others	13.3	0.0	0.0	0.0	6.3	3.0

	Buseta	Naigobya	Kyanvuma	Lambala	Nondwe	Nambale
How to water cattle	%	%	%	%	%	%
There is a separate watering place	50.0	31.8	29.5	31.8	31.4	%
Use bucket to convey water for animals from that of human beings	45.8	59.1	63.6	54.5	50.0	20.0
Others	12.5	9.1	9.1	13.6	12.9	80.0

In locations where cattle still access water together with the people, the reasons given for this condition are given in table 3.1-61 below. The reason presented by most people is weak management of the water source. The second most important reason is that there is no other water source or it is very far. Improving access to water will therefore help to reduce the risk posed when livestock is watered at the same sources as human beings.

TABLE 3.1-61A REASONS FOR WATERING CATTLE FROM THE SAME SOURCE AS HUMANS - RGC WIDE

Why the water source is not separated	%
No management of the water source	52.9
Only option, not in control	17.6
Water for animals very far	17.6
Don't know	11.8

TABLE 3.1-61B REASONS FOR WATERING CATTLE FROM THE SAME SOURCE AS HUMANS –RGC WISE

	Acuna	Tubur	Kidetok	Kapala	Kameke	Kasasira
Why the water source is not separated	%	%	%	%	%	%
No management of the water source	0.0	100	0.0	0	0	100
Only option, not in control	0.0	0	0.0	50	0	0
Water for animals very far	0.0	0	33.3	50	0	0
Don't know	0.0	0	66.7	0	0	0

	Buseta	Naigobya	Kyanvuma	Lambala	Nondwe	Nambale
Why the water source is not separated	%	%	%	%	%	%
No management of the water source	0	0	100	100	60	0
Only option, not in control	0	100	0	0	20	0
Water for animals very far	0	0	0	0	20	0
Don't know	0	0	0	0	0	0

3.2 THE CONDINTION OF VILLAGES.

3.2.1 The Village Condition Survey - Introduction

The survey of village leaders sought to obtain information on the situation of the communities in the RGCs with respect to a range of variables. The information was obtained from the village leaders or LC1 chairmen. Some of the RGCs have one LC1 village while some have two and more. The number of LC1 zones in each of the RGCs is summarised in table *3.2-1* below. It should be noted that the perimeter of the RGC as specified in this project do not necessarily tally with the jurisdictional areas of the LC1s, however LC1 chairmen were briefed about the perimeter of the RGC demarcations but most of the time they were not able to isolate the information pertaining to the included area only. For that reason data refers to the mentioned villages in the RGCs.

TABLE 3.2-1 NUMBER OF VILLAGES INCLUDED IN THE SURVEY

RGC	No of Villages
Acuna	2
Buseta	3
Kameke	2
Kapala	3
Kasasira	6
Kidetok	3
Kyanvuma	2
Lambala	2
Naigobya	3
Nambale	1
Nondwe	2
Tubur	1
Total	30

3.2.2 Employment

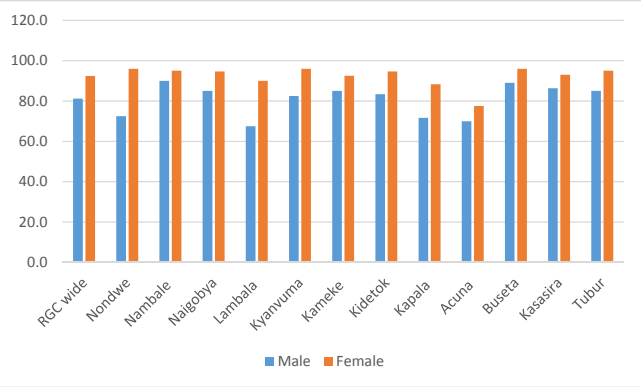
Village leaders were asked the number of women and men that are actively looking for jobs to be stated as a percentage of the labour force in their villages. The responses they gave are summarised in table *3.2-2* below. Their report show that for men on average 81.2% are actively looking for work while for women the equivalent statistic is 99% Given that in the general population the number of women is slightly higher than that of men, this means that there are more women looking for jobs than men. As mentioned in the HH section of this report, there are push and pull factors that determine the employability of women especially in the context of the survey area. Most of these act to reduce the chances of the employment of women.

TABLE 3.2-2 PROPORTION OF MEN AND WOMEN LOOKING FOR JOBS.

	Men	Women
Min	50	60
Max	95	99
Average	81.2	92.4
Mode	80	95

In Figure 3.2-1 below the rates of unemployment in the different RGCs are compared. Clearly according to the village leaders, the rates of unemployment in the RGCs are very high hovering in the 80s and 90s with female worse than male in all the RGCs. Buseta, Kyanvuma and Nondwe all tie in the worst situation with 96% of females being out of job while the situation of men is worst in Nambale where 90% of them are out of job according to the village leaders.

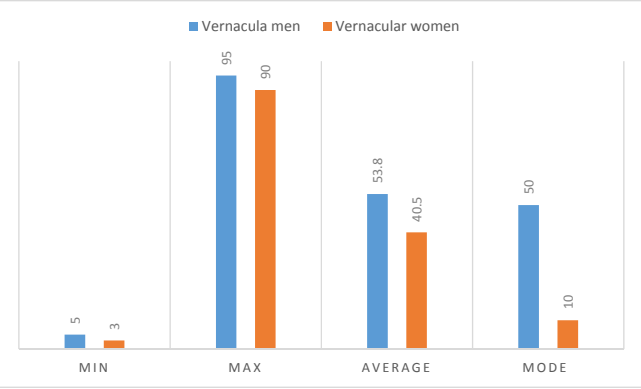
Figure 3.2-1 Unemployment rates across the RGCs



3.2.3 Literacy

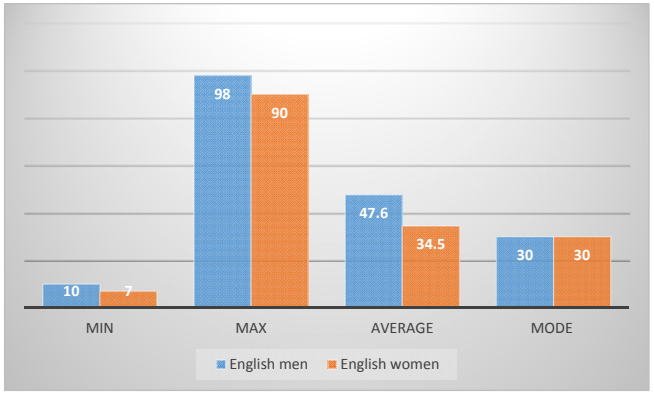
Village leaders were also asked to indicate how many men and women are literate in vernacular and in English in their communities. Their answers are summarised in the chart below.

Figure 3.2-2a Literacy in vernacular.



It can be seen from the table that a greater proportion of men are literate in vernacular. On average 53.8% of men are literate in vernacular while 40.5 % of women are literate in vernacular

Figure 3.2-2b Literacy in English.



Again as in vernacular, greater proportions of men are literate in English as compared to women. These findings are consistent with those noted in the household survey and may point to the imbalance in school attendance for boys and girls. It should be noted that this would reflect the imbalance of some ten or so years ago and that the situation may have changed somewhat since then with more girls attending school now due to UPE.

A comparison of literacy across the RGCs is shown in figures 3.2-2c and 3.2-2d. Accordint to the village leaders's assessment of their residents, the situation is worst in Nondwe, Knavuma and Kasasira while the best literacy rates in vernacular are in Tubur and Kameke. When it comes to English, the situation is worst in Nondwe and Nambale while it appears to be best in Acuna, Tubur and Kameke. Tubur and Kameke coincide at the top both in English and Vernacular indicating good levels of balanced education in these two villages.

Figure 3.2-2c Literacy in vernacular across the RGCs.

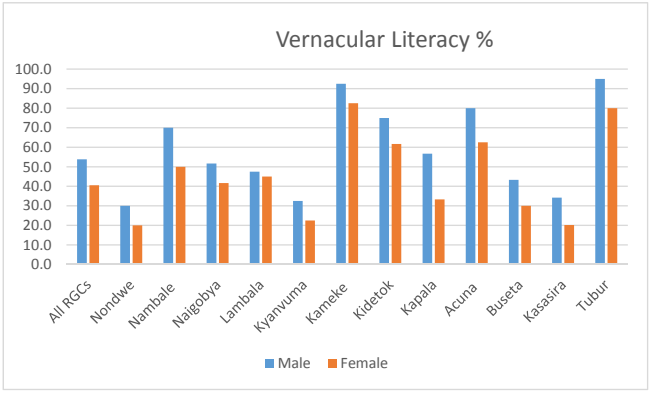
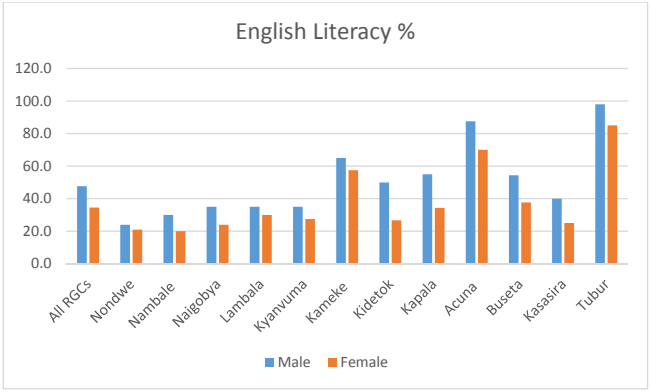


Figure 3.2-2d Literacy in English across the RGCs



3.2.4 School enrolment – Primary School

UNICEF defines **Net primary school enrolment ratio** as- The number of children enrolled in primary school who belong to the age group that officially corresponds to primary schooling, divided by the total population of the same age group. Table 3.2-3 shows the primary school enrolment data as provided by village leaders and in a few cases officials at the sub-county. Figure 3.2-3 compares the primary school enrolment rates in the different RGCs.

The illustration shows that total enrolment in primary school in terms of numbers is highest in Lambala and Kidetok RGCs while it is lowest in Kyanvuma and Acuna. Kidetok has a number of primary schools right in the RGC. Lambala also has two of them, however while the presence of primary schools may help, it may not be the complete explanation of the higher enrolment rates as Kyanvuma, Nondwe and other

RGCs also have schools right inside the RGCs. Schools attract pupils from long distances if they are good and poor schools will be skipped by pupils to go to those that are further off. The schools in Kidetok are of very high standards basing on the buildings, the teachers that we interacted with and the reputation at the national level. This may explain the enrolment rates. The same may be the case with those in Lambala.

When enrolment examined on the basis of gender, it is clear that females exceed male in enrolment in seven out of the 12 RGCs. The seven include Kapala, Kameke, Buseta, Kasasira, Naigobya, Lambala and Nambale. In the remaining 5 RGCs males exceed females in enrolment. The fact that there are more girls enrolled in primary schools in the majority of RGCs is positive pointer for those RGCs and predicts better literacy rates for girls and perhaps better employment for girls from those RGCs.

TABLE 3.2-3 SCHOOL ENROLMENT PRIMARY ALL RGCS

	School enrolment rate			Graduation rate			Drop-out rate		
RGC	Male	Female	Total Enrolment	Male	Female	Total Graduation	Male	Female	Total Drop out
Nambale	100	130	230	73	77	150	27	53	80
Nondwe	205	165	370	90	115	205	115	50	165
Lambala	261	365	626	191	123	314	70	242	312
Naigobya	260	325	585	182	208	390	78	117	195
Kyanvuma	49	36	85	45	35	80	4	1	5
Kasasira	90	125	215	35	28	63	55	97	152
Buseta	180	300	480	20	100	120	160	200	360
Kameke	90	110	200	37	60	97	53	50	103
Kapala	212	250	462	93	135	228	119	215	334
Kidetok	380	220	600	250	110	360	130	110	240
Acuna	53	54	107	0	0	0	0	0	0
Tubur	71	72	143	67	64	131	4	8	12
Average	162.6	179.3		90.3	87.9		67.9	95.3	

Figure 3.2-3a Primary school enrolment across the RGCs

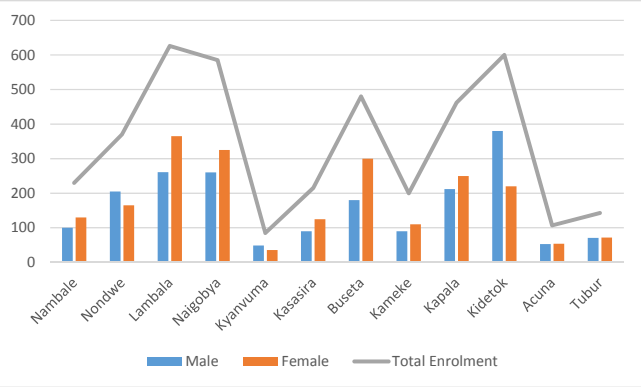
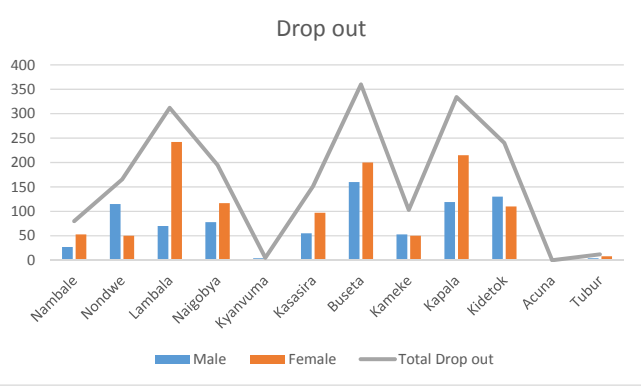


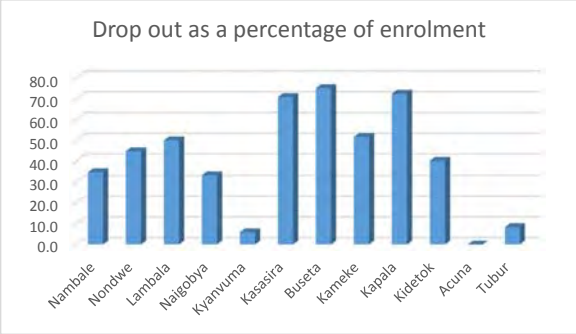
Figure 3.2-3b Primary school dropout rates across the RGCs



Dropout rates are highest in Buseta followed by Kapala and Lambala and they are lowest in Acuna and Kyanvuma. When drop out is expressed as a percentage of enrolment, the outcome is presented in figure 3.2-3c below. The highest percentage drop out rates are reported in Buseta, Kapala and Kasasira. In these RGCs according to the data, more than a half of all the children who enrol in primary 1 drop out of school before they complete P7. While this dropout rate is to be interpreted carefully as it include those children who just change school, it points to a serious problem in those communities. In eastern Uganda in general, there have been increasing cases of children dropping out of school due to the increasing practice of growing rice as a cash crop. Children are compelled to stay at home to chase birds away from the rice crop. Rice is a major crop in Kapala though perhaps it is not as big in Buseta and Kasasira. The fact that

Kasasira and Buseta are in the same district and are close to one another may be significant. The problem of primary school dropout in these two RGCs needs to be explored.

Figure 3.2-3c Drop out as a percentage of enrolment



Enrolment rates for boys and girls at senior (S1 to S4) level are also explored in the figure 3.2-4a below. Total enrolment is highest at Kyanvuma followed by Lambala and Kameke. What is more, at all those RGCs, the number of girls enrolled is greater than that of boys. Enrolment rates at this stage are lowest at Nambale, Kasasira, Buseta, Kidetok and Acuna. For Kasasira and Buseta, a pattern seems to be emerging where children drop out at some stage in primary and they never get back to school at all. The data points to a critical situation in the RGCs of Buseta and Kasasira. Again the fact that these are in the same district and are close to one another should not be ignored.

Figure 3.2-4a Enrolment rates at S1 to S4 stage

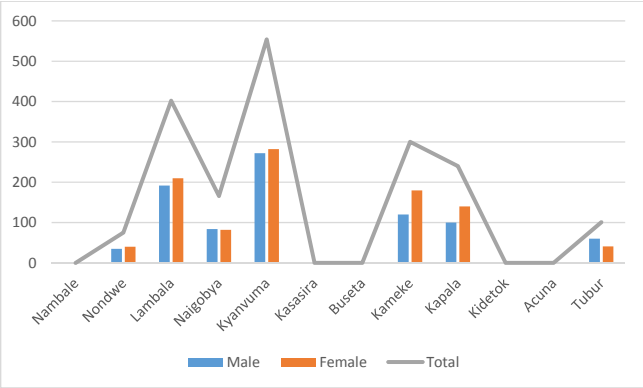
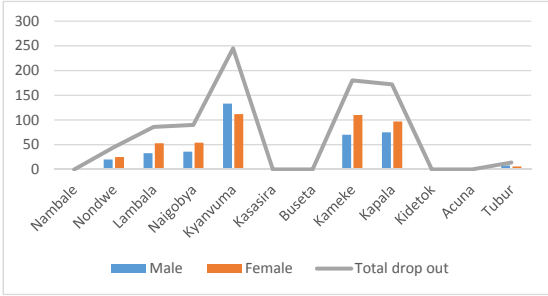


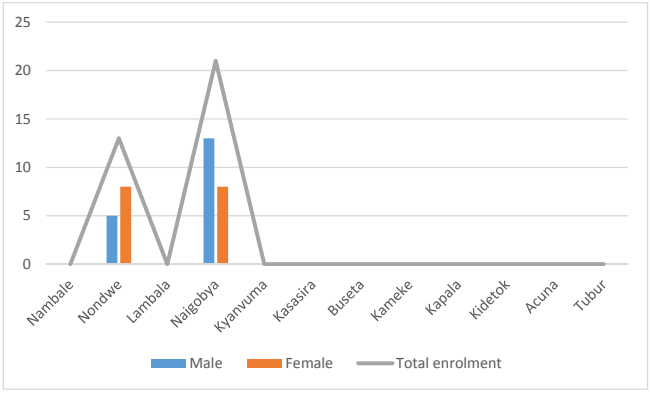
Figure 3.2-4b Dropout rates S1 to S4 stage



Dropout rates at this level are highest in Kyanvuma and Kameke and Kapala. They are lowest at Kasasira, Buseta, Nambale, Kidetok and Acuna. The case of Buseta and Kasasira is not necessarily good as the level of enrolment at this level is also low. The pattern that emerges from the two graphs is that where enrolment is low, drop out is also low. The exception is Lambala where enrolment is high and drop out is relatively low putting Lambala in a good position in terms of retention of students at senior school level.

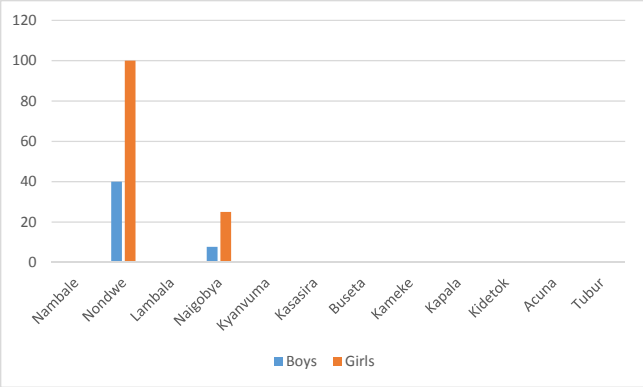
At S5 to S6 level, the data on enrolment shows that there are only two RGCs that report any enrolment and those are Nondwe and Naigobya. At Nondwe, the number of girls exceeds that of boys while at Naigobya it is the opposite.

Figure 3.2-5a Enrolment rates at S5 to S6 stage.



A graph of the dropout rates at the S5 to S6 level shows that in Nondwe, all the girls that enrol at this stage drop out before they complete while 40% of the boys do not complete the stage as well. In Naigobya, about 24% of the girls don't make it to the end of the stage while 4% of the boys also do not make it. In both RGCS the proportion of girls dropping out is higher than that of the boys. At this stage, the possible reasons for this are early marriages and teenage pregnancy. Long times spent at the water sources have been repeatedly blamed for teenage pregnancies. However there is not enough data to explain this observation in this study and the issue begs further investigation.

Figure 3.2-5b Dropout rates at S5 to S6 stage.



3.2.5 Electricity supply

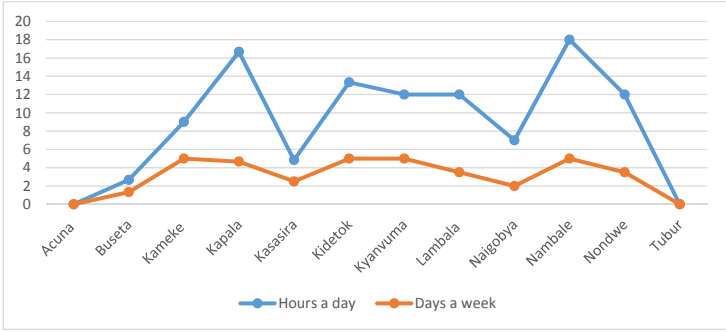
TABLE 3.2-4 ELECTRICITY SUPPLY TO THE RGCS

	Hours a day	Days a week
Acuna	0.0	0.0
Buseta	2.7	1.3
Kameke	9.0	5.0
Kapala	16.7	4.7
Kasasira	4.8	2.5
Kidetok	13.3	5.0
Kyanvuma	12.0	5.0
Lambala	12.0	3.5
Naigobya	7.0	2.0
Nambale	18.0	5.0
Nondwe	12.0	3.5
Tubur	0.0	0.0
Min	0	0
Max	24	7
Average	8.5	3.1
Mode	0	0

Data on electricity supply to the RGCs is presented in table 3.2-4 to the left. Note that the figures are average figures based on the reports of one or more LC1 in an RGC. In some RGCs there are zones with power and zones without any power while in some RGCs, all zones have power but some have more frequent power cuts than others.

The data shows that Acuna and Tubur have no power at all. Others have power for differing numbers of hours a day and differing numbers of days a week. Kapala and Nambale are the RGCs with the most reliable power supply enjoying over 16 hours of power every day for at least 4 days a week. Kameke, Kidetok, Kyanvuma, Lambala and Nondwe also have fairly reliable power supply with at least 12 hours of power supply for at least 3.5 days a week.

Figure 3.2-6 Electricity supply.



Steady power supply is very important for fostering investment in small enterprises as electricity is, in general, the least cost way of running machinery like flour mills and equipment like refrigerators. Reliable power supply helps industrialists to set up companies that create employment which the RGCs need desperately. Reliable power supply is now also believed to improve performance of children in school due to the convenience of doing their homework.

3.2.6 Water fetching

3.2.6a Impact on job opportunity for women.

TABLE 3.2-5 ADVERSE EFFECT ON JOB OPPORTUNITY FOR WOMEN.

Adverse effect	Count	%
Reporting late for work, opening business late	11	36.7
Loss of customer or business while fetching water	1	3.3
Carrying water affects a human health	3	10.0
Takes time for other activities	13	43.3
There is no effect	2	6.7
Total	30	100

One of the major impacts of water fetching on job opportunities for women is that it takes time for other activities. This was mentioned by 43% of the respondents. The time spent fetching water is significant and women are the HH members that have the greatest responsibility for fetching water. While they are fetching water their other engagements such as child care, cooking, and gardening suffer. Another significant impact is that those women who are already in employment are forced to report late for work. This undermines their ratings at work as well as their chances of promotion, at times their pay and sometimes it can even lead to losing their jobs.

3.2.6b Adverse effect on school attendance for children

The effects named in connection with children are outlined in table below. The main one is that they reach school late or they miss lessons. In rural and semi-rural setting, one of the first chores for children is to go to the well or water source and collect the water for the day. For that purpose they have to wake up sometimes as early as 5.00 am. But even then, owing to the distance and the queue at the source, they are only able to return home just a few minutes before school time. By the time they jog to school, it will be past the acceptable time and they will get punished for being late and get into the class late having

missed some lessons. Moreover, sometimes out of lack of alternatives or due to the need to minimise time wastage, children often go to the water source in their school uniforms which also get wet and muddy making their school ordeal worse.

TABLE 3.2-6 ADVERSE EFFECT ON SCHOOL ATTENDANCE FOR CHILDREN

Adverse effect	Count	%
Reach school late or miss some lessons	16	53.3
Poor attendance, can't focus due to fatigue	8	26.7
They get seduced at water source resulting into early pregnancy	3	10.0
Poor performance in class due to poor attendance	2	6.7
There is no effect	1	3.3
Total	**30**	**100**

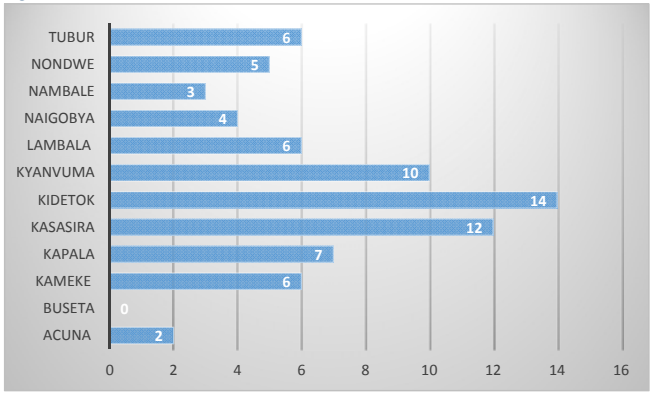
Late arrival at school leading to missing some lessons as well as poor attendance due to fatigue all lead to poor performance. Since girls carry a greater responsibility for fetching than boys, the impacts of water fetching are likely to affect girls more than boys, perpetuating the imbalance that already exists in literacy and employment.

3.2.7 Water sellers

3.2.7a Existence of water sellers

On existence of water sellers, 53.3% of the village leaders reported that there are water sellers in their villages and 46.7% said that they do not have water sellers. The average number of sellers reported for all the villages is 6.25. The RGCs that report water sellers are seen in figure 3.2-7 below. The number of water sellers in those RGCs are also indicated.

Figure 3.2-7 Number of water sellers.



Kidetok RGC has the highest number of water sellers at 14 while Buseta has none. Data was also sought on where the water sellers fetch water. The main source of water for the water sellers was named as the borehole.

3.2.7 Income and expenditure

3.2.7a Sources of income

Table 3.2-7 below shows the sources of income for the residents in the villages. Based on the data, the main source of income is the sale of agricultural produce. Selling labour comes second.

TABLE 3.2-7 SOURCES OF INCOME

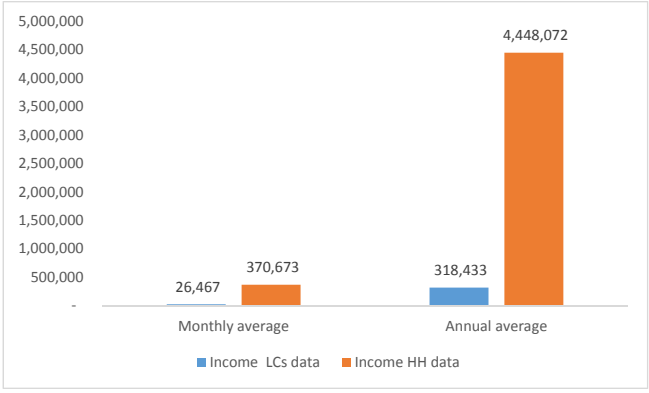
Source of income	Villagers getting the income (count)			
	Many	Some	A few	None
Selling animals	1	4	17	8
Agricultural crops	29	1	0	0
Selling labour	9	9	10	2
Forestry	0	2	11	17
Others1 (business)	2	5	14	9
Others2 (business)	2	1	7	20

The observation on the sale of agricultural produce tallies with the household data where a lot of people reported the sale of agricultural produce as a source of income. Forestry ranked least as a source of income with most respondents indicating that none of the residents got their income from there.

3.2.7b Income per HH

According to the village leaders, the average HH monthly income is around Shs 26,467- while the average annual income is around Shs 318,433. These data differ greatly from the self-reported data of respondents in the HH data. The HH data puts the monthly and annual incomes significantly higher. The difference is most likely due to the poor information that village leaders have on income of HH in their jurisdictional areas. Income is a highly private matter in most communities in Uganda. In particular HHs tend to greatly underestimate their incomes when interacting with LC1 leaders due to the fact that local government leaders have traditionally been associated with taxation. Village leaders may however also underestimate the incomes of members of the community if they believe that this will persuade project and services to be sent to the community. These two factors may have been at play in the reporting of the LC 1s.

Figure 3.2-8 Comparison of HH income data.



3.2.7c Seasonal Changes in income

Responses on seasonal changes in income are summarised in table 3.2-8 below. A major observation is that there is low income during the dry season. The dry season is associated with low agricultural production and low sales of agricultural produce. Harvest season is associated with high income due to the sale of agricultural produce and planting season is associated with low income due to the fact that there will not be any produce to sale. The fluctuation in incomes associated with the sale of agricultural produce reveals that storage and preservation of produce is a challenge and so is processing to longer lasting forms. Improvement in post-harvest handling, storage and processing can help to create a more stable flow of income to HHs in the survey area.

TABLE 3.2-8 SEASONAL CHANGES IN INCOME

Seasonal changes	Count	%
Income is constant	2	6.7
Low income during the dry season	12	40.0
High income during harvest/low income during planting season	8	26.7
Price fluctuation of agricultural products	1	3.3
Adverse conditions like pests, flooding, prolonged drought	7	23.3
Total	30	100

3.2.7d Number of livestock in the HH

Village leaders were also asked about the number of livestock in HH in their areas. According to the leaders, on average each HH has 1 cow, 1.8 goats and 0.3 sheep. By implication, many HH do not have any sheep while many HHs have more than 1 goat. The average number of livestock per village is 62.3 animals. The average per RGC has also been calculated and is shown in table 3.2-9 below.

Figure 3.2-9 Comparison of HH income data.

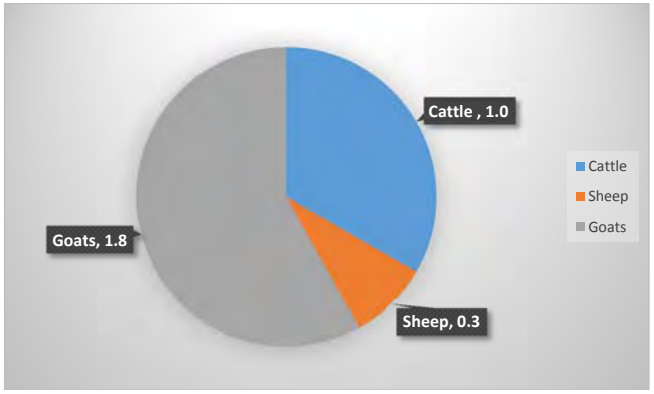
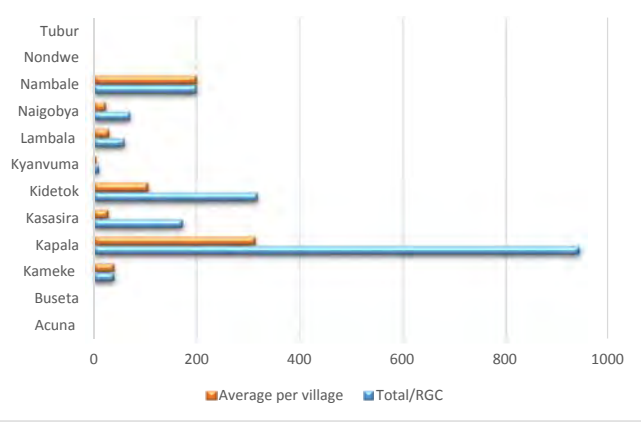


TABLE 3.2-9 DETAILS ON LIVESTOCK IN THE RGCS.

Cattle		Sheep		Goats		Total/RGC	No of villages	Average per village	Average for all Villages
Acuna	0	Acuna	0	Acuna	0	0	2	0	
Buseta	0	Buseta	0	Buseta	0	0	3	0	
Kameke	0	Kameke	40	Kameke	0	40	1	40	
Kapala	160	Kapala	212	Kapala	570	942	3	314	
Kasasira	64	Kasasira	24	Kasasira	85	173	6	28.8	
Kidetok	70	Kidetok	168	Kidetok	80	318	3	106	
Kyanvuma	0	Kyanvuma	10	Kyanvuma	0	10	2	5	
Lambala	10	Lambala	0	Lambala	50	60	2	30	
Naigobya	65	Naigobya	6	Naigobya	0	71	3	23.7	
Nambale	200	Nambale	0	Nambale	0	200	1	200	
Nondwe	0	Nondwe	0	Nondwe	0	0	2	0	
Tubur	0	Tubur	0	Tubur	0	0	1	0	
	569		460		785			747.5	62.29167

Figure 3.2-10 illustrates the figures for total per RGC and average per village. Kapala has the highest total and the highest average per village. Kidetok has a relatively high total for the RGC but the average per village is lower as there are 3 villages. Nambale has a good number of animals and the average is also the same since it has only one village.

Figure 3.2-10 Details on livestock in the RGCs.



3.2.7e Remittances

When data on remittances was analysed it showed that 33% of the people receive no remittances while 66.7% receive some remittances.

TABLE 3.2-10 PEOPLE RECEIVING REMITTANCES

Remittances	Count	%

None	10	33.3
Some	20	66.7
Others	0	0

It would appear therefore that remittances contribute to the income of the majority of the residents in the villages where the survey took place.

3.2.7f Payment for water per jerry can

Fourteen (14) out of the 30 respondents or 46.7% indicated that they do not pay for water per jerry can.

TABLE 3.2-11A PAY FOR WATER PER JERRY CAN

	Uganda Shs
Minimum	50
Maximum	300
Average	200
Mode	300

The rest 16 or 53.3% indicated that they pay. The average pay per jerry can is Shs 200 though the leaders reported payment ranging from Shs 50 to Shs 300. Both Shs 200 and Shs 300 are mentioned the same number of times, indicating that these are the most common prices for one jerrycan of water. This information is also illustrated in table 3.2-11b below.

TABLE 3.2-11B PAY FOR WATER PER JERRY CAN

Payment Per jerry can (Ugx)	Count
50	2
100	2
200	5
300	5
Nothing	16

3.2.7g Water consumption

Table 3.2-12 below presents the data on water consumption. The table shows that most people consume between 11 and 30 litres of water per person per day. However, as can be seen, most respondents reported a figure between 11 and 15 litres per person per day.

TABLE 3.2-12 WATER CONSUMPTION – LITRES PER CAPITA PER DAY.

Consumption - litres per capita per day	Count	%
Less than 5	0	0.0
6 to 10	5	16.7
11 to 15	10	33.3
16 to 20	7	23.3
21 to 30	6	20.0
31 to 50	2	6.7
More than 50	0	0.0

3.2.7g Latrine cost including soap

In most of the RGCs, there is no payment for toilet. However, most of these RGCs also do not have any public toilets. A public toilet was seen in Kameke however it appeared to be locked most of the time. Most people therefore use their personal toilets and when they are not at home they use institutional toilets

such as schools and government offices like the parish sub-county offices. In those RGCs where public toilets are to be found they are likely to be out of use due to lack of water or sheer misuse.

The lack of public toilets, free or paid for, is a major problem for sanitation and hygiene in the RGCs. Without convenient public toilets, people resort to urinating everywhere and finding the nearest bush or garden if they get a bout of diarrhoea. One of the major challenges with public toilets is water both for flushing and for washing hands. Improving access to safe water will help in facilitating the availability of public toilets in the RGCs.

Table 3.2-13a shows that most in most of the RGCs, going to the toilet costs nothing. Table 3.2-13B shows the situation in the respective RGCs. The culture of paying for toilets in the RGCs is absent except may be in Lambala where all people pay at least a little. The situation is however reversed for Tubur where it is indicated that most people pay a lot. It is not clear why this is the case in Tubur. However, this situation is also not helpful as people will still resort to unhygienic options either because they cannot pay or just to avoid the high cost of latrine. (note that the averages of table 3.2-13b will not equal the figures in table 3.2-13a as some of the figure in the later RGC wise table are themselves averages.)

TABLE 3.2-13A PAYMENT OF TOILET

Latrine cost including soap				
Payment	Nothing	A little	In between a little and much	A lot
Percentage (%)	80.83	8.80	3.33	7.03

TABLE 3.2-13B PAYMENT OF TOILET

	Payment (%)			
RGC	Nothing	A little	In between a little and a lot	A lot
Nambale	100	0	0	0
Nondwe	100	0	0	0
Lambala	0	92.5	5	2.5
Naigobya	100	0	0	0
Kyanvuma	100	0	0	0
Kasasira	100	0	0	0
Buseta	100	0	0	0
Kameke	52.5	2.5	10	35
Kapala	55.00	11.67	10.00	23.33
Kidetok	100	0	0	0
Acuna	75	12	10	3
Tubur	5	15	20	60

3.2.7h Payment for medicine and hospital

In the case of payment for medicine and hospital, the higher percentages in all the RGCs were reported to be paying a lot. The average of the percentage of the people who are paying a lot in all the RGCs is 55.1 and most of the RGCs are above this except for Naigobya and Tubur. The assessment of whether one is paying a lot or a little can be subjective but at least it tells us that the people in these locations feel that

they are paying a lot. When people feel that they are paying a lot, they may hesitate to seek medical attention due to concern over the expense and this could make the spread of infections worse.

TABLE 3.2-14A PAYMENT FOR MEDICINE AND HOSPITAL

Payment for medicine and hospital				
Payment	Nothing	A little	In between a little and much	A lot
Percentage (%)	8.50	19.00	35.00	37.50

TABLE 3.2-14B PAYMENT FOR MEDICINE AND HOSPITAL – RGC WISE

	Payment (%)			
RGC	Nothing	A little	In between a little and a lot	A lot
Nambale	10	20	20	50
Nondwe	0	0	10	90
Lambala	0.5	0.5	1	97.5
Naigobya	3	12.7	53.3	31
Kyanvuma	7.5	12.5	20	60
Kasasira	8.5	5.7	22.5	63.3
Buseta	30	8.3	11.7	50
Kameke	8.5	19	35	37.5
Kapala	5.7	14.3	26.7	53.3
Kidetok	15.0	10.0	21.7	53.3
Acuna	1.5	8.5	20	70
Tubur	10	15	70	5

3.2.8 Cooperative (communal) activities and organisations

3.2.8a Organisation and activities

According to the O and M guidelines from the Government of Uganda, rural water sources are supposed to be maintained through the community bases operation and maintenance system. This system is based on the cooperative activities of all the water users who must regularly contribute some fee so that when the water facility breaks down, there is money for its repair. Where people have experience with cooperative and communal activities including the raising of funds and working on projects as a community, the establishment of O and M systems for water sources is likely to be easier. Previous experiences will be brought to bear on the new situation and this will ease the challenges associated with setting up the systems for the operation and maintenance of the new systems.

3.2.8b Women's water related and other collective activities

Only one out of the 30 respondents reported any women's organisation for water related activities. Twenty nine (29) or 97% reported that there were no women's organisations for water in their villages. This is perhaps attributable to ministry guidelines that mandates the existence of WSCs for all water facilities. Besides, most of the organisations attract a monetary value and majority of the women would not find it satisfying to engage or start up water related organisations whose monetary returns may not easily be measure at face value. However women's organisations were reported for a series of other activities as outlined in table 3.2-15 below. The most frequently named activity is savings and credit –

what is commonly called SACCO in Uganda, where women pool money through saving and then lend it out to individual members for business. Other types of organisations named include those for farming and mobilisation and sensitisation for health.

TABLE 3.2-15 WOMEN'S ORGANISATION-OTHER ACTIVITIES

Women's organisation-Other activities	
Activity	**Count**
Savings and credit activity	18
Farming	4
Mobilisation and sensitisation on health	2
None	6
Total	**30**

3.2.8c Youth water related and other collective activities

TABLE 3.2-16 YOUTH ORGANISATION-OTHER ACTIVITIES

Youth organisations-Other activities activity	
Activity	**Count**
Welding	1
Making bricks	4
Farming-Agric and livestock	5
Savings and credit	5
None	15
Total	**30**

Youth had no organisation involved in water related activities but when it came to other activities, there were quite a number as listed in table 3.2-16 with several naming savings and credit as well as farming with agriculture and livestock. Both "Farming and Agriculture" as well as "Saving and Credit" featured significantly in this list.

3.2.8d Contribution to the construction of new piped water facility

Asked about the possible contribution of the RGC to the new piped water facility, more people communicated willingness to contribute with the highest score going to "collecting water fee" as well as "simple repair of the facility"

TABLE 3.2-17 CONTRIBUTION TO THE CONSTRUCTION OF NEW PIPED WATER FACILITY

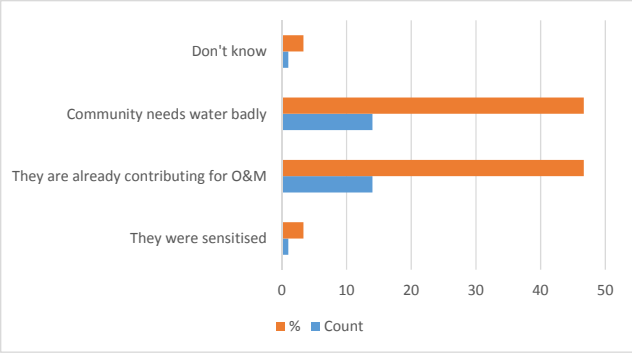
Contribution	Yes	No
Collecting water fee	20	10
Operating the facility	15	15
Simple repair of the facility	19	11
Others	16	14

Other contributions were led by contributing land, providing labour and mobilisation of community members in that order.

3.2.8e Willingness of villagers to pay O and M money regularly

Twenty nine out of thirty leaders reported that village residents are willing to pay for O and M regularly. The other person said that he did not know whether they are willing or not. The questionnaire also probed those who felt that people are willing to pay regularly for O and M the reason why they felt this is the case. The answers are presented in figure 3.2-11. The main reason is that the community needs water badly. However, the leaders also said that the residents are already paying for O and M and therefore they are familiar with the concept and action.

Figure 3.2-11 Reasons why they would be willing to pay O and M fee regularly.



3.3 ACTIVITIES OF THE WATER AND SANITATION COMMITTEES (WSCs)

3.3.1 Characteristics of the respondents

The activities of the water and sanitation committees were also investigated in this study. A questionnaire to collect information on the activities of the WSCs was designed and administered to members of the WSCs. A total of 49 respondents were interviewed with this questionnaire. The respondents held different responsibilities with their WSCs as outlined in table 3.3-1 below.

TABLE 3.3-1 DETAILS ON THE RESPONDENTS

Position of the respondent	
Chairperson	22
Vice chairperson	3
Secretary	4
Treasurer	2
Member	0
Caretaker	15
Mobiliser	2
Other	1

3.3.2 Water sources

For each of the respondents, information on the water source that he/she is responsible for was collected. Most of the respondents were members of the WSC of boreholes. This is not surprising as most of the other sources such as protected spring and unprotected spring normally have weak on non-existent WSCs. This is because they do not need a lot of maintenance which involves cost and therefore there is little need to collect O and M fees regularly. It is also pertinent to note that in vernacular, both a deep borehole and a shallow well with a hand pump have the same name.

TABLE 3.3-2 WATER SOURCES REPRESENTED BY THE RESPONDENTS

Water Source	1. Borehole	2. Shallow well	3. Dug well	4. Protected spring	5. Unprotected Spring
Number	47	2	0	0	0

3.3.3 Establishment and existence of WSCs

TABLE 3.3-3 YEAR OF ESTABLISHMENT AND AGE OF WSC

Year of construction	Number
1990-1995	2
1996 - 2000	4
2001 - 2005	1
2006 - 2009	5
2010 - 2015	34
2016 on	1

The year of establishment ranged from 1993 for the oldest WSC having lasted 23 years to one that was established just this year 2016. Most of the WSCs were established between 2010 and 2015. To give details these have been isolated and are presented in table 3.3-4 below.

TABLE 3.3-4 DETAILS ON WSC ESTABLISHED BETWEEN 2010 AND 2015

Year of establishment	No of WSCs	Age
2010	1	6
2011	3	5
2012	8	4
2013	5	3
2014	8	2
2015	9	1

The minimum number of years of existence was 0 as some of the WSCs had not seen their first birthday. The highest was 23 years while the mean was 5.3 years. The most frequently occurring single value was 1 and that means that a good number of WSCs were set up in 2015. The number of these as seen from the table above is actually 9.

TABLE 3.3-5 YEARS OF EXISTENCE OF WSC

	Year in existence
Min	0
Max	23
Average	5.3
Mode	1

All the respondents interviewed were members of existing WSCs which is the reason they were able to participate in the study. All the WSCs they represented are still existing and none has been disbanded.

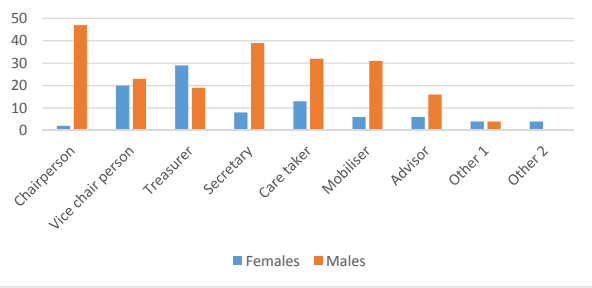
3.3.4 Number of committee members in the WSC

The data on the membership of the WSCs that were represented in this study is presented in table 3.3-6 below and is presented graphically in figure 3.3-1 below. From the graph it is easy to tell that men exceed women in all positions except that of treasurer. The reason for this is that women are generally believed to be more honest with money than men and most times they are voted into the position of treasurer to boost confidence in the WSC's management of finances. It is also possible that these committees are formed without proper sensitisation and guidance on how they should be structured, hence the male dominance in most of the key areas. Yet it's already been established in this survey that women are the ones that have the greatest responsibility for fetching the water needs of the home and should therefore be at the forefront of water and sanitation related activities.

TABLE 3.3-6 MEMBERS ON THE WSC

Number of members	Chairperson	Vice chair person	Treasurer	Secretary	Care taker	Mobiliser	Advisor	other1	Other 2	Other 3
Females	2	20	29	8	13	6	1	4	4	4
Males	47	23	19	38	32	31	11	5	4	0

Figure 3.3-1. Gender and the positions of the WSC



Regarding the full term of the different positions on the WSC, there is no standard across the region. Each WSC operates according to its byelaws. Due to the fact that positions on the WSC are volunteer positions – not paid and good committed people are difficult to find, many WSCs find it convenient to leave committed officials for as long as they are willing to serve. In table 3.3-7 below, the responses to the question of the full term are analysed. It can be seen that different WSCs have different terms. At the same time there were a number of WSCs that clearly stated that they do not have limits on terms and that the longevity of the official in the position depends on his/ her performance. It can be seen however that the average is around 3.5 years.

TABLE 3.3-7 FULL TERMS OF THE DIFFERENT POSITIONS ON THE WSC

Role		C/person	Vice C/person	Treasurer	Secretary	Care taker/ Mobiliser	Advisor	Other1	Other 2	Other 3
Full term of the role	Min	1	1	1	1	1	1	1	2	2
	Max	15	15	15	15	15	15	15	5	2
	Average	3.5	3.6	3.6	3.6	3.6	3.5	3.6	3.2	2
	Mode	3	3	3	3	3	3	2	2	2

Method of selection

Tables 3.3-8a and b below summarise the method of selection. Because each of the WSCs represented in this study has its way of selecting its leaders, it is not possible to just associate one method with a position. However it is clear from the data that most of the positions are filled by election by the water users. This approach is also recommended by the Ministry of Water as it enhances participation and ownership of the decisions that the leaders make.

TABLE 3.3-8A METHOD OF SELECTION

Method of selection	Count	%
Elected by water users	44	89.8
Took over due to poor management	1	2.0
Appointed by WSC official	1	2.0
Appointed by donor/sponsor/owner	3	6.1
Total	49	100.0

TABLE 3.3-8B METHOD OF SELECTION

	C/person	Vice C/person	Treasurer	Secretary	Care taker	Mobiliser	Advisor	Other1	Other 2
Election by water users	46	38	45	44	43	36	21	8	4
Appointed by WSC officials	0	1	0	0	0	0	0	0	0
Appointed by donor/sponsor/owner of BH	2	3	2	1	1	1	1	0	0
Took over due to poor management	1	1	1	2	1	0	0	0	0

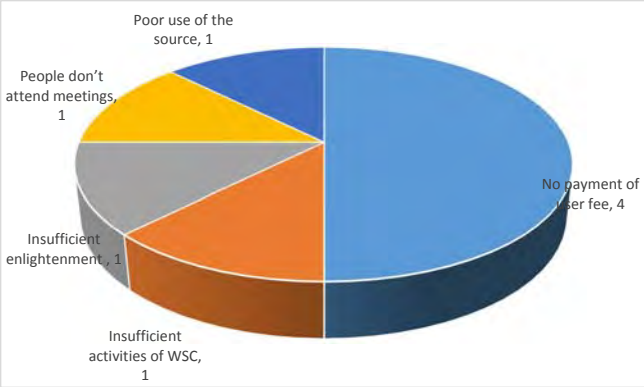
There are however some unique approaches to the selection of leaders mentioned and they include appointment by the donor or owner for facilities set up by missions or at the mosques. One unique approach that was mentioned is the taking over of management after mismanagement by the previous officials of the WSC. This is not a recommended method by the ministry.

3.3.5 Management of WSCs

When WSC officials were asked whether the management of their WSC is going well, 85.7% reported that it was going well while 14.3 percent reported that it was not going well.

When probed for the reasons for the management not going well the main answers were as presented in chart 3.3-2 below.

Figure 3.3-2. Reasons why management of WSC is not going well.



Activities for improvement of management

Two measures are suggested for the improvement of management by those who said that management was not going well and these are "saving water user fee collection from members for repair" and "common understanding between WSC and water users" (quoted verbatim) The first refers to collecting user fee regularly and accumulating it so that when there is a break down, funds for repair are easily available. The second refers to the promotion of harmony between the WSC and the water users and may be based on misunderstanding that exist in the area of the person that gave it. By implication, these practices are not well grounded in the WSCs where it was reported that management is not going well. This points to the need to have regular support to the WSCs from the officials in the local government as a way of enhancing O and M and the sustainability of handpumps.

Meetings of the WSC in the past.

On meetings in the foregone period, 98% of the respondents reported that their WSC had held meetings in the past. Only one reported that there had been no meetings in the past.

TABLE 3.3-9 WSC MEETINGS IN THE PAST.

WSC meeting in the past	Count	%
Yes	48	98.0
No	1	2.0

The number of meetings ranged from 0 to 8 meetings in the past year with an average of 2.6 meetings. With 8 meetings, the WSC is meeting almost once a month and this is quite a high frequency of meetings. Note that some of the people who reported that their WSC had had meetings in the past did not report a meeting in the past year perhaps indicating that it is more than a year since the last formal meeting of the WSC. Such a low frequency of meeting could be a sign of problems for the WSC.

TABLE 3.3-10 NUMBER OF MEETING IN THE PAST YEAR

E1-Number of meeting in the past year	
Minimum	0
Maximum	8

Average	2.6

The details of the meetings are given in the subsequent tables.

TABLE 3.3-11 A, PURPOSE OF MEETING OF WSC

Purpose	Meeting1	meeting2	meeting3	meeting4
	Count	Count	count	Count
Election of WSC members	5	0	1	0
Ways of collecting user fees	5	8	2	2
Maintenance of the facility	21	11	2	2
Mobilisation and sensitisation on sanitation and hygiene	7	5	3	0
Source repair	5	1	4	0
Protection/fencing of the water source	1	0	2	1
Issues concerning new water project	0	2	0	0
Report on the condition of BH	0	0	0	2
Others	1	1	2	0

All together the most frequent purpose for meetings is "Maintenance of the facility". Discussing "Ways of collecting user fees" is also a major reason for meetings as well as mobilisation and sensitisation on sanitation.

TABLE 3.3-11 B, AGENDA OF MEETING

Agenda	Meeting1	Meeting2	Meeting3	Meeting 4
	Count	Count	Count	Count
Collection of user fee	14	13	1	2
Repair of the source	17	6	7	1
Maintenance-O&M	4	1	0	0
Election of leaders	4	0	1	0
Improving cleanliness, sanitation and hygiene	2	5	1	1
Water source management issues	2	0	2	0
Protection of the borehole	2	1	1	1
Hosting water providers	0	1	0	0
Establish number of water users	0	0	2	0
Report on the condition of BH	0	0	0	1

The data also shows that the predominant agenda item in all the meetings is "Collection of the user fee" and "Repair of the source". Most of the WSC met once a year and the participants were dominated by the users both male and female.

Opinions from female participants

Responses show that 93.8% observed that women submitted opinions in the meetings. In the same way, 97.8% of the respondents observed that when women submitted opinions, those opinions were treated the same way as those of men. Regarding questions from participants apart from the committee members, all respondents reported that such questions were there.

The type of opinions that they submitted are summarised in the table below and the type of motions that participants submitted are summarised in the subsequent table.

TABLE 3.3-12 OPINIONS SUBMITTED BY WOMEN

Opinion	Count	%
Ways of improving sanitation and hygiene	**8**	17.4
Improving collection, recording and management of user fees	**11**	23.9
Orderly use of the Borehole	**10**	21.7
Mobilising resources to get another borehole	**3**	6.5
To protect and secure the water source	**4**	8.7
Ensuring that facility is maintained and repaired	**8**	17.4
Improving the management of the facility	**2**	4.3
Total	46	100

The majority of the opinions were concerning improving collection, recording and management of user fees. The second most important category of opinions was concerning orderly use of the borehole. The prominence of the issue of user fees is expected since this is the most vital and yet most troublesome issue in the management of water sources. The prominence of the issue of orderly use of the facility points to another important issue. Orderly use impacts the longevity of the facility as well as the sanitation and hygiene at the facility.

On the motions, data as seen in the table below, shows that the most frequent motions was on improving the management of the water source. The elements of this motion are similar to the contents of the opinions on orderly use of the borehole. There were also a significant number of motions on the treatment of water to make it safer. Some of the motions in this category had to do with the use of chlorine dispensed at the borehole while others were raising the issue of either coloured water or water with an undesirable taste and how to treat such water to make it more usable.

TABLE 3.3-13 TYPE OF MOTIONS SUBMITTED BY THE PARTICIPANTS BESIDES THE WSC OFFICIALS

Motions/questions	Count	%
Discussion on getting a new borehole	2	5
Improving maintenance and repair	3	7.5
Improving water source management	8	20
Protecting and fencing the source	2	5
Treating water to improve its safety	5	12.5
WSC to account for user fees collected	20	50

TABLE 3.3-14 IMPROVEMENT IN THE ACTIVITIES OF WSC

Improvement/changes	Count	%
Yes	32	80.0
No	8	20.0
Total	40	100

Regarding improvement in the activities of the WSC after the motions of the female participants, 61% of the respondent felt that indeed there were improvements in the activities and management of the WSC after the discussion.

Respondents specified six types of improvement as a consequence of the motions and decisions initiated by the female participants. The main ones of these improvement were that "accountability was provided to the users". Nineteen respondents or 59.4% mentioned this one. This one regards the management and use of the O and M fee regularly collected. The other improvement noted by seven or 21.9% of the respondents was that the rules for the proper use of the facility were enforced.

TABLE 3.3-15A EXISTENCE OF RECORD OF INCOME AND EXPENSE OF WSC

F- Does WSC have record of income and expenses	Count	%
Yes	44	89.8
No	5	10.2

On the existence of records of incoming and outgoing money, 89.8% of the respondents said that such records exist. This means that most of the WSCs were doing well in terms of the documentation of financial transactions of the WSC. Where such records did not exist, the reasons given were as summarised in table *3.3-15b* below. The passing on of the responsible official is a significant issue. The passing on or emigration of a WSC official has frequently proved a problem for many WSCs as organising for the replacement is often not done.

TABLE 3.3-15B REASON FOR NON-EXISTENCE OF RECORDS

Reasons for having no records	Count
Secretary died and has not been replaced	2
No money is collected	1
WSC has never resolved to keep records	1
Private borehole, no need of records	1

These records were for the most part in the hands of the secretary as seen from the table below.

TABLE 3.3-16 PERSON IN CHARGE OF KEEPING RECORDS

Person in charge of keeping records	Count	%
Chairperson	**10**	22.7
Secretary	**28**	63.6
Treasurer	**3**	6.8
Caretaker	**2**	4.5
School bursar	**1**	2.3

This is surprising since the person that should be in charge of collecting and spending finances is the treasurer. However, it may be that with many WSCs, the secretary is the person to do most of the day to day activities while the treasurer is left to manage the account and receive and organise for the keeping of the finances.

The number of WSCs with a check system was nearly equal with 56.5% saying that they have a system and 43.55% saying that they do not have one. This check system in the majority of cases involves the WSC sitting in a meeting and cross checking all the records one by one.

TABLE 3.3-17 OTHER ACTIVITIES CARRIED OUT BY THE WSC IN THE LAST YEAR

Activity	Count
Repair of facility	41
Request to sub-county /DWO	3
Improve sanitation and hygiene for the borehole	8
Raising funds for maintenance and repair	3
Fencing around the borehole	5

Besides the meetings and the activities mentioned above, 98% of the respondents said that the WSC carried out other activities in the last year. The kind of activities carried out are outlined in table 3.3-17 on the left. The leading activity was repair of the

facility named by 41 respondents. But there were also activities for the improvement of sanitation and hygiene for the borehole.

Respondents (98%) also admitted that the WSC has the mandate to carry out the activities named above.

Decisions on important issues of the WSC

TABLE 3.3-18 HOW DECISIONS ON IMPORTANT ISSUES OF WSC ARE MADE

How decisions on important issues of WSC are made	Count	%
Hold all water users meeting	**34**	66.7
Hold meeting of committee members and main users	**9**	17.6
Committee has power to decide	**7**	13.7
School administration	**1**	2.0

When respondents were asked how decisions on important matters are made, the responses they gave are listed in table 3.3-18. In 34 out of the 49 cases (or 69%), they hold a water users meeting and the motion is tabled and a decision made.

3.3.6 Operation and maintenance activities

3.3.6a Payment of initial contribution.

Respondents reported different amounts paid as initial contribution. This information is summarised in table 3.3-19 below. 18.8% reported that initial contribution is not paid or that they do not know about it.

TABLE 3.3-19 AMOUNT PAID BY HH AS INITIAL.

Amount paid for initial contribution	Count	%
None	9	18.4
Don't know	3	6.1
2000 and below	18	36.7
2001-5000	15	30.6
Above 5000	4	8.2

The rest stated that it is paid and amounts varied from less than Shs 2,000 to Shs 10,000. People are often willing to give significant amounts of money for initial contribution so as to enable the community to get a facility.

Once a facility is constructed, it must be maintained. To this end it is recommended that users contribute money regularly to meet all the costs associated with maintenance and repair.

TABLE 3.3-20 REGULAR PAYMENT FOR O AND M

Regular payment for O&M	Count	%
Per jerry can	2	4.1
Per month	18	36.7
None	25	51.0
Whenever it breaks	4	8.2

Regarding regular payment, respondents reported that the favoured method of payment is payment per month. Payment per jerry can of water was reported by only two out of the 49 respondents with amounts ranging from Shs 100 to Shs 1,000 per jerry can.

The majority of water users pay a monthly fee ranging from Shs 100 to Shs 3,000 per month, with most reporting between 1,000 and 2,000= (3.3-20 below)

TABLE 3.3-21 AMOUNT EACH HH PAYS REGULARLY FOR O AND M PER MONTH

Amount per month	count
200	2
500	3
1000	6
2000	5

3000	2

TABLE 3.3-22 HOW OFTEN THE AMOUNT IS PAID (12-B)

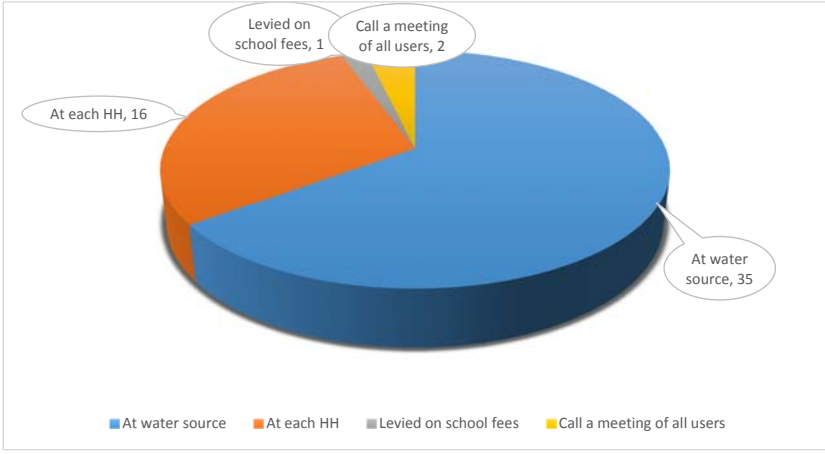
How often HH pays the fee	Count	%
Monthly	16	35.6
Weekly	0	0.0
Other -When facility breaks down	23	51.1
Other yearly	6	13.3

When asked how often the amount is paid, the responses were concentrated mostly around "when facility breaks down" (51.1%), implying that the WSC makes an emergency meeting and takes up a collection for repair when the facility breaks down. The second biggest proportion of responses 35.6% went to "monthly" reiterating the established practice of paying every month.

However, there are also other methods of payment. The most common of these is more of an excuse not to pay than a method. This method is making contribution whenever the HP breaks down and needs repair. The contribution can however come from a donor or the owner of the facility in case it was set up by a school or a religious organisation.

Where money for O and M was reported to be collected regularly, the method of collection was reported to be mostly collection at the water source followed by collection at the household. There were also instances where it was levied on the school fees of children and this is more practical if the water source is at the school and was constructed by the school.

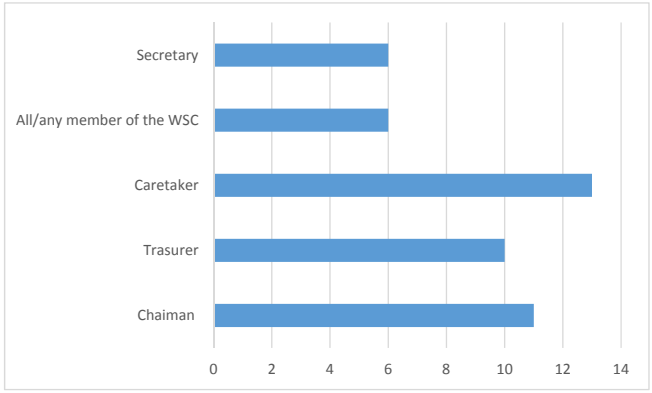
Figure 3.3-3 How money is collected (I3)



Where money is collected regularly, it was reported that it is collected mostly by the caretaker, followed by the chairperson and then the treasurer. The caretaker is very important in regular collection of O and

M money especially if it is collected at the source since it is the caretaker that has the responsibility of daily care of the source.

Figure 3.3-4 who collects the regular payment.



Money collected regularly poses a challenge of safe keeping. With easy availability of cash the chances of misappropriation and theft increase. When asked where the money is kept, village leaders gave the answers summarised in table 3.3-23 below.

TABLE 3.3-23 WHERE THE MONEY IS KEPT.

Where the money is kept	Frequency	%
Treasurer	34	69.4
Chairperson	2	4.1
Savings group/Bank	1	2.0
Used there and then	6	12.2
Secretary	1	2.0
Other, N/A	5	10.2

For the most part, the money is kept with the treasurer. Respondents also indicated that for some facilities the money is used immediately it is collected. However this is a method that may not be appropriate for regular collection of money. It is more suitable to situations where money is collected when there is a break down. The fact that only one leader indicated that the money is kept with a savings group is also significant. The guideline for most of the facilities is that the money should be kept with microfinance institutions or banks. In practice however, this seems to be uncommon and indeed there are many challenges to its achievement including literacy and distances to bank branches.

Regarding the kinds of repairs done on the facility by the WSC, village leaders reported the replacement of different parts of a borehole including pipes, cylinder, chain, bearings, seals, rings and handles.

On the existence of byelaws, all village leaders reported that they exist. As to whether they are in operation, only 4.1% reported that they are not in operation. The rest – 95.9% said that they are in operation. Responses - 93.8% also indicated that the RGC's do not receive any O and M services from the government. Where it was reported that services were received, the service named was the repair of boreholes by the replacement of different parts. There were no software services reported.

95.9% of the village leaders also felt that village residents are willing to pay more regularly for O and M. Even so, 36.7% of the leaders reported that there are users who do not pay their water user fee. As to why they do not pay their user fees, the most common answer was that 'they do not have money' or 'they are poor'. All these data are summarised in table 3.3-24 below.

TABLE 3.3-24 BYELAWS AND O AND M FEES

Questions I7, I8, I9, I10, I11	Yes	%	No	%
Existence of bylaws	49	100.0	0	0.0
Are the bylaws in operation	47	95.9	2	4.1
WSC receives service of O and M from Govt.	3	6.1	46	93.9
Opinion on willingness to pay for O and M	47	95.9	1	2.0
Any members who do not pay water user fee	31	63.3	18	36.7

But when people default on their O and M payments is there any action taken to compel them to pay up? To this question the WSCs gave the answers in the table below. On the one hand there is pressure exerted on them to pay but this is only in the case of 15 of the 49 WSCs. One of the measures taken is to stop them from collecting water and this may also involve the confiscation of their jerry cans. This was reported by 65.3% of the respondents. However in some villages, the WSC leaders choose to be patient and instead sensitise and persuade the defaulters. There are also situations where they are just left to go on as usual, fetching water like the rest but not paying.

TABLE 3.3-25 MEASURES TAKEN ON THOSE WHO DO NOT PAY.

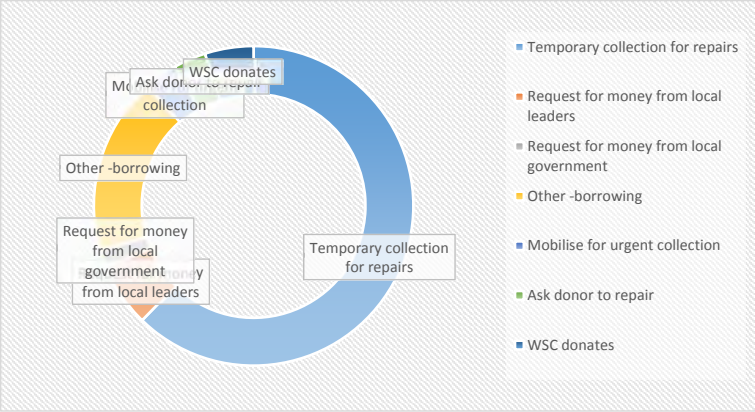
I11-b Effort to collect	Yes
Press relevant members	15
Do not press relevant members	2
Stop them from fetching water	18
Educate persuade mobilize	7
Leave them/ do nothing	7

NB. Answers not mutually exclusive. Percentage will not total to 100.

All except one of the respondents in this study indicated that the WSCs had explained the reason for payment of the water user fee.

When the facility breaks down and there is no money in the WSC purse to repair it, a number of options were given by the village leaders. These are outlined in the chart below.

Figure 3.3-5 Actions taken to repair when there is no savings



3.3.7 Income and expenditure of WSCs

TABLE 3.3-26 INCOME AND EXPENDITURE OF WSCS

	Income and Expenditure	
	Income	**Expenditure**
Min	0	0
Max	1,100,000	1,100,000
Average	204,824	195,559

WSCs gave some figure on income and expenditure of WSCs in their jurisdictional areas. These have been analysed and they are presented in table 3.3-26 to the left. Minimum annual income stood at Shs 0 while the maximum stood as Shs 1,100,000 and the average stood at 204,824. This average comes to around Shs 17,000 or USD 5.2 per month.

3.4 THE CONDITION OF HEALTH AND HEALTH SERVICES FOR THE RGCS

3.4.1 Introduction

The survey on the condition and health services in the RGCs targeted the health centre III in the RGCs and where the RGC did not have a centre located in it, the nearest HC III preferably in the same sub-county.

The purpose of including the Health Centres was to assess their influence on the promotions of sanitation and hygiene in the RGCs and how they impact and are impacted by the available supply of safe water. The questionnaire used for the HC survey is attached to this report as **Attachment 4.**

3.4.1a Health centres surveyed

Ten HCs were covered in the survey. These are presented in table 3.4-1 below. At each of the health centres, the most senior officer present was interviewed. In the table, the positions of the respondent at each health centres is also presented.

TABLE 3.4-1. HEALTH CENTRES SURVEYED

District	Sub county	Name of Health Centre	Private/Government	Villages/location	Enumerator	Respondent/ representative	Position of Respondent
KIBUKU	BUSETA	BUSETA HC3	GOVERNMENT	BUSETA C	EMMANUEL	OKOLERE	INCHARGE
PALLISA	KAMEKE	KAMEKE HC3	GOVERNMENT	KOMOLO B	CHERERE	ORINGA JUDE	HEALTH OFFICER
PALLISA	GOGONYO	GOGONYO HC3	GOVERNMENT	OUKOT	CHERERE	AMUGE JENNIFER	ENLOLLED NURSE
KIBUKU	KASASIRA	KASASIRA HC3	GOVERNMENT	KASASIRA TOWNSHIP	CHERERE	NAMAJJA RUTH	HEALTH OFFICER
SERERE	PINGIRE	KIDETOK MISSION HC3	PRIVATE	AGONYO 1	CHERERE	SISTER MARCELLINA	H/C IN CHARGE
LUUKA	IRONGO	IRONGO HC3	GOVERNMENT	LAMBALA	CHERERE	MUNOGI JENNIFER	RECORDS OFFICER
LUUKA	BUKOMA	NAIGOBYA NGO HC3	PRIVATE	NAIGOBYA TOWNSHIP	CHERERE	MUWERWA RITAH	RAB TECHINICIAN
IGANGA	NAMBALE	NAMBALE HC3	GOVERNMENT	NAMBALE	EMMANUEL	ACHENG MARTHA	ENROLLED NURSE
IGANGA	MAKUTU	KASOZI HC2	GOVERNMENT	NONDWE	CHERERE	ASUMAN MULINDA	ASSISTANT HEALTH OFFICER
SOROTI	TUBUR	TUBUR HC3	GOVERNMENT	TUBUR CENTRAL	EMMANUEL	IJONGAT HARRIET	NURSING OFFICER

3.4.2 Water borne diseases in the RGC

3.4.2a Prevalence of water borne diseases

TABLE 3.4-2A PREVALENCE OF WATER BORNE DISEASES.

Prevalence				
Disease	**Prevalence**			
	Very common	**Common**	**Rare**	**Very rare**
Malaria fever	10	0	0	0
Diarrhoea	3	6	1	0
Skin disease	0	8	2	0
Respiratory diseases	4	2	2	2
Worms	0	7	0	3
Eye disease/infection	0	7	1	2
Intestinal infection	0	1	0	9
Typhoid	0	1	1	8
Dysentery	0	2	0	8

When all the data from the 10 HCs is combined, the most prevalent disease is malaria/fever. Malaria/fever was ranked as very common by the majority of the respondent. This was followed by respiratory diseases which 4 people ranked as very common and diarrhoea which 3 people ranked as very common.

The ranking for very rare put the highest score at intestinal infections, followed by typhoid implying that from the health centre view, these are the least prevalent diseases when all the RGCs are taken together.

TABLE 3.4-2B PREVALENCE IN DIFFERENT AGE CATEGORIES

Disease	Age group	No. of patients	(%)
Malaria fever	Adults	32,895	67.02
	Children	252	0.51
	Infants	15,936	32.47
Diarrhea	Adults	2,349	48.85
	Children	29	0.60
	Infants	2,431	50.55
Skin Disease	Adults	1,852	56.84
	Children	29	0.89
	Infants	1377	42.27
Respiratory diseases	Adults	13,130	63.38
	Children	7	0.03
	Infants	7,578	36.58
Worms	Adults	3,810	80.87
	Children	22	0.47
	Infants	879	18.66
Eye diseases	Adults	1,105	64.77
	Children	0	0.00
	Infants	601	35.23
Intestinal infection	Adults	475	74.92
	Children	18	2.84
	Infants	141	22.24
Typhoid	Adults	30	81.08
	Children	4	10.81
	Infants	3	8.11
Dysentery	Adults	75	65.79
	Children	0	0.00
	Infants	39	34.21

Data on prevalence in the different age groups is presented in table 3.4-2b. The data shows that for prevalence is higher among adults as compared to children and infants for all diseases except diarrhoea. This is not so surprising as awareness and care in the management of food and water is important for the prevention of diarrhoea. Infants tend to be less careful regarding what they eat out of ignorance hence the higher prevalence of diarrhoea among them (At the time of the study, it was found that most of the HCs are using a new system for the classification of patients. This system make a difference between adults and infants only. Anyone below the age of 5 is an infant while anyone above that age is an adult. However, there was one HC in Makuutu Nondwe, where the old system was being used. The old system has a category for children between the ages of 5 to 12 years.)

3.4.3 Differences in prevalence in dry and wet season.

TABLE 3.4-3. DIFFERENCE IN PREVALENCE RAINY AND DRY SEASON.

Disease	Number of patients per season			
	Rainy season	Dry season	Difference	% difference
Malaria fever	27,040	22,043	4,997	22.7
Diarrhoea	3,100	1,709	1,391	81.4
Skin disease	2,179	1,099	1,080	98.3
Respiratory diseases	3,175	7,759	-4,584	-59.1
Worms	3,073	1,638	1,435	87.6
Eye disease/infection	967	739	228	30.9
Intestinal infection	258	376	-118	-31.4
Typhoid	22	15	7	46.7
Dysentery	91	23	68	295.7

Data shows that in general the prevalence of diseases reduces in the dry season. Prevalence of all diseases except respiratory diseases and intestinal infections is lower in the dry season as compared to the wet season.

A possible reason for this is the ease with which water borne diseases can be transmitted in the wet season as compared to the dry season. Wet conditions normally favour the survival of microorganisms which makes them available in various ecologies to be transferred from one person to another. In addition, rains creates run off which carries improperly disposed human waste, spreading it so that more people especially in the low lying areas come in contact with it. In the

high density areas, people with poor toilet facilities sometimes dispose waste into the storm water so as to allow the storm water to carry the waste away. Poor drainage ensures that the storm water and its infectious load is available for a long time to facilitate transmission of infections. The infected people eventually end up in the HCs for treatment.

The most significant difference between the dry and the rainy seasons relates to skin diseases, worms and diarrhoea with 98.3%, 87.6% and 81.4% increase in the rainy season respectively.

There are some diseases however whose prevalence increases in the dry season and these are respiratory diseases and intestinal infections. The increase in respiratory diseases in the dry season is consistent with the reports of the responses in the HH survey where most people attribute it to dust and smoke, both of which are plentiful in the dry season. One of the sources of smoke in the dry season are the bush fires in the areas surrounding the RGCs while dust is a usual menace of the dry season as most surfaces are not paved.

The cause for the increase in intestinal infections in the dry season is more surprising but it may be associated with other seasonal development. In seasonal calendars, times of high intestinal infections have been associate with the mango ripening season due to the increase in flies associated with rotting fruit. The end of year dry season also tallies somewhat with the mango season and there may be a link between these two.

3.4.4 Water supply and consumption for the health facilities.

Water is a critical input in any health facility as it is a key ingredient in any cleaning activity. Table 3.4-4 below shows the average water consumption in the health centres surveyed. The average number of jerry cans required for a health centre is 39.3 and the average per-capita daily water consumption is 17 litres. These data reveal a dire situation for the health centres. At 17 litres per capita per day, the health centres is barely meeting Sphere the standards for a domestic setting leave alone a medical facility. Yet 39.3 jerry cans per day is a huge amount of water to fetch by hand or even bicycle.

TABLE 3.4-4 WATER CONSUMPTION BY THE HCS

	Water Consumption	Water needed	Deficit	Deficit as % of current consumption
No of jerry cans	39.3	74.4	35.1	89.3
Litres/capita per day	17	25.7	8.7	51.2

All of the HCs reported that on the basis of their current demand, none of them is getting enough water. In table 3.4-4, the deficit is indicated both in terms of litres per capita per day and in terms of jerry cans. A percentage deficit is also calculated and the data shows that on average, the HCs are only getting 10.7% of their water needs in jerry cans or 48.8% when it is measured in litres per capita per day.

3.4.5 Sensitisation/enlightenment activities on health and sanitation

3.4.5a Characteristics of respondents

At the relevant sub-counties where HCs are located, officials were interviewed about sensitisation activities on hygiene and sanitation. The official interviewed included 3 Health Assistants – (HA), 3 Sub-county Chiefs, 3 parish Chiefs and 1 community Development Assistant (CDA)

3.4.5b Kind of sensitisation activities combined

TABLE 3.4-5. EASE OF CARRYING OUT SENSITISATION ACTIVITIES.

Each sub-county has its own challenges, opportunities and resources and these are reflected in the ease with which they are able to carry out sensitisation on different aspects of sanitation and hygiene.

Activity	Circumstances of executing the activity	
	Ease	Difficulty
Promotion of water, sanitation and hygiene	5	5
Pre-planning of implementation of a project	10	0
Mobilization and training	7	4
Standardization of systems and procedure	3	6
Effective Operation and maintenance	5	4
Monitoring and adaptation	4	6
Establishment of an institutional framework	5	6
Specify if any	1	4

Data from the study shows that the easiest of the activities based on the number of nominations is "pre planning of implementation of a project". The second easiest based on the number of nominations is mobilisation and training. The one which scored the least in ease is standardisation of systems and procedure. Pre planning of implementation of projects usually comes with lots of eagerness from the community as there is high expectations from the project. Where there is nothing in particular that is being anticipated, community members are less eager to participate in sensitisation activities. Thus it may be wise that whenever there is a pre-planning of projects, a whole lot of sensitisation is also covered along with the main thrust of the project.

On the enlightenment or sensitisation activities that the local governments were not able to do with ease, the one scoring the highest is standardisation of systems and procedure. This was followed by monitoring and adaptation.

CHAPTER FOUR - ISSUES CHALLENGES AND CONCLUSIONS

4.1 Challenges

The execution of this study encountered a number of challenges. These are briefly outlined below

4.1.1 Logistical issues.

Among the logistical challenges were the issues related to the movement of the teams, the language challenges and the several public holidays.

In spite of detailed planning, there are many challenges that cannot be foreseen in an exercise like this. It was planned that the survey team would move together. This has many advantages, not least being the ease with which information can be shared. Every day there is some new lesson that comes from the experience in the field that day and it is important for all the team members to get that lesson so that the following day they do not have a similar challenge without a solution. However this comes with some challenges especially in an exercise like this where there were many sites in a wide area. There was a time

when the survey team had to be split into smaller teams to save time. However it was found that this was one of the issues that we discussed in one team were not covered in another hence a repetition of mistakes.

The region covered in this study is a multi-lingual area. Although many people understand English and Luganda, there are areas where these languages will not be understood. From the onset therefore one of the criteria for the recruitment of interviewers was the ability to speak one of the languages in the area of the survey. Yet there had to be a good mix of the languages. Even then it was difficult to find one person who could speak all the languages in the area. The pressure to have people conversant in the languages meant that there was pressure to overlook certain other qualifications such as past experience in interviewing of this nature. To reduce the impact of this, the survey management undertook rigorous training of the interviewers before embarking on data collection.

The concept of a RGC is real on paper but it is not a clearly demarcated entity on the ground. For that reason there are villages within the RGC which lie partly in the RGC and partly out of the RGC. At the time of data collection, it was difficult for the village leaders to isolate the details pertinent to the area within the RGC and those pertinent to the area outside of the RGC. Village leaders accumulate information on the village as a whole not on small part of each village. Therefore some of them ended up giving the general picture of the villages including the area beyond the RGC.

The survey was carried out in a period of political campaigns. This came with its own challenges. At times like this people are elated and often they expect that all activities going on in the community might have to do with some politicking. There are expectations associated with this and the survey team spent significant time explaining this away before they could embark on effective interviewing.

It was planned that data entry would be done as it is collected and to this effect two people were hired for data management. However their work is mostly computer based but in the conditions of the field there were many instances where they just could not do anything due to power cuts thus losing valuable time.

4.1.2 Availability of valid data

In undertaking any survey, one proceeds under the premise that the respondent will have the required data and that he/she will be willing to divulge it correctly. However this was not always the case in this survey.

In the semi urban conditions of the RGCs surveyed, people in general have a poor record of statistics of everyday life. If you have to pay a monthly bill for water, you will have some idea of what it is expected to be. If you just pay on a daily basis as need arises, it may be more difficult to put a figure to it. Thus on situations like "no of jerry cans of water bought in the last year" people would struggle to put accurate figure mostly because they could not remember.

Information given by respondents is also sometimes coloured by their expectations. For instance, a village leader might underestimate the income of his subjects if he expects that this will persuade a donor to grant a project. Individuals might also underestimate their incomes if they think the information will somehow be used for taxation. Others might overestimate it if only to impress. With prior knowledge on these challenges, the survey team was intensively trained. Even then much time was spent on harmonising figures especially of aspects of income and expenditure with some respondents becoming unresponsive

when pressed about conflicts and inconsistencies in the data they were giving. At times these inconsistencies were discovered after the interview and interviewers had to go back or had to call or had to figure the reality out on the basis of the rest of the information in the questionnaire. These kinds of activities took a significant amount of unanticipated time.

Due to their positions in the local government and in the various institutions in the communities, community and local government leaders are supposed to have certain information. However it was found that this is not the case mainly because the system of data accumulation and data management at the local government level is in a sorry state. For instance information on school enrolment was expected from the village leaders but is was soon noticed that they did not have it as it was required.

Finally there are cultural issues relating to data and information. For a semi-rural person in Uganda, there is little difference between 3 Km and 4. But for an engineer from Japan 3 Km is quite different from 3Km and 10 metres. This level of accuracy had to be brought to bear on the interview situation sometimes causing irritation to the respondent. Perhaps he answers in one question that the borehole is 100 metres away from home and then in the other he says it is about 200metres. In reality he is saying it is not too far but it could be any number of metres. This respondent would be confronted with the contradiction but in reality he/she would be telling the truth in their context and frame of reference. It is also important to note that some of these measures are not familiar to some of the people in the semi-rural conditions of the RGCs who do not often reckon time or distances in these precise terms.

4.2 Observations and Recommendations

4.2.1 Introduction.

The objectives of the Socio-economic Condition Survey were: a) To grasp actual condition of RGCs, and b) To obtain the basic data for designing water supply facilities and the formulation of efficient operation and maintenance plan for the Project. The survey utilised three sources of information including HH respondents, the village leaders and Water and Sanitation Committee members to examine knowledge, behaviour patterns and practices relating to water including operation and maintenance of water facilities in the communities. The observation and recommendations arising from the survey are made in line with these major themes of the survey.

4.2.2 Household characteristics.

The typical household in the survey area has 7 people consisting of 1 man, 1 woman, 2 boys and 3 girls thus there will be three male members and four female members. Within the HH, the man is the leader and his main role is “providing basic needs”. This means that he has to do any sort of work to earn the money to meet the basic needs of the family including food, clothing, housing and school fees for the children. Besides this he has to provide protection for the family. The main role of the wife is to prepare food and to take care of the children. The main role of the boy is to fetch water and to clean the compound while the main role of the girls is to fetch water and wash clothes. Chances are approximately 2.4:1 the HH will be Christian. While it is the role of the man to provide, in 64% of the homes, the woman will also be working to get money and she will most likely be involved in trading or some sort of farming. The man is more likely to be literate in both English and vernacular than the woman.

Because of this pattern of allocation of roles, the woman and the girl will most likely be found fetching water than the boy, and the man will rarely be found fetching water. This reality is important in planning both the hardware and software of the proposed facilities. Because women and girls are more likely to be fetching water, the physical arrangement and design of the facilities should be convenient for these people. Many women have no one to leave their babies with at home when they go to fetch water therefore they go with the babies. It would be a great relief if they had a place to sit and either breast feed or just rest as the queue for water moves on. Perhaps even space for the older kids to play so that as they fetch water they do not have to be concerned that the children will be endangered. Women need to be involved in all software activities and to be encouraged to participate in decision making in relation to O and M of all water facilities. Boys and girls need to be allowed to make an input in the planning for and O and M of water facilities. Moreover sensitisation activities and software for O and M of water facilities must ensure the participation of boys and girls. One challenge is that these boys and girls also go to school and this makes it difficult for them to participate in software sensitisation activities that take place in the course of the week.

4.2.3 Main source of water.

It is clear from the survey that the main source of water, both in the rainy season and the dry season is the borehole. In the dry season the second most important water source is the unprotected spring. In the rainy season, the second most important source changes to rain harvest. The preference for the BH is probably associated with several factors namely a) location in proximity to centres of population, b) the perception that it is a source of safe water, c) reliability - the fact that deep boreholes have a steady flow of water in both the dry and the rainy season and d) the relative affordability of water from boreholes. These conditions must be borne in mind as new facilities are put in place. All of these factors are within the control of the planners of the new facilities. The borehole is therefore a good benchmark for all these parameters in relation to the new facilities. But convenience may be the reason behind the choice of the unprotected spring in the dry season in preference to the protected spring. This should also inform planning.

The pressure on boreholes and other sources is relieved in the rainy season by rain harvest and it is clear from the survey that it forms a viable alternative especially as the region has two season of rainfall each lasting no less than three months thus ensuring water security for 6 months a year if well harnessed. There are two practical implications of this: the first is that investment in rain harvest could have good yield in water security and cost benefit studies need to be carried out to compare with the other alternatives water sources. The other is that while the relief on some sources in the rainy season makes fetching from these sources convenient, it may lead to negligence and partial abandonment and break down. This implies that the rainy season should not be a period of rest for those involved in the O and M of water facilities and O and M activities are as important in the rainy season as in the dry season.

4.2.4 Water consumption

Water consumption differs very little in the dry and the rainy season with average consumption in the rainy season exceeding consumption in the dry season by only about 2.8 litres per person per day. The most frequently named per capita consumption is 20 litres per day and the average per capita water consumption is 21.8 litres. The international standard for per-capita water consumption is a minimum of 20 litres. Besides litres per capita, there are also international standards for distance to source, queuing time, time for round trip and labour. All these things considered, there is a side gap between need and

availability in the survey area. This gap will expand with population growth hence the need to have some excess capacity in the proposed facilities.

4.2.5 Paying for water and O and M

There is a contradiction in the practice of paying for water and O and M. On the one hand people report that they are already buying water and paying for O and M and indeed most say that they are willing to pay a monthly fee for O and M. On the other hand WSCs report resistance to paying the regular O and M fee and when asked the amount that they are willing to pay for a jerry can of water people always state a figure below what they are already paying.

The source of the problem is likely to be the perception that water service provision is the responsibility of government and people should only pay in the face of government failure. There is therefore a huge need for proper information and sensitisation on the population to own the responsibility for water provision. Sensitisation should also aim to enable people to recognise that even though the project is donor supported, they have a central role to play in its establishment and maintenance. Unfortunately, such sensitisation is often undone by unscrupulous leaders who promise free water when they cannot deliver it. This underlines the need for this theme to be included in all software activities of the project.

4.2.6 Water borne diseases

Among the least common, the highest percentage is scored by respiratory diseases and eye diseases. While fever may be a general symptom for many diseases including malaria, diarrhoea is closely related to unsafe water. The fact that these diseases are pointed out as common means that there are frequent opportunities for transmission of these diseases via contaminated water and it is important that people get access to safe water.

It can therefore be concluded that improving access to safe water will reduce the incidence of these diseases and their debilitating effects and enhance families' livelihoods and incomes. An intervening factor in this respect is the level of awareness of the link between unsafe water and disease transmission. Therefore these have the potential for the greatest reduction in water borne diseases with the introduction of more safe water sources.

When the remedies to the various diseases are examined, it is clear that the first line remedy for almost all diseases is to seek medication from a health facility. However coming a close second for most diseases is the preventive measures which include the use of safe water and good hygiene practices. This level of awareness of the fact that use of safe water and hygienic practices will reduce the incidence of diseases means that improving access to safe water will quickly lead to benefits in health and welfare. Moreover it also means that with a premium on safe water, there will be motivation for effective O and M including the regular payment of user fees.

4.2.7 Water and health problems

The biggest water problem for households is "too many people use the same source" This speaks to the congestion at the water sources in particular the boreholes which are the source used by most of the respondents. "Water source is too far" and "water quality is bad" featured in second and third position respectively. With regard to quality mentioned above, the biggest problem is colour, while the least is smell.

4.2.8 Effects of water fetching on women's work and children's school

In the household survey, the people who agreed that water fetching has adverse effect on women's job opportunities and on children's school attendance were 42.5% and 48.2% respectively. This proportion is less than a half of the respondents but it is nevertheless significant. In the survey of village leaders, only 6.6% felt that there is no adverse effect on job opportunities for women and 3% felt that there were no adverse effects on school attendance for children. Overall therefore the message from the surveys is that there is an impact on both and that the impact is significant. Information from both types of respondents shows that the impact arises from the time spent in the activity of fetching water as well as the effort itself. It is clear that reducing the distance to the source, the queuing time will help to alleviate this problem for both women and children. The new water facilities will achieve both of these and will therefore reduce the adverse effects. Further reduction can be achieved by encouraging the man to take up some of the responsibilities of this duty in the software arrangements for the project. However, this has to be done with care so as not to cause a backlash against women and girls since this is a deeply ingrained cultural role allocation.

4.2.9 Income and expenditure

There are more men in paid employment than women by a ratio of 1.8:1. The average annual HH income from wage employment is UShs 5,098,066 or USD 1,522 (n=116) while the average income from the production and sale of items is UShs 2,960,621 or USD 883.7. This implies that HHs with both wage income and income from the production and sale of items have generally higher incomes than families with income from the production and sale of items only. The average annual income of HH in the RGCs all sources considered it UShs 4,232,798 or USD 1,264. This comes to USD 3 per household per day or about USD 0.5 per person per day given an average of 7 people per HH. This income is way below the international standard of absolute poverty which stands at USD 1.9 per person per day. Therefore, the case for programmes of social support in the region quite strong.

With such income levels the big question is whether the population then is able to contribute the O and M fees to sustain the established facilities. The answer will depend on the amount needed for the O and M of the facilities to be established. The HH shows that the average expenditure on water at present is UShs 4,789. Results of the WSC study show that there is potential to increase this outlay on water if there is better mobilisation of the water users and if the management of the WSCs is improved to reduce the stigma of embezzlement that is now associated with WSC financial management affairs.

The key action from these observations is that WSCS have to understand the critical value of transparency when it comes to the financial management of WSC finances. This truth must be made part of the software sensitisation for this project. In addition, HHs need to understand the monetary cost associated with the adverse effects of water fetching on job opportunities for women and school attendance for children. Then they will be motivated to make regular contribution to the O and M fund for the new facilities.

Cycles of income may make it difficult to meet regular financial obligations for O and M especially during the times of low income. It was noted in the study that there is low income during the dry season. The dry season is associated with low agricultural production and low sales of agricultural produce. Harvest season is associated with high income due to the sale of agricultural produce and planting season is associated with low income due to the fact that there will not be any produce to sale. The fluctuation in incomes associated with the sale of agricultural produce reveals that storage and preservation of produce is a challenge and so is processing to longer lasting forms. Improvement of post-harvest handling, storage and

processing can help to create a more stable flow of income to HHs in the survey area. While this is out of the scope of this project, it can be a point of interaction with other programmes that are focused on income generation and agricultural output marketing. However, perhaps it is possible to work within these cycles if people in charge of O and M plan to make collection of dues during the times of high income.

The expenditure of HH is heavily skewed in favour of food and education with education being the single expenditure items with the highest outlay. This is an interesting observation given that there has been a programme for "Universal Primary Education" (UPE) for over 10 years now. This observation may come as a negative commentary on that programme but the expenditure shows that HH put a high premium on the education of children and this is a positive trend for incomes, literacy and health in the HH in the area in the future. The emphasis on education should be supported in the software activities of this project.

4.2.10 Cooperative organisations and community activities.

The observation from this study is that most of the people in the survey area are already familiar with cooperative or community activities especially in connection with water. Of all the HH respondents, 90.2% reported that they have paid initial contribution for water before. (Though only 20.7% are paying regular water user fees). Moreover women are participating in these communal activities with 65.8% of the respondents reporting that there is one or more women on the WSC in their area with. Additionally the majority of people who admit knowing what goes on the in the WSC reported that women's opinions are not ignored. Some 60.4% of respondents also reported that they are involved in other cooperative organisations of different categories with most of these being involved in savings and credit cooperatives SACCOS and other organisations focused on development and income generation. Other significant proportions (17.4%) reported that they are involved in social support groups such as those which save money regularly to support a member in times of loss of a family member or a relative.

These findings suggest that the environment for community activities in the operation and maintenance of the new facilities is good and mechanisms should be put in place to create the groups that will be responsible for O and M of the facilities. With fewer people reporting regular payment for O and M than those reporting initials contribution, it is important to address the issues that mitigate against the regular payments meaning including the weaknesses of the WSCs, the fluctuations in income and the negative reputation of WSC on financial management. These should all be taken care of in the software activities of the project.

4.2.11 Sanitation and hygiene

The sanitation situation in the survey area is well above average with 94.5% of respondents having toilets, 73.6% having kitchens and 77.5% having a hand washing facility and 79.2% having not faecal presence in the home. But there are issues to work on as well. These include ensuring that toilets have toilet covers, the construction of animal shelters, and construction or arrangement of compost pits in homes. People also need to understand that hand washing should be a regular activity and not just before meals or after an activity that makes hand dirty, as it the case right now. These aspects should be emphasised in the software activities of the project but this does not mean that others like the 100% toilet coverage and cleanliness of toilets should not be mentioned.

4.2.12 The employment situation in the villages

The survey of village leaders shows that there is a high level of unemployment in the RGCs with a greater proportion of women – 99% looking for employment than that of men - 81.2%. These are extremely high levels of unemployment and they mean that there is a lot of disguised unemployment as it is not apparent

form appearances that there are so many people that are actively looking for jobs. In the HH survey most people describe themselves as farmers and it may be that farming is some form of escape from unemployment where if someone has something else to do, he/she will quickly abandon farming and get into that employment. However, as noted in the report these figure need to be interpreted with care as there is no formal registration for unemployment and neither are there organised statistics on employment in the villages. In water projects in Northern Uganda, one of the consistent request of the communities was to employ the local youths in the construction of the water facilities. This action while not verbalised in this survey might be one way to reduce unemployment during the time of the construction of the facilities and it should be borne in mind at the planning stage of the project.

4.2.13 Activities of the Water and Sanitation Committees (WSCs)

Besides boreholes and shallow wells there are no other types of water sources with WSCs. The reason for this is most likely that boreholes as a rule and most shallow wells, have hand pumps of different types without which it is impossible or very difficult to access the water at the source. This means that if there is a mechanical breakdown at the facility the community must organise for repair which makes the WSC necessary. Sources like the protected spring and the unprotected spring cannot break down in the technical sense of the word. Therefore a WSC is not essential. The proposed facilities have the same potential to break down as boreholes and they will need some form of organisation to manage the operation and maintenance of the facilities and outlets.

On the existing WSCs, most of the members are men and indeed most of the senior positions are occupied by men. Out of the 49 WSCs referred to in the study of WSCs 47 were chaired by men. The proportion of women increases with the lesser positions but in all cases the number of men in any specific position exceeded that of women except in the position of treasurer where there were more women than men. The choice of women in this position is a vote of confidence in them as they are seen as more honest and trustworthy to handle the finances of the people than the men. In the same vein the selection of women in all the other senior positions should be encouraged.

The members of the WSC are almost in all cases elected by the water users which is a very good practice. However, once they are elected, there is no limit to how long they can serve in a position and most of the respondents reported that it is a matter of ability and performance. This reference to ability and performance in the face of a lack of a strict performance criteria and a repeated failure by most WSCs to collect O and M fees belies a reluctance of member of the community to serve on these committees on the one hand and a reluctance of those in the positions of responsibility to relinquish responsibility. For effective management, it is important that there are periodic evens for the selection of new leaders or the renewal of terms of service. This will enhance the accountability of the leaders to the water users and even integrity in the handling of the affairs of the WSC.

One of the critical roles of the WSC is the collection of the water user fee for O and M. The reports from the study show that where it is collected, the collection is done mostly by the caretaker followed by the chairman and the treasurer. However regular collection is a major problem in all WSCs. This has compelled many WSCs to adopt the approach of calling a meeting and making an emergency collection whenever the facility breaks down. This approach has almost become the standard modus operandi in all the WSCs. While this approach may eventually work, it lengthens the down time of facilities and exacerbates all the costs associated with fetching water such as distance to source queuing time and even health effects. Therefore in the setup of O and M activities and organisations for the new facilities the regular collection

of O and M fees needs to be emphasised and the community needs to agree on action to be taken on defaulters including a criteria for accepting people to use the facility for free on account of their old age, disability and poor income status.

4.2.14 Health centres (HCs)

The case load of HCs in the RGCs is dominated by a few diseases. The main ones among these are Malaria fever, Respiratory infections, and diarrhoea and worm infestations. Malaria exceeds all the rest by far. The intensity of these diseases increases in the rainy season and decreases in the dry season except in the case of respiratory infections which intensify in the dry season and ebb in the wet season. The causes associated with these diseases as given by the respondents give a hint as to why this is the case. Malaria is associated with mosquitoes and stagnant water hence its intensity in the rainy season. The mechanism of transmission of the other 3 namely contaminated water becomes abundantly available in the wet season.

In connection with various infections, HH members reported going to hospital as the main resort when they get sick. This behaviour is appropriate but it also ensures that the hospitals are heavily loaded during the wet season and even the dry season. But HCs have a serious deficit of safe water which can even undermine their efforts to treat this heavy case load. On average HC have a water deficit of 89.3% measured against current supply in jerry cans or 51.2% measured against current supply in litres per capita per day. This shortage is critical and demands urgent attention. Where possible, HCs should be linked to the new water supply facilities with an outlet right at the HC.

HCs reported engaging in a variety of sensitisation or enlightenment activities. In their assessment, the easier activity is preplanning of the implementation of a project while the most difficult is standardisation of systems and procedure.

4.3 Conclusion

This study set out to achieve two main objective namely:

a. To grasp actual social and economic condition of the selected RGCs, and
b. To obtain the basic data for designing water supply facilities and the formulation of efficient operation and maintenance plan for the Project.

To achieve these objectives, the survey collected data from various sources including members of households in the 12 RGCs, the village leaders in the 12 RGCs, officials of the WSCs in the 12 RGCs and Health Centres within and in the proximity of the 12RGCs. The study used four different instrument namely the HH questionnaire, the questionnaire for the WSCs, the questionnaire for the Village leaders and an instrument for collecting data on HCs. Besides these, interviewers and assistants used observation and informal interaction with residents and individuals in the RGC to obtain data on various other related factors such as the seasons for the agricultural cycle and aspects of sanitation and hygiene in the RGCs.

As with any social study, there were many developments in the field that could not have been predicted and the team did the best to manage these and still obtain the required data. At the end of the field data collections exercise the team had the required data and this has been analysed and observations have been outlined in the preceding pages of this report.

The report outlines findings relating to the key social economic conditions of the 12 RGCs including the characteristics of household, sources and access to water, sources and levels of income as well as

expenditure patterns. The report has also documented details on community cooperative activities including activities for the operation and maintenance of water sources, health issues including disease incidence and seasonality, hygiene and sanitation situation in homes and communities as a whole, school enrolment for boys and girls as well as literacy in households. Also documented in the report is the situation of Health Centres in terms of water supply and use as well as the case load and common diseases treated.

Needless to say, water is one of the most important resources in the lives of the people in the area and it is still in short supply with many homes living on less water than that which is recommended according to international standards. Besides access to sufficient volumes of safe water, it is clear that there are significant strides that have to be made in all the RGCs in the areas of health, education and sanitation and hygiene even to maintain the current inadequate situation in the face of a growing population. Given the current situation, it is clear that improving access to safe water will have immense benefits in terms of reduction of water borne diseases, reduction of time and resources wasted in the process of fetching water, enhancing the status and welfare of women and girls who are the HH members with the responsibility for water fetching and improving incomes of HH through better employment for women. The potential for women to engage in income generating activities to enhance the welfare of home will also improve as they will have more time to be effective in those engagements. In the same way, improving access to safe water supply is likely to enhance literacy rates for women and to improve school attendance and performance for both boys and girls and even to reduce teenage pregnancy rates.

With the data from this study, the engineers and planners of the proposed water facilities can be able to design systems that will supply safe water in quantities and in access points in locations where it may be used effectively for the maximum benefit of the community.

List of Attachments

1. The HH questionnaire
2. The Village Leaders Questionnaire
3. The Questionnaire – Survey of WSC Officials
4. Questionnaire – Survey of Health Centres
5. Detailed Field Deployment Plan
6. Directory on Gender Aspects in the Study

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Appendix-11

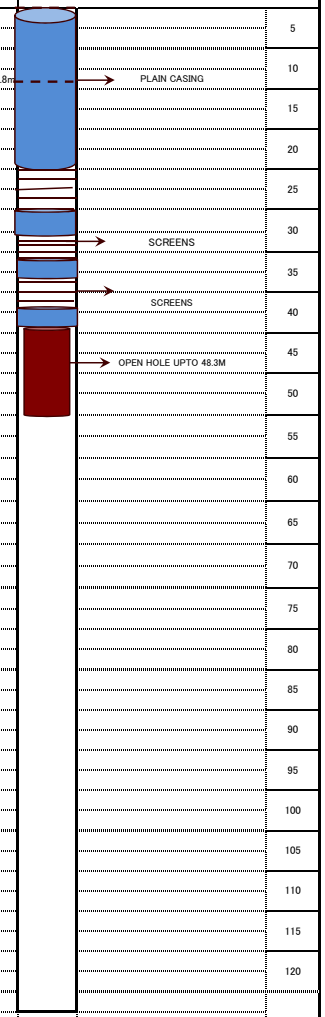
Reference

(2) Result of Pumping Test for Existing Wells

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

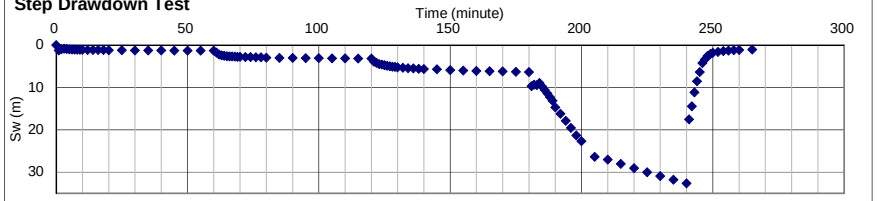
OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH
Executed Date:	16-Jul-15	
Borehole No.:	I-01-EX01	
Village	Nabitende	
Working Time:	1hr	SWL =9.8m
Depth of HP		
Casing Depth:	38.9M	
Casing Size :	6"	
Casing material	Metalic	
Static Water Table:	9.8M	
Screen Depth:	0.2m-25.2m, 28.5m-31m, 33.8m-36.8m	
Sedimentation:		
Safe yield		
Dynamic drawdown at safe yield		
Top of casing Pipes (m)		

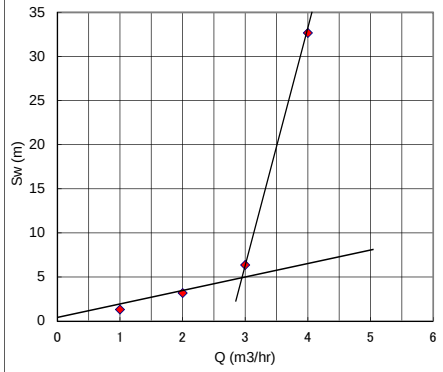


I-01-EX01(Nabitende Banada)

Step Drawdown Test



Q-Sw Curve

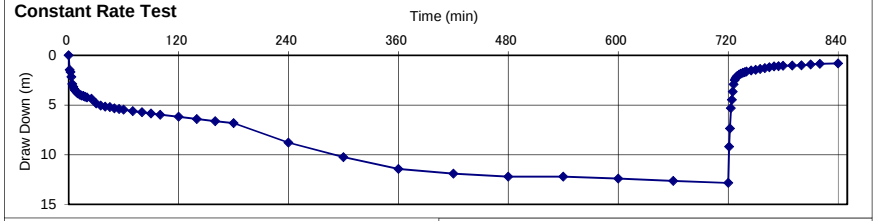


Q-Sw Curve

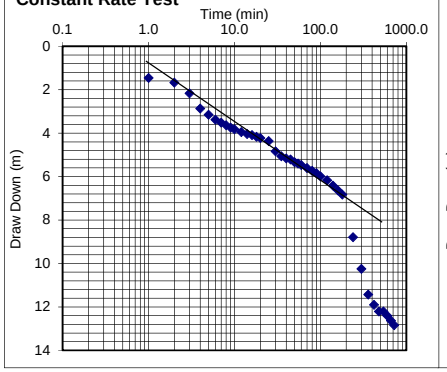
Q(m^3/h)	Sw(m)
1.0	1.33
2.0	3.19
3.0	6.38
4.0	32.67

Critical Yield	2.9
Safe Yield	2.32

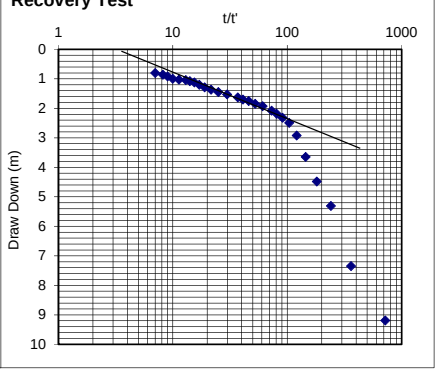
Constant Rate Test



Constant Rate Test



Recovery Test

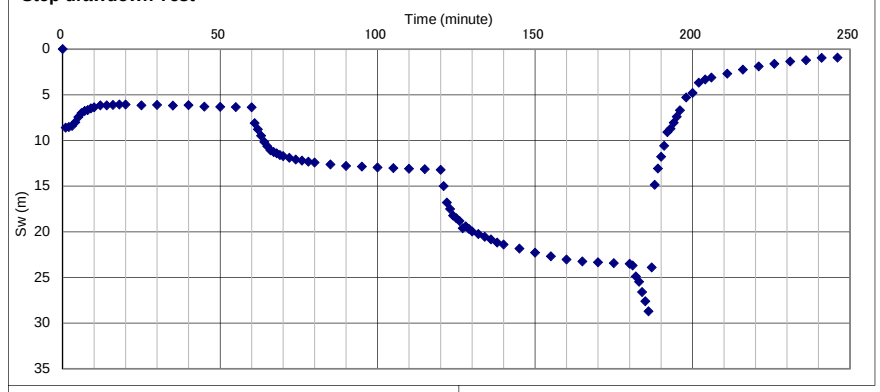


A11-2-2

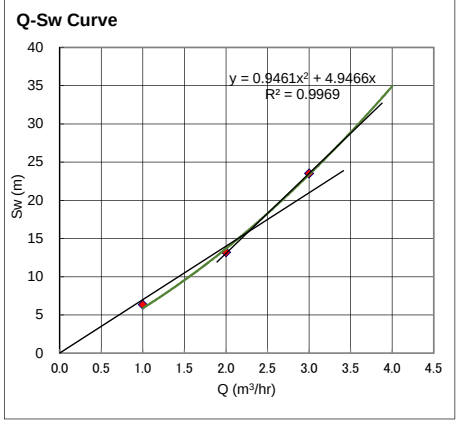
The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	3-Jul-15		
Borehole No.:	I-01-EX02		
Village	NABITENDE		
Working Time:	1hr		PLAIN CASING
Depth of HP		SWL =10.2m	
Casing Depth:	45.3M		
Casing Size :	5"		
Casing material	UPVC		
Static Water Table:	10.2M		
Screen Depth:	36.3M -44.3M		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yiel			
Top of casing Pipes (m)			
			SCREENS



I-01-EX02(Nabitende Banada)



Q-Sw Curve

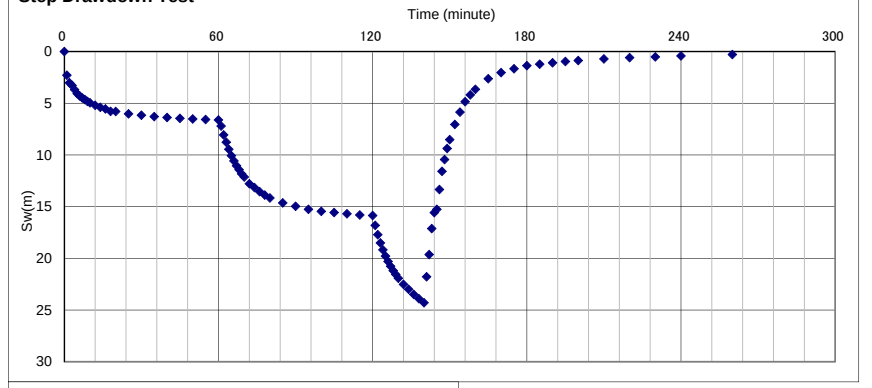
Q(m^3/h)	Sw(m)
1.0	6.36
2.0	13.21
3.0	23.51

Critical Yield	2.4
Safe Yield	1.9

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

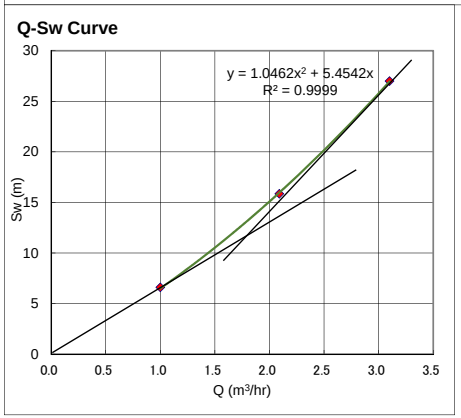
OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	8-Jul-15		
Borehole No.:	I-01-EX04		
Village	NABITENDE	SWL =6.9m	
Working Time:	1hr 20 minutes		PLAIN CASING
Depth of HP			
Casing Depth:	35M		
Casing Size :	5″		
Casing material	UPVC		
Static Water Table:	6.8M		
Screen Depth:	26.5M -32.2M		
Sedimentation:			
Safe yield			SCREENS
Dynamic drawdown at safe yiel			
Top of casing Pipes (m)			
			OPEN HOLE UPTO 47.5M



A11-2-3

I-01-EX04(Nabitende Banada)



Q-Sw Curve

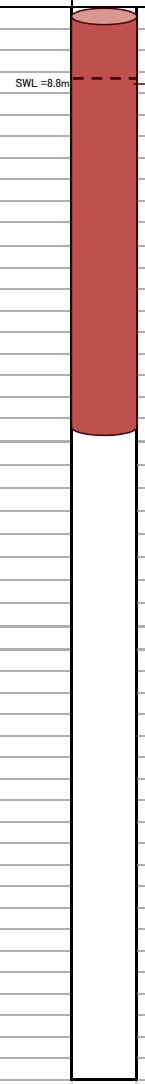
Q(m^3/h)	Sw(m)
1.00	6.61
2.09	15.86
3	27

Critical Yield	1.8
Safe Yield	1.44

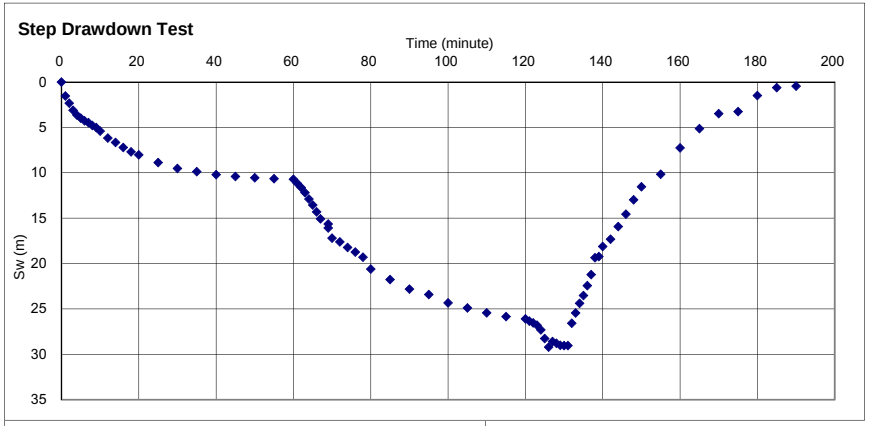
The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

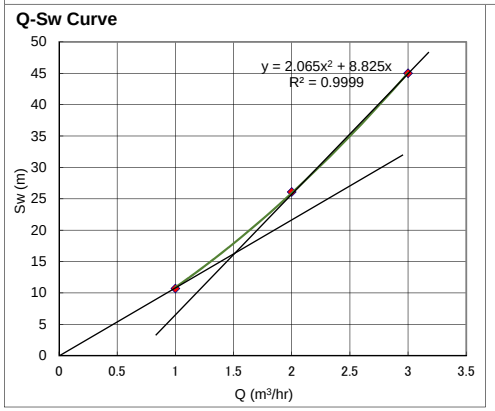
OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	1-Jul-15		
Borehole No.:	I-01-EX06		
Village	Nabitende		
Working Time:	1hr 20 minutes	SWL =8.8m →	→ STEEL CASING UPTO 49M
Depth of HP			
Casing Depth:	49M		
Casing Size :	6"		
Casing material	Metalic		
Static Water Table:	8.8M		
Screen Depth:	N/A		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yield			
Top of casing Pipes (m)			



I-01-EX06(Nabitende Banada)





Q-Sw Curve

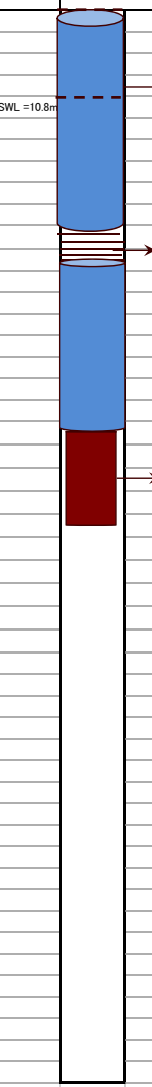
Q(m^3/h)	Sw(m)
1.0	10.71
2.0	26.09

Critical Yield	1.4
Safe Yield	1.12

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	8-Jul-15		
Borehole No.:	I-01-EX09		
Village	Nabitende		
Working Time:	1hr		PLAIN CASING
Depth of HP		SWL =10.8m	
Casing Depth:	30.5M		
Casing Size :	5″		
Casing material	UPVC		
Static Water Table:	10.8M		
Screen Depth:	26.1M-28.8M		
Sedimentation:			
Safe yield			SCREENS
Dynamic drawdown at safe yiel			
Top of casing Pipes (m)			
			OPEN HOLE UPTO 58M



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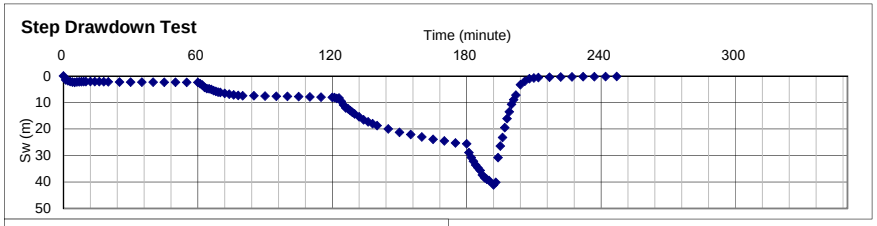
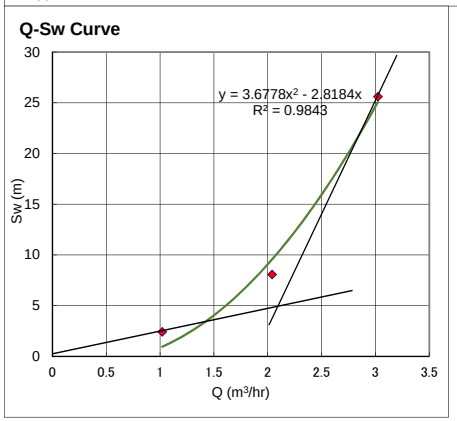
A11-2-5

I-01-EX09(Nabitende Banada)





Q-Sw Curve

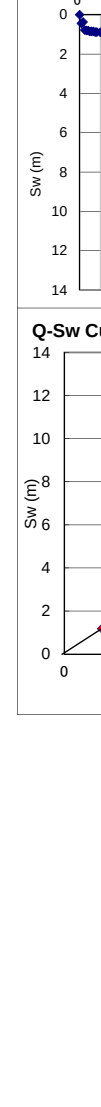
Q(m^3/h)	sw(m)
1.02	2.41
2.04	8.07
3.023	25.6
4.08	41.12

Critical Yield	2.1
Safe Yield	1.68

The project for Rural water supply Phase Ⅲ in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	23-Jul-15		
Borehole No.:	I-02-EX02		
Village	NAMUNGALWE		
Working Time:	1hr 10 minutes	SWL =7.6m	PLAIN CASING
Depth of HP			
Casing Depth:	27.6M		
Casing Size :	5″		
Casing material	UPVC		SCREENS
Static Water Table:	7.6M		
Screen Depth:	18.2m-24.1m		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yie			
Top of casing Pipes (m)			OPEN HOLE UPTO 53.9M



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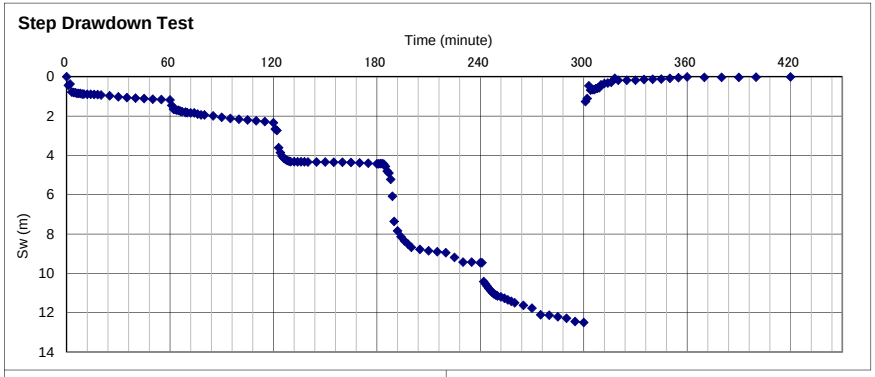
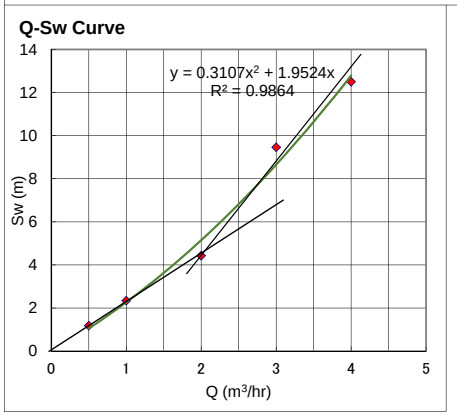
A11-2-6

I-02-EX02(Namungalwe)





Q-Sw Curve

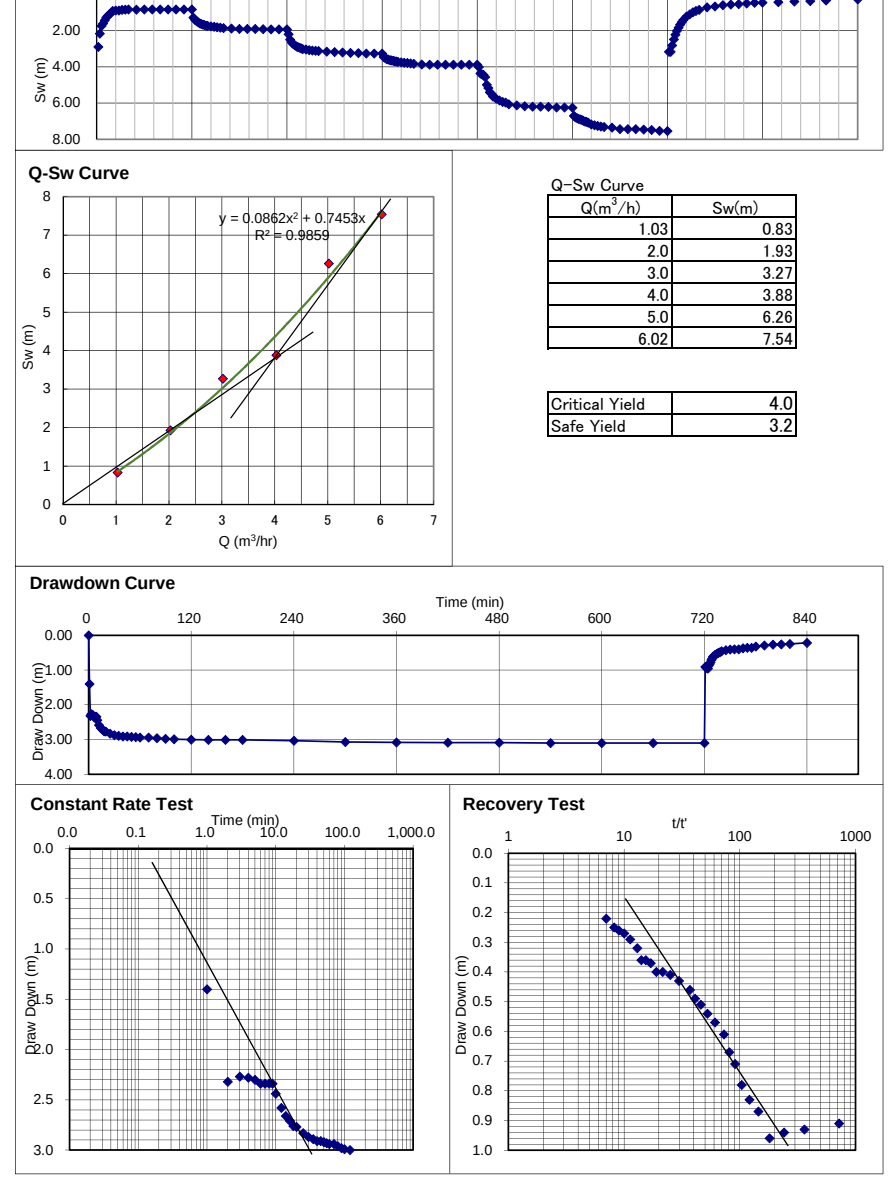
Q(m^3/h)	Sw(m)
0.5	1.18
1	2.34
2	4.43
3	9.46
4	12.5

Critical Yield	2
Safe Yield	1.6

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	23-Jul-15		
Borehole No.:	I-02-EX04		
Village	NAMUNGALWE		
Working Time:	1hr		PVC CASING
Depth of HP	30.0M	SWL =11.3m	
Casing Depth:	APROXIMATELY 30.0M		
Casing Size :	5″		
Casing material	UPVC		
Static Water Table:	11.3M		
Screen Depth:	25.0 - 30.0		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yiel			
Top of casing Pipes (m)			



Q-Sw Curve

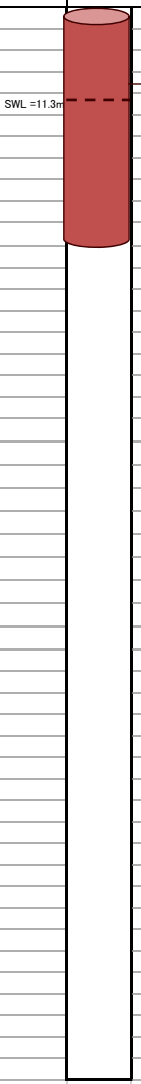
Q(m^3/h)	Sw(m)
1.03	0.83
2.0	1.93
3.0	3.27
4.0	3.88
5.0	6.26
6.02	7.54

Critical Yield	4.0
Safe Yield	3.2

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	23-Jul-15		
Borehole No.:	I-02-EX05B		
Village	NAMUNGALWE		
Working Time:	1hr		STEEL CASING
Depth of HP		SWL =11.3m	
Casing Depth:	APROXIMATELY 40.5M		
Casing Size :	5″		
Casing material	STEEL		
Static Water Table:	11.3M		
Screen Depth:	-		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yiel			
Top of casing Pipes (m)			



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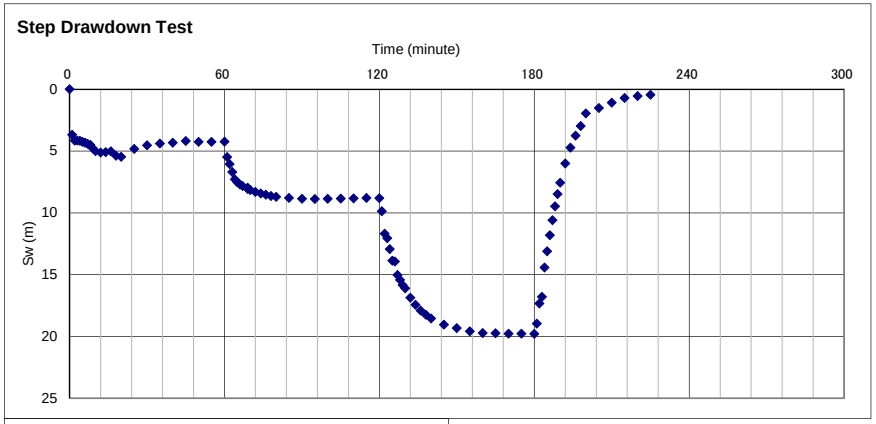
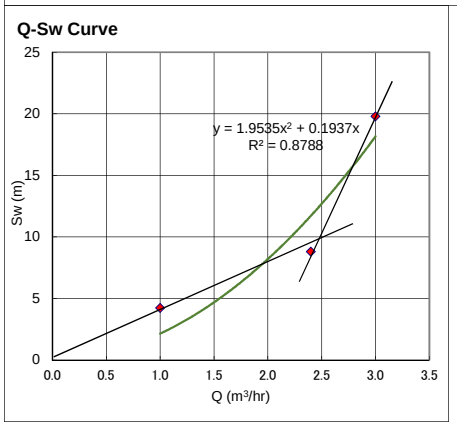
A11-2-8

I-02-EX05B(Namungalwe)





Q-Sw Curve

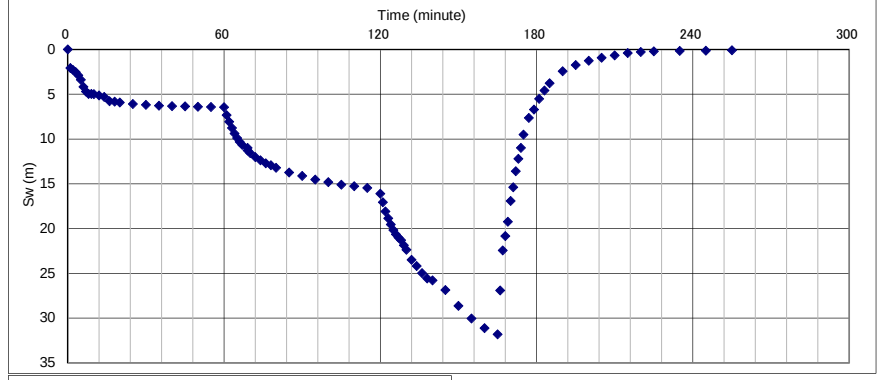
Q(m^3/h)	Sw(m)
1.0	4.24
2.4	8.81
3.0	19.79

Critical Yield	2.5
Safe Yield	2

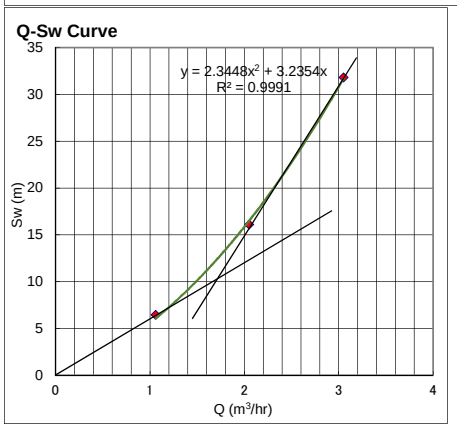
The project for Rural water supply Phase Ⅲ in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	4-Jul-15		
Borehole No.:	I-03-EX02		
Village	NAMBALE		
Working Time:	1hr 10 minutes	SWL =9.7m →	PLAIN CASING
Depth of HP			
Casing Depth:	46.4M		
Casing Size :	5″		
Casing material	UPVC		
Static Water Table:	9.7M		
Screen Depth:	Visual obstruction due to turbidity		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yie			
Top of casing Pipes (m)			



I-03-EX02(Nambale)



Q-Sw Curve

Q(m³/h)	Sw(m)
1.06	6.44
2.05	16.1
3.05	31.81

Critical Yield	1.7
Safe Yield	1.36

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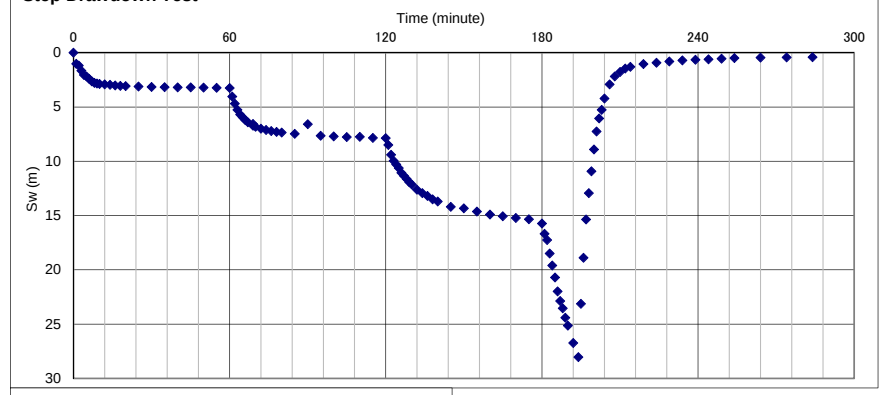
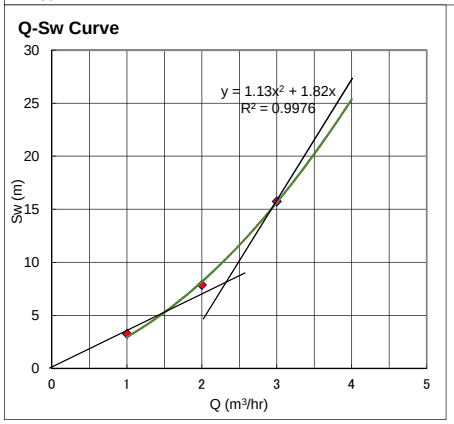
The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	1-Jul-15		
Borehole No.:	I-06-EX02		
Village	Lambala		
Working Time:	1hr 20 minutes		PLAIN CASING
Depth of HP		SWL =10.6m	
Casing Depth:	30.2M		
Casing Size :	5″		
Casing material	UPVC		
Static Water Table:	6M		
Screen Depth:	23M -26M		
Sedimentation:			SCREENS
Safe yield			
Dynamic drawdown at safe yield			
Top of casing Pipes (m)			OPEN HOLE UPTO 44.7M



I-06-EX02(Lambala)



Q-Sw Curve

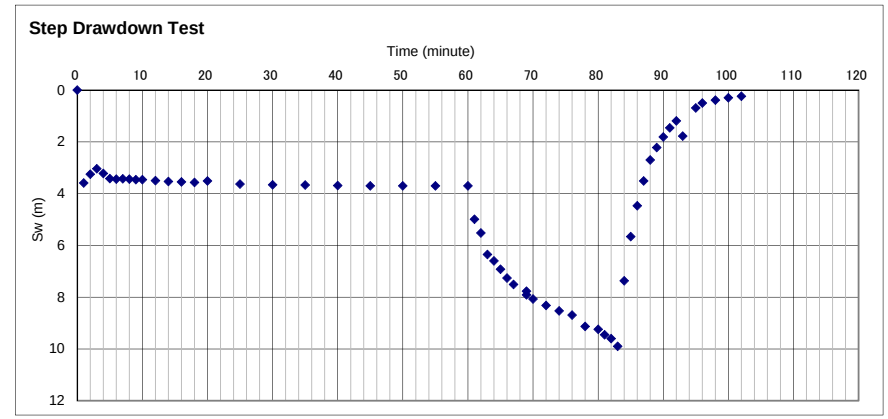
Q(m³/h)	Sw(m)
1.0	3.25
2.0	7.86
3.0	15.73

Critical Yield	2.4
Safe Yield	1.92

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	29-Jun-15		
Borehole No.:	I-06-EX04		
Village	Lambala	SWL =5.5m	
Working Time:	1hr 30 minutes		PLAIN CASING
Depth of HP			
Casing Depth:	39.6M		
Casing Size :	5″		
Casing material	UPVC		
Static Water Table:	5.5M		
Screen Depth:	33.7m-36.7m		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yield			
Top of casing Pipes (m)			
			SCREENS
			OPEN HOLE UPTO 49.3M



I-06-EX04(Lambala)

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

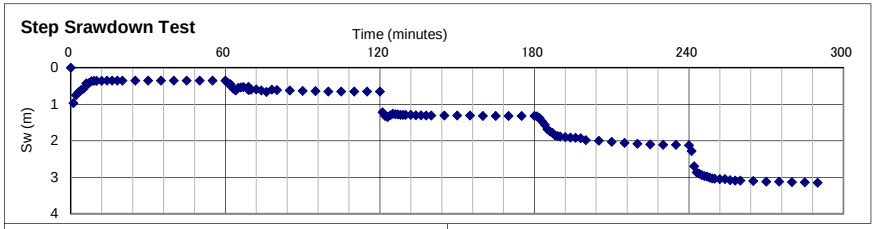
OBSERVATION RECORD BY BOREHOLE CAMERA

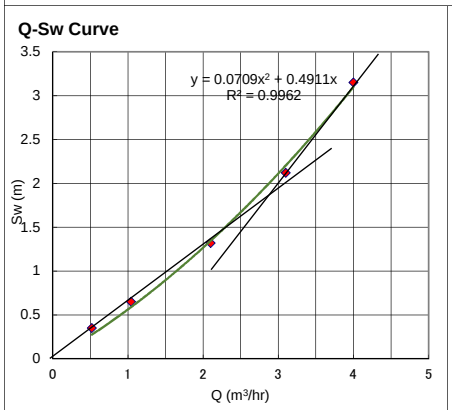
Items		Description of observation in the BH	Casing schedule
Executed Date:	25-Jun-15		
Borehole No.:	I-07-EX02		
Village	NAIGOBYA		
Working Time:	1hr 10 minutes	SWL =9.2m →	PLAIN CASING
Depth of HP			
Casing Depth:	29.6M		
Casing Size :	5"		
Casing material	UPVC		
Static Water Table:	9.2M		
Screen Depth:	Visual obstruction due to turbidity		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yie			
Top of casing Pipes (m)			

5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120

A11-2-12

I-07-EX02(Naigobya)

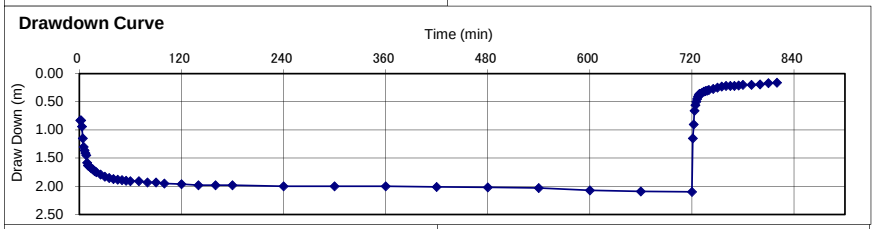


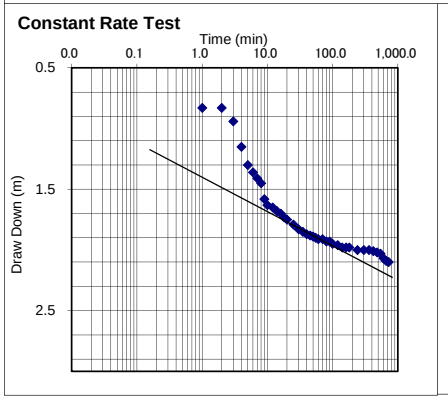


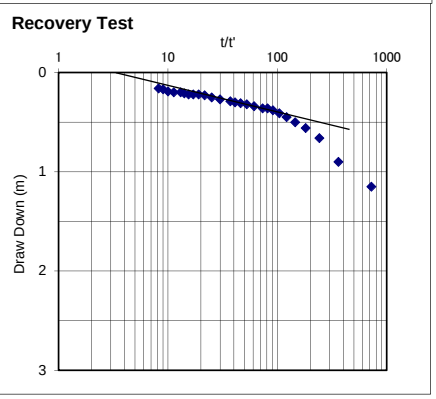
Q-Sw Curve

Q(m³/h)	sw(m)
0.52	0.35
1.0	0.65
2.1	1.32
3.1	2.12
4	3.15

Critical Yield	2.8
Safe Yield	2.2



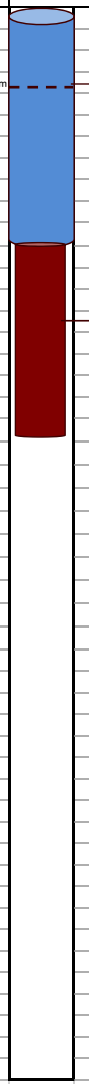




The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

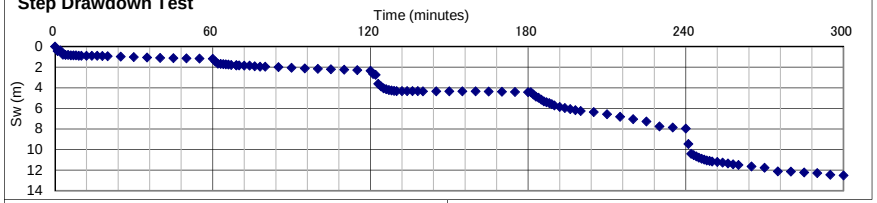
Items		Description of observation in the BH	Casing schedule
Executed Date:	25-Jun-15		
Borehole No.:	I-07-EX04		
Village	NAIGOBYA		
Working Time:	1hr	SWL =9.6m	PLAIN CASING
Depth of HP			
Casing Depth:	27.3M		
Casing Size :	5″		
Casing material	UPVC		
Static Water Table:	9.6M		
Screen Depth:	–		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yiel			
Top of casing Pipes (m)			OPEN HOLE UPTO 35.6M



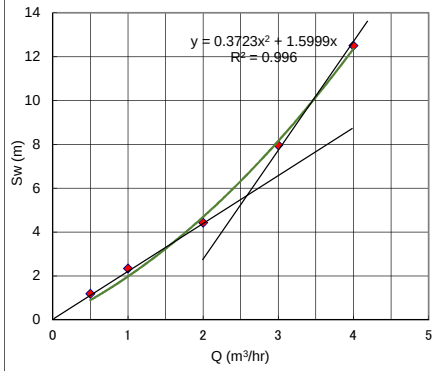
A11-2-13

I-07-EX04(Naigobya)

Step Drawdown Test



Q-Sw Curve

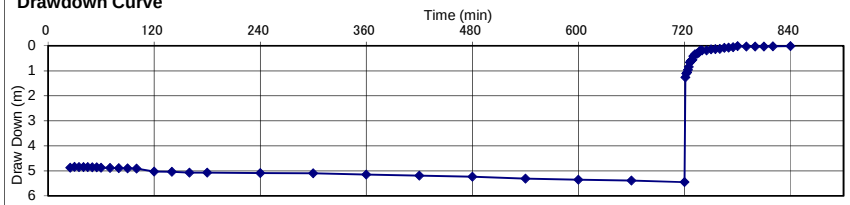


Q-Sw Curve

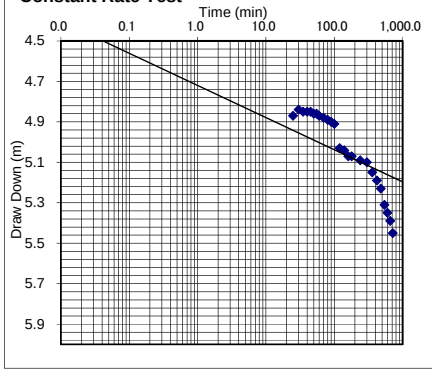
Q(m³/h)	sw(m)
0.5	1.18
1.0	2.34
2.0	4.43
3.0	7.96
4	12.5

Critical Yield	2.5
Safe Yield	2.0

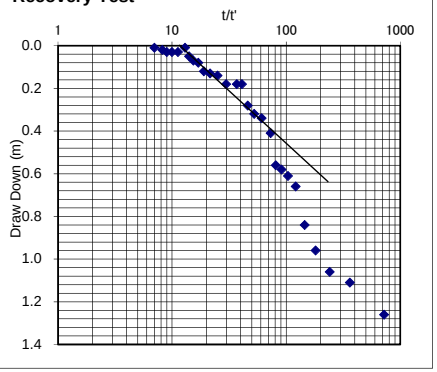
Drawdown Curve



Constant Rate Test



Recovery Test

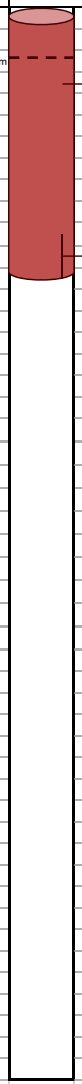


The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH
Executed Date:	10-Jul-15	
Borehole No.:	I-08-EX01	
Village	Buses	SWL =6.7m
Working Time:	1hr 30 minutes	
Depth of HP		
Casing Depth:	32.7M	
Casing Size :	6″	
Casing material	Metalic	
Static Water Table:	6.7M	
Screen Depth:	N/A	
Sedimentation:		
Safe yield		
Dynamic drawdown at safe yiel		
Top of casing Pipes (m)		

Casing schedule

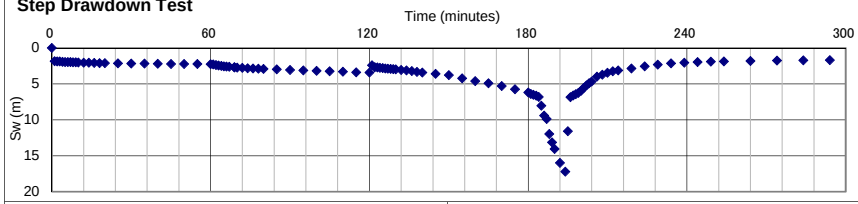


5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120

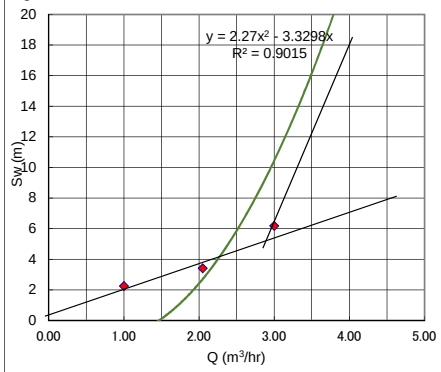
A11-2-14

I-08-EX01(Busesa)

Step Drawdown Test



Q-Sw Curve

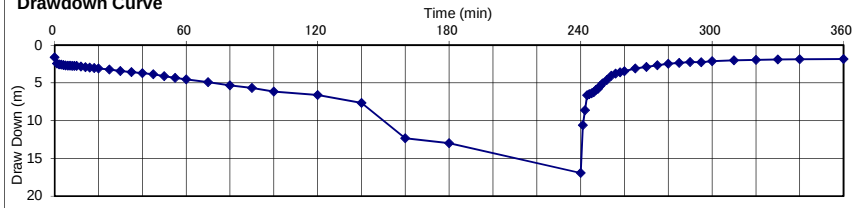


Q-Sw Curve

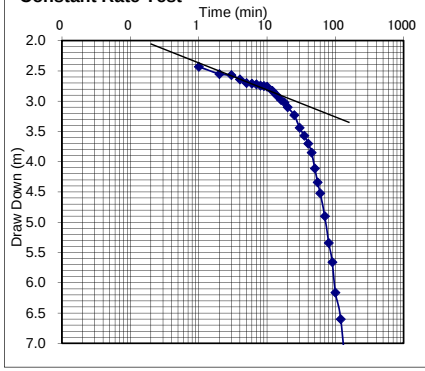
Q(m³/h)	sw(m)
1	2.25
2.1	3.42
3.0	6.19
4.0	

Critical Yield	2.9
Safe Yield	2.3

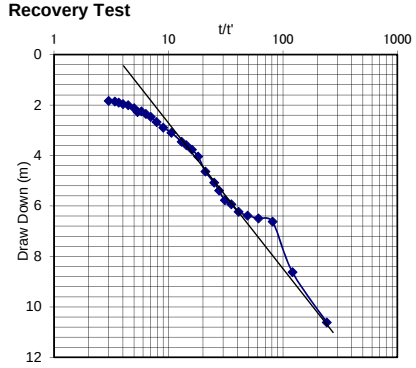
Drawdown Curve



Constant Rate Test



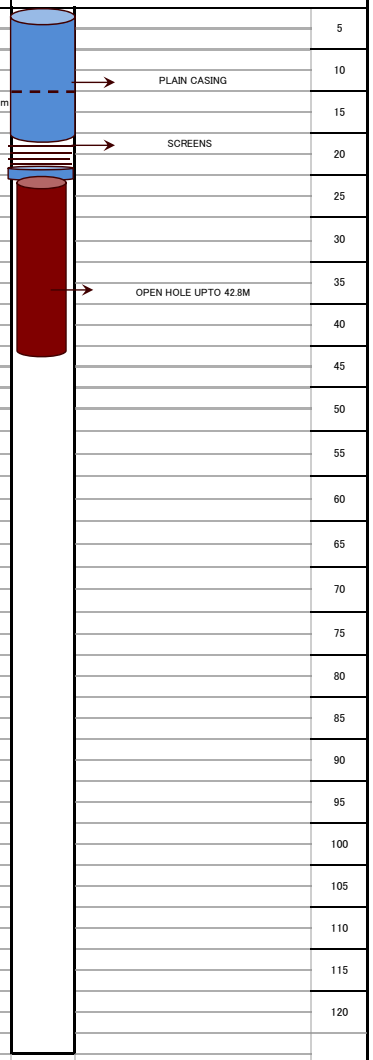
Recovery Test



The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

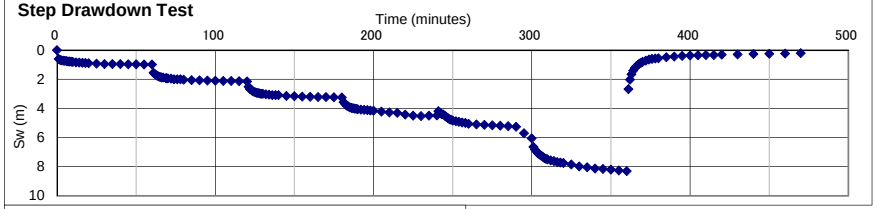
Items		Description of observation in the BH	Casing schedule
Executed Date:	6-Jul-15		
Borehole No.:	I-08-EX02		
Village	Busesa		
Working Time:	1hr 20 minutes		
Depth of HP		SWL =11.1m	PLAIN CASING
Casing Depth:	21.6M		
Casing Size :	5″		SCREENS
Casing material	UPVC		
Static Water Table:	11.1M		
Screen Depth:	16.2M -19M		
Sedimentation:			OPEN HOLE UPTO 42.8M
Safe yield			
Dynamic drawdown at safe yield			
Top of casing Pipes (m)			



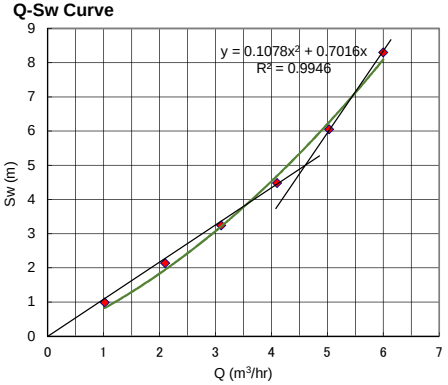
A11-2-15

I-08-EX02(Busesa)

Step Drawdown Test



Q-Sw Curve

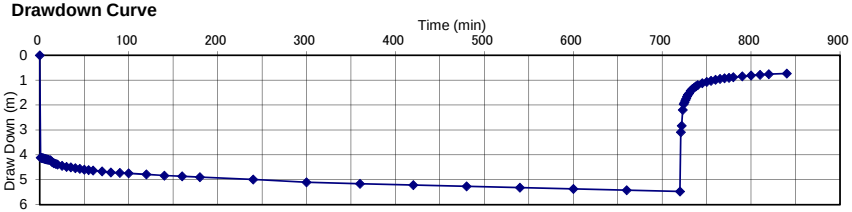


Q-Sw Curve

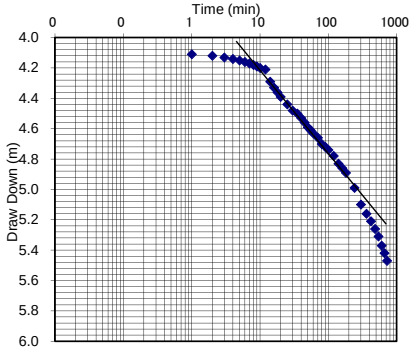
Q(m^3/h)	Sw(m)
1.02	0.99
2.1	2.14
3.1	3.24
4.1	4.48
5.03	6.05
6	8.3

Critical Yield	4.6
Safe Yield	3.7

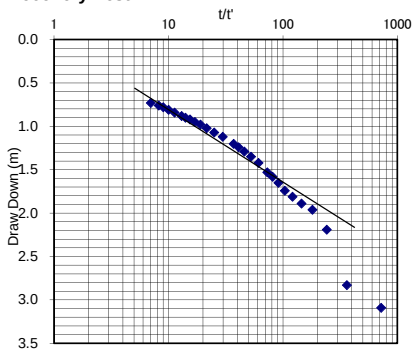
Drawdown Curve



Constant Rate Test



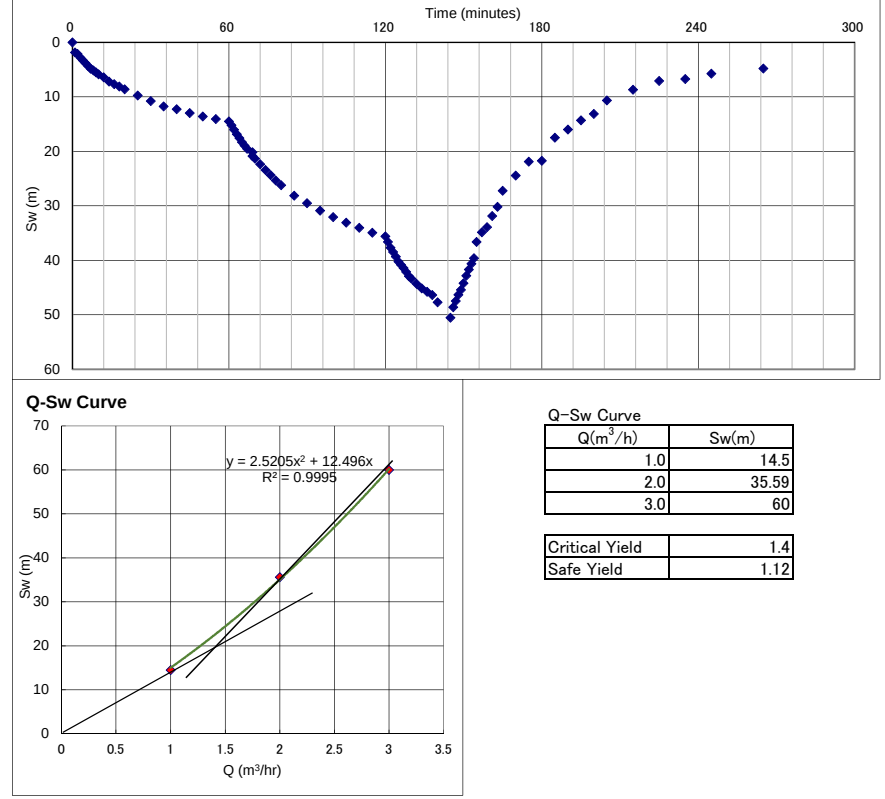
Recovery Test



The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	10-Jul-15		
Borehole No.:	I-08-EX03		
Village	Busesa		
Working Time:	1hr 31 minutes		PLAIN CASING
Depth of HP		SWL =12.1m	
Casing Depth:	16.3M		
Casing Size :	5″		
Casing material	UPVC		
Static Water Table:	12.1M		
Screen Depth:	NOT VISIBLE		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yiel			
Top of casing Pipes (m)			OPEN HOLE UPTO 66.2M



A11-2-16

I-08-EX03(Busesa)

Q-Sw Curve

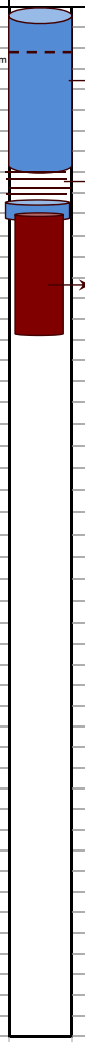
Q(m^3/h)	Sw(m)
1.0	14.5
2.0	35.59
3.0	60

Critical Yield	1.4
Safe Yield	1.12

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

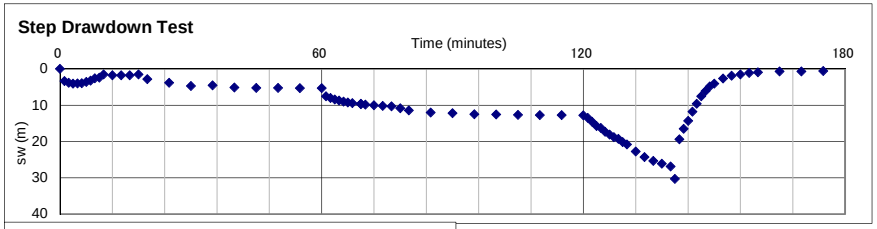
OBSERVATION RECORD BY BOREHOLE CAMERA

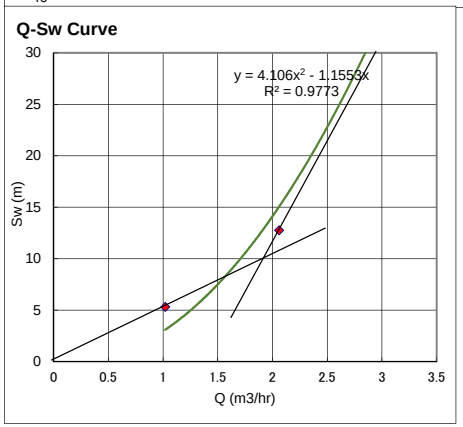
Items		Description of observation in the BH	Casing schedule
Executed Date:	9-Jul-15		
Borehole No.:	I-08-EX05		
Village	Busesa	SWL =6.9m	
Working Time:	1hr 20 minutes		PLAIN CASING
Depth of HP			
Casing Depth:	28.6M		
Casing Size :	5"		
Casing material	UPVC		
Static Water Table:	6.9M		SCREENS
Screen Depth:	20.4M -25.9M		
Sedimentation:			
Safe yield			
Dynamic drawdown at saf			
Top of casing Pipes (m)			OPEN HOLE UPTO 39.4M



5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120

I-08-EX05(Busesa)





Q-Sw Curve

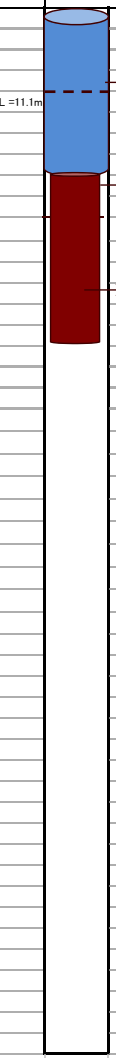
Q(m^3/h)	Sw(m)
1.02	5.32
2.1	12.76

Critical Yield	1.8
Safe Yield	1.4

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

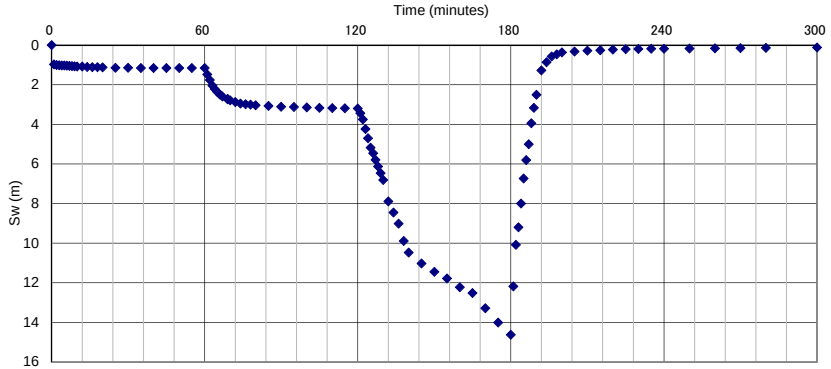
OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	10-Jul-15		
Borehole No.:	I-08-EX06		
Village	Busesa		
Working Time:	1hr 10 minutes		PLAIN CASING
Depth of HP		SWL =11.1m	
Casing Depth:	23.0M		
Casing Size :	5"		
Casing material	UPVC		
Static Water Table:	11.1M		SCREENS
Screen Depth:	20.4M -25.9M		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yield			
Top of casing Pipes (m)			OPEN HOLE UPTO 39.7M

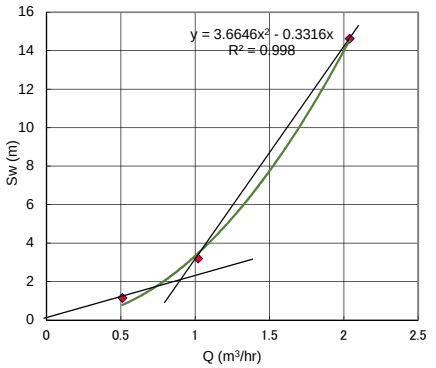


I-08-EX06(Busesa)

Step Drawdown Test



Q-Sw Curve



Q-Sw Curve

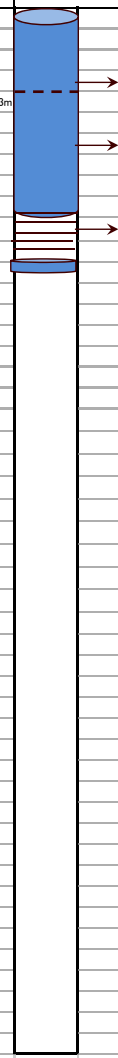
Q(m³/h)	Sw(m)
0.5	1.15
1.0	3.2
2.04	14.62

Critical Yield	0.9
Safe Yield	0.72

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

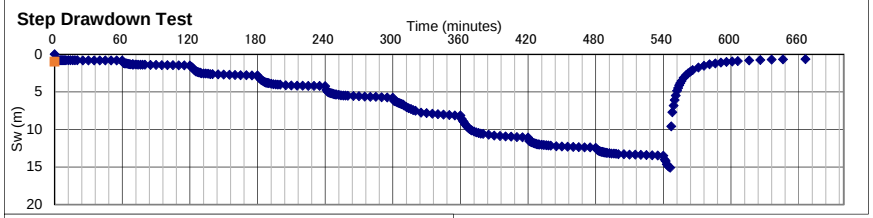
Items		Description of observation in the BH	Casing schedule
Executed Date:	26-Jun-15		
Borehole No.:	I-09-EX04		
Village	Kyanvuma		
Working Time:	1hr 20 minutes		PLAIN CASING
Depth of HP		SWL =10.3m	
Casing Depth:	31.2M		
Casing Size :	5"		
Casing material	UPVC		
Static Water Table:	10.3M		
Screen Depth:	24.6m-30.6m		SCREENS
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yiel			
Top of casing Pipes (m)			



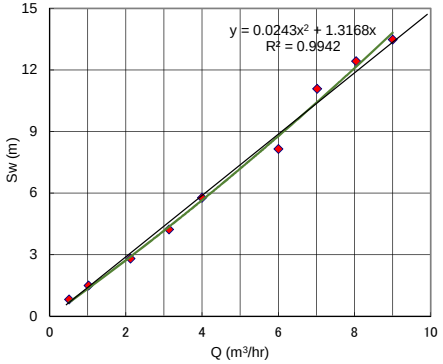
A11-2-19

I-09-EX04(Kyamvuma)

Step Drawdown Test



Q-Sw Curve

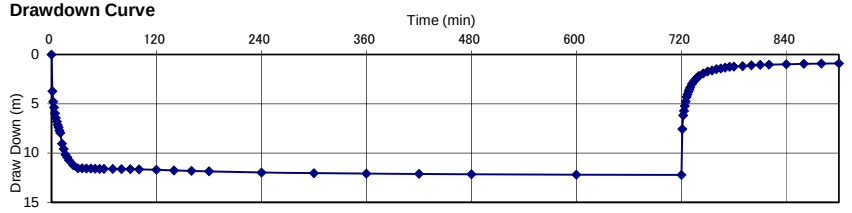


Q-Sw Curve

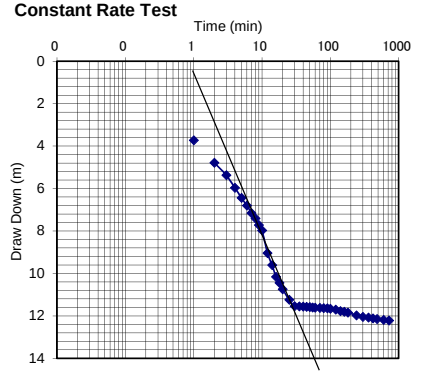
Q(m³/h)	Sw(m)	
0.51	0.82	
1.0	1.49	
2.1	2.81	
3.1	4.23	
4	5.77	
6	8.15	
7.02	11.08	
8.04	12.43	
9	13.48	
10.02	15.1	6min.

Critical Yield	9
Safe Yield	7.2

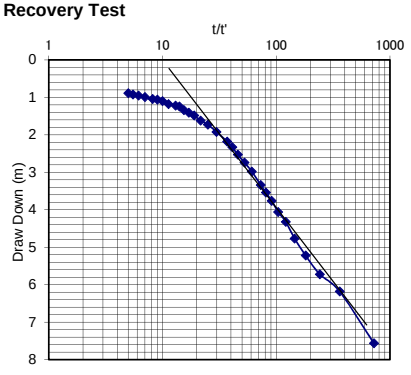
Drawdown Curve



Constant Rate Test



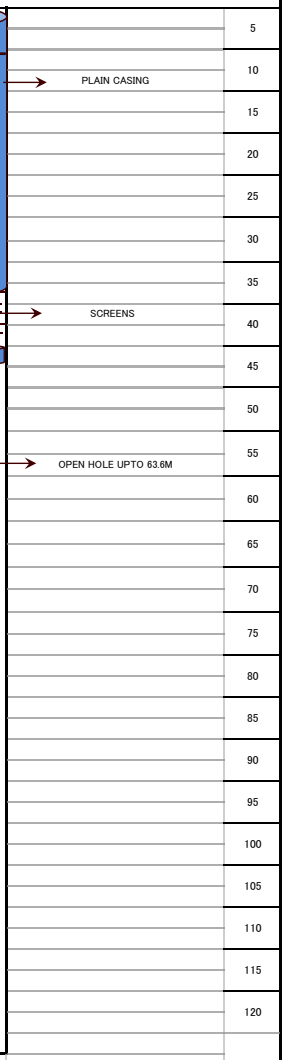
Recovery Test



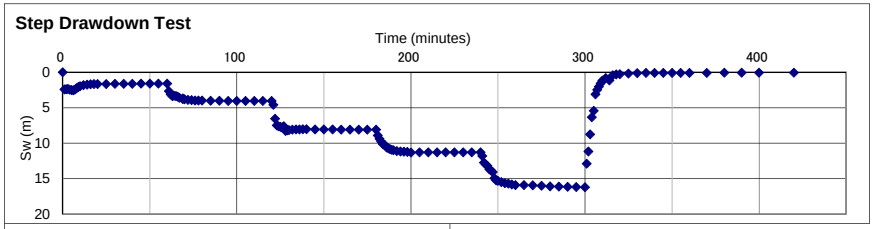
The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

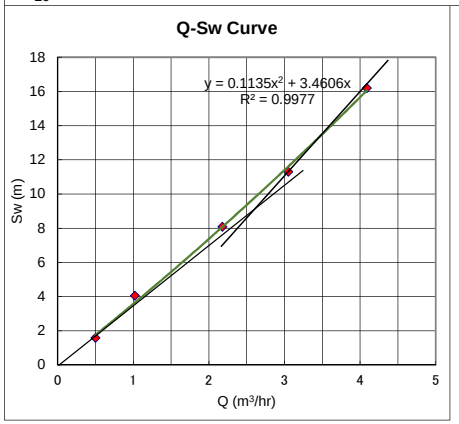
OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	26-Jun-15		
Borehole No.:	I-09-EX06		
Village	KASASIRA		
Working Time:	1hr		
Depth of HP		SWL =10.6m	
Casing Depth:	42.2M		
Casing Size :	5″		
Casing material	UPVC		
Static Water Table:	10.6M		
Screen Depth:	34M -39M		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yiel			
Top of casing Pipes (m)			



I-09-EX06(Kyamvuma)





Q-Sw Curve

Q(m^3/h)	Sw(m)
0.5	1.59
1.0	4.05
2.2	8.09
3.1	11.3
4.09	16.2

Critical Yield	2.6
Safe Yield	2.08

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

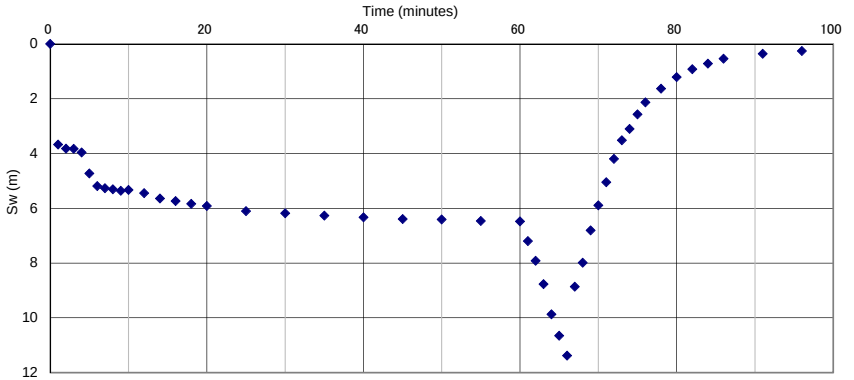
OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	11-Jul-15		
Borehole No.:	I-10-EX03		
Village	Nakivumbi	SWL =5.5m	
Working Time:	1hr 10 minutes		PLAIN CASING
Depth of HP			
Casing Depth:	21.6M		
Casing Size :	5″		
Casing material	UPVC		SCREENS
Static Water Table:	5.5M		
Screen Depth:	16.5m-21.5m		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yield			
Top of casing Pipes (m)			

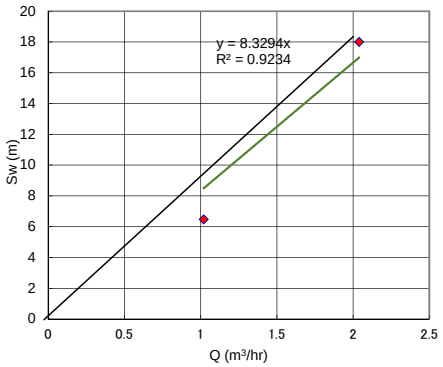
A11-2-21

I-10-EX03(Nakivumbi)

Step Drawdown Test



Q-Sw Curve



Q-Sw Curve

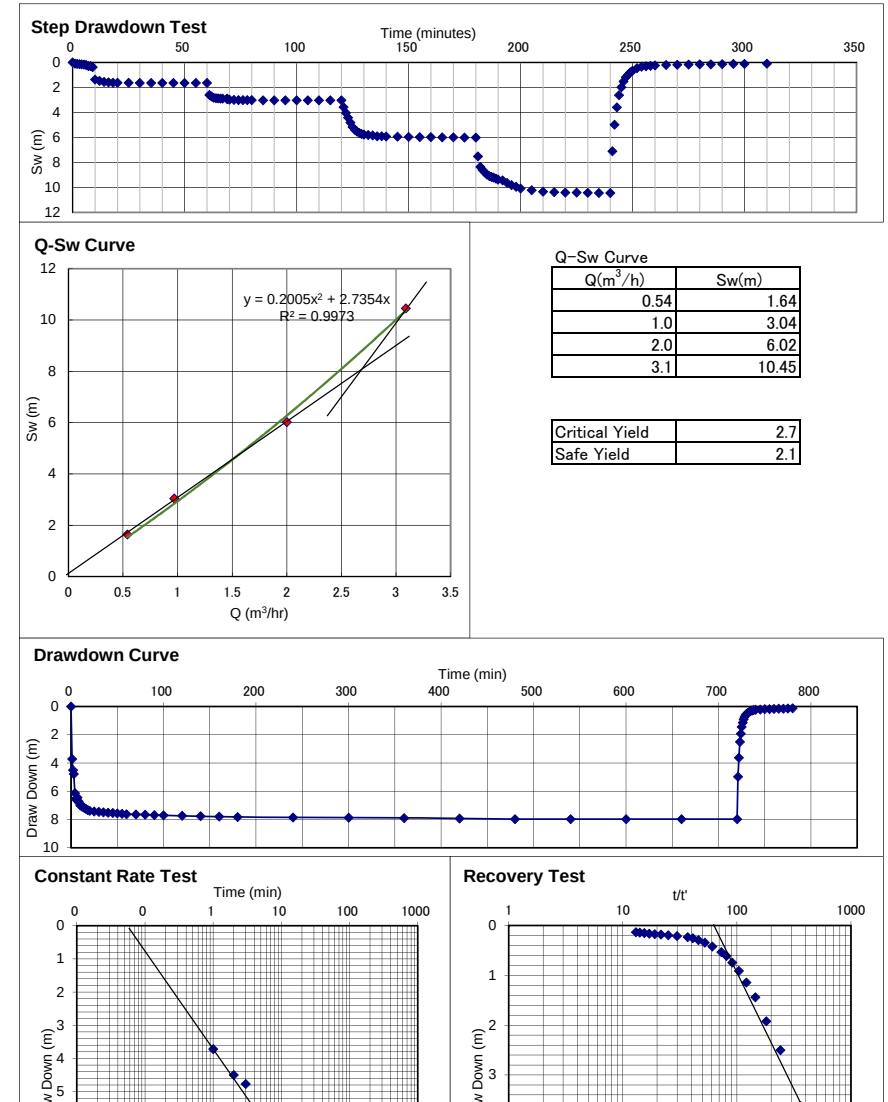
Q(m³/h)	Sw(m)
1.0	6.48

Critical Yield	
Safe Yield	

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	23-Jun-15		
Borehole No.:	I-11-EX01		
Village	NONDWE		
Working Time:	1hr 10 minutes		PLAIN CASING
Depth of HP			
Casing Depth:	30.2M		
Casing Size :	5"	SWL =15.4M	
Casing material	UPVC		
Static Water Table:	15.4M		
Screen Depth:	ISUAL OBSTRUCTION IMPEEDEMEN		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yield			
Top of casing Pipes (m)			



A11-2-22

I-11-EX01(Nondwe)

Q-Sw Curve

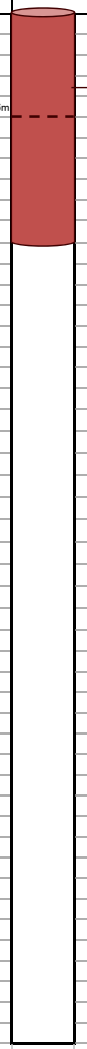
Q(m^3/h)	Sw(m)
0.54	1.64
1.0	3.04
2.0	6.02
3.1	10.45

Critical Yield	2.7
Safe Yield	2.1

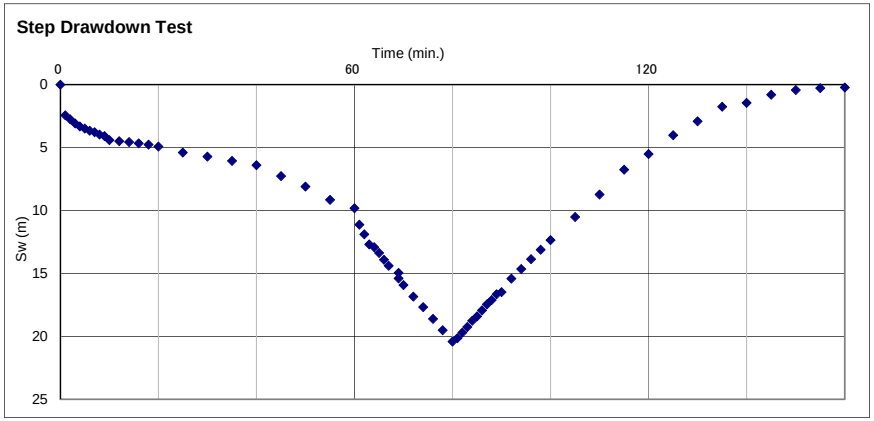
The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	23-Jun-15		
Borehole No.:	I-11-EX03		
Village	Nondwe		
Working Time:	1hr		STEEL CASING
Depth of HP		SWL =12.6m	
Casing Depth:	OVER 27.6M BUT OBSTRUCTED		
Casing Size :	6"		
Casing material	STEEL		
Static Water Table:	12.6M		
Screen Depth:	-		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yield			
Top of casing Pipes (m)			



I-11-EX03(Nondwe)



Q-Sw Curve

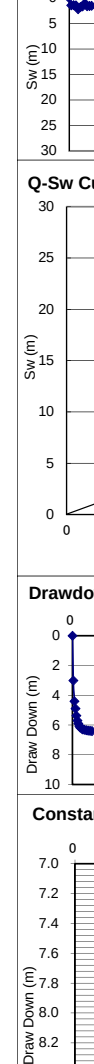
Q(m^3/h)	Sw(m)
0.5	9.81

Critical Yield	
Safe Yield	

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

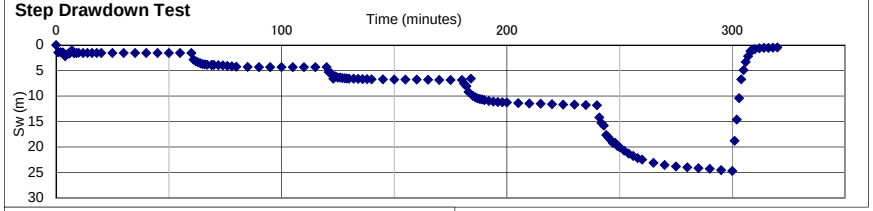
OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	13-Jul-15		
Borehole No.:	P-25-EX03		
Village	Kasasira		
Working Time:	1hr 20 minutes	SWL =8.1m	PLAIN CASINGS
Depth of HP			
Casing Depth:	44.4M		
Casing Size :	5"		
Casing material	UPVC		
Static Water Table:	8.1M		
Screen Depth:	38m- 44m		SCREENS
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yield			
Top of casing Pipes (m)			

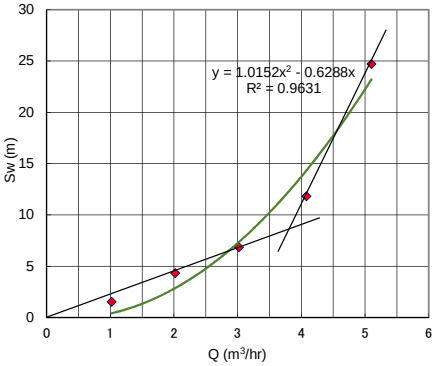


P-02-EX03(Kasassira)

Step Drawdown Test



Q-Sw Curve

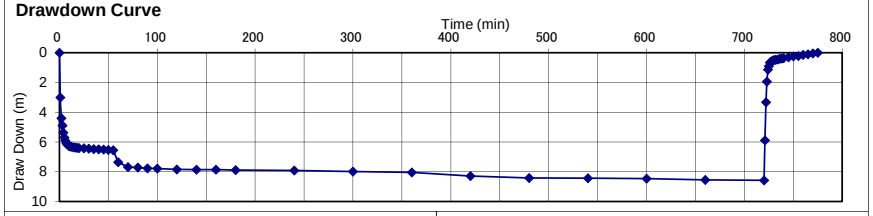


Q-Sw Curve

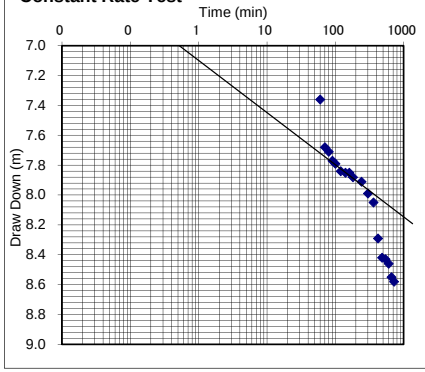
Q(m^3/h)	Sw(m)
1.02	1.53
2.02	4.33
3.02	6.85
4.08	11.81
5.1	24.72

Critical Yield	3.8
Safe Yield	3.04

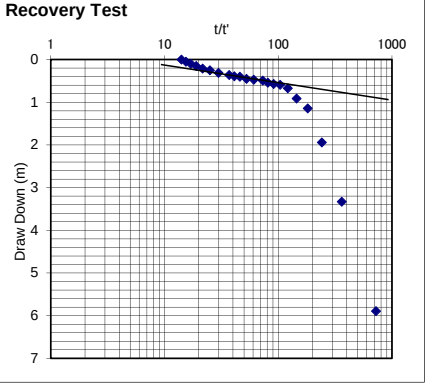
Drawdown Curve



Constant Rate Test



Recovery Test

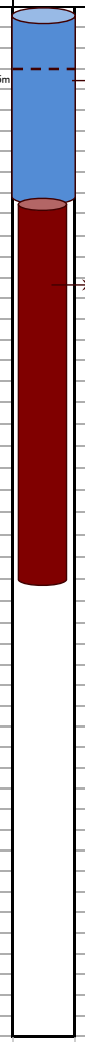


A11-2-24

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

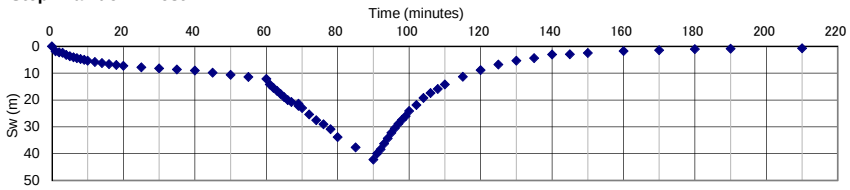
Items		Description of observation in the BH	Casing schedule
Executed Date:	7/114/2015		
Borehole No.:	P-02-EX04		
Village	Kasasira		
Working Time:	1hr 30 minutes	SWL =7.5m	PLAIN CASINGS
Depth of HP			
Casing Depth:	24.5M		
Casing Size :	5"		
Casing material	UPVC		
Static Water Table:	7.5M		
Screen Depth:			
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yield			
Top of casing Pipes (m)			OPEN HOLE UPTO 67.9M



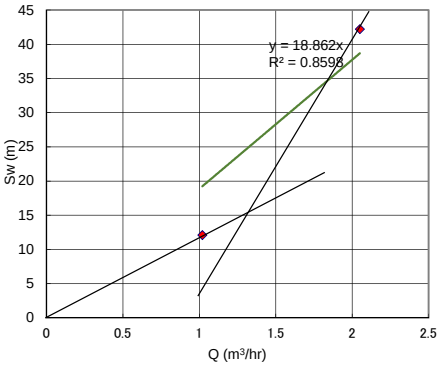
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120

P-02-EX04(Kasassira)

Step Drawdown Test



Q-Sw Curve



Q-Sw Curve

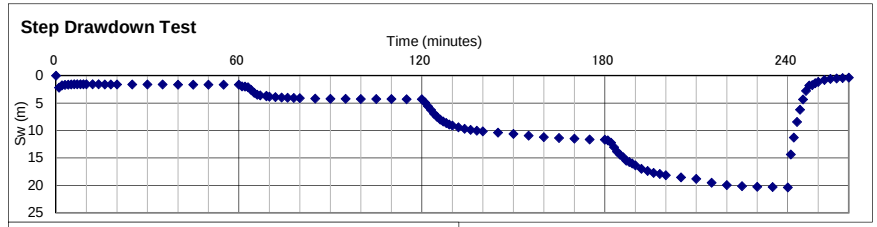
Q(m^3/h)	Sw(m)
1.02	12.1
2.05	42.22

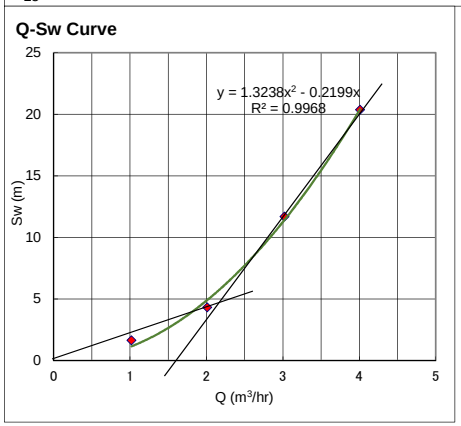
Critical Yield	1.3
Safe Yield	1.04

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	15-Jul-15		
Borehole No.:	P-02-EX05		
Village	Kasasira	SWL =6m	
Working Time:	1hr 30 minutes		PLAIN CASING
Depth of HP			
Casing Depth:	42M		
Casing Size :	5"		¥
Casing material	UPVC		
Static Water Table:	6M		SCREENS
Screen Depth:	29.2m-34.9m, 37.9m-40.8m,43.6m-46.6m		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yield			SCREENS
Top of casing Pipes (m)			
			SCREENS
			SCREENS
			PLAIN CASING
	5-Jan-00		





P-02-EX05(Kasassira)

Q-Sw Curve

Q(m^3/h)	Sw(m)
1.02	1.65
2.0	4.32
3.0	11.69
4.0	20.36

Critical Yield	2.1
Safe Yield	1.68

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	15-Jul-15		
Borehole No.:	P-02-EX06		
Village	Kasasira		
Working Time:	1hr 30 minutes	SWL =7.2m	PLAIN CASING
Depth of HP			
Casing Depth:	42M		
Casing Size :	5"		
Casing material	UPVC		
Static Water Table:	7.2M		
Screen Depth:	25.8M -28.7M, 37.5M- 40.4M		SCREENS
Sedimentation:			
Safe yield			PLAIN CASING
Dynamic drawdown at safe yie			
Top of casing Pipes (m)			SCREENS

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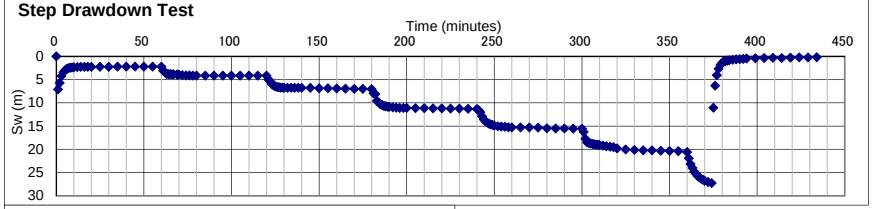
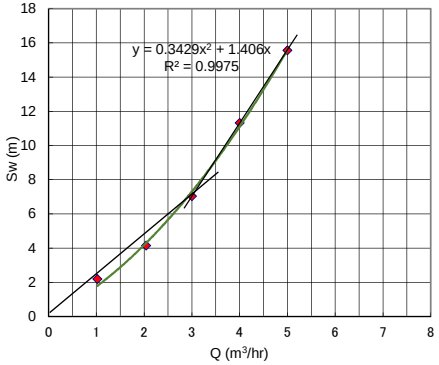
P-02-EX06(Kasassira)

Step Drawdown Test



Q-Sw Curve

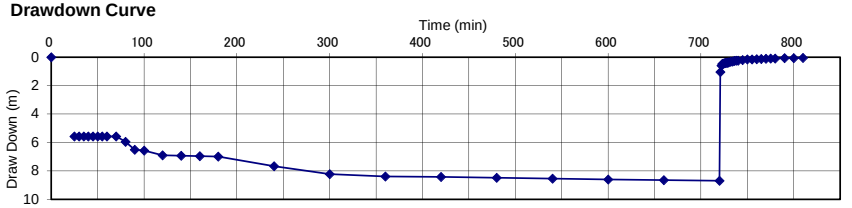


Q-Sw Curve

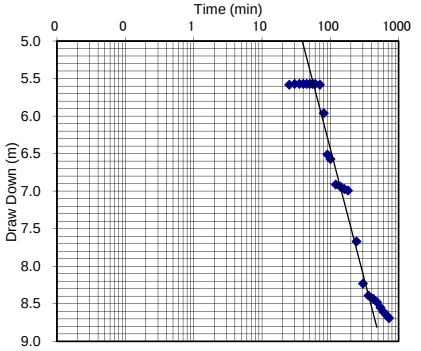
Q(m³/h)	Sw(m)
1.02	2.19
2.04	4.15
3.00	7.04
4.00	11.32
5.00	15.57
6.00	20.56
7.10	27.24

Critical Yield	3.2
Safe Yield	2.6

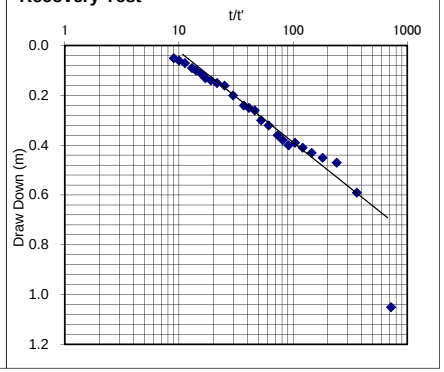
Drawdown Curve



Constant Rate Test



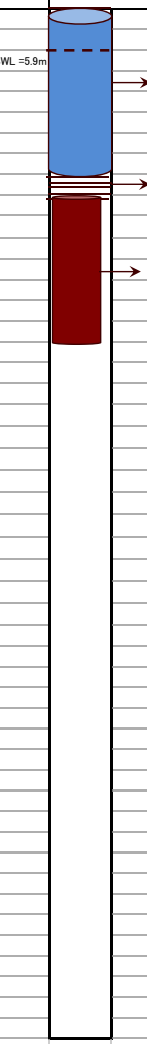
Recovery Test



The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

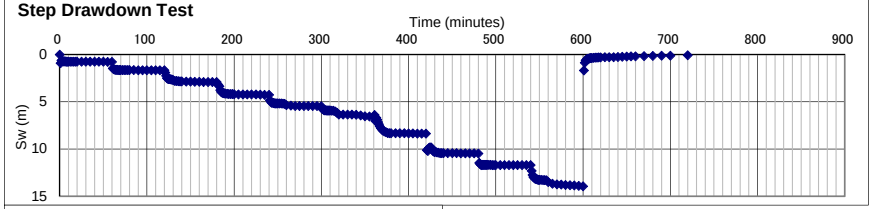
Items		Description of observation in the BH	Casing schedule
Executed Date:	19-Jul-15		
Borehole No.:	P-04-EX01		
Village	Kapala	SWL =5.9m	
Working Time:	1hr 20 minutes		PLAIN CASINGS
Depth of HP			
Casing Depth:	25.5M		
Casing Size :	5"		
Casing material	UPVC		
Static Water Table:	5.9M		SCREENS
Screen Depth:	20.1m-22.9m		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yield			OPEN HOLE UPTO 38.2 M
Top of casing Pipes (m)			



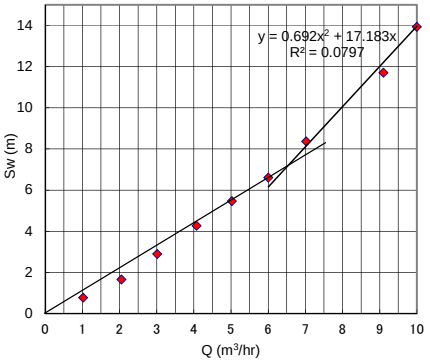
A11-2-28

P-04-EX01(Kapala)

Step Drawdown Test



Q-Sw Curve

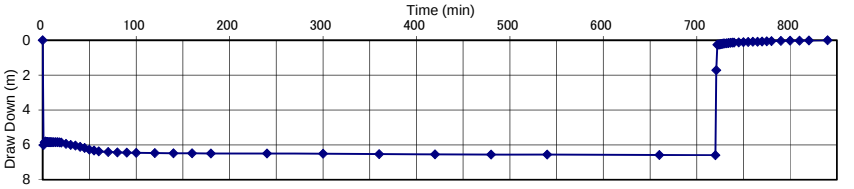


Q-Sw Curve

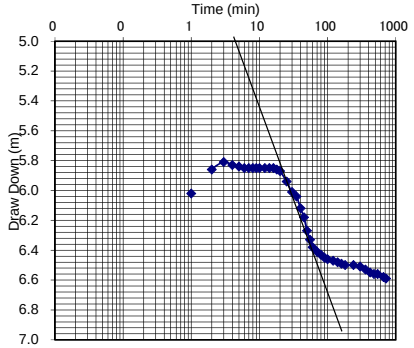
Q(m³/h)	Sw(m)
1.02	0.77
2.05	1.66
3.01	2.9
4.07	4.27
5.02	5.46
6	6.61
7.02	8.37
8	1048
9.1	11.7
10	13.93

Critical Yield	6.5
Safe Yield	5.2

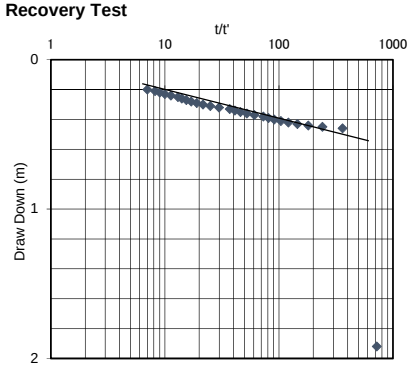
Drawdown Curve



Constant Rate Test



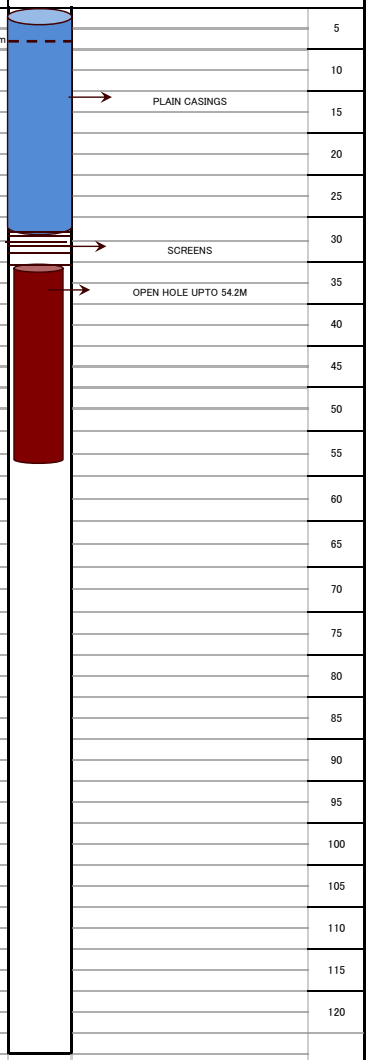
Recovery Test



The project for Rural water supply Phase Ⅲ in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH
Executed Date:	19-Jul-15	
Borehole No.:	P-04-EX03	
Village	Kapala	
Working Time:	1hr 20 minutes	
Depth of HP		
Casing Depth:	31.5M	
Casing Size :	5″	
Casing material	UPVC	
Static Water Table:	4.6M	
Screen Depth:	27M -30M	
Sedimentation:		
Safe yield		
Dynamic drawdown at safe yiel		
Top of casing Pipes (m)		

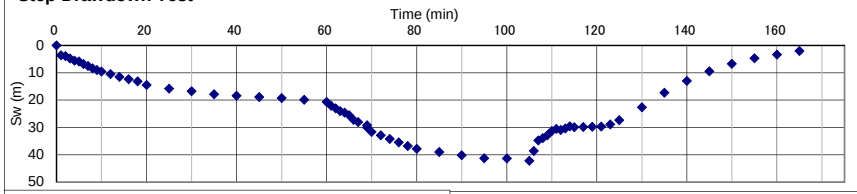


Casing schedule

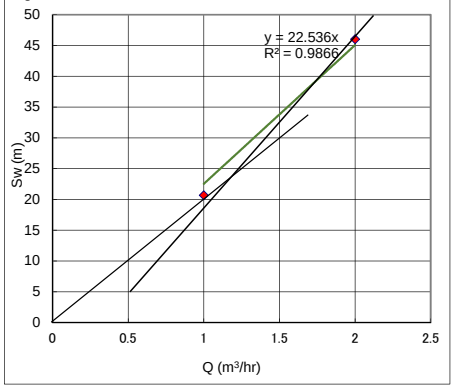
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120

P-04-EX03(Kapala)

Step Drawdown Test



Q-Sw Curve



Q-Sw Curve

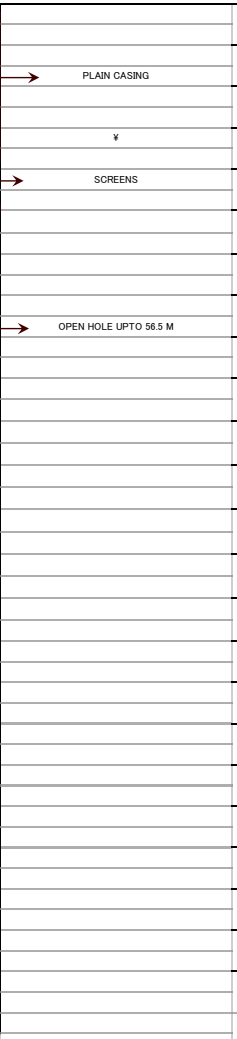
Q(m^3/h)	Sw(m)
1.02	20.68
2.04	46

Critical Yield	1.2
Safe Yield	0.96

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

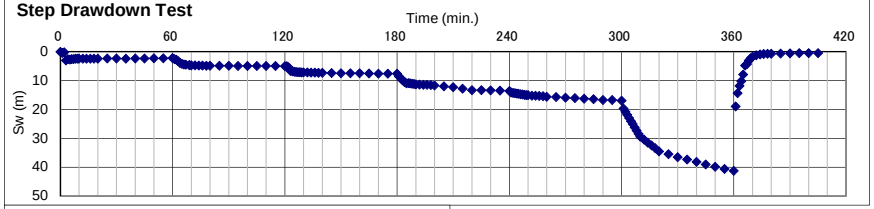
Items		Description of observation in the BH	Casing schedule
Executed Date:	19-Jul-15		
Borehole No.:	P-04-EX05		
Village	Kapala		
Working Time:	1hr 30 minutes	SWL =9.5m	PLAIN CASING
Depth of HP			
Casing Depth:	26.3M		¥
Casing Size :	5″		
Casing material	UPVC		SCREENS
Static Water Table:	9.5M		
Screen Depth:	18.5M – 26.3M		
Sedimentation:			OPEN HOLE UPTO 56.5 M
Safe yield			
Dynamic drawdown at safe yie			
Top of casing Pipes (m)			



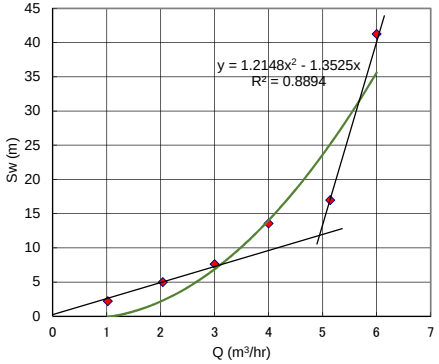
A11-2-30

P-04-EX05(Kapala)

Step Drawdown Test



Q-Sw Curve

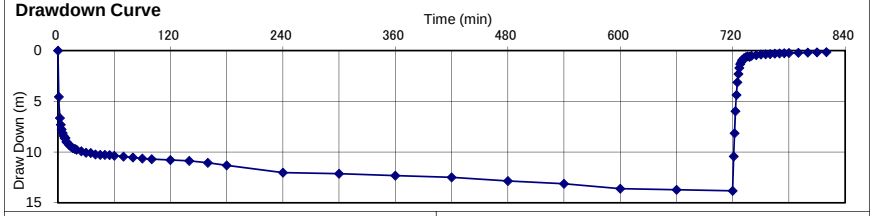


Q-Sw Curve

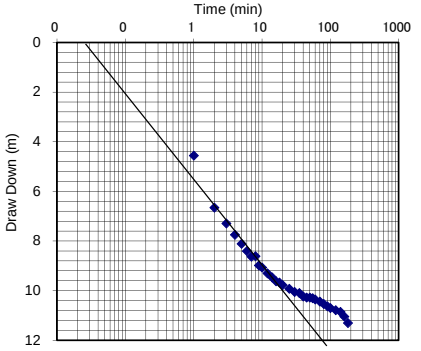
Q(m^3/h)	Sw(m)
1.02	2.19
2.04	4.97
3	7.6
4	13.57
5.14	16.96
6	41.27

Critical Yield	4.9
Safe Yield	3.9

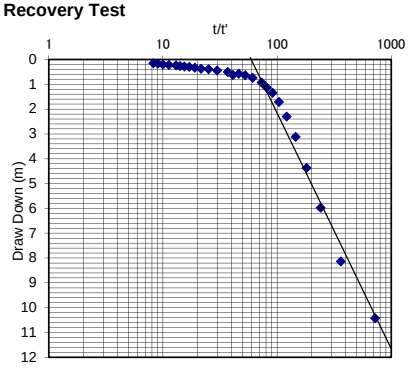
Drawdown Curve



Constant Rate Test



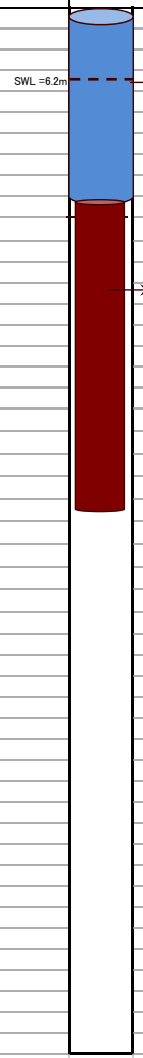
Recovery Test



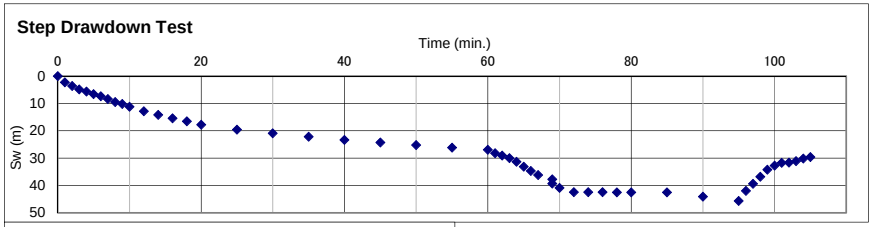
The project for Rural water supply Phase Ⅲ in Kyoga Basin, Eastern Uganda

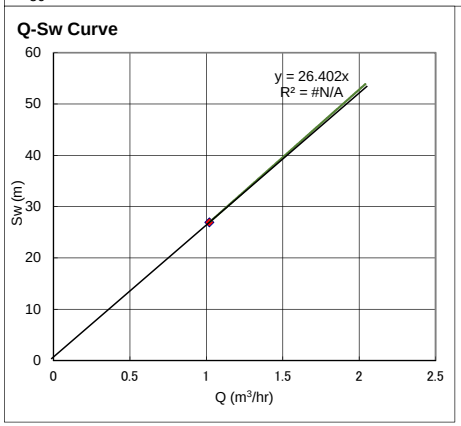
OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	17-Jul-15		
Borehole No.:	P-05-EX02		
Village	Buseta		
Working Time:	1hr 10 minutes	SWL =6.2m	PLAIN CASING
Depth of HP			
Casing Depth:	23.5M		
Casing Size :	5"		
Casing material	UPVC		
Static Water Table:	6.2M		
Screen Depth:			
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yield			
Top of casing Pipes (m)			OPEN HOLE UPTO 39.7M



P-05-EX02(Buseta)





Q-Sw Curve

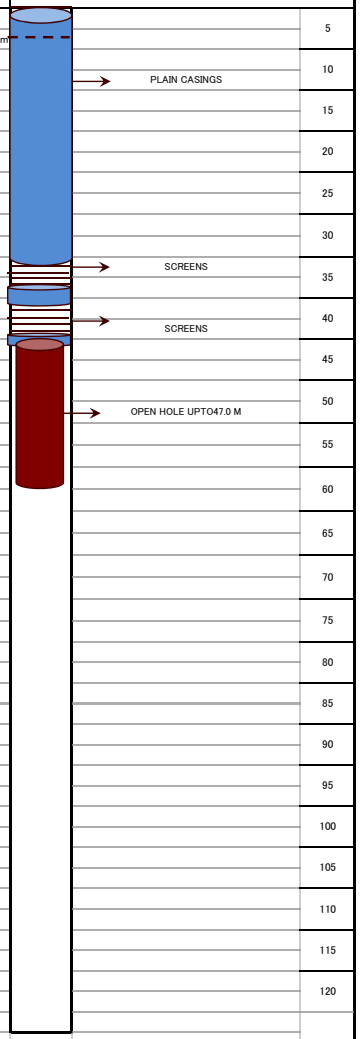
Q(m^3/h)	Sw(m)
1.02	26.93

Critical Yield	
Safe Yield	

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH
Executed Date:	18-Jul-15	
Borehole No.:	P-05-EX03	
Village	Buseta	
Working Time:	1hr 30 minutes	
Depth of HP		
Casing Depth:	41.5M	
Casing Size :	5"	
Casing material	UPVC	
Static Water Table:	3.9M	
Screen Depth:	31.4m-34.4m, 37.1m-40.1m	
Sedimentation:		
Safe yield		
Dynamic drawdown at safe yield		
Top of casing Pipes (m)		



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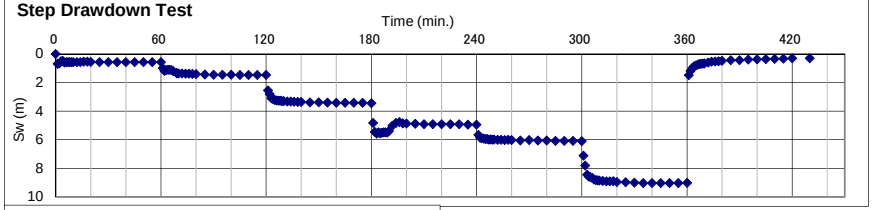
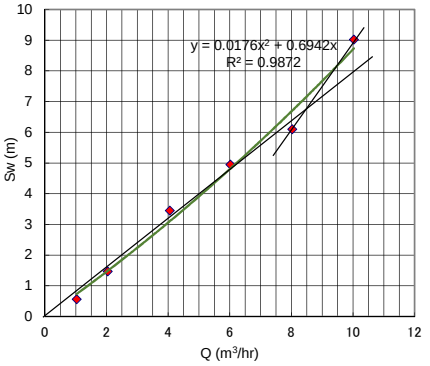
P-05-EX03(Buseta)

Step Drawdown Test



Q-Sw Curve

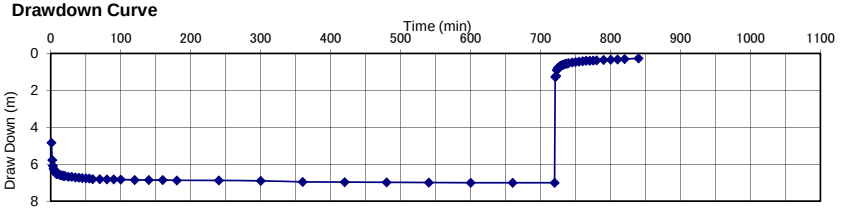


Q-Sw Curve

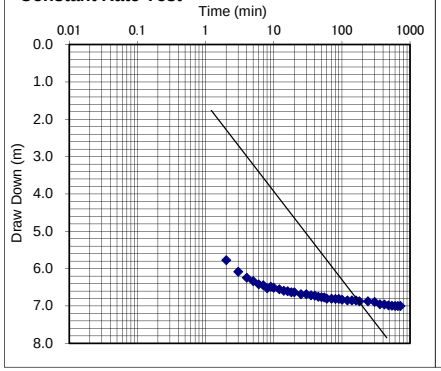
Q(m^3/h)	Sw(m)
1.03	0.56
2.04	1.47
4.05	3.45
6.02	4.95
8.03	6.10
10.03	9.02

Critical Yield	8.5
Safe Yield	6.8

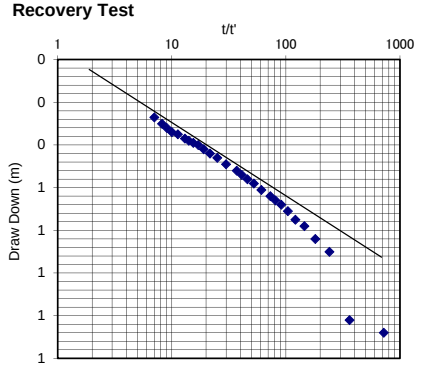
Drawdown Curve



Constant Rate Test



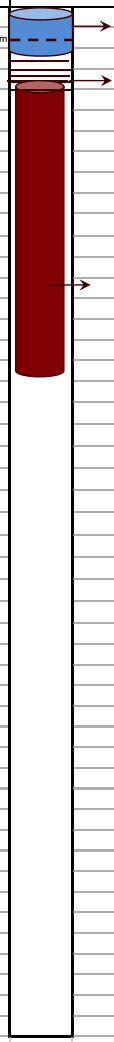
Recovery Test



The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

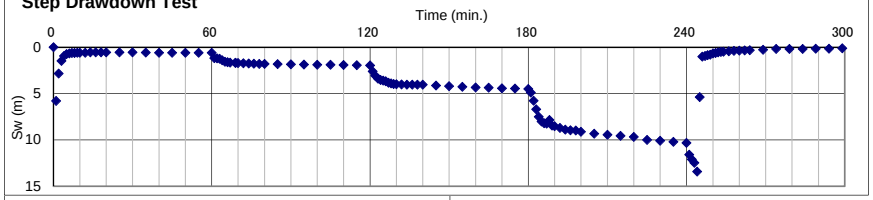
Items		Description of observation in the BH	Casing schedule
Executed Date:	18-Jul-15		
Borehole No.:	P-05-EX05	SWL =4.6m	
Village	Buseta		
Working Time:	1hr 20 minutes		SCREENS
Depth of HP			
Casing Depth:	9.9M		
Casing Size :	5"		
Casing material	UPVC		
Static Water Table:	11.1M		
Screen Depth:	16.2M -19M		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yiel			
Top of casing Pipes (m)			OPEN HOLE UPTO 47.0M



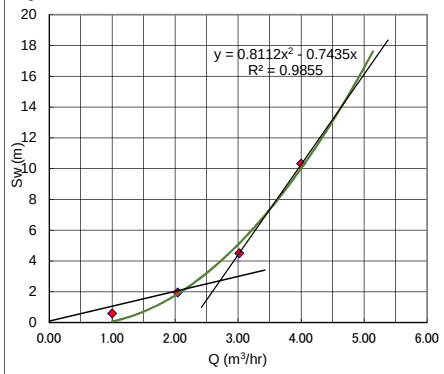
A11-2-33

P-05-EX05(Buseta)

Step Drawdown Test



Q-Sw Curve

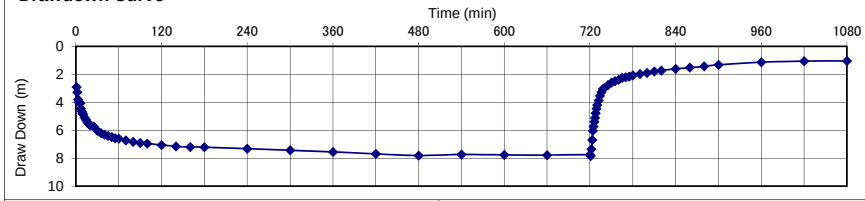


Q-Sw Curve

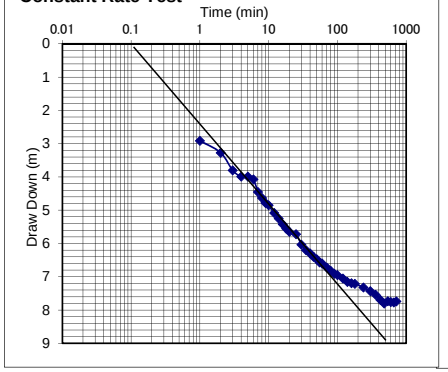
Q(m^3/h)	Sw(m)
1	0.59
2.04	1.95
3.02	4.50
4	10.32

Critical Yield	2.7
Safe Yield	2.2

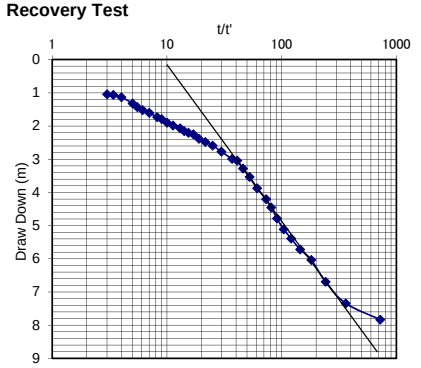
Drawdown Curve



Constant Rate Test



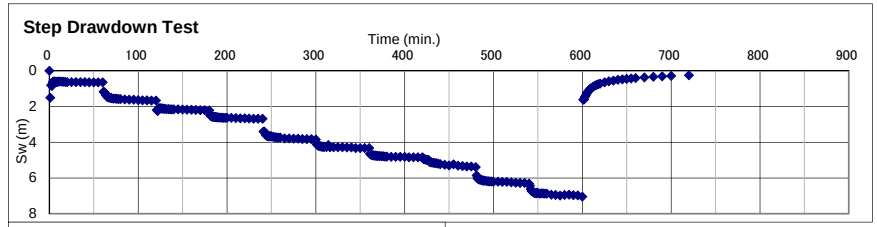
Recovery Test

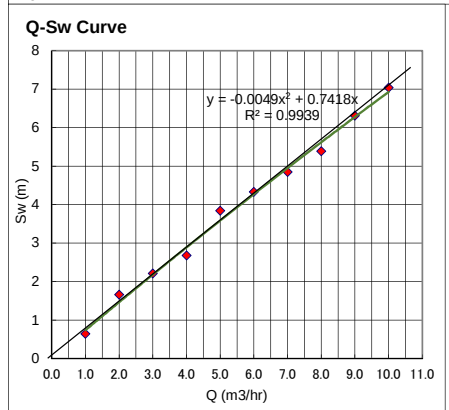


The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH	Casing schedule
Executed Date:	14-Jul-15		
Borehole No.:	P-05_EX06		
Village	Buseta		
Working Time:	1hr 20 minutes		PLAIN CASING
Depth of HP		SWL =10.0m	
Casing Depth:	Not identified due to visual obstarction		
Casing Size :	5″		¥
Casing material	UPVC		
Static Water Table:	10.0M		SCREENS
Screen Depth:	19.7M – 22.4, 25.4M – 8.4M		
Sedimentation:			
Safe yield			
Dynamic drawdown at safe yield			
Top of casing Pipes (m)			

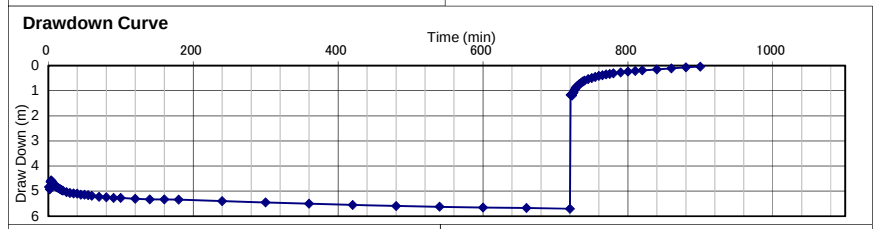


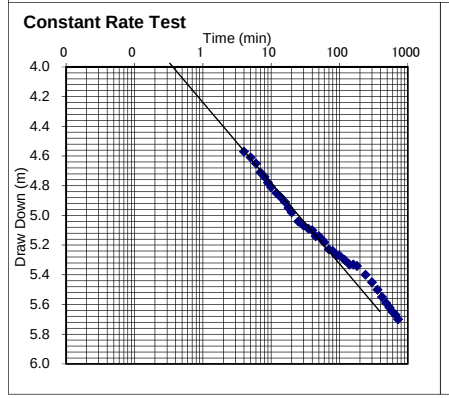


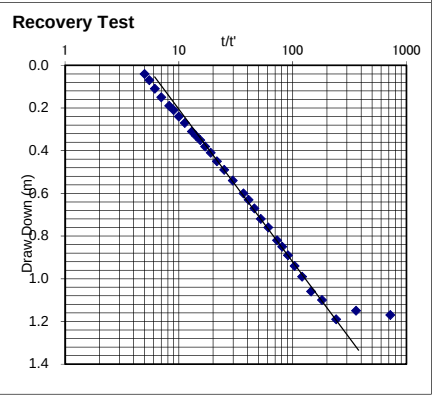
Q-Sw Curve

Q(m^3/h)	Sw(m)
1	0.64
2	1.66
3	2.21
4	2.68
5	3.84
6	4.33
7	4.85
8	5.39
9	6.31
10	7.04

Critical Yield	10.0
Safe Yield	8.0







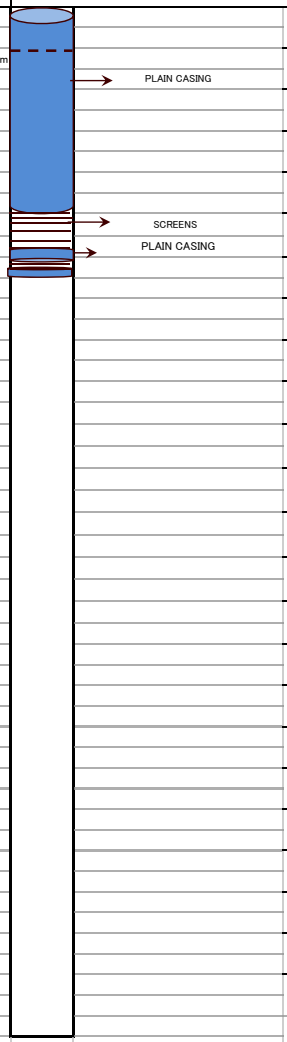
P-05-EX06(Buseta)

The project for Rural water supply Phase III in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH
Executed Date:	16-Jul-15	
Borehole No.:	P-05-EX07	
Village	Buseta	SWL =5.8m
Working Time:	1hr 20 minutes	
Depth of HP		
Casing Depth:	32.4M	
Casing Size :	5"	
Casing material	UPVC	
Static Water Table:	5.8M	
Screen Depth:	25.5M -28.3M, 30.7M- 32.4M	
Sedimentation:		
Safe yield		
Dynamic drawdown at safe yield		
Top of casing Pipes (m)		

Casing schedule

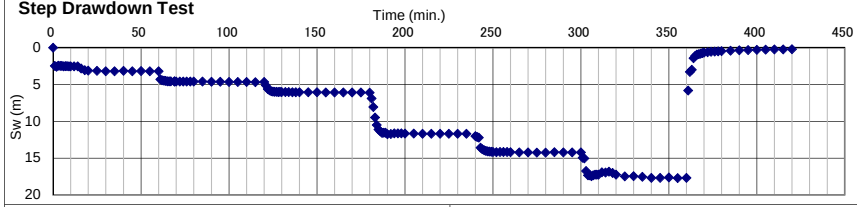


5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120

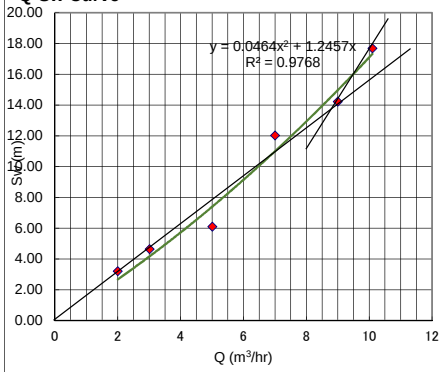
A11-2-35

P-05-EX07(Buseta)

Step Drawdown Test



Q-Sw Curve

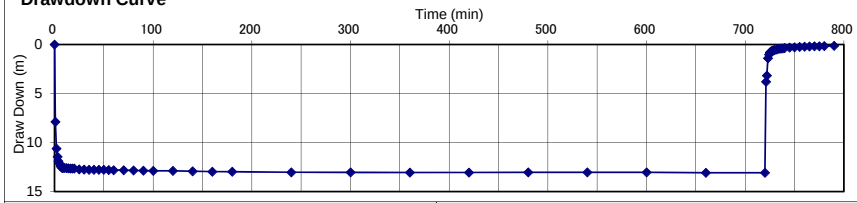


Q-Sw Curve

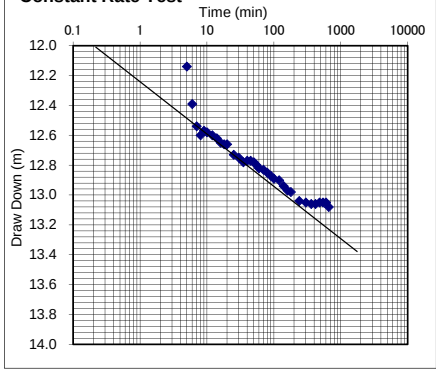
Q(m³/h)	Sw(m)
2	3.20
3.01	4.64
5.01	6.10
7	12.02
9	14.22
10.1	17.68

Critical Yield	9.0
Safe Yield	7.2

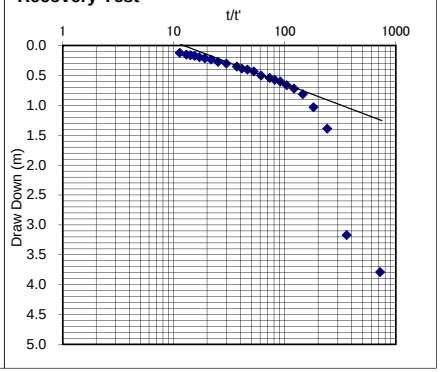
Drawdown Curve



Constant Rate Test



Recovery Test

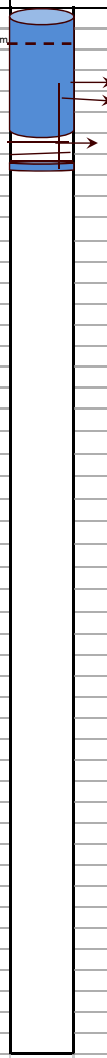


The project for Rural water supply Phase Ⅲ in Kyoga Basin, Eastern Uganda

OBSERVATION RECORD BY BOREHOLE CAMERA

Items		Description of observation in the BH
Executed Date:	21-Jul-15	
Borehole No.:	S-02-EX02	SWL =4.2m
Village	Tubur	
Working Time:	1hr10 minutes	
Depth of HP		
Casing Depth:	19-Jan-00	
Casing Size :	5″	
Casing material	UPVC	
Static Water Table:	4.2M	
Screen Depth:	17m-20m	
Sedimentation:		
Safe yield		
Dynamic drawdown at safe yie		
Top of casing Pipes (m)		

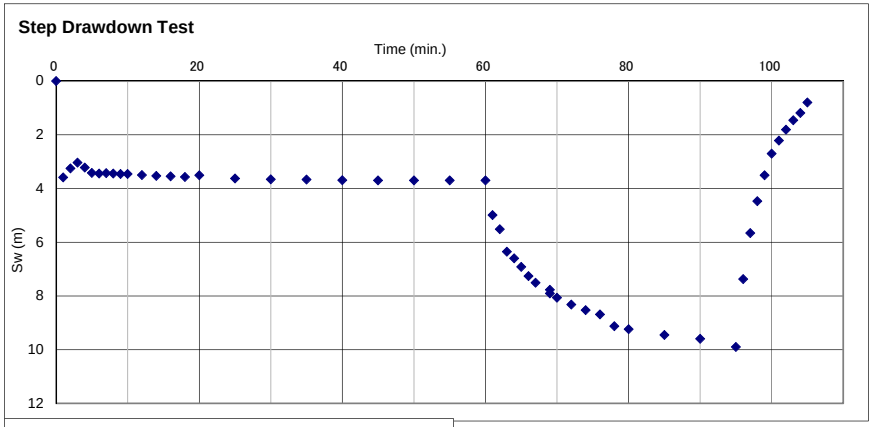
Casing schedule

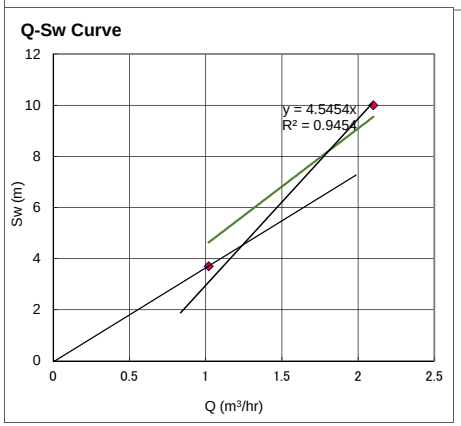


5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120

A11-2-36

S-02-EX02(Tubur)





Q-Sw Curve

Q(m^3/h)	Sw(m)
1.0	3.7

Critical Yield	
Safe Yield	

Result of Pumping Test and Water Quality Analysis

RGC Name	Existing BH No.	Hostility (Yes: ×, No: ○)	Availability of Pumping Test	Reason of Abort of Pumping Test	Borehole Camera			Step Drawdown Test		Continuous Test			Recovery Test	Water Quality at Field					Colour	Turbidity	TDS	TSS	Hardness	Magnesium	Chloride	Fluoride	Total Iron	Sulphate	Nitrate	Nitrite	Ammonia	Manganese	Arsenic	Sodium	Potassium
					Depth (m)	Casing Bottom (m)	SWL (m)	Critical Yield (m^3/hr)	Safe Yield (m3/hr)	Dischrge Rate (m3/hr)	Trans-missivity (m2/hr)	Strage Co-efficient	Trans-missivity (m2/hr)	Temper-ature (oC)	pH	EC (mS/cm)	TDS (mg/L)	Coliform (No./100 mL)	PtCo	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
																		50	25	1500	Not detectable	600	100	250	1.5	0.3	400	45	12	0.5	0.1	0.01	200	100
Nabitende Banada	I-01-EX01	×	○		48.3	38.8	9.8	2.9	2.3	2.5	0.23	0.24	0.29	24.7	6.25	338	250	1	0	0.2	163	0	120	12	12	0.16	0.003	5	0.02	0	0	0	<0.001	10.3	0.9
	I-01-EX02	×	○		48.0		10.10	2.4	1.9	-	-	-	-	25.1	6.37	593	310	1	2	0.5	300	0	130	14.4	13.5	0.21	0.004	7	0.03	0	0.004	0	<0.001	13.5	2.3
	I-01-EX03	○		Small Dia.						-	-	-	-																					
	I-01-EX04	×	○		47.5	35.0	6.33	<2.0	<2.0	-	-	-	-	25.6	6.06	360	180	7	7	0.9	185	0	130	14.4	15.5	0.22	0.009	6	0.02	0	0.005	0	<0.001	10.5	1.8
	I-01-EX05	×		Rust						-	-	-	-																					
	I-01-EX06	×	○		49.0	38.8	8.70	<2.0	<2.0	-	-	-	-	26.5	6.03	514	260	0	4	0.7	170	0	130	14.4	11.7	0.23	0.006	5	0.03	0	0.001	0	<0.001	11.3	1.7
	I-01-EX07	×		Hostility						-	-	-	-																					
	I-01-EX09	×	○					2.1	1.7	-	-	-	-	25.8	6.07	252	130	0	44	8.5	143	6	80	7.2	8.4	0.14	0.032	4	0.04	0.002	0.023	0.001	<0.001	10.3	1.2
	I-01-EX10	—		Shallow well						-	-	-	-																					
Namungalwe	I-02-EX01	—		Too Old						-	-	-	-																					
	I-02-EX02	△	○		53.9	27.5	7.6	2.0	1.6	-	-	-	-	26.2	6.75	386	200	0	16	1.9	200	2	130	14.4	16	0.21	0.022	6	0.03	0	0.007	0.001	<0.001	7.4	1
	I-02-EX03	—		Too Old						-	-	-	-																					
	I-02-EX04	△	○		30.0	-	11.3	4.0	3.2	3.4	0.57	8.49	1.09	25.9	6.2	199	100	0	8	0.9	115	0	85	7.2	7.5	0.12	0.014	4	0.02	0	0.001	0	<0.001	6.2	0.9
	I-02-EX05A	○		Small Dia.						-	-	-	-																					
	I-02-EX05B	×	○		40.2	33.4	11.1	2.5	2.0	-	-	-	-	25.9	6.1	190	200	0	7	0.9	115	0	75	7.2	7.4	0.12	0.011	3	0.02	0	0.06	0	<0.001	5.2	0.5
	I-02-EX06	—		Too Old						-	-	-	-																					
Nambale	I-03-EX01	○	○		25.6	-	8.80	<2.0	<2.0	-	-	-	-	26.0	5.86	231	120	0	4	0.7	134	0	75	8.4	6.2	0.13	0.009	4	0.01	0	0.001	0	<0.001	9.5	0.9
	I-03-EX02	×	○		50.0			2.1	1.7	-	-	-	-	26.4	5.74	237	120	0	14	1.6	130	1	70	7.2	5	0.12	0.018	4	0.02	0	0.006	0.001	<0.001	11.5	1.7
Lambala	I-06-EX02	×	○		45.0	30.2	5.60	2.0	1.6	-	-	-	-	25.5	6.00	360	180	0	2	0.5	204	0	140	14.4	17	0.23	0.006	5	0.02	0	0.001	0	<0.001	9.7	1.2
	I-06-EX03	—		Shallow Well						-	-	-	-																					
	I-06-EX04	×	○		49.3	39.5	5.50	<2.0	<2.0	-	-	-	-	26.5	5.98	310	110	0	3	0.7	170	0	140	12	16.5	0.21	0.005	5	0.03	0	0.004	0	<0.001	10.3	1.2
	I-06-EX05	—		Shallow Well						-	-	-	-																					
Naigobya	I-07-EX02	×	○		30.5		9.30	2.8	2.2	2.5	1.69	0.006	1.83	27.7	5.87	490	230	0	0	0.3	120	0	70	7.2	6.9	0.13	0.004	2	0.02	0	0.005	0	<0.001	10.3	1.2
	I-07-EX04	×	○		62.7	35.6	9.70	2.5	2.0	2.0	2.15	0.4	0.76	26.9	6.02	360	180	0	0	0.2	178	0	144	15.4	15	0.16	0.003	6	0.02	0	0.001	0	0	9.8	1.4
Busesa	I-08-EX01	○	○		32.7	21.0	6.70	2.9	2.3	2.5	0.91	0.68	0.08	26.2	5.83	248	160	>50	13	1.6	155	1	120	9.6	8.4	0.12	0.018	4	0.02	0	0.003	0.001	<0.001	5.4	0.6
	I-08-EX02	○	○		42.8	21.6	11.10	4.6	3.7	3.8	1.24	6.52	0.87	26.4	5.71	184	120	0	7	0.9	103	0	50	4.8	2.5	0.06	0.008	1	0.01	0	0.003	0	<0.001	9.4	1.1
	I-08-EX03	○	○		66.1		12.78	<2.0	<2.0	-	-	-	-	25.5	6.00	395	210	0	0	0.3	200	0	156	14.4	15.2	0.18	0.004	7	0.03	0	0	0	<0.001	8.1	1.2
	I-08-EX05	○	○		39.4		7.50	<2.0	<2.0	-	-	-	-	26.6	6.01	314	160	0	16	2	177	1	130	12	12.8	0.15	0.019	5	0.03	0	0.09	0.001	<0.001	13	1.9
	I-08-EX06	○	○		39.6		11.98	<2.0	<2.0	-	-	-	-	26.2	6.08	247	130	>50	9	1.2	135	0	85	8.4	13.5	0.16	0.012	4	0.03	0	0.008	0.001	<0.001	9.2	1.6
Kyanvuma	I-09-EX04	×	○		31.2		10.30	9.0	7.2	7.5	0.2	0.61	0.2	26.0	5.52	240	120	0	8	0.9	135	0	80	7.2	5.6	0.12	0.009	4	0.02	0	0.001	0	<0.001	8.8	0.9
	I-09-EX05	×		Small Dia.						-	-	-	-																					
	I-09-EX06	×	○		63.7	42.2	10.60	2.6	2.1	-	-	-	-	23.9	5.95	379	-	0	0	0.3	200	0	140	14.4	13.9	0.17	0.004	5	0.03	0	0.003	0	<0.001	12.4	1.9
Nakivumbi	I-10-EX01	×		Hostility						-	-	-	-																					
	I-10-EX02	×		Hostility						-	-	-	-																					
	I-10-EX03	×	○				15.40	<2.0	<2.0	-	-	-	-	27.6	6.01	397	200	0	7	0.9	190	0	144	12	15.2	0.16	0.01	6	0.02	0	0.002	0.001	<0.001	8.4	0.9
Nondwe	I-11-EX01	○	○		32.2		16.28	2.7	2.2	2.2	0.18	0.05	0.23	29.4	-	-	-	2	0	0.2	66	0	30	2.4	0.5	0	0.003	0	0	0	0.002	0	<0.001	7.3	0.8
	I-11-EX03	○	○		39.1		13.39	<2.0	<2.0	-	-	-	-	24.6	5.37	158	160	0	8	0.9	100	0	45	6	1.2	0.07	0.008	1	0	0	0.04	0.001	<0.001	9.5	1
Kasassira	P-02-EX03	○	○		44.4		8.1	3.8	3.04	3	1.22	2.29	1.37	28.8	5.89	400	200	0	8	1	216	0	160	14.4	16.5	0.17	0.011	6	0.02	0	0	0.002	<0.001	9.4	1.1
	P-02-EX04	○	○		67.9	24.5	7.6	<2.0	<2.0	-	-	-	-	28.7	6.11	760	380	0	19	3.2	375	2	240	24	19.4	0.27	0.044	10	0.04	0.002	0.003	0.001	<0.001	12.4	1.9
	P-02-EX05	○	○		49.3		6.0	2.1	1.68	-	-	-	-	29.6	6.57	1,470	730	0	10	1.3	435	0	280	28.8	31.2	0.3	0.022	18	0.03	0.002	0.005	0.001	<0.001	13.9	2.2
	P-02-EX06	○	○		42.0	42	7.2	3.2	2.56	3.1	0.17	25.03	1.53	29.5	6.37	1,460	730	0	3	0.7	800	0	388	36	49.5	0.39	0.008	78	0.03	0	0.001	0	<0.001	22.5	4.3
Kapala	P-04-EX01	○	○		38.2	25.5	5.9	6.5	5.2	5.7	0.9	13.49	5.49	27.2	6.67	612	300	23	12	1.4	288	1	220	24	18.5	0.24	0.011	7	0.03	0	0.02	0.001	<0.001	10.3	1.3
	P-04-EX03	○	○		54.2	31.5	4.6	<2.0	<2.0	-	-	-	-	29.0	6.44	850	430	0	4	0.8	400	0	245	24	26.8	0.3	0.009	23	0.02	0	0.02	0	<0.001	11.3	1.2
	P-04-EX05	○	○		56.5	31.0	9.5	4.9	3.92	3.4	0.45	0.03	0.79	28.0	5.95	410	200	0	4	0.7	210	0	155	12	16.3	0.23	0.008	5	0.03	0	0.03	0	<0.001	8.5	1.1
Buseta	P-05-EX02	○	○		58.5	23.5	6.1	<2.0	<2.0	-	-	-	-	26.5	6.24	510	260	0	11	1.5	240	1	140	14.4	16.3	0.19	0.02	6	0.03	0	0.04	0	<0.001	8.4	1.2
	P-05-EX03	○	○		58.4	41.5	3.9	10.0	8.0	8.0	0.9	0.3	0.8	26.4	6.26	980	490	0	2	0.5	600	0	320	28.8	22.5	0.29	0.006	48	0.02	0	0	0	<0.001	15.2	2.7
	P-05-EX05	○	○		47.0	9.9	4.6	2.7	2.2	-	-	-	-	28.7	5.95	630	310	0	11	1.4	325	1	230	21.6	18.8	0.27	0.019	8	0.03	0	0.002	0.001	<0.001	9.4	1.9
	P-05-EX06	○	○		31.7		10.0	10.0	8.0	7.0	2.5	3.3	3.0	28.7	6.02	810	410	0	9	1.2	370	0	285	24	29.5	0.29	0.013	9	0.03	0	0.001	0	<0.001	13.5	2
	P-05-EX07	○	○		>32.4	30.7	5.8	10.0	8.0	8.0	4.0	3.0	1.8	26.2	6.99	1,559	710	0	3	0.6	700	0	360	38.4	39.5	0.33	0.007	55	0.02	0	0.01	0	<0.001	18.3	3.2
	P-05-EX08			Small Dia.						-	-	-	-																					
Tubur	S-02-EX01	○		Too Old						-	-	-	-																					
	S-02-EX02	×	○		20.0		4.2	<2.0	<2.0	-	-	-	-	27.1	5.86	170	90	0	16	1.9	100	2	70	7.2	8.5	0.16	0.024	2	0.01	0	0.07	0	<0.001	4	0.4
Acuna	S-03-EX01	×		Refused						-	-	-	-																					
	S-03-EX03	×		Refused						-	-	-	-																					