

6. Other Relevant Data

Market Centre Project

- 6-1 Evaluation of Water Sources for Market Centres***
- 6-2 Water Quality Test (Existing Water Supply Facilities)***
- 6-3 Social Condition Survey for Market Centres***
- 6-4 Examination of Intake Pump***
- 6-5 Hydraulic Calculation for Distribution Pipe***

Mchinji Rehabilitation Project

- 6-6 Borehole Survey***
- 6-7 Water Quality Test***
- 6-8 Borehole Condition Survey***
- 6-9 Social Condition Survey for Mchinji Project***
- 6-10 Borehole Rehabilitation and Construction Plan***

***6- 1 EVALUATION OF WATER SOURCE
FOR THE MARKET CENTRES***

TABLE OF CONTENTS

1. Outline of Survey	1
2. Namitete/Chileka Market Centre.....	8
2.1 Source of Surface Water	8
(1) River flow fluctuation	8
(2) Water Quality	11
(3) Water Rights.....	14
2.2 Source of Groundwater.....	15
(1) Siting of Drilling Point for Test Boreholes	15
(2) Test borehole Drilling	20
(3) Pumping Test.....	22
(4) Water Quality Test.....	26
2.3 Evaluation of Water Source for Water Supply	27
3. Water Source for Mkanda Market Centre	30
3.1 Source of Surface Water	30
(1) River Flow Fluctuation	30
(2) Water Quality	33
(3) Water Rights.....	36
3.2 Source of Groundwater.....	37
(1) Siting of Drilling Point for Test Borehole.....	37
(2) Drilling of Test Borehole	41
(3) Pumping Test.....	43
(4) Water Quality Test	49
3.3 Evaluation of Water Source for Water Supply	50
(1) Evaluation of Water Source	50

(2) Drawdown of Water Level by Mutual Interference	50
(3) Discharge Compared with Planned Water Supply Amount	50
4. Water Source for Santhe Market Centre	52
4.1 Source of Surface Water	52
4.2 Groundwater Source	52
(1) Siting of Drilling Point for Test Borehole	52
(2) Drilling of Test Borehole	58
(3) Pumping Test.....	61
(4) Water Quality Test.....	67
4.3 Evaluation of Water Source for Water Supply	68
(1) Interference to Other Boreholes	68
(2) Discharge Compared with Planned Water Supply Amount	68

1. Outline of Survey

In order to evaluate the potential of candidate water sources for the water supply of market centres, which are targeted for the Project for Water Supply Systems for Santhe, Mkanda and Namitete/Chileka Market Centres, the survey team conducted the review of the past feasibility studies carried out in 1998, collection of existing data and field survey in each market centre.

Targeted Market Centres;

- (1) Namitete/Chileka Market Centre, Lilongwe District
- (2) Mkanda Market Centre, Mchinji District, and
- (3) Santhe Market Centres, Kasungu District

The contents of field survey are shown in Table A6-1-1.

Table A6-1-1 Contents of Field Survey for Water Source Evaluation

	Contents of Field Survey	Survey Method	Target Market Centres		
			Namitete/Chileka	Mkanda	Santhe
Surface Water	River flow	Data collection in Department of Water Resources 10 years for 2 stations	Namitete River	Liwelezi River	N/A
	Water Quality (including Agrochemicals)	Entrusted to Central Water Laboratory, MoAIWD			
		Physical /Chemical :4 samples			
		Microbial : 4 samples			
Water rights	Collection of existing water rights listed in Water Resources Board, MoAIWD				
Groundwater	Selection of drilling points	Area was recommended through consultation with MoAIWD and CRWB	Namitete 2 sites Chileka 1 site	3 sites	3 sites (Additional) 3 sites
		Points were decided after geo-electric survey done by the Survey Team			
	Test Boreholes	PVC Casing 160mm			
		Depth : from 50m to 80m			
	Pumping Test	Step drawdown :4 steps			
		Continuous Pumping :24 hrs.			
		Recovery Test :2 hrs.			
Water Quality Test	One sample each borehole				

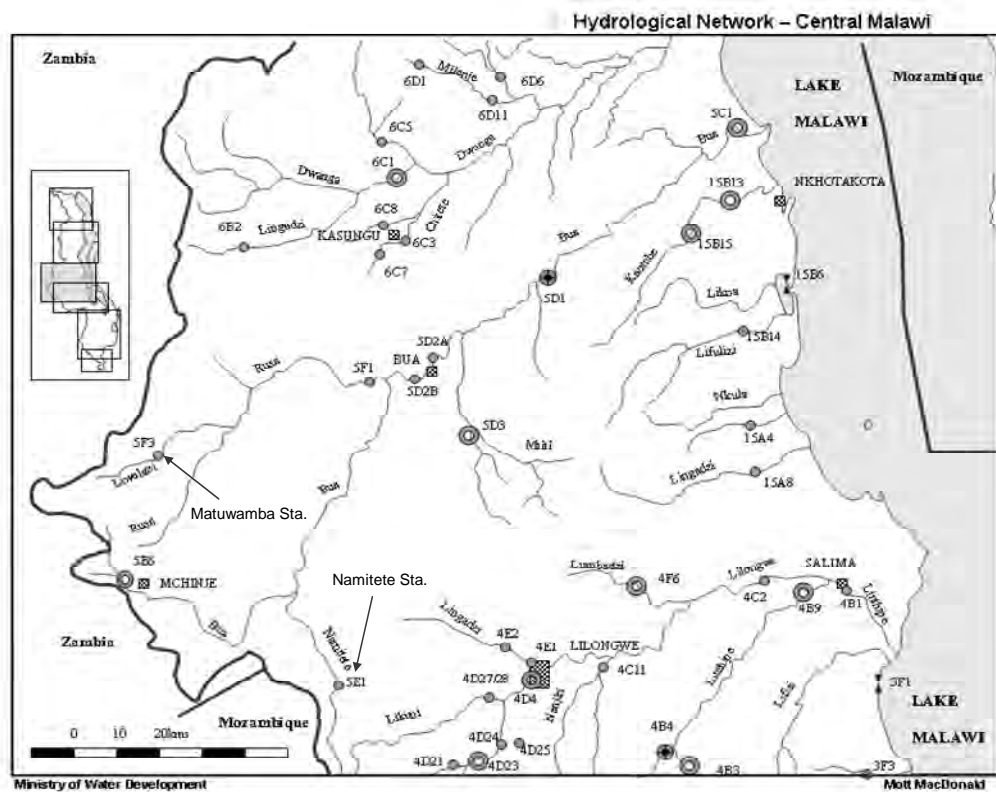
1.1 Surface Water Source

(1) River flow data

The hydrological observation points in Central Malawi under Department of Water Resources are shown in Table A6-1-2 and Fig. A6-1-1. In the target area three (3) observation points, which are the points of 5.E.1 on Namitete River and 5.F.2, 5.F.3 on Liwelezi River, are referred to the Project.

Table A6-1-2 Hydrological Observation Stations on Namitete River and Liwelezi River

Target Market Centres	Station No.	Name of Station	River Name	Catchments Area (km ²)	Year Observation Started	Remarks
Namitete/Chileka	5.E.1	Namitete town	Namitete	147	1953.11.17	
Mkanda	5.F.2	Mkanda	Liwelezi	-	1976.10.08	Stopped after starting observation at 5.F.3
	5.F.3	Matumamba	Liwelezi	278	1987.8.27	Established at 5 km upper stream from 5.F.2



Source: NWDP (2003) Strengthening of the Water Resources Board, Ministry of Water Development, National Water Development Project

Figure A6-1-1 Hydrological Observation Network in Central Malawi

(2) Water Quality Test

Water Quality Test was carried out to find the physical/chemical characteristics with 19 parameters and microbial characteristics (Faecal Coliform , Faecal Streptococci). The numbers of the sample by water source are shown as below.

Surface water	4 samples
Groundwater	12 samples

The sampling points for surface water quality test are shown in Table A6-1-3.

Table A6-1-3 Sampling point for water quality test for surface water

Target Market Centres	River Basin	Sampling point	Date of Sampling	Remarks
Namitete/Chileka	Namitete River	Upper stream of bridge on M12	7th Oct. 2010	Station 5.E.1
		Kakuyu Dam	7th Oct. 2010	Located between Namitete and Chileka
Mkanda	Liwelezi River	Mkanda bridge	9th Oct. 2010	Station 5.F.2
		Matuwamba village	9th Oct. 2010	Station 5.F.3

The tested parameters are shown in Table A6-1-4 and Table A6-1-5.

Table A6-1-4 Water Quality Parameters

Physical Parameter (4)	pH Value, Electric Conductivity, Turbidity, Suspended Solids (SS)
Chemical Parameter (15)	Carbonate (as CO_3^{2-}), Bicarbonate (as HCO_3^-), Chloride (as Cl^-), Sulphate (as SO_4^{2-}), Nitrate (as NO_3^-), Fluoride (as F^-), Sodium (as Na^+), Potassium (as K^+), Calcium (as Ca^{2+}), Magnesium (as Mg^{2+}), Iron(Fe^{++}), Manganese (Mn^{2+}), Total Hardness (as CaCO_3), Total Alkalinity (as CaCO_3), Silica (as SiO_2)
Microbial Item (2)	Faecal Coliform , Faecal Streptococci

Table A6-1-5 Water Quality Parameters (Agrochemicals and Pesticide)

Sample	One sample each for Namitete river and Liwelezi River Sampled in dray season
Parameters	DDT (include DDD & DDE), Aldrin, Dieldrin, Chlordane Dibromochloropropane (DBCP), Cypermethrin, Permethirin Heptachlor (includes Hexachlorobenzene), Methoxychlor
Method	Gas-chromatography Analysis

(3) Water Rights

In order to evaluate the legal potential for intake of river water, the survey team carried out collection of data on the existing water rights of related rivers from Water Resources Board (WRB), Ministry of Agriculture,

Irrigation and Water Development (MoAIWD).

According to Water Resource Act (Chapter 72:03) , all water users have to apply their water rights to WRB, MoAIWD when they use surface water or groundwater except for domestic water. Water users have to pay their water right charge consists of MK. 3,000 for application and an annual charge specified for their applied consumption. The water rights are renewed 5 years each for surface water, and 10 years each for groundwater.

1.2 Groundwater Source

In order to evaluate groundwater potential the survey team conducted to drill three (3) test boreholes in each market centre, maximum 9 sites in total in 2010 and three (3) additional test boreholes at Santhe in 2011.

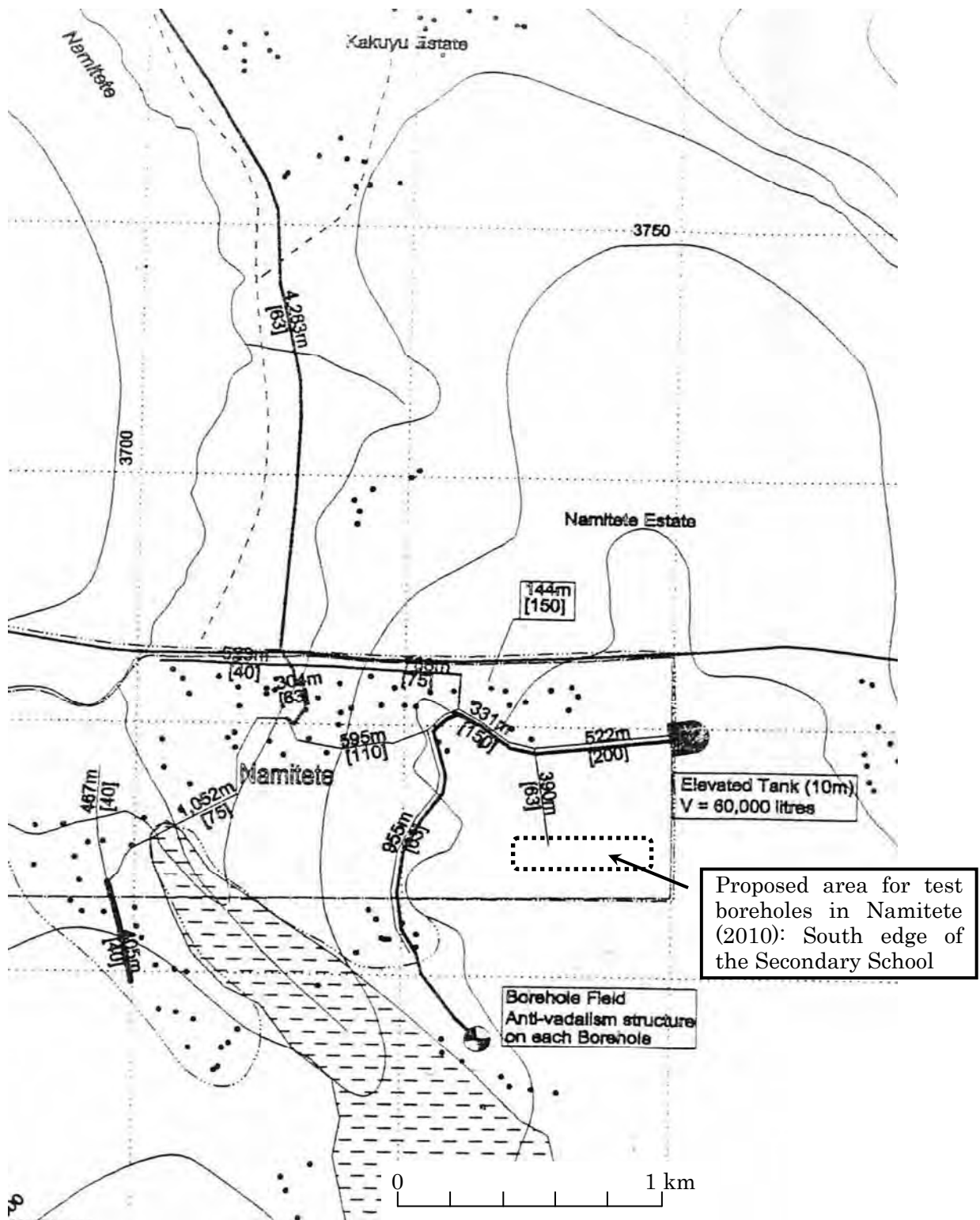
The team requested MoAIWD and CRWB to arrange the candidate area for drilling of these test boreholes with consideration of following conditions;

- Refer to the “well field” mentioned on the feasibility study reports¹¹
- Vicinity to the each water supply area
- Possibility of land acquisition for production well
- Distance to the existing boreholes

Upon the request from the team, MoAIWD and CRWB recommended the candidate area for drilling of test boreholes for each market centre as shown in Figure. A6-1-2, Figure. A6-1-3 and Figure. A6-1-4.

The team carried out the geo-electric survey in those candidate areas to decide the drilling points.

¹¹ NWDP (1998), Detailed Design for New Urban and Rural Gravity Fed Water Schemes
NWDP (1998), 16 New Water Supply Schemes Feasibility Study



Chileka market centre, located about 5 km east of Namitete Market, was not targeted in the feasibility study in 1998, and there was no existing proposal for well field. The survey area for drilling one test borehole was selected in southern end of ADMARC in Chileka, through the consultation with MoAIWD and CRWB .

Figure A6-1-2 Water Supply Plan in F/S Report and Area for Groundwater Development Survey (Namitete Market Centre)

Source: NWDP(1998),Detailed Design for New Urban and Rural Gravity Fed Water Schemes, retouched.

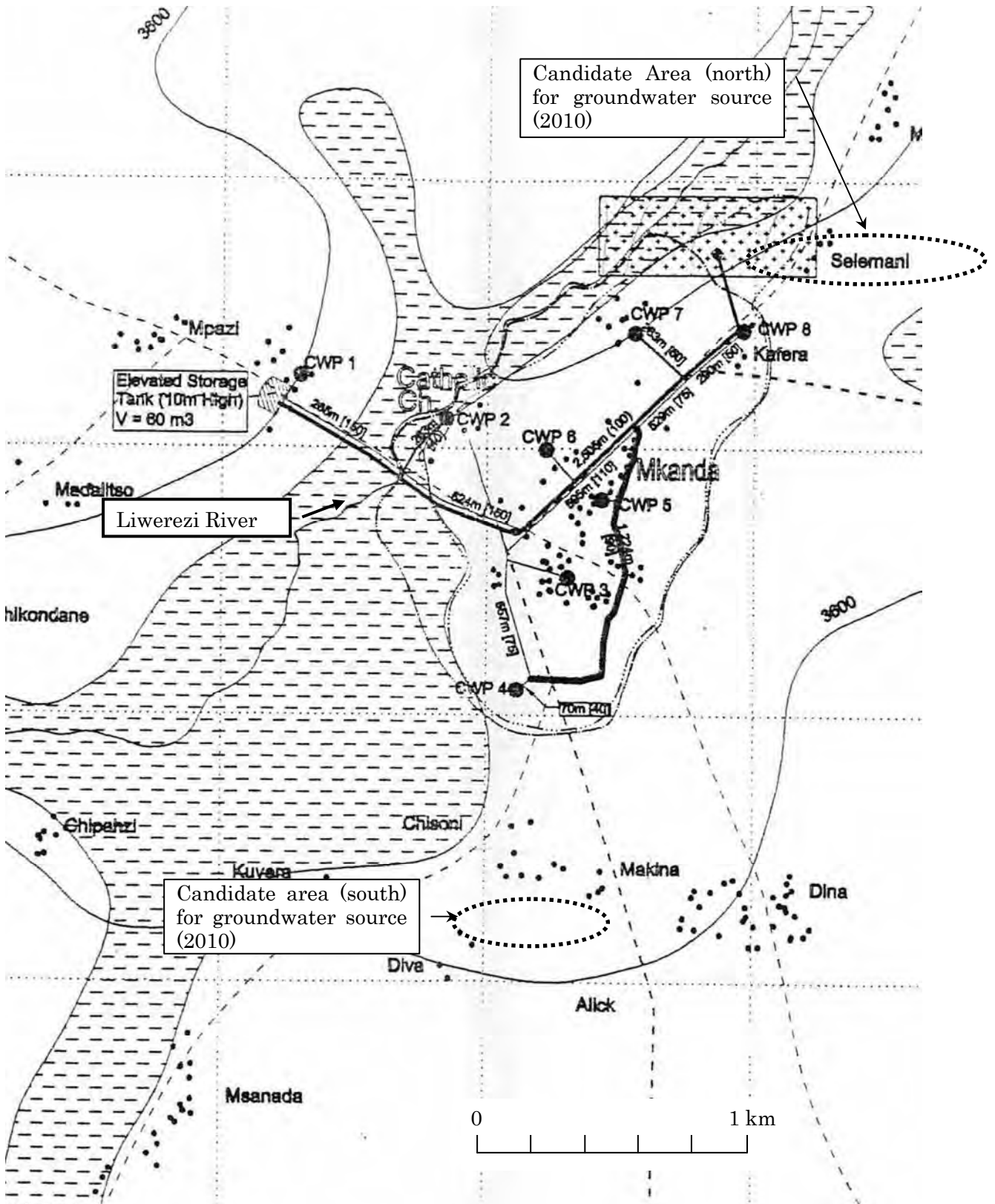


Figure A6-1-3 Water Supply Plan in F/S Report and Area for Groundwater Development Survey (Mkanda Market Centre)

Source: NWDP(1998), Detailed Design for New Urban and Rural Gravity Fed Water Schemes, retouched

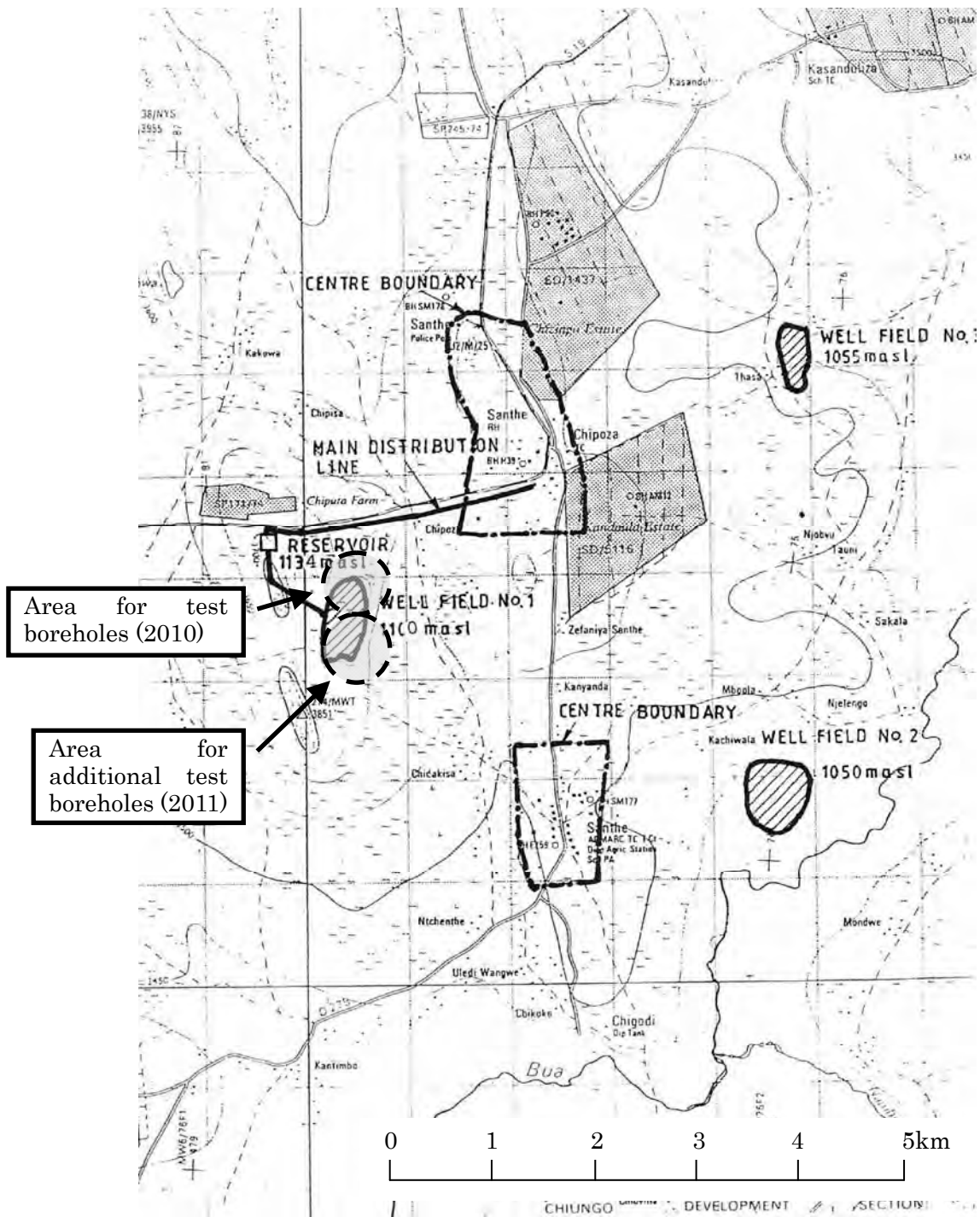


Figure A6-1-4 Water Supply Plan in F/S Report and Area for Groundwater Development Survey (Santhe Market Centre)

Source: NWDP (1998), 16 New Water Supply Schemes Feasibility Study, retouched

2. Namitete/Chileka Market Centre

2.1 Source of Surface Water

(1) River flow fluctuation

The monthly flow data (Maximum, Minimum and number of days missing) on Station 5.E.1 of Namitete River are shown in Table A6-1-6. The discharge-duration curves are shown in Figure. A6-1-5. The Figures of flow data were based on the instantaneous flow (m^3/sec) measured once a day at fixed time. While the duration of data shown in the tables were selected to get continuous data as many as possible, the recent river flow data were not collected from June 2002 and there were many lacks of data in rainy seasons. The lack of data in rainy season might be caused with high water level over the gauge.

According to the collected data for past 10 years (1993-2002) stored in Department of Water Resources, there was a year which monthly minimum flow records zero (0) (m^3/sec) for 8 months continuously, and monthly maximum flow records zero (0) (m^3/sec) for 4 months continuously. And November's monthly minimum flows are zero in 4 years out of 5.

Therefore, it is not appropriate to use river water from Namitete River as a water source for the water supply system due to unstable river flow according to the limited flow data.

Table A6-1-6 River flow data of Namitete River for ten years (1993-2002)

Monthly Maximum Flow in past 10 years (m3/s)

	JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
1993	2.254	1.859	2.244	1.945	2.249	0.434	0.304	0.203	0.155	-	-	0.713
1994	0.445	0.379	0.694	0.302	0.103	0.045	0.025	0.025	0.018	0.018	0.025	0.370
1995	0.685	0.518	0.544	0.222	0.044	0.018	0.018	0.018	0.034	0.025	-	0.291
1996	0.651	0.251	0.260	0.541	0.302	0.212	0.120	0.045	0.008	0.000	-	-
1997	-	-	-	-	-	-	-	-	-	-	0.159	4.954
1998	6.572	5.040	4.454	1.189	0.427	0.165	0.064	0.000	0.000	0.000	0.000	2.091
1999	1.749	1.126	1.456	2.322	1.816	0.431	0.497	0.083	0.064	0.003	1.051	0.872
2000	0.938	-	-	1.855	0.230	0.080	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	1.714	0.543	-	-	-	-	-	-	-
Max	6.572	5.040	4.454	2.322	2.249	0.434	0.497	0.203	0.155	0.025	1.051	4.954
Min	0.445	0.251	0.260	0.222	0.044	0.018	0.018	0.000	0.000	0.000	0.000	0.291

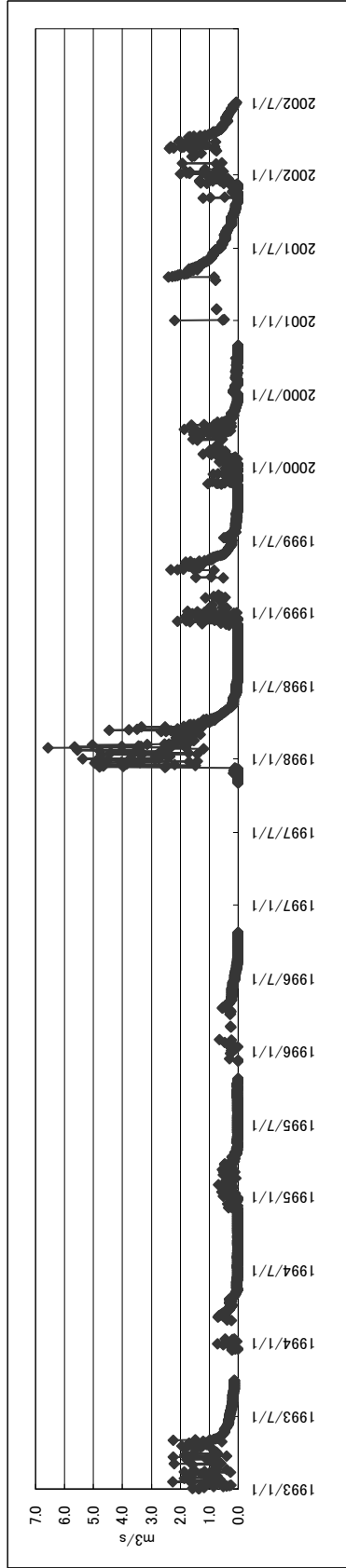
Monthly Minimum Flow in past 10 years (m3/s)

	JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
1993	0.245	0.272	0.392	0.570	0.459	0.304	0.203	0.168	0.126	-	-	0.005
1994	0.054	0.233	0.296	0.118	0.012	0.012	0.012	0.002	0.003	0.008	0.012	0.006
1995	0.083	0.090	0.121	0.034	0.002	0.000	0.003	0.004	0.012	0.002	-	0.000
1996	0.024	0.251	0.260	0.251	0.212	0.120	0.055	0.008	0.001	0.000	-	-
1997	-	-	-	-	-	-	-	-	-	-	0.000	0.001
1998	1.191	1.532	1.258	0.430	0.165	0.064	0.000	0.000	0.000	0.000	0.000	0.000
1999	0.052	0.442	0.516	0.826	0.452	0.230	0.088	0.049	0.003	0.000	0.000	0.000
2000	0.000	0.409	0.262	0.241	0.081	0.002	0.015	0.015	0.009	0.001	-	-
2001	0.490	-	-	0.784	1.054	0.638	0.452	0.230	0.123	0.000	0.000	0.000
2002	0.064	1.275	0.745	0.543	0.335	-	-	-	-	-	-	-
Max	1.191	1.532	1.258	0.826	1.054	0.638	0.452	0.230	0.126	0.008	0.012	0.006
Min	0.000	0.090	0.121	0.034	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Number of days missing river flow data in past 10 years

	JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total
1993	5	13	10	12	1	0	0	0	0	31	30	22	124
1994	24	26	6	0	0	0	0	0	0	0	0	5	61
1995	6	16	6	0	0	0	0	0	0	7	30	25	90
1996	19	28	30	10	0	0	0	0	0	7	30	31	155
1997	31	28	31	30	31	30	31	31	30	31	0	3	307
1998	2	1	0	0	0	0	0	0	0	0	1	2	6
1999	19	21	28	16	0	0	0	0	0	0	0	0	84
2000	0	15	11	0	0	0	0	0	0	0	30	31	87
2001	26	28	31	17	0	0	0	0	0	0	0	6	108
2002	1	24	4	0	0	30	31	31	30	31	30	31	243

Discharge – Duration Curve for NamiteteRiver (General)



Discharge – Duration Curve for Namitete River (Low water discharge)

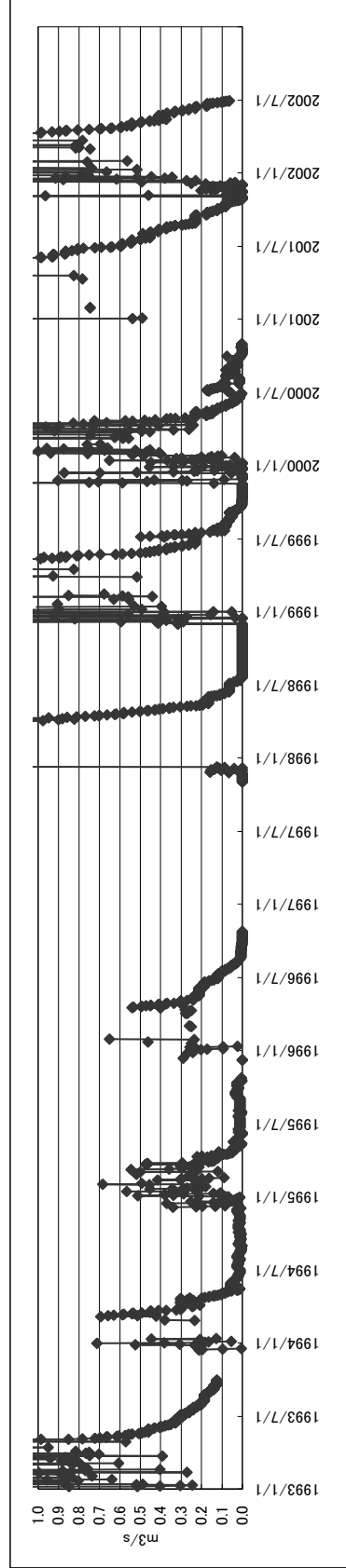


Figure A6-1-5 Discharge of Namitete River (1993~2002)

(2) Water Quality

The sampling points for water quality test are shown in Fig. A6-1-6. One for Namitete River (N-1) and the other one for Kakuyu dam (N-2) which located on the branch stream of Namitete River between Namitete and Chileka.

The result of test for physical, chemical and microbial characters are shown in Table A6- 1-7.

Comparing to the Malawi Standards (MS 214 (2005)-Drinking water-Specification) , turbidity, Iron and microbial characters are exceeded the standards. The past water quality test result in rainy season indicates that values of pH, Chloride, Sulphate, Turbidity and Suspended Solid are obviously increased in rainy season. Especially the pH value is exceeded the standard of MS 214, and a delicate management of pH is required in the treatment process under the condition of varied pH value.

Exceeded physical or chemical parameters are able to be treated with some rapid filtration system. Microbial characters, i.e. 270-400 count/ 100 ml of faecal Coliform and 70 -100 count/ 100 ml of faecal streptococci are indicating that the river water is contaminated with domestic drainage, sewage and excrement of livestock.

One sample from Namitete River was transported to Japan and tested for contamination of agrochemicals. The tested agrochemicals are selected from popular items used in tobacco farms in Malawi according to Agricultural Research and Extension Trust, Malawi. No agrochemical in the list is detected over the detection limit from the test in Japanese institution as shown in Table A6-1-8.

Though the agrochemicals were not detected, it shall be noted that the water was sampled in dry season in which agrochemicals are normally scarcely in use. The agrochemicals would be possibly detected in rainy season, though the laboratory test was not conducted in Malawi because the capable laboratories were all under renovation in this rainy season.

Table A6-1-7 Water Quality Test for Namitete River
(at Station 5.E.1, except No.682 from Kakuyu Dam)

Source of Data	Results in this Survey		Past Test Results at Station 5.E.1						MS 214:2005
	683 (N-1)	682 (N-2)	303	267	477	519	485	87	
Date Sampled	07/10/'10	07/10/'10	17/09/'98	27/2/'02	17/6/'02	21/10/'03	27/9/'04	10/??/'05	
Season	Dry	Dry	Dry	Rainy	Dry	Dry	Dry	Dry	
pH Value	7.57	7.59	7.3	10.09	7.43	7.4	6.4	7.43	5.0-9.5
Conductivity (µS/cm)	230	331	158	169	154	519	230	156	700-1500
Total Dissolved Solids (mg/l)	166	166	73	87	77	277	111	78	450-1000 ^{a)}
Carbonate (as CO ₃ ²⁻) (mg/l)	14	20	0	7	0	0	0	0	-
Bicarbonate (as HCO ₃ ⁻) (mg/l)	97	139	85	19	64	315	100	77	-
Chloride (as Cl ⁻) (mg/l)	1	5.9	2.1	50	6.2	4.3	14.4	7.4	100-200
Sulphate (as SO ₄ ²⁻) (mg/l)	2.9	3.78	3.5	35.3	3.6	1.3	7.7	3.5	200-400
Nitrate (as NO ₃ ⁻) (mg/l)	0.029	0.042	<0.01	<0.01	<0.01	<0.01	<0.01	0.8	6.0-10.0
Fluoride (as F ⁻) (mg/l)	0.7	0.69	N.A	N.A	N.A	0.48	0.43	0.46	0.7-1.0
Sodium (as Na ⁺) (mg/l)	3.8	16.3	9.5	8.3	8	64.8	6.1	12.2	100-200
Potassium (as K ⁺) (mg/l)	1.8	1.1	1	2.2	1	1	1.2	1.4	25-50
Calcium (as Ca ⁺⁺) (mg/l)	23	32	12.4	15.8	9.9	27.2	20.8	13.6	80-150
Magnesium (as Mg ⁺⁺) (mg/l)	8.6	9.7	4.9	15.8	4.1	17.8	11.7	4	30-70
Iron(Fe ⁺⁺) (mg/l)	0.628	0.396	1.3	1.1	1,10	0.73	0.11	0.16	0.01-0.2
Manganese (Mn ⁺⁺) (mg/l)	<0.01	<0.01	N.A	0.01	N.A	N.A	<0.01	<0.01	0.05-0.1
Total Hardness (as CaCO ₃) (mg/l)	93	120	-	-	-	-	-	50	-
Total Alkalinity (as CaCO ₃) (mg/l)	102	147	-	-	-	-	-	63	-
Silica (as SiO ₂) (mg/l)	21	17	21	13	5	15	6	7	-
Turbidity (NTU)	13	1	10	35	20	10	14	6	0.1-1
Suspended Solids (SS) (mg/l)	9	3	7	28	17	11	13	5	-
Faecal Coliform (/100 ml)	400	270							0 in 100ml
Faecal Streptococci (/100 ml)	70	100							0 in 100ml

Note: a) Dissolved Solids

Table A6-1-8 Water Quality Test (agrochemicals and pesticide) Namitete River

Agrochemical / Pesticide	Detection limit (mg/L)	Result 2010.7.10 Sample N-1	WHO Guideline (mg/L)
DDT* (include DDD & DDE)	0.001	N.D.	0.002
Aldrin	0.00003	N.D.	Aldrin + Dieldrine 0.00003
Dieldrin	0.00003	N.D.	
Chlordane	0.0002	N.D.	0.0002
Dibromochloropropane (DBCP)	0.001	N.D.	0.001
Cypermethrin	0.02	N.D.	—
Permethrin	0.02	N.D.	—
Heptachlor	0.00003	N.D.	—
Hexachlorobenzene	0.001	N.D.	0.001
Methoxychlor	0.02	N.D.	0.02

Notes N.D.: Not detected

DDT: Dichloro-dipheny-trichloroethane (p,p'-DDD, p,p'-DDE, o,p'-DDT, p,p'-DDT)

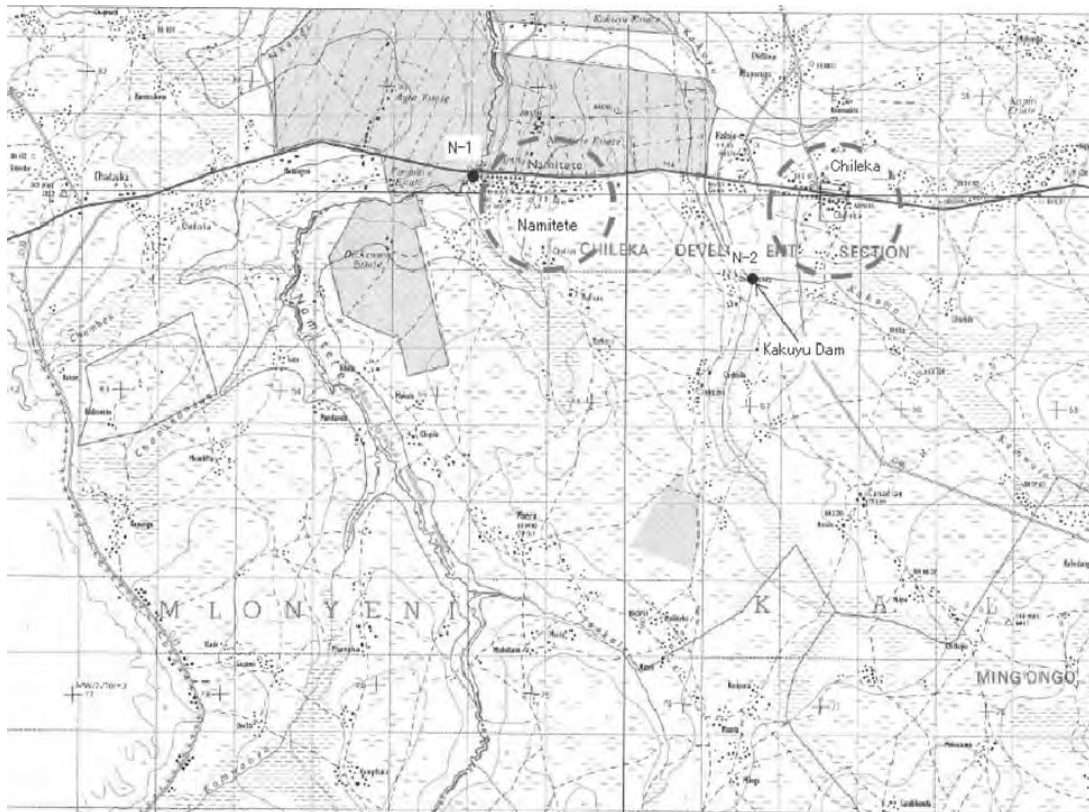


Figure A6-1-6 Sampling points for Water Quality Test (Namitete/Chileka)

(3) Water Rights

The water rights registered on Namitete River is shown in Table A6-1- 9.

Table A6-1-9 Existing water rights on Namitete River (as of Oct. 2010)

No.	Position from the bridge on M12 (km)		Appropriator of Water Rights	License No.	Purpose	Amount of rights	
						m ³ /day	m ³ /s/10hr
1	Lower stream	10	Press Agric (Lisoka estate)	S19/1993	Irrigation	144	0.0040
2		6.5	Press Agric (Nsangwa estate)	S21/1993	Irrigation	288	0.0080
3		18	Press Agric (Kalowe estate)	S23/1993	Irrigation	4,800	0.1333
4		1, 2	Press Agric (Namitete estate)	S24/1993	Irrigation	3,000	0.0833
5		1	DWK McPherson	S534/1974	Irrigation	109	0.0030
6		3.5	DWK McPherson	S3/1990	Irrigation	75	0.0021
7		4	DWK McPherson	S533/1974	Irrigation, Domestic	114	0.0032
8		3.5	DWK McPherson	S16/95	Irrigation	800	0.0222
9		3.5	Kakuyu Investiments	S1/1989	Irrigation	19.13	0.0005
10		3.5	Kakuyu Investiments	S46/1985	Irrigation	120	0.0033
11		10	Gulugulu Estate	S17/2008	Irrigation	94	0.0026
12		15	N.A	N.A	Irrigation	432	0.0120
Total						9,995	0.2776

Source: Water Resources Management Board, MoAIWD

Comparing to the river flow data shown in Table A6-1-6, the total vested water rights on Namitete River from (the bridge on M12 Road to 20 km lower) is over the river flow except a part of some rainy seasons.

2.2 Source of Groundwater

(1) Siting of Drilling Point for Test Boreholes

The areas of candidate site for test borehole were arranged with land owner in southern edge of Namitete Secondary School for Namitete Market Centre and in southern edge of Chileka ADMARC for Chileka Market Centre.

Considering proportion of water service population, two drilling sites were allocated for Namitete and one site for Chileka respectively. For selection of these drilling points, geo-electric prospecting survey (two lines of horizontal survey and 7 points of vertical survey) were carried out along the edge of Namitete Secondary School and Chileka ADMARC.

The vertical survey points were selected on the horizontal survey line which indicate relatively lower or higher resistivity (30 to 200 Ω -m) of which possibly indicate aquifer at 80m depth. After comparison of each vertical survey results, two drilling points for Namitete and one drilling point for Chileka were selected considering the thickness of assumed aquifer and distances between the boreholes.

The location of horizontal survey, results of horizontal survey with selected vertical survey points and results of vertical survey are shown in Figure. A6-1-7 to Figure. A6-1-10.

In Namitete survey area, the very low resistivity (10~30 Ω -m) at 80 m characterised its basement. This low resistivity may indicate clay layer or aquifer with electrolyte water, e.g. salty water. It shall be noted that over drilling may cause unsuitable water quality for drinking. The vertical survey points were selected for the points indicate relatively higher resistivity than other points. Vertical survey showed that assumed aquifer consists of upper layer (up to 16 to 24 m depth) with resistivity of 60 -195 Ω -m and lower layer (up to 70 to 75 m) with resistivity of 18 to 30 Ω -m. Therefore the target depth of drilling was set as 72 m each.

In Chileka survey area, as the resistivity at 80 m (100~150 Ω -m) appeared higher than one of assumed aquifer, vertical survey points were selected at the points indicating relatively lower resistivity than other points. After comparison of 3 vertical survey results, the drilling point were selected at the point which indicate the most thick assumed aquifer which is distributing up to 65 m depth with resistivity of 225~380 Ω -m. Considering sand pocket on the bottom, the target depth of drilling was set at 72 m.

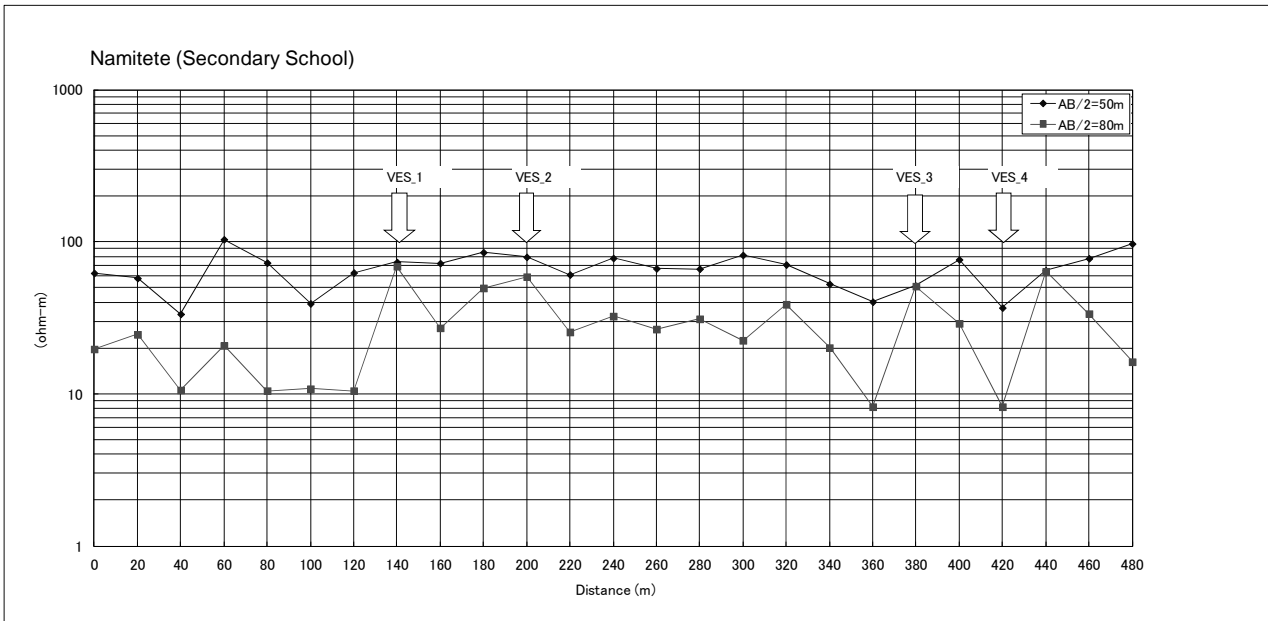
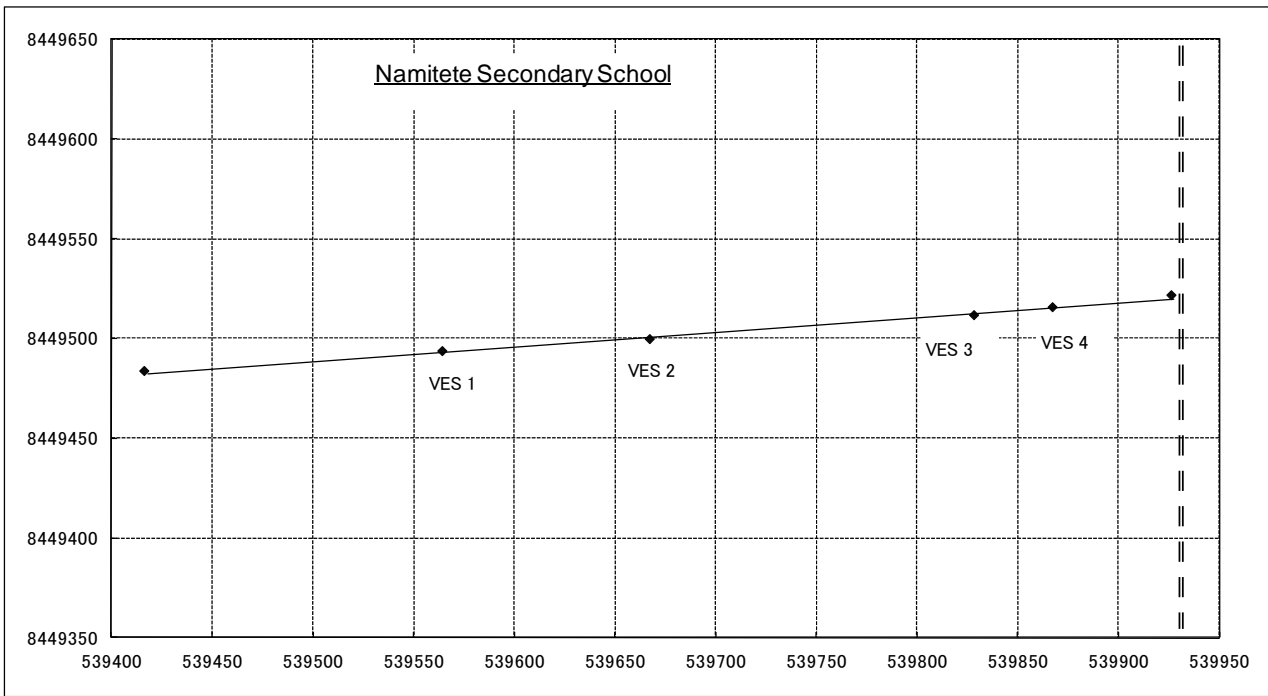


Figure A6-1-7 Horizontal survey and selection of vertical survey points based on resistivity –Namitete-

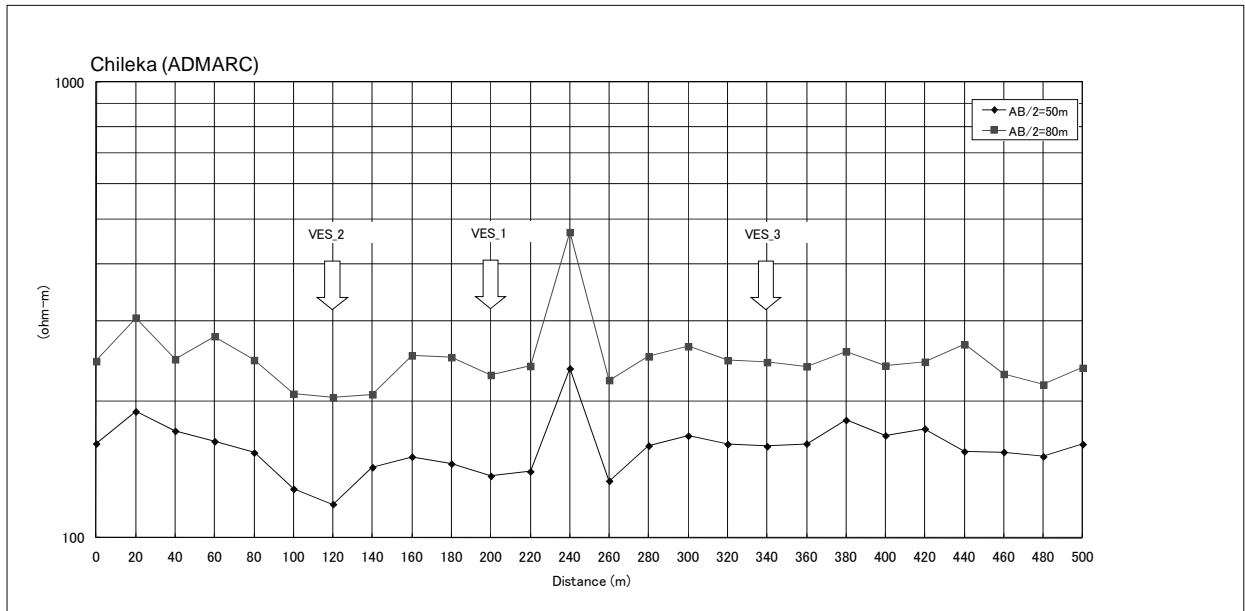
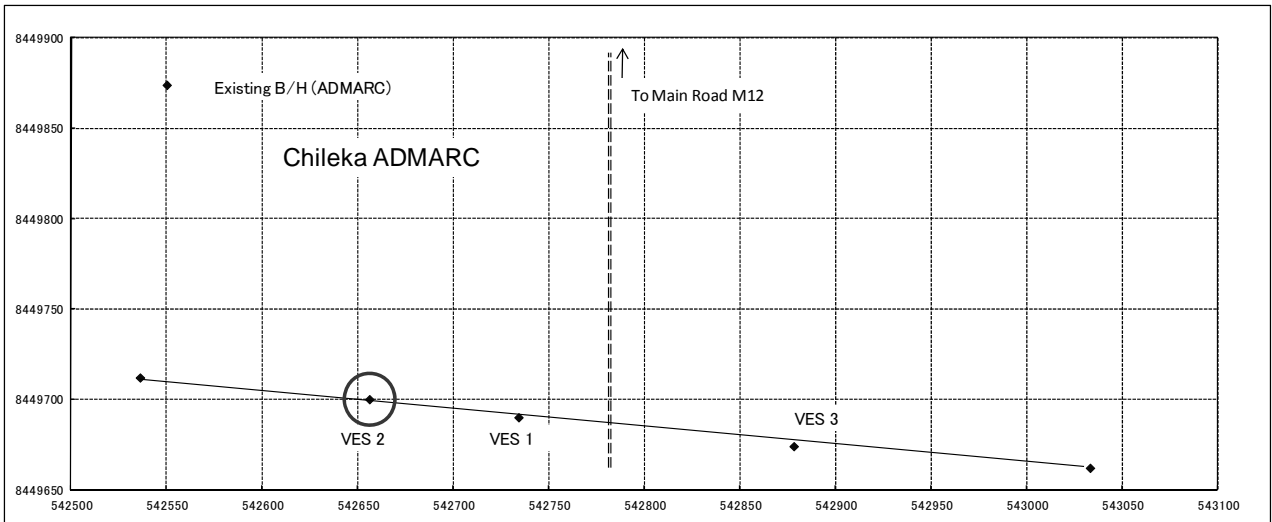


Figure A6-1-9 Horizontal survey and selection of vertical survey points based on resistivity –Chileka-

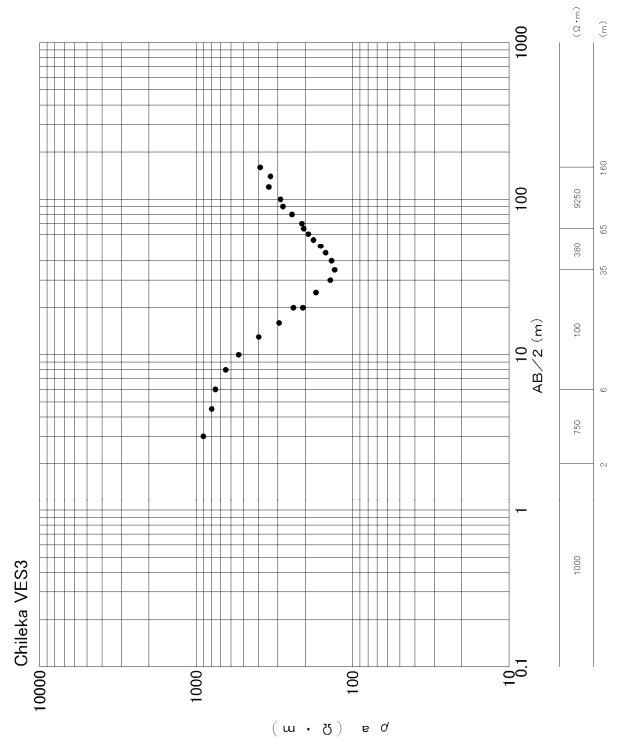
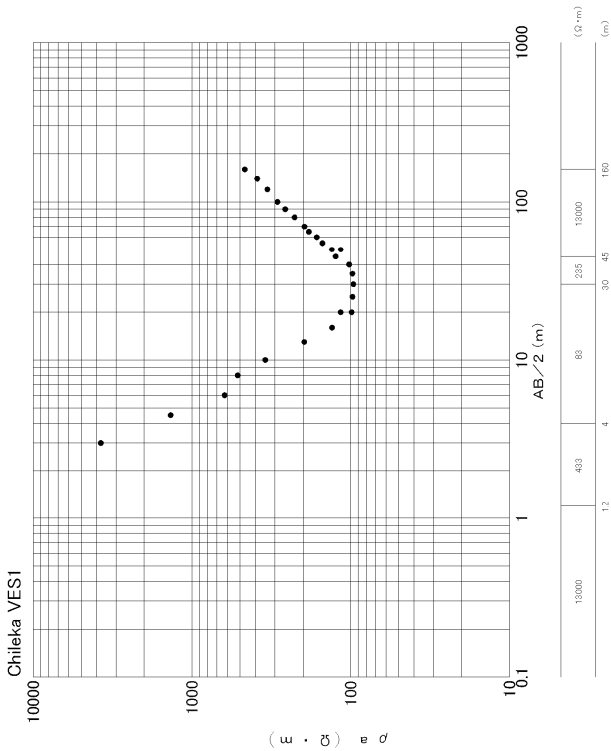
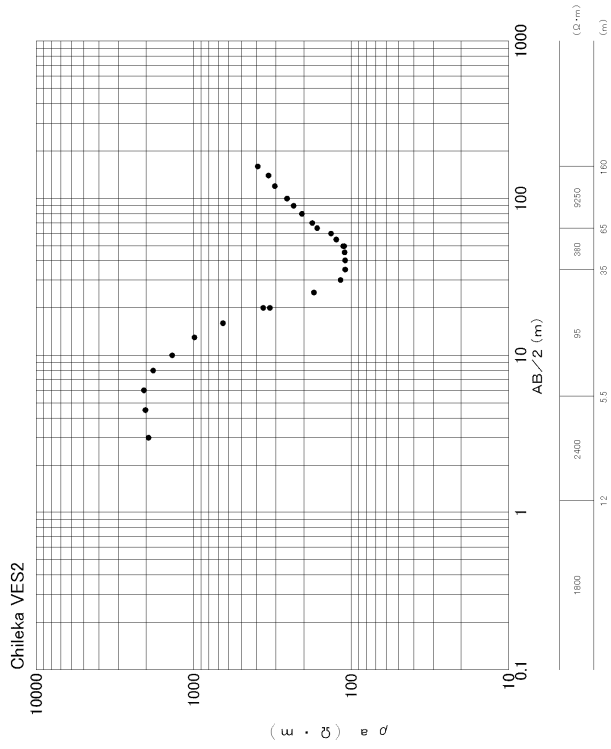


Figure A6-1-10 Vertical Survey Result –Chileka-

(2) Test borehole Drilling

According to the survey results and selection of suitable location for setting of drilling rig, the drilling points were set as shown in Table A6-1-10 and Figure. A6-1-11.

The result of drilling is shown in Figure. A6-1-12 with geology encountered, borehole structure, static water level and dynamic water level at continuous pumping test.

Table A6-1-10 Location of Test Boreholes (Namitete/Chileka)

BH No.	Coordinate*		Remarks
	Easting	Northing	
NC-1	542653	8449398	Chileka ADMARC (VES-2)
NC-2	539870	8449222	Namitete Sec. School (VES-3)
NC-3	539669	8449212	Namitete Sec. School (VES -2)

*WGS 84/ UTM

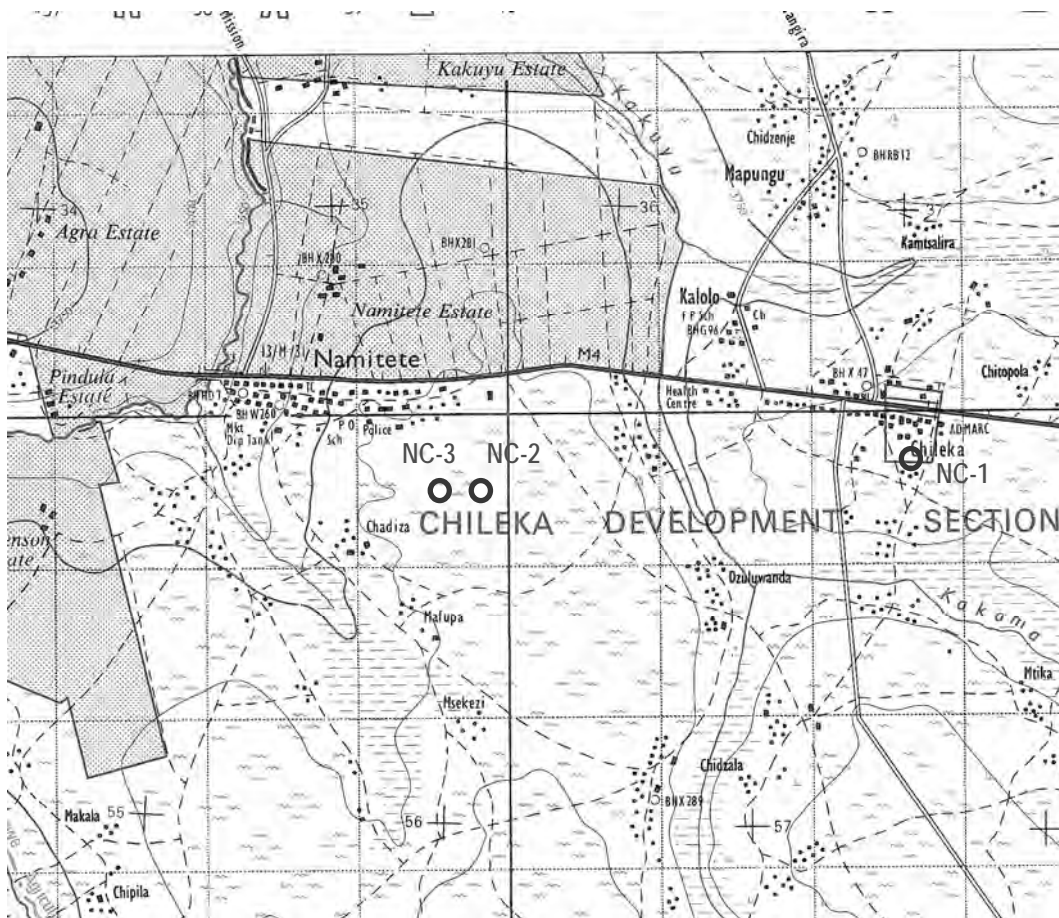
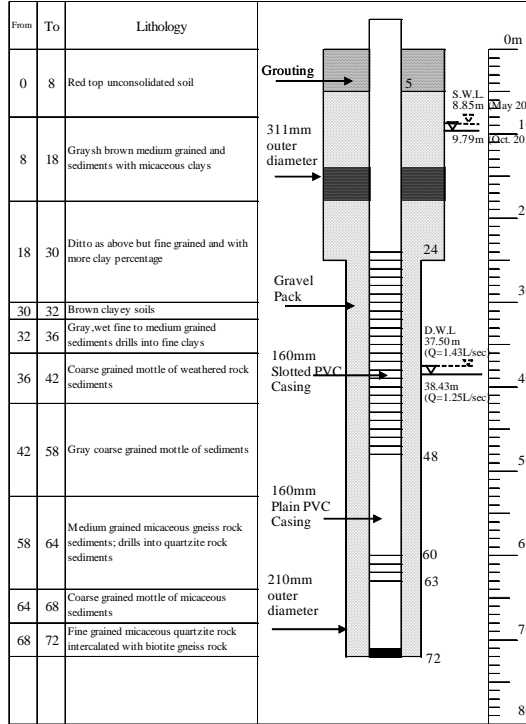


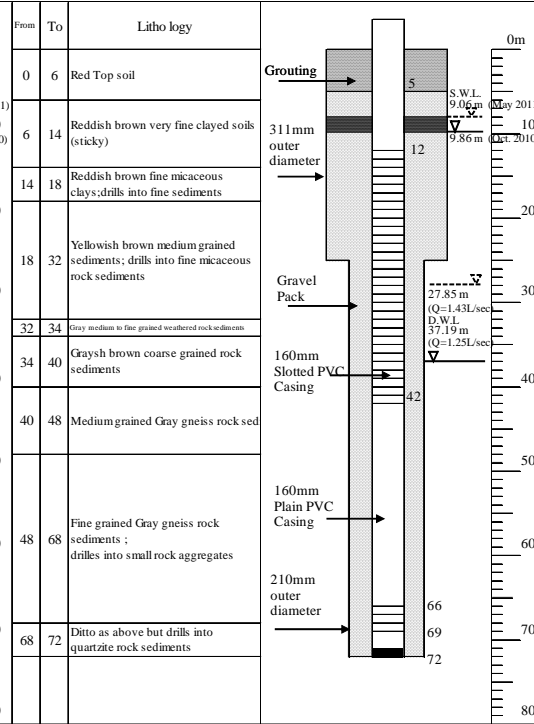
Figure A6-1-11 Location Map of Test Borehole (Namitete/Chileka)

Location : Namitete Sch. BH2
BH No. NC - 3



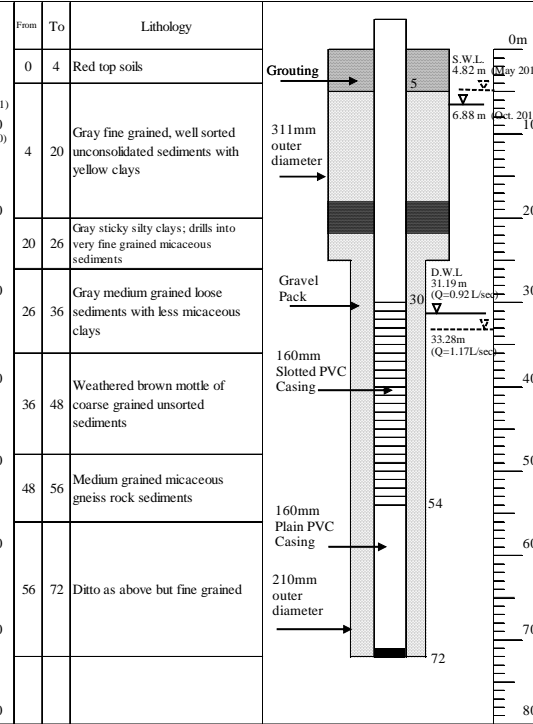
NC-3 (Namitete 2)

Location : Namitete Sch. BH1
BH No. NC - 2



NC-2 (Namitete 1)

Location : Chileka BH1
BH No. NC - 1



NC-1 (Chileka)

Figure A6-1-12 Bore Log and Borehole Structure (Namitete Chileka Market Centre)

(3) Pumping Test

The drawdown curves of pumping test are shown in Figure. A6-1-13 to Figure. A6-1-15

According to the result of step drawdown test shown in Table A6-1-12 and Figure. A6-1-16, any inflection point, which may indicate the ultimate discharge, can not be found on the Discharge (Q)-Drawdown (s) curves up to the maximum discharge ($Q_{max} = 1.48 \sim 1.67$ L/sec).

The continuous pumping tests were carried for 24 hours with the discharges 76 to 97 % of each Q_{max} .

As these pumping test were carried out on May 2011 just after the rainy season, the static water levels have been risen 0.8 to 2.1 m comparing these measured on October 2010 in dry season. And the specific yields (Q/s, m^3 /hour/m), the discharge per 1 m of drawdown have increased 0.012 in NC-1, 0.109 in NC-2 and 0.023 in NC-3 (See Table A6-1-13). Therefore, it is necessary to consider the lowering water level and the decreasing pumping capacity in dry season for the evaluation of the stable discharges for each borehole.

The stable discharges are set as shown in Table A6-1-11.

Table A6-1-11 Stable Continuous Discharge for Test Boreholes in Namitete/Chileka

Test Borehole	Stable Discharge (L/sec)	Cause of setting
NC-1 (Chileka)	1.2	As lowering of water level is remarkable in dry season, the discharge is set at 80% of the maximum discharge of May 2011 (1.54 L/sec)
NC-2 (Namitete 1)	1.25	As decreasing of specific yield is considerable in dry season, the discharge is set at 75% of the maximum discharge of May 2010 (1.67 L/sec)
NC-3 (Namitete 2)	1.25	Considering fair decreasing of specific yield in dry season, the discharge is set at 85% of the maximum discharge of May 2010 (1.48 L/sec) \approx 85%

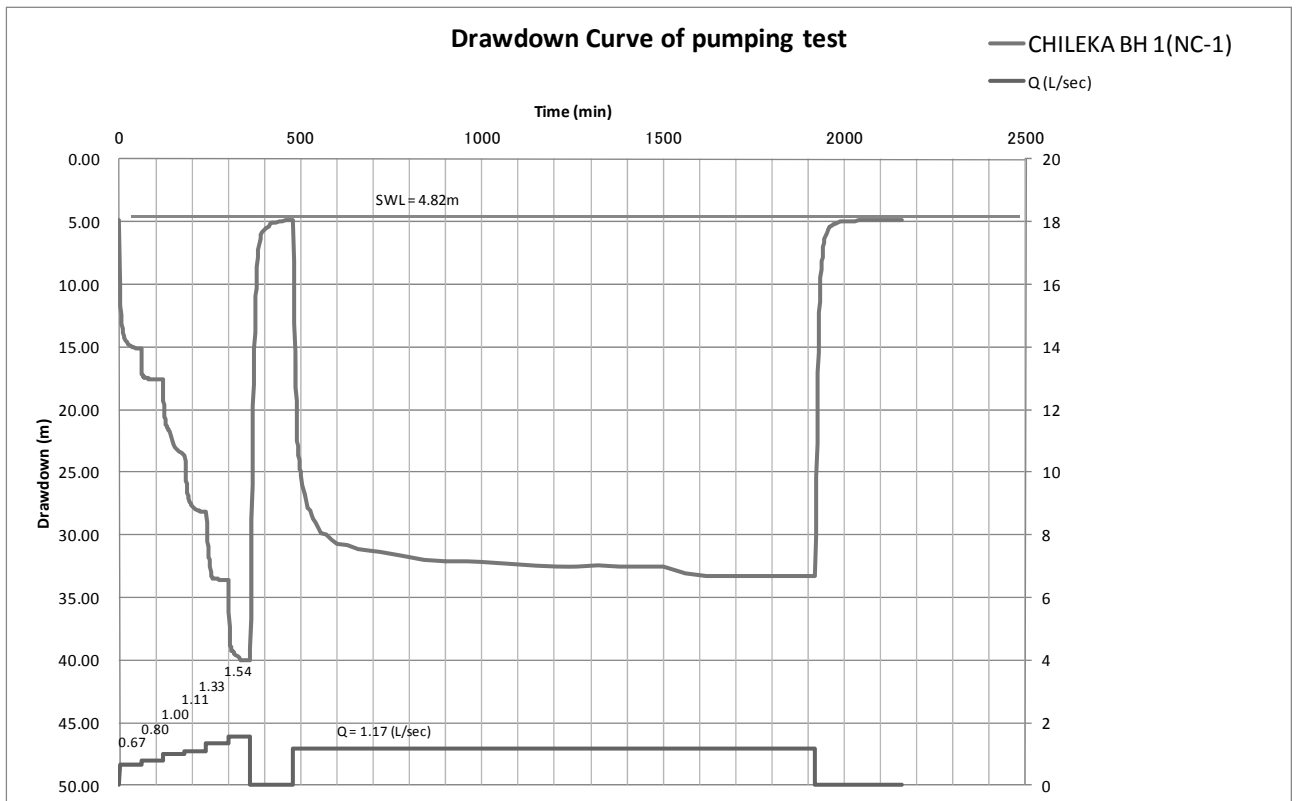


Figure A6-1-13 Drawdown Curve of Pumping Test (Chileka BH1 (NC-1))

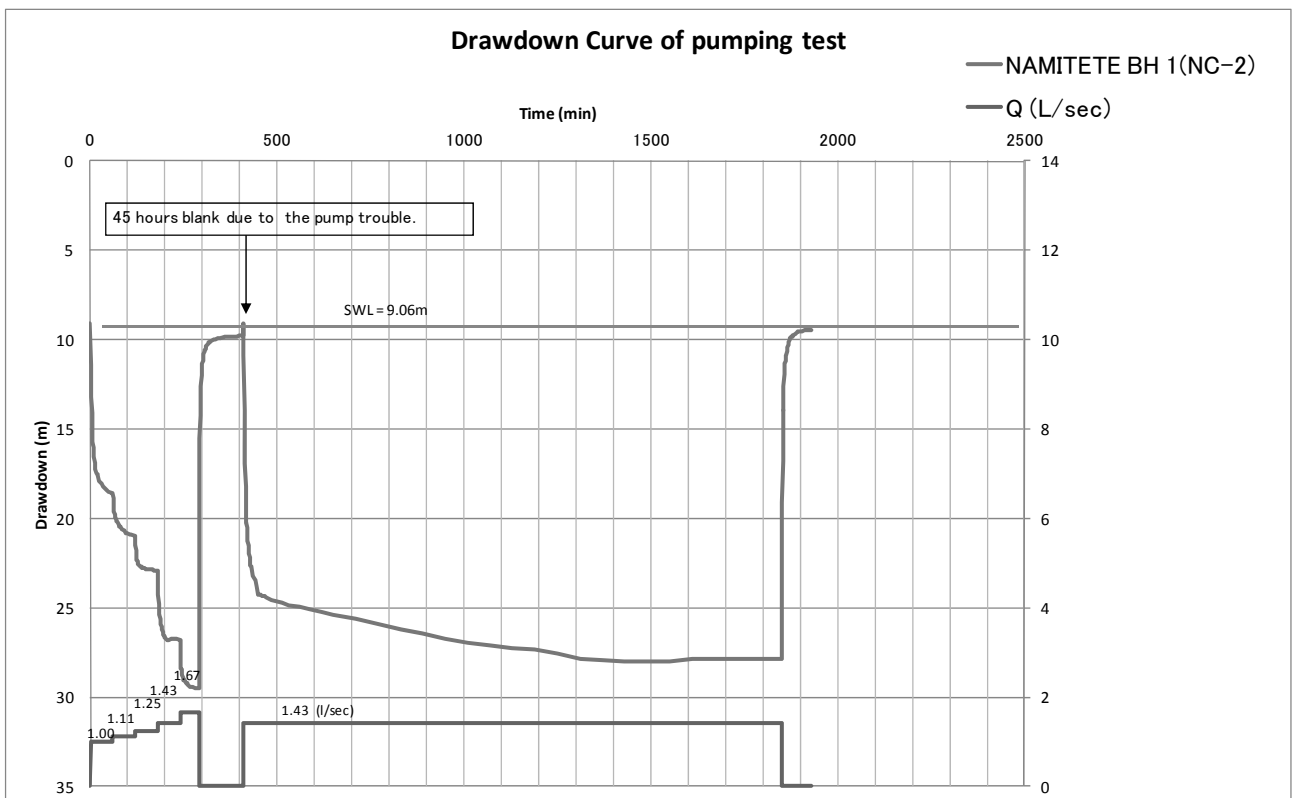


Figure A6-1-14 Drawdown Curve of Pumping Test (Namitete BH1 (NC-2))

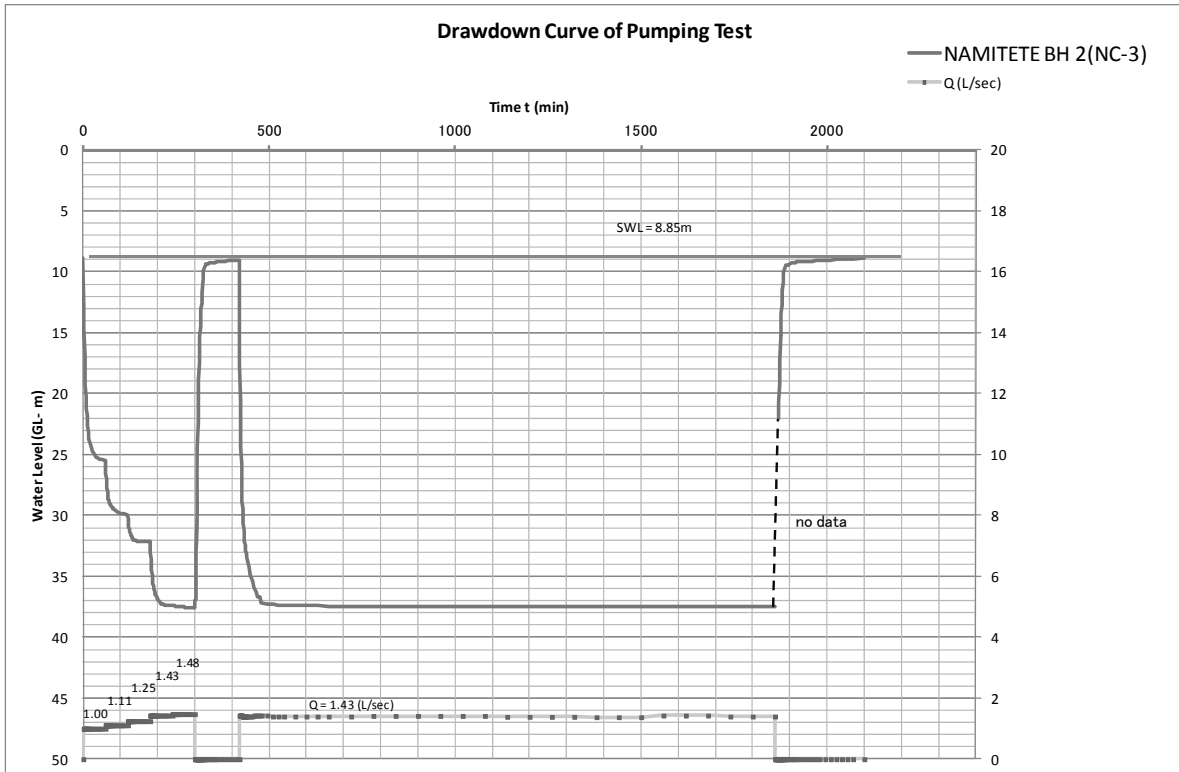


Figure A6-1-15 Drawdown Curve of Pumping Test (Namitete BH2 (NC-3))

Table A6-1-12 Step Drawdown Test (Namitete/Chileka)

Chileka BH 1(NC-1) Q: Discharge,

Step No	Time (Hours)	Q (L/sec)	s (m)	Q/s
1	1.00	0.67	10.34	0.06
2	1.00	0.80	12.77	0.06
3	1.00	1.00	18.83	0.05
4	1.00	1.11	23.36	0.05
5	1.00	1.33	28.82	0.05
6	1.00	1.54	35.2	0.04

Namitete BH 1(NC-2)

Step No	Time (Hours)	Q (L/sec)	s (m)	Q/s
1	1.00	1.00	9.5	0.11
2	1.00	1.11	11.91	0.09
3	1.00	1.25	13.86	0.09
4	1.00	1.43	17.76	0.08
5	1.00	1.67	20.42	0.08

Namitete BH 2(NC-3)

Step No	Time (Hours)	Q (L/sec)	s (m)	Q/s
1	1.00	1.00	16.68	0.06
2	1.00	1.11	21.08	0.05
3	1.00	1.25	23.31	0.05
4	1.00	1.43	28.51	0.05
5	1.00	1.48	28.73	0.05

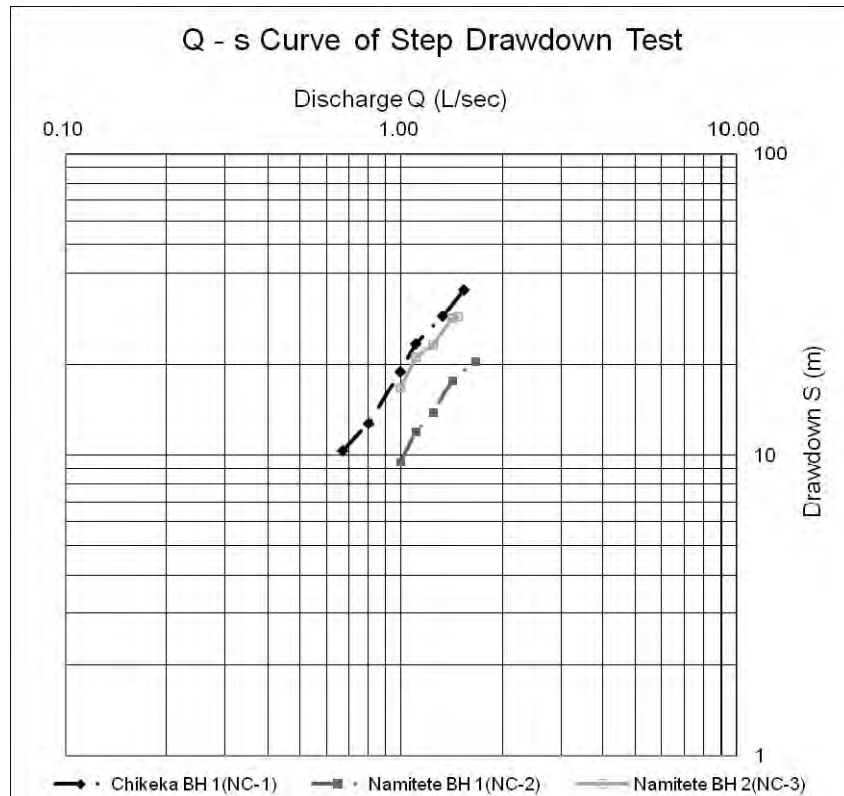


Figure A6-1-16 Discharge (Q)-Drawdown (s) Curve of Step Drawdown Test (Namitete/Chileka)

Table A6-1-13 Seasonal Change in Static Water Level, Dynamic Water Level and Specific Yield
(Continuous Pumping Test in Namitete/Chileka)

BH No.	Month of Test	Discharge Q (m ³ /hour)	Static Water Level SWL (m)	Dynamic Water Level DWL (m)	Drawdown s (m)	Specific Yield (m ² /hour)
Chileka	Oct. 2010	3.31	6.88	31.19	24.31	0.136
	May 2011	4.21	4.82	33.28	28.46	0.148
Namitete 1	Oct. 2010	4.50	9.86	37.19	27.33	0.165
	May 2011	5.15	9.06	27.85	18.79	0.274
Namitete 2	Oct. 2010	4.50	9.79	38.43	28.64	0.157
	May 2011	5.15	8.85	37.50	28.65	0.180

(4) Water Quality Test

The results of water quality test for boreholes are shown in Table A6-1-14.

Comparing Malawi Standards (MS 214: 2005-Drinking Water Specification), the values of turbidity and faecal coliform are exceeded the standards values. As sampling was collected just after the pumping test, artificial influence may cause these high values. Turbidity of borehole water may reduced by drawing water and low level of faecal Coliform can be treated with normal disinfection. These values of turbidity and Faecal Coliform are not exceeded the standards for borehole water (MS 733).

Table A6-1-14 Water Quality Test Result (Test Boreholes in Namitete/Chileka)

LAB No.	148	760	761	MS 214:2005
DATE SAMPLED	14/10/2010	03/11/2010	03/11/2010	
Source Type /Location Traditional Authority	Borehole/ Chileka ADMARC, Kalolo, Lilongwe District	Namitete Sec. School,BH No.1 Kalolo, Lilongwe District	Namitete Sec. School,BH NO.2 Kalolo, Lilongwe District	
pH Value	6.54	7.41	7.69	5.0-9.5
Conductivity ($\mu\text{S}/\text{cm}$ at 25 °C)	200	570	430	700-1500
Total Dissolved Solids, mg/l	100	297	220	450-1000 ^{a)}
Carbonate (as CO_3^{2-}), mg/l	0	0	14	-
Bicarbonate (as HCO_3^-), mg/l	120	85	118	-
Chloride as (Cl ⁻), mg/l	1.8	3.4	10.1	100-200
Sulphate (as SO_4^{2-}), mg/l "	2.9	171	62.3	200-400
Nitrate (as NO_3^-) mg/l	0.027	< 0.001	< 0.001	6.0-10.0
Fluoride (as F ⁻) mg/l	0.18	0.69	0.63	0.7-1.0
Sodium (as Na ⁺) mg/l	7.04	30.4	30.0	100-200
Potassium (as K ⁺), mg/l	1.5	5.6	5.0	25-50
Calcium (as Ca ⁺⁺), mg/l	22.0	44.0	32.0	80-150
Magnesium (as Mg ⁺⁺), mg/l	8.2	13.3	8.7	30-70
Iron (Fe ⁺⁺) mg/l	0.02	0.160	0.178	0.01-0.2
Manganese (Mn ⁺⁺) mg/l	<0.01	< 0.001	< 0.001	0.05-0.1
Total Hardness (as CaCO ₃), mg/l	88	164	116	-
Total Alkalinity (as CaCO ₃), mg/l	98	69	120	-
Silica (as SiO ₂), mg/l	48	22	27	-
Turbidity, NTU	2.3	7.01	1.27	0.1-1
Suspended Solids, mg/l	1.0	8.0	2.0	-
Faecal. Coliform, Count/100 ml	5*	2*	10	0 in 100ml
Faecal Streptococci, Count/100 ml	0	0	0	0 in 100ml

*Tested on 22/01/2011

2.3 Evaluation of Water Source for Water Supply

The service population and planned supply amount for Namitete/Chileka Market Centre is shown in Table A6-1-15 and Table A6-1-16. The maximum daily supply amounts are 849 (m³/day) for Namitete and 377 (m³/day) for Chileka.

As mentioned in 2.1 (1), the water of Namitete River is unsuitable for the source of water supply system because the flow rate is possible to be zero continuously in later of dry season.

The demand for abstraction of river water is very tight against flowing water with existing water rights, which volume is exceeding the river flow in dry season. From the water right point of view even for a seasonal or temporary abstraction, it is required to get agreement with the appropriators of existing water rights who have about 10,000 m³/day in total of 12 water rights approved on lower stream of Namitete River.

With respect to the water quality in order to conform the river water quality to the standards (MS 214), it is required to treat the intake water with a rapid filtration system and well managed disinfection against variable concentration of faecal coliform and other microbial factors.

Regarding groundwater resource, the possible discharge volume by three test boreholes is not enough to meet the water demand and can cover only about a quarter of demands of service population (2020) in Namitete and Chileka as follows;

Namitete Area: $Q = 1.25 \text{ (L/sec)} \times 60 \times 60 \times 24 \times 2 \text{ wells} = 216,000 \text{ (L/day)} = 216 \text{ (m}^3\text{/day)}$

Chileka Area : $Q = 1.2 \text{ (L/sec)} \times 60 \times 60 \times 24 \times 1 \text{ well} = 103,680 \text{ (L/day)} = 103 \text{ (m}^3\text{/day)}$

Thus it is confirmed that Namitete river water is not appropriate as water source for water supply due to unstable flow rate, contamination and over vested water rights and that the groundwater of discharge volume from three (3) test boreholes does not meet the water demand under this Preparatory Survey.

2.4 Recommendation

It seems that a detailed survey and coordination among the related institutions is required to develop the more suitable water sources for Namitete/Chileka Market Centre hereinafter.

For Namitete River, accurate flow data for long term are required to be stocked because there are only records at the station 5.E.1 up to 2002. And it is desirable that water quality and flow condition are checked on upper stream because that microbial contamination was found at the hydrological station. The water quality in rainy season shall be checked on agrochemicals and microbial characteristics.

Registrations of water rights are recommended to be reviewed on the basis of actual water abstraction from Namitete River because some of water rights might not been renewed periodically.

Many boreholes with handpump are located surrounding Namitete/Chileka Market Centre, mainly constructed under the Japan's Project for groundwater development in Lilongwe west (2006 -2008). The blown yields during construction of these boreholes are shown in Figure. A6-1-17. Since these blown yields are distributed in a range of 0.25~3.33 L/sec against that the required yield is 5 L/sec per borehole, it is recommended to expand the target area for groundwater exploration to find out more suitable borehole with high potential productivity out of the area of Namitete/Chileka Market Centre.

Therefore, a further feasibility study for water source, especially for groundwater source, is recommended to be carried prior to the future planning of water supply facilities in Namitete/Chileka Market Centre hereinafter.

1. To select a candidate well field within about 10 km radius from the centre of Namitete in which the discharge is expected as 5 L/sec or more per one borehole on the basis of past performance of drilling sites.
2. To select the test borehole sites for 5 points with geo-electric survey. These points shall arrange to keep distance 200 ~300 m or more each other, and to consider the distribution of existing boreholes nearby.
3. To examine the discharge which supply water stably in long term after drilling test boreholes and pumping tests. The influences to the surrounding boreholes are also required to be examined.
4. To plan the most effective water source to cover the water demands of service area with newly constructed boreholes and existing boreholes drilled in 2010.
5. In case that the discharge is found insufficient after new development of groundwater, further feasibility survey shall be considered for other area and other water source such as surface and spring water.

Table A6-1-15 Planned Service Population (Namitete/Chileka)

Area	Current Population (2008)	Annual Growth Rate* (%)	Projected Population (2020)
Namitete	6,316	3.1	9,100
Chileka	2,800	3.1	4,039

* Growth rate in Lilongwe Rural (1998-2008)

Table A6-1-16 Planned Water Supply (Trial)

Area	Namitete	Chileka	Remarks
1) Service Population (person)	9,100	4,039	Year 2020
2) Daily consumption per capita (lcd)	50.8	50.8	Domestic * ¹
3) Domestic water (m ³ /day)	462	205	1)×2)÷1000
4) Public water (m ³ /day)	116	51	3)×30% * ²
5) Demands in total (m ³ /day)	601	267	3)+4)
6) Average Daily Supply (m ³ /day)	707	314	5)÷(1-0.15) * ³
7) Maximum daily supply (m ³ /day)	849	377	6)×1.2
8) Maximum hourly supply (m ³ /hr)	70.7	31.4	6)×2.4÷24

*1 : Average daily consumption: $36 \times 48\% + 50 \times 30\% + 80 \times 20\% + 125 \times 2\% = 50.8 \text{ lcd}$

Calculated based on basic supply amount of housing category as shown in Table A6 -1- 17

*2: "30%" is an anticipated rate against domestic water, in the normal range adopted in Malawi

*3: "0.15" is an anticipated leakage ratio.

Table A6-1-17 Daily consumption per capita and population rate by each classification

Classification	Daily consumption per capita (lcd)	Population rate
Traditional Housing Area	36	48%
High Density Housing Area	50	30%
Medium Density Housing Area	80	20%
Low Density Housing Area	125	2%

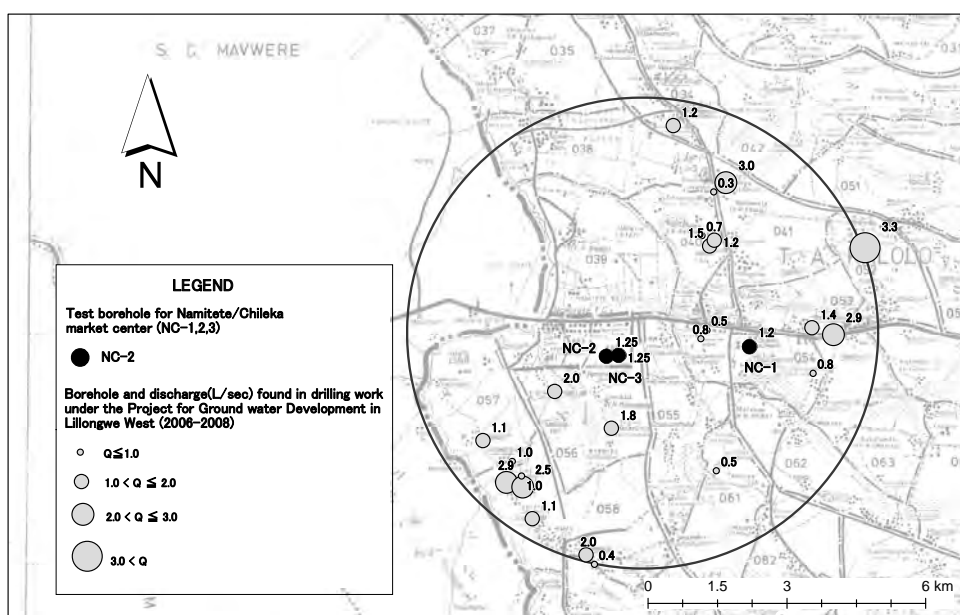


Figure A6-1-17 Distribution of Yield comparing Test Boreholes and Existing boreholes

3. Water Source for Mkanda Market Centre

3.1 Source of Surface Water

(1) River Flow Fluctuation

Liwelezi River is running toward east along the northern end of Mkanda, and is the candidate water source for Mkanda Market Centre. The monthly flow data (Maximum, Minimum and number of days missing) on Station 5.F.3 (Matsumbwa) of Liwelezi River are shown in Table A6-1-18. The discharge-duration curves are shown in Figure A6-1-18.

The figures of flow data were based on the instantaneous flow (m^3/sec) measured once a day at fixed time. While the duration of data shown in the tables were selected to get continuous data as many as possible, most of the recent river flow data were missed from June 2000 and there were also some other lacks of data in some months before 2000. The lack of data might be caused by mechanical problem.

According to the collected data for past 10 years (1992-2001) stored in Department of Water Resources, there was a year which monthly minimum flow records $0.054 \text{ (m}^3/\text{sec)}$, ($= 4,665 \text{ m}^3/\text{day}$) for 4 months continuously, and November's monthly minimum flows are same $0.054 \text{ (m}^3/\text{sec)}$ in 4 years out of 7.

These minimum monthly flows are recorded on 10 months in 10 years, and the maximum monthly flows are same amount for one month in 1992 and two months in 1995. These records lead that $0.054 \text{ (m}^3/\text{sec)}$ is possibly a lower limit of observation or a limit of accuracy, and the actual river flow may be lower than the recorded flow.

It is noted that the river flow data recorded after the long data missing, from July 1999 to March 2001, are several times higher than the records of before 1999. The methods of observation and calculation between H (height of water)-Q (quantity of water) are recommended to be verified.

Table A6-1-18 River flow data of Liwelezi River (at E.6.3) for ten years (1992-2001)

Monthly Maximum Flow in past 10 years (m3/s)

	JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
1992	3.925	0.900	0.939	0.576	0.229	0.186	0.169	0.157	0.138	0.113	0.054	2.144
1993	2.084	3.081	4.946	2.834	1.124	0.474	0.354	0.348	0.302	0.216	0.267	0.718
1994	2.710	3.444	3.723	0.490	0.261	0.254	0.252	0.216	0.184	0.160	0.132	0.163
1995	2.100	3.191	1.123	0.228	0.163	0.144	-	0.128	0.098	0.054	0.054	1.617
1996	2.983	6.001	6.629	0.725	0.553	0.382	0.305	0.290	0.237	0.186	0.139	0.214
1997	3.288	3.471	2.236	2.427	0.601	0.337	0.336	0.256	0.244	0.263	2.296	3.058
1998	3.808	2.328	3.169	0.843	0.270	0.228	0.211	0.172	0.211	0.157	0.879	7.431
1999	3.405	-	-	1.793	1.584	1.285	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	6.752	5.415	-	-	1.293	0.795	0.546	-	-
Max	3.925	6.001	6.629	6.752	5.415	1.285	0.354	1.293	0.795	0.546	2.296	7.431
Min	2.084	0.900	0.939	0.228	0.163	0.144	0.169	0.128	0.098	0.054	0.054	0.163

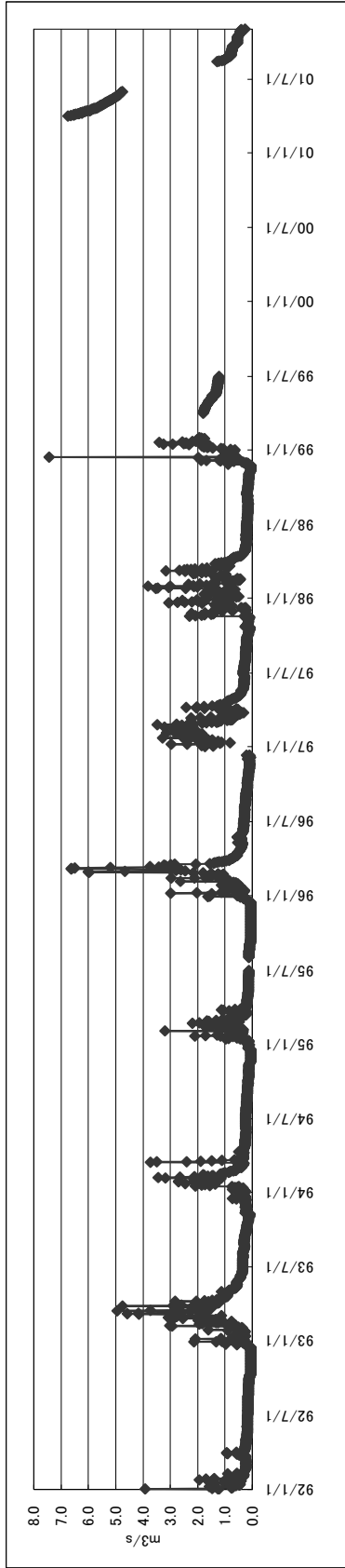
Monthly Minimum Flow in past 10 years (m3/s)

	JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
1992	0.382	0.217	0.218	0.225	0.182	0.169	0.157	0.136	0.119	0.054	0.054	0.054
1993	0.250	0.371	1.122	0.881	0.496	0.351	0.335	0.286	0.219	0.125	0.093	0.225
1994	0.250	0.589	0.308	0.260	0.229	0.227	0.216	0.185	0.150	0.118	0.054	0.054
1995	0.117	0.328	0.204	0.165	0.137	0.124	-	0.102	0.054	0.054	0.054	0.054
1996	0.288	0.594	0.772	0.391	0.354	0.303	0.269	0.235	0.174	0.127	0.092	0.075
1997	0.809	1.669	0.317	0.532	0.311	0.276	0.257	0.226	0.178	0.087	0.103	0.236
1998	0.490	0.442	0.824	0.254	0.197	0.210	0.160	0.147	0.157	0.124	0.054	0.318
1999	0.787	-	-	1.590	1.297	1.216	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	5.442	4.757	-	-	0.773	0.546	0.258	-	-
Max	0.809	1.669	1.122	5.442	4.757	1.216	0.335	0.773	0.546	0.258	0.103	0.318
Min	0.117	0.217	0.204	0.165	0.137	0.124	0.157	0.102	0.054	0.054	0.054	0.054

Number of days missing river flow data in past 10 years

	JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total
1992	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	1	3	0	0	0	0	0	0	4
1995	0	0	0	0	0	0	31	0	0	0	0	0	31
1996	0	0	0	0	0	0	0	0	0	0	0	20	20
1997	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	28	31	0	0	0	31	31	30	31	30	31	243
2000	31	29	31	30	31	30	31	31	30	31	30	31	366
2001	31	28	31	0	0	30	31	12	0	0	30	31	224

Discharge – Duration Curve for Livelezi River



Discharge – Duration Curve for Livelezi River (Low water discharge)

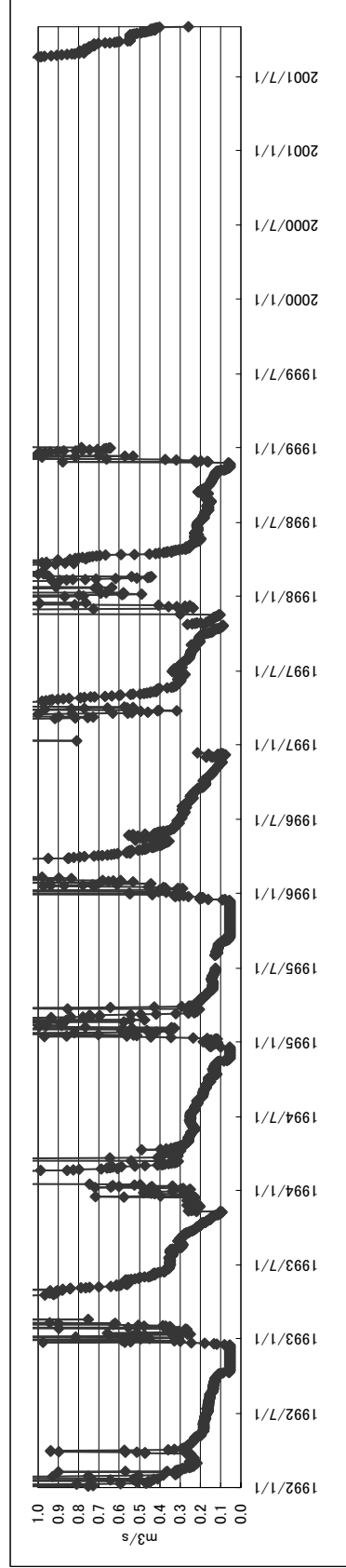


Figure A6-1-18 Discharge of Livelezi River (1992~2001)

(2) Water Quality

The sampling points for water quality test are shown in Figure. A6-1-19.

The result of test for physical, chemical and microbial characters are shown in Table A6-1-19. One sample from lower Liwelezi River (L-1) was transported to Japan and tested for contamination of agrochemicals. The tested agrochemicals are selected from popular items used in tobacco farms in Malawi according to Agricultural Research and Extension Trust, Malawi. No agrochemical in the list is detected over the detection limit from the test in Japanese institution as shown in Table A6-1-20.

Comparing to the Malawi Standards (MS 214 (2005)-Drinking water-Specification), iron and microbial characters are exceeded the standards in the samples collected for the Project. On the past test results, excessive turbidity is found in most of cases.

Exceeded physical or chemical parameters are able to be treated with some rapid filtration system. Though microbial characters, i.e. 3,000-4,000 count/ 100 ml of faecal Coliform and 90 -200 count/ 100 ml of faecal streptococci are indicating that the river water is contaminated with domestic drainage, sewage and excrement of livestock flowing from many villages and farms located from the sampling points to 30 km upper stream along Liwelezi River.

Though the agrochemicals were not detected, it shall be noted that the water was sampled in dry season in which agrochemicals are normally scarcely in use. The agrochemicals would be possibly detected in rainy season, though the laboratory test was not conducted in Malawi because the capable laboratories were all under renovation in this rainy season.

Table A6-1-19 Water Quality Test Result for Liwelezi River

Source of Data	Results in this Survey		Past Test Results at Station 5.F.3				MS 214:2005
LAB No. (Sample No.)	710 (L-1)	711 (L-2)	304	602	453	487	
Date Sampled	09/10/'10	09/10/'10	17/09/'98	29/10/'01	21/10/'03	27/09/'04	
Season	Dry	Dry	Dry	Dry	Dry	Dry	
pH Value	6.73	8.1	7.4	7.76	7.4	7.1	5.0-9.5
Conductivity (µS/cm)	136	102	161	240	353	120	700-1500
Total Dissolved Solids (mg/l)	70	50	75	120	177	78	450-1000 ³⁾
Carbonate (as CO ₃ ²⁻) (mg/l)	0	5	0	10	0	0	-
Bicarbonate (as HCO ₃ ⁻) (mg/l)	85	26	88	108	197	83	-
Chloride (as Cl ⁻) (mg/l)	3	11.9	1	8.1	7.3	7.8	100-200
Sulphate (as SO ₄ ²⁻) (mg/l)	<0.01	<0.01	0.3	4.4	1.2	<0.01	200-400
Nitrate (as NO ₃ ⁻) (mg/l)	0.013	<0.01	<0.01	<0.01	<0.01	0.1	6.0-10.0
Fluoride (as F ⁻) (mg/l)	0.54	0.63	N.A	0.27	0.22	0.87	0.7-1.0
Sodium (as Na ⁺) (mg/l)	3.6	5.9	5	1.8	3.6	3.1	100-200
Potassium (as K ⁺) (mg/l)	0.4	0.6	0.3	<0.01	0.5	0.4	25-50
Calcium (as Ca ⁺⁺) (mg/l)	15.4	7.6	15.2	38.7	48	21.6	80-150
Magnesium (as Mg ⁺⁺) (mg/l)	5.8	3	7.3	4.3	13.6	5.3	30-70
Iron(Fe ⁺⁺) (mg/l)	0.335	0.008	0.76	0.36	0.35	0.52	0.01-0.2
Manganese (Mn ⁺⁺) (mg/l)	<0.01	<0.01	N.A	N.A	N.A	N.A	0.05-0.1
Total Hardness (as CaCO ₃) (mg/l)	62	31	-	-	-	-	-
Total Alkalinity (as CaCO ₃) (mg/l)	69	29	-	-	-	-	-
Silica (as SiO ₂) (mg/l)	21	26	23	5	15	6	-
Turbidity (NTU)	1	0	9	7	3	4	0.1-1
Suspended Solids (SS) (mg/l)	0	0	4	3	1	4	-
Faecal Coliform (/100 ml)	3020	4000					0 in 100ml
Faecal Streptococci (/100 ml)	90	200					0 in 100ml

No.304, 602,453,487 are past test data sampled at point L-1

L-1: Upper stream under the bridge 750 m North-west from Centre of Mkanda

L-2: Matsuwamba Bridge, 5 km upper stream from L-1

Table A6-1-20 Water Quality Test (Agrochemicals and Pesticides) for Liwelezi River

Chemicals	Detection Limit (mg/L)	Result 2010.7.10 Sample L-1	WHO Guideline for drinking water (mg/L)
DDT* (include DDD & DDE)	0.001	N.D.	0.002
Aldrin	0.00003	N.D.	Aldrin + Dieldrine 0.00003
Dieldrin	0.00003	N.D.	
Chlordane	0.0002	N.D.	0.0002
Dibromochloropropane (DBCP)	0.001	N.D.	0.001
Cypermethrin	0.02	N.D.	—
Permethrin	0.02	N.D.	—
Heptachlor	0.00003	N.D.	—
Hexachlorobenzene	0.001	N.D.	0.001
Methoxychlor	0.02	N.D.	0.02

Notes:

N.D.: Not detected

DDT: Dichloro-dipheny-trichloroethane

(includes p,p'-DDD, p,p'-DDE, o,p'-DDT, p,p'-DDT)

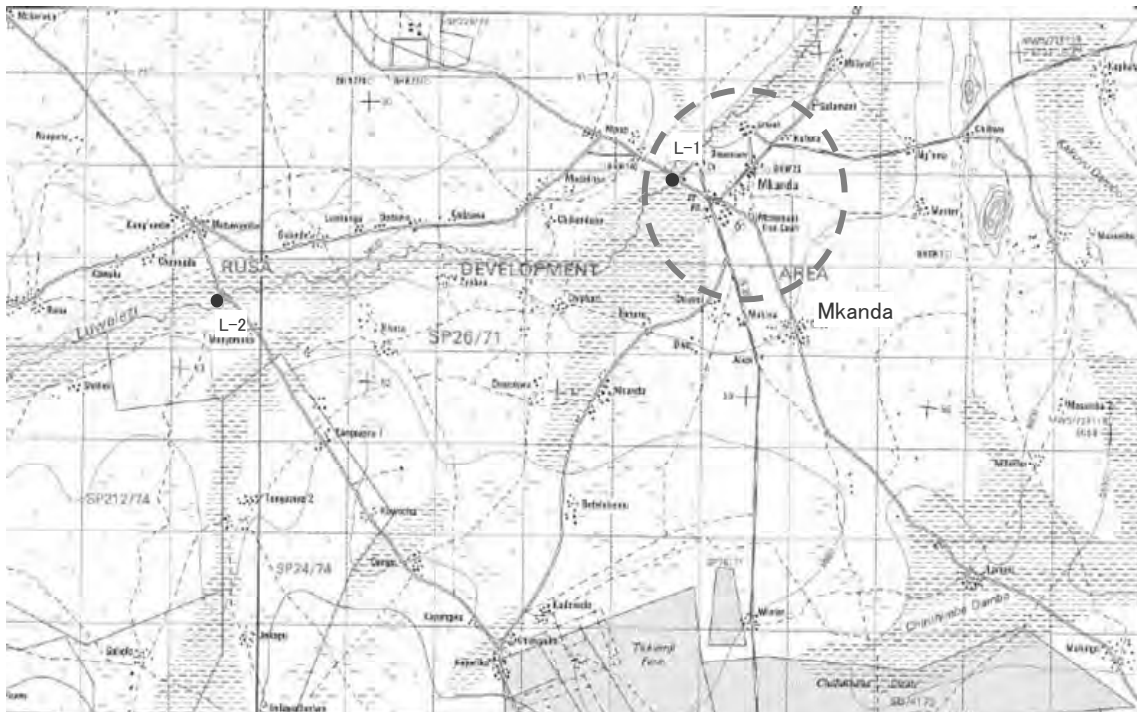


Figure A6-1-19 Sampling Points of Surface Water for Water Quality Test (Mkwinda)

(3) Water Rights

The water rights registered on Liwelezi River is shown in Table A6-1- 21.

Table A6-1-21 Existing water rights on Lilewazi River (as of Oct. 2010)

No.	Location from Mkanda Bridge (km)		Appropriator of Water Rights	License No.	Purpose	Amount of right	
						m ³ /day	m ³ /s/10hr
1	Upper	12	Press Agric	S16/1982	Irrigation	15,400	0.4278
2		0.5	Press Agric	S11/2006	Irrigation	413	0.0115
3	Lower	0.5	Press Agric	S921/1979	Irrigation	136	0.0038
4		15	Press Agric	S10/2006	Irrigation	310	0.0086
5	Unknown		Press Agric	S26/2006	Irrigation	416	0.0116
TOTAL						16,675	0.4633

The five water rights have been set as 16,675 m³/day for irrigation from 12 km upper to 15 km lower stream of Liwelezi River from Mkanda Bridge in the Project Area. Comparing to the river flow data shown in Table A6-1-18, the total amount of vested water rights exceeds the maximum river flow in one year out of 2 for three months, September to November, and for 8 months in draught year (1995). Especially in October and November in 1995, the maximum river flow became less than one third of the amount of water rights.

In case that the water supply system is designed to intake the river water under these conditions, a new water abstraction needs to get an agreement with the existing appropriators on the basis of actual volume of water abstraction on Liwelezi River.

3.2 Source of Groundwater

(1) Siting of Drilling Point for Test Borehole

After the discussion with MoAIWD and CRWB, the survey team set two survey lines for horizontal resistivity survey in north of Mkanda (near Selemani village) and south of Mkanda (near Makina Village). Figure A6-1-20 shows the locations of horizontal survey line for selecting the candidate sites for test borehole drilling.

Figure A6-1-21 shows the result of horizontal survey on northern line. Only one point was detected for expected resistivity range of aquifer, though it was on “Dambo” where the ground could be submerged in rainy season. On the other hand, assumed weathered rock, in which some aquifer was expected, was found on the southern line as shown in Figure A6-1-22. The team decided the well field on the southern line and selected three sites for test borehole according to the vertical survey carried out on the line. Figure A6-1-23 shows the result of the vertical survey. The resistivity layer of 40 -70 Ω -m, which found in 35-110 m depth was expected to be an aquifer and targeted depths were set up to 80m for each test borehole.



Figure A6-1-20 Location Map of Horizontal Geo-electric Survey

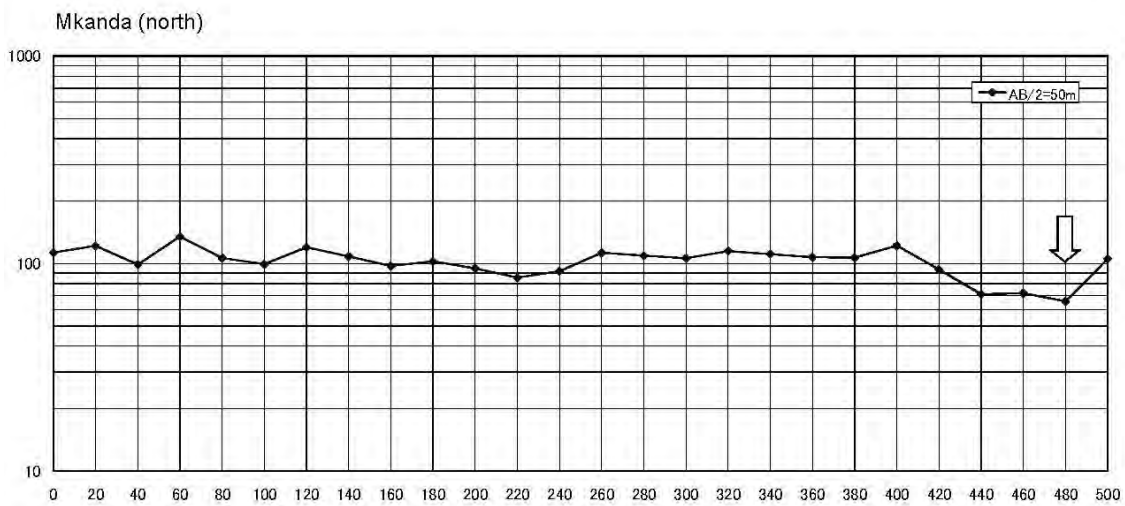
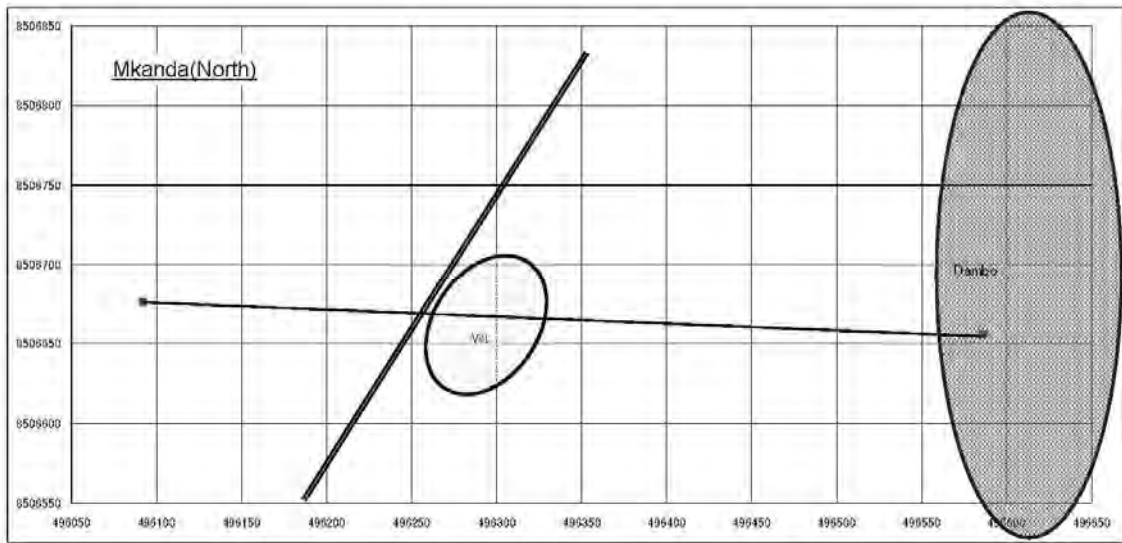


Figure A6-1-21 Selection of Vertical Survey Points on Horizontal Survey Result –Mkanda North-

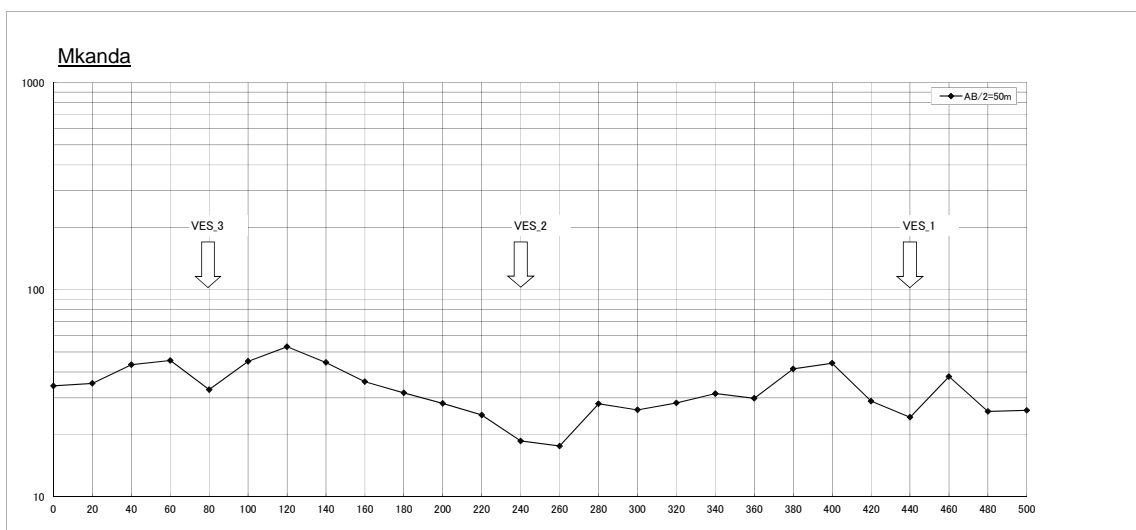
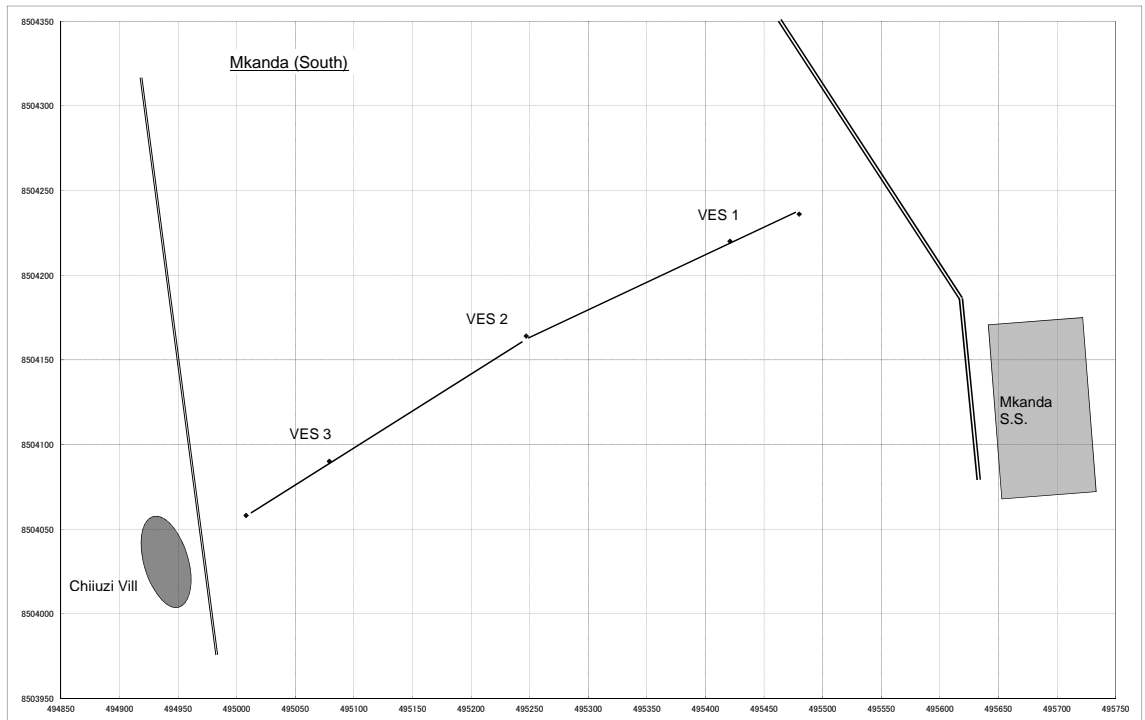


Figure A6-1-22 Selection of Vertical Survey Points on Horizontal Survey Result –Mkanda South-

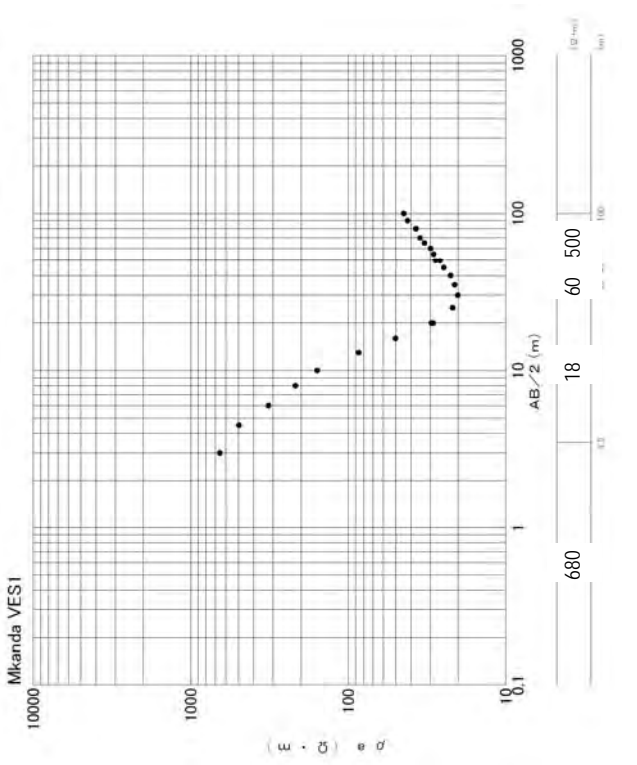
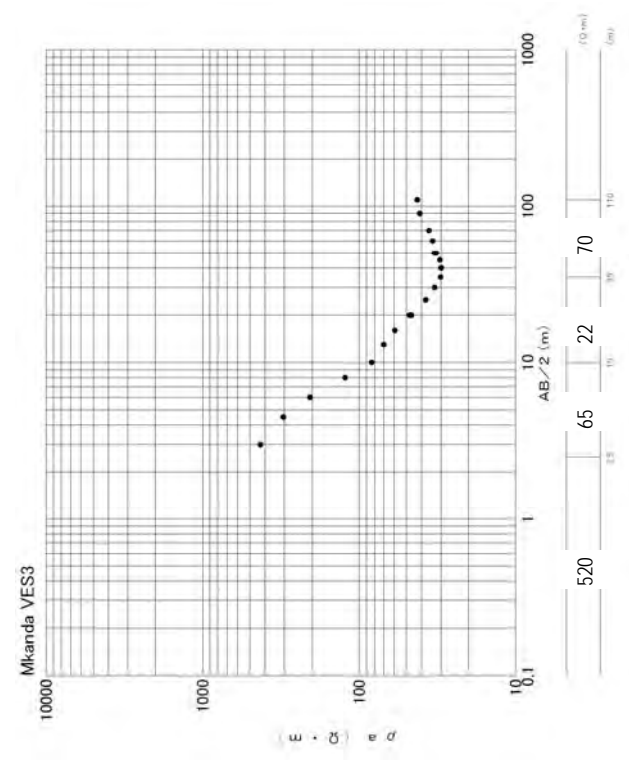
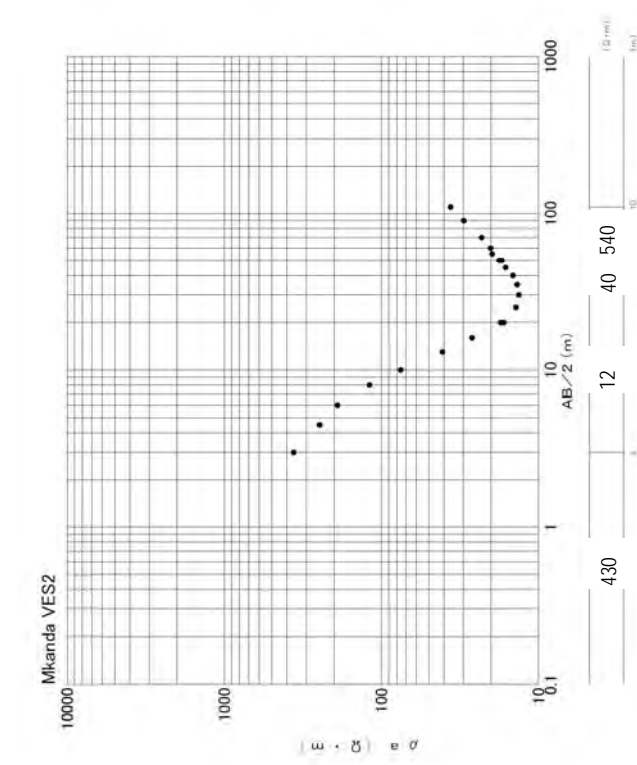


Figure A6-1-23 Result of Geo-electric Survey (VES)-Mkanda-

(2) Drilling of Test Borehole

On the basis of geo-electric survey result and negotiation with the land owner for setting drilling rig, three sites for test boreholes were decided as shown on Table A6-1-22 and Figure. A6-1-24.

The result of test borehole drilling is shown on Figure. A6-1-25 with encountered geology, borehole structure, static water level and dynamic water level (at continuous pumping test).

Table A6-1-22 Location of Test Borehole

BH No.	Coordinate*		Remarks
	Easting	Northing	
MK-1	495421	8504220	Makina Village
MK-2	495247	8504164	Lufina Village
MK-3	495079	8504090	Chiluzi Village

* WGS 84/ UTM

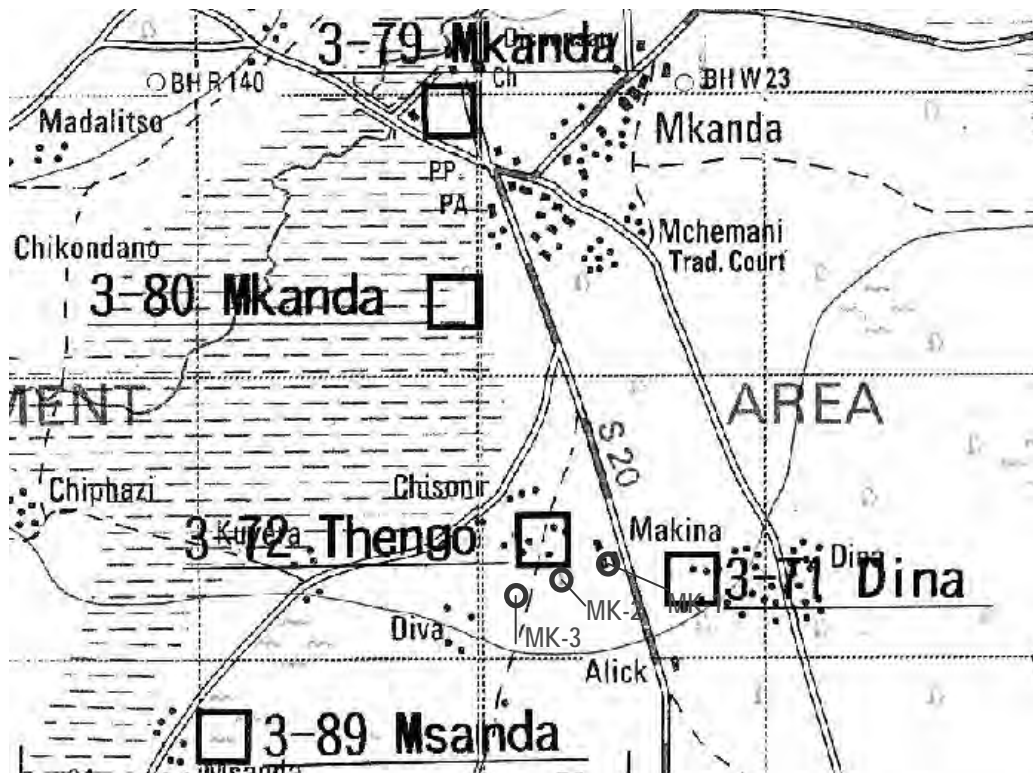
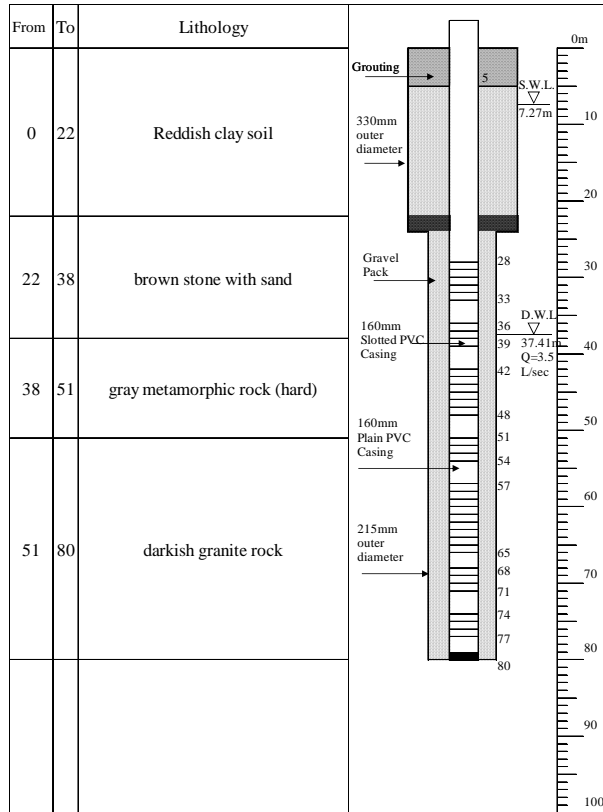


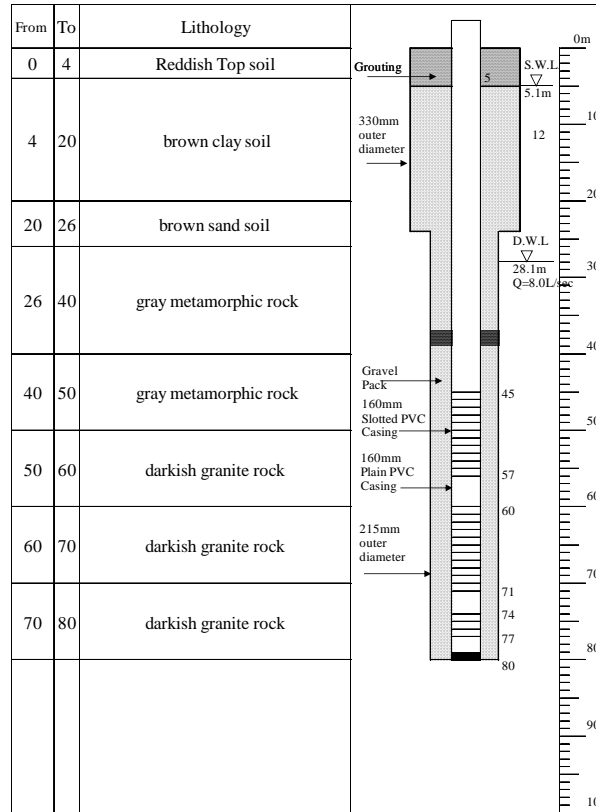
Figure A6-1-24 Locations of test boreholes for Mkanda Market Centre

Location : Mkanda MK1 (Makina)



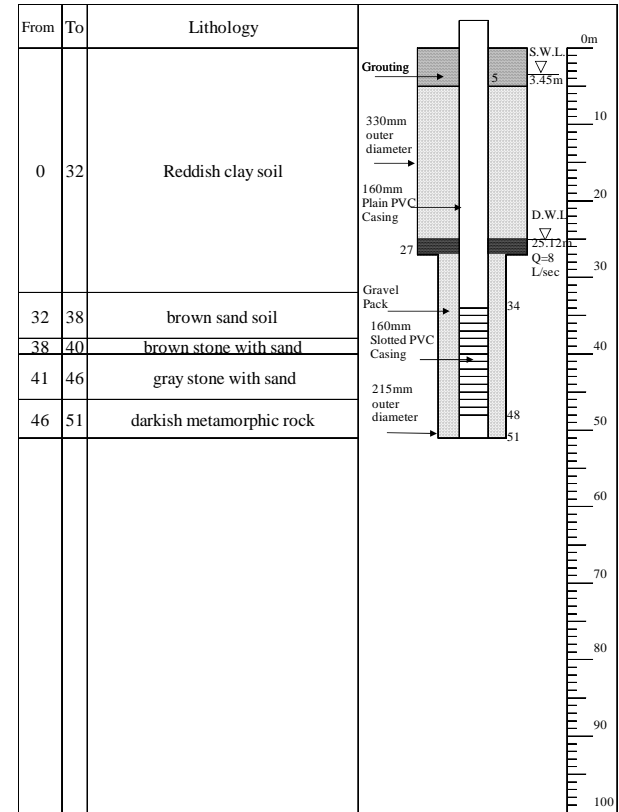
MK-1 (Makina)

Location : Mkanda MK2 (Rufina)



MK-2 (Lufina)

Location : Mkanda MK3 (Chiluzi)



MK-3 (Chiluzi)

Figure A6-1-25 Borehole Log and Structure (Mkanda South)

(3) Pumping Test

Two times of pumping test were carried out to find a sustainable discharge from each test borehole.

- 1st test: To find capacity of pumping as a borehole alone (October to November, 2010: late dry season)
- 2nd test: To find mutual interference among the test boreholes by observing water levels in the boreholes other than the pumping borehole. (May, 2011: Early dry season)

Figure A6-1-26, 27 and 28 show the results of continuous pumping test (for 1st and 2nd tests)

Table A6-1-23 and Figure A6-1-29, 30 and 31 show the results of Step drawdown test (for 1st test)

Figure A6-1-32 shows Discharge (Q)-Drawdown (s) curve (for 1st test)

The ultimate yields are estimated as follows;

- MK-1 : As water level goes down steeply in step drawdown test at discharge $Q=4.0$ (l/sec), the ultimate yield (Q_u) is between 3.0 and 4.0 (l/sec).
- MK-2 : As water level becomes unstable with $Q=8.0$ l/sec and goes down steeply with $Q=10$ l/sec, Q_u is estimated around $Q_u = 8.0$ (l/sec)
- MK-3 : Though water level goes down in proportion to increasing discharge and Specific Yield (Q/s) is almost constant until $Q=8.0$ l/sec, goes down steeply at $Q=10$ (l/sec). The Q_u is estimated between 8 and 10 (l/sec).

The rate of continuous pumping test was set as 3.5 l/sec for MK-1, and 8.0 (l/sec) was set for MK-2 and MK-3. The stable water levels were found during 24 hour continuous pumping for MK-2 and MK-3, though water level continues going down gently even at 24 hours after start of pumping in MK-1. The ultimate yield of MK-1 is estimated less than 3.5 (l/sec).

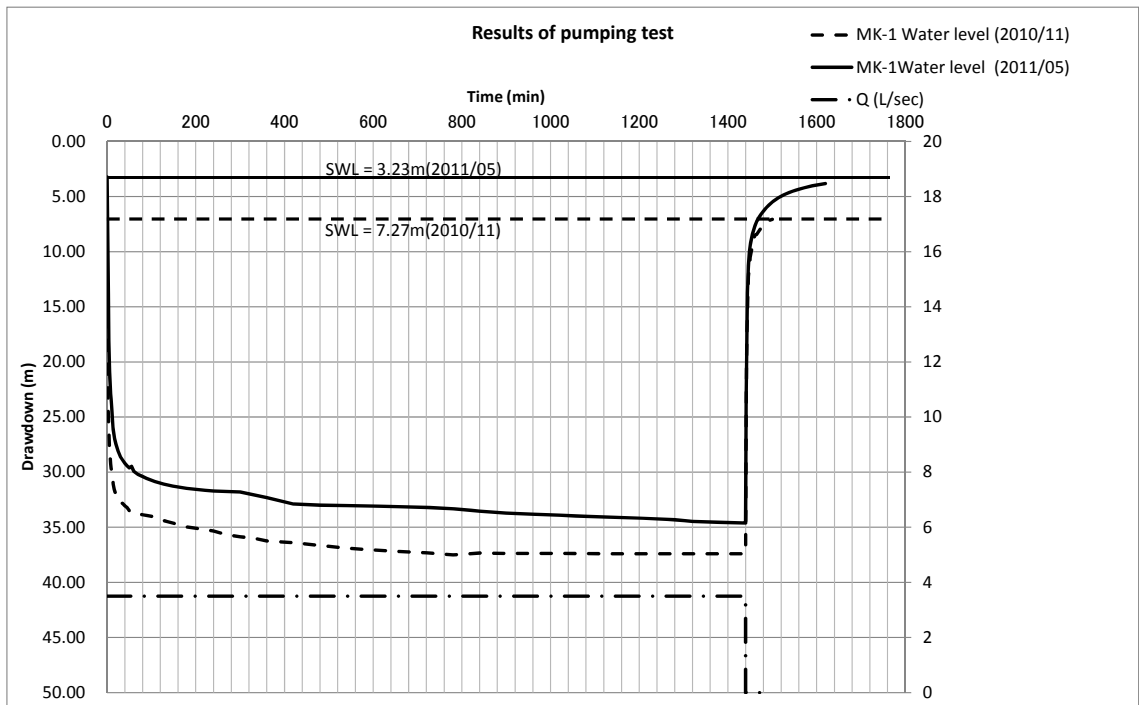


Figure A6-1-26 Continuous Pumping Test (MK-1)

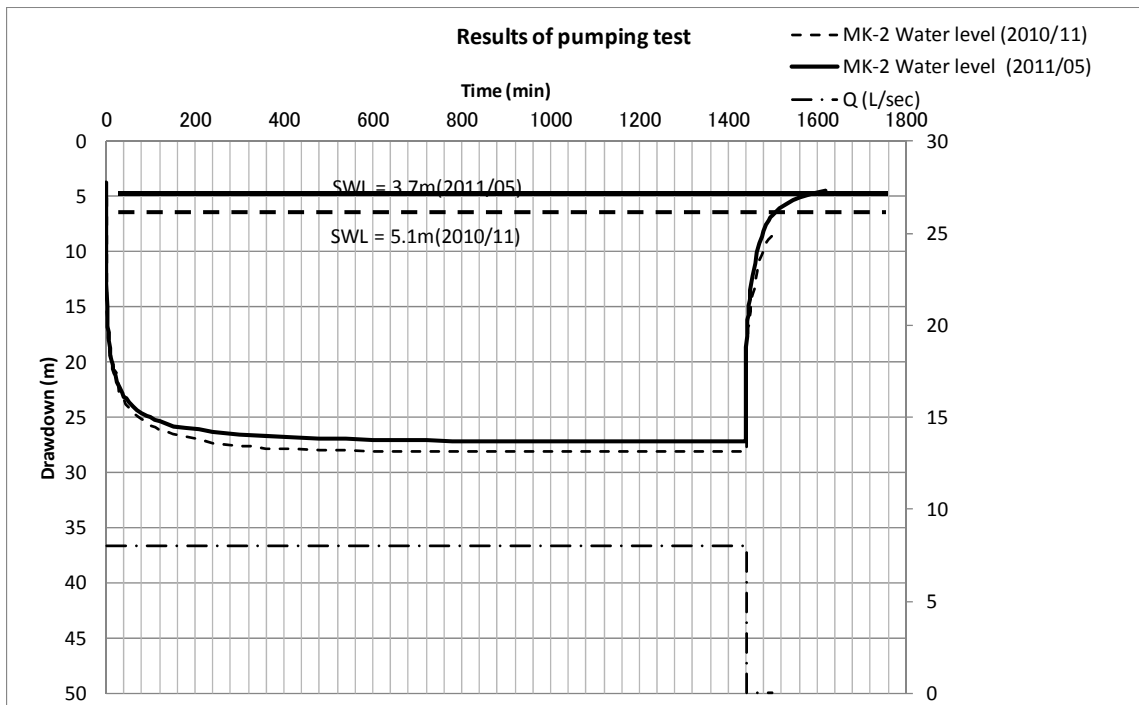


Figure A6-1-27 Continuous Pumping Test (MK-2)

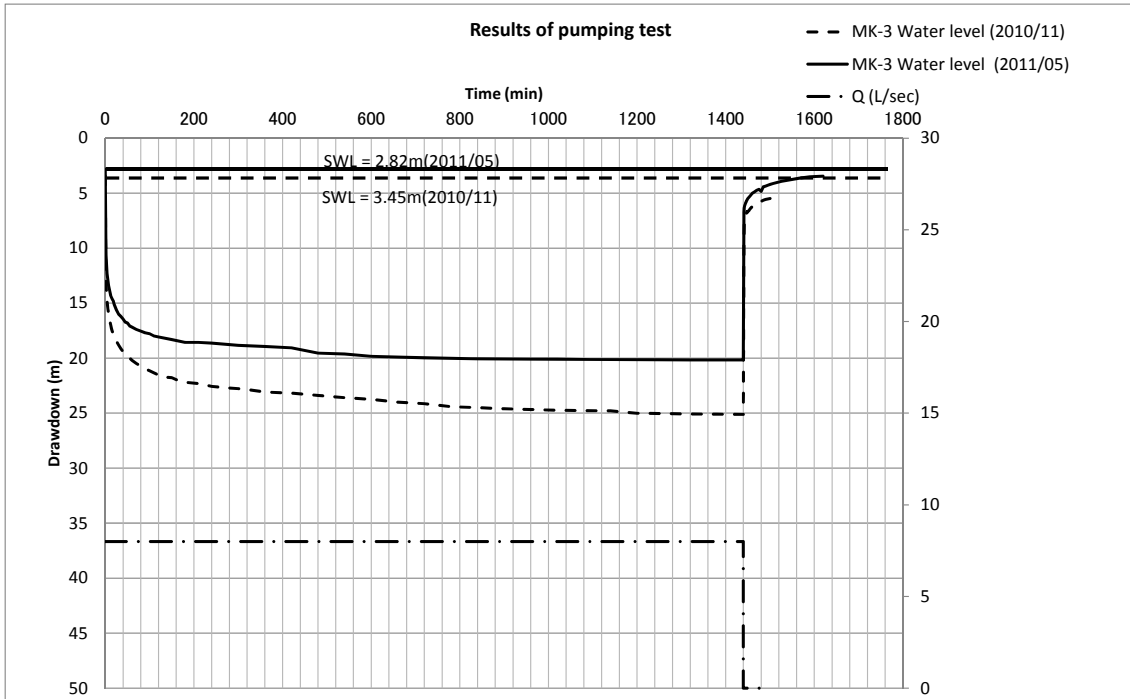


Figure A6-1-28 Continuous Pumping Test (MK-3)

Table A6-1-23 Step Drawdown Pumping Test (Mkanda, 1st Test)
Mkanda BH 1(MK-1)

Step No	Time (Hours)	Q (L/sec)	S (m)	Q/S
1	1.67	2.50	14.74	0.16
2	1.67	3.00	23.62	0.12
3	1.17	4.00	51.82	0.07
4	0.42	5.00	51.06	0.10

Mkanda BH 2(MK-2)

Step No	Time (Hours)	Q (L/sec)	S (m)	Q/S
1	1.67	5.00	7.77	0.64
2	1.67	6.00	10.70	0.56
3	1.67	8.00	20.03	0.40
4	1.33	10.00	53.71	0.19

Mkanda BH 3(MK-3)

Step No	Time (Hours)	Q (L/sec)	S (m)	Q/S
1	1.67	5.00	10.10	0.50
2	1.67	6.00	11.99	0.50
3	1.67	8.00	17.52	0.46
4	1.67	10.00	39.52	0.25

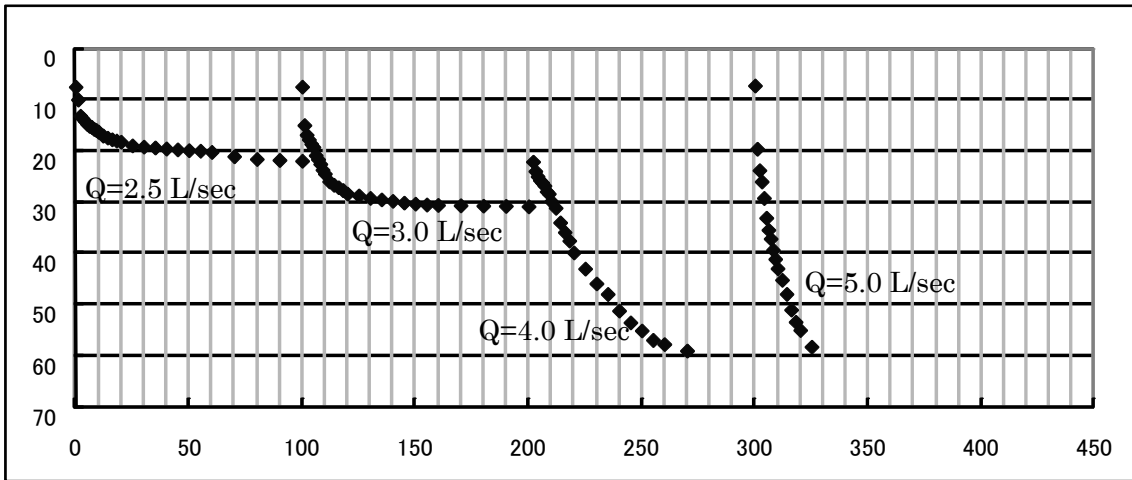


Figure A6-1-29 Step Drawdown Test (MK-1 / Makina, Mkanda)

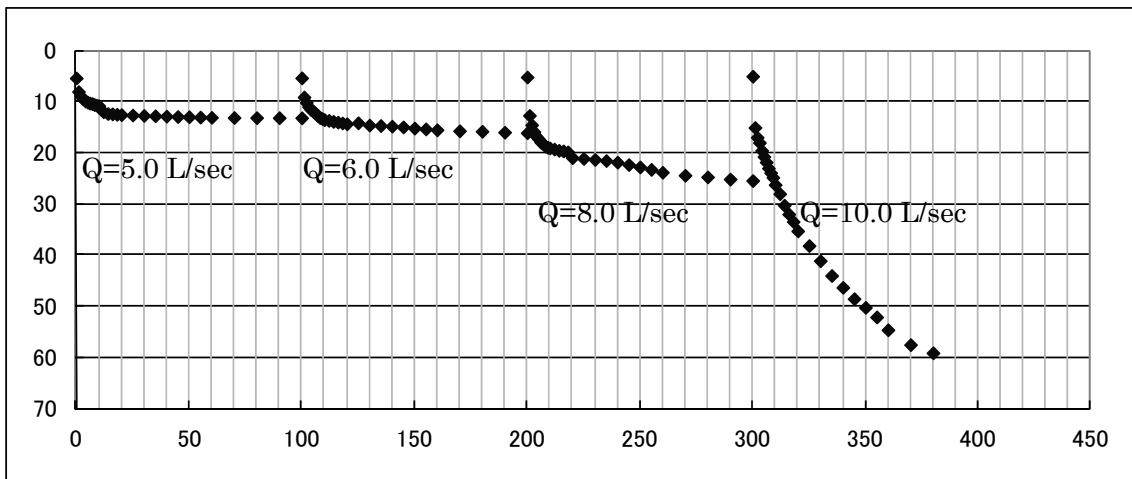


Figure. A6-1-30 Step Drawdown Test (MK-2 / Lufina, Mkanda)

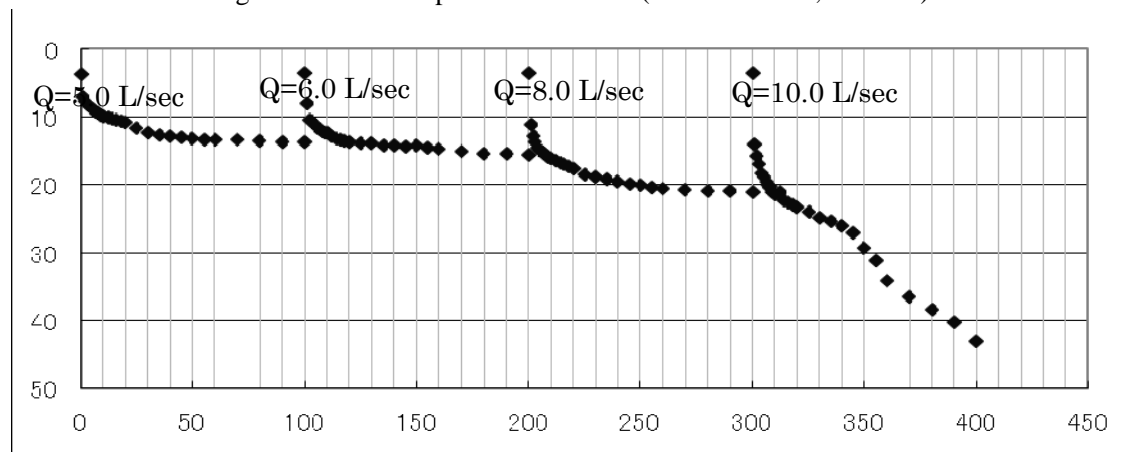


Figure A6-1-31 Step Drawdown Test (MK-3 / Chiluzi, Mkanda)

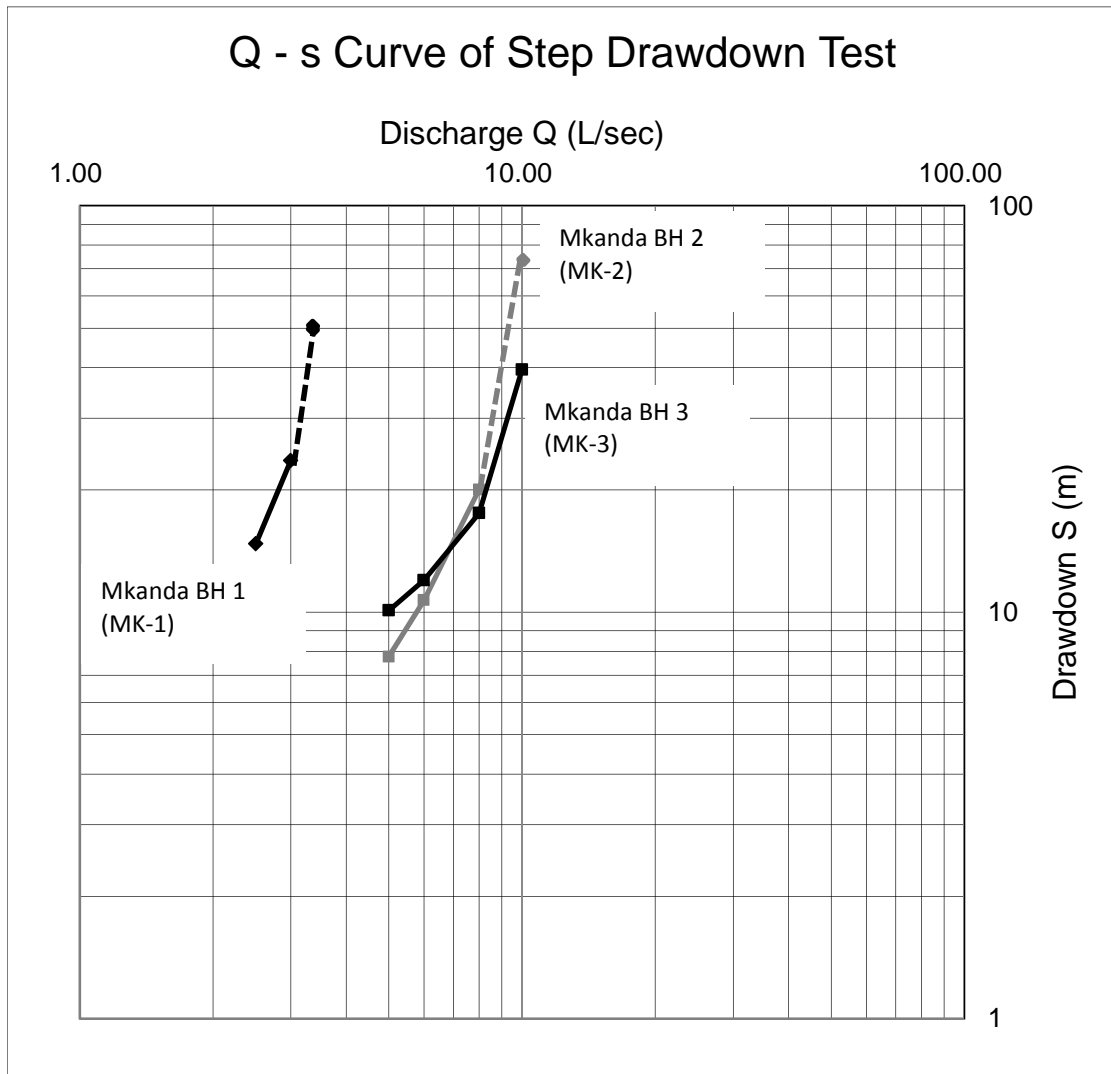


Figure A6-1-32 Discharge (Q)-Drawdown (s) in Step Drawdown Test in Mkanda

Mutual Interferences among the test boreholes in Mkanda

The team observed water levels at the other test boreholes in addition to the pumping borehole, and tried to find the relation between drawdown (s) by interference and distance (d) from the pumping hole.

The result of observation of water level is shown in Table A6-1-24. During the pumping at MK-1, no drawdown was found in other boreholes, though 49 to 58 cm of drawdown was found mutually during the pumping at MK-2 and MK-3. The drawdown in MK-1 was found 20 cm by drawing at MK-2, but it is less than the drawdown in MK-3 even in same distances from MK-2. The rate of interference to east side, e.g. from MK-2 to MK-1 is less than the rate to west side.

Table A6-1- 24 Interference of drawdown during continuous pumping test in Mkanda

	Pumping hole	Observation hole		Pumping hole	Observation hole		Pumping hole	Observation hole	
	MK.1	MK.3	MK.2	MK.2	MK.1	MK.3	MK.3	MK.1	MK.2
Discharge (l/sec)	3.5			8.0			8.0		
Static Water Level (m)	3.23	2.28	3.70	3.70	3.23	2.83	2.28	3.32	3.69
Dynamic Water Level (m)	36.42	2.28	3.70	27.20	3.43	3.32	20.16	3.34	4.27
Drawdown (m)	33.19	0.00	0.00	23.50	0.20	0.49	17.88	0.02	0.58
Distance (m)	-	366	183	-	183	184	-	366	184

(4) Water Quality Test

Table A6-1-25 shows the result of water quality test for borehole water sampled after developing up the borehole (October, 2010). Comparing to Malawi Standards (MS 214: 2005 for treated drinking water), the values of iron, turbidity, faecal Coliform and faecal streptococci are exceeded each standards. For faecal Coliform and faecal streptococci, the water quality test was carried again in May 2011 for checking.

The standard value for iron is set against corrosion of iron pipes, colouring on washed cloths, unpleasant test so on, but not based on affection to health. WHO recommended the limit as 0.3 mg/l, and the results of the test are lower than the WHO standard. Turbidity was detected from the samples collected just after the development of borehole and more clean water was confirmed with eyes at the second testing for microbial parameters. The periodical checking on turbidity is required as same as other parameters, though reducing turbidity can be expected after longer pumping. The count of faecal streptococci detected with the second test is in a range which can be treated with minimum disinfection with chlorine.

Table A6-1-25 Water Quality Test for Borehole Water

LAB No. (Sample No.)	MS 214:2005	766 (MK-1)	765 (MK-2)	767 (MK-3)	(MK-1)	(MK-2)	(MK-3)
Date Sampled		14/11/'10	14/11/'10	14/11/'10	27/05/'11	27/05/'11	27/05/'11
Season		Dry	Dry	Dry	Early Dry	Early Dry	Early Dry
pH Value	5.0-9.5	7.71	7.63	7.69	-	-	-
Conductivity (µS/cm)	700-1500	506	480	353	-	-	-
Total Dissolved Solids (mg/l)	450-1000 ^{a)}	250	240	177	-	-	-
Carbonate (as CO ₃ ²⁻) (mg/l)	-	33	29	22	-	-	-
Bicarbonate (as HCO ₃ ⁻) (mg/l)	-	220	198	137	-	-	-
Chloride (as Cl ⁻) (mg/l)	100-200	6.8	13.5	11.8	-	-	-
Sulphate (as SO ₄ ²⁻) (mg/l)	200-400	0.05	0.21	0.11	-	-	-
Nitrate (as NO ₃ ⁻) (mg/l)	6.0-10.0	0.033	0.037	0.003	-	-	-
Fluoride (as F ⁻) (mg/l)	0.7-1.0	0.60	0.60	0.59	-	-	-
Sodium (as Na ⁺) (mg/l)	100-200	35.2	33	30.7	-	-	-
Potassium (as K ⁺) (mg/l)	25-50	3.8	4.1	3.9	-	-	-
Calcium (as Ca ⁺⁺) (mg/l)	80-150	46	43	25	-	-	-
Magnesium (as Mg ⁺⁺) (mg/l)	30-70	10.6	9.7	8.1	-	-	-
Iron(Fe ⁺⁺) (mg/l)	0.01-0.2	0.043	0.211	0.236	-	-	-
Manganese (Mn ⁺⁺) (mg/l)	0.05-0.1	<0.001	<0.001	<0.001	-	-	-
Total Hardness (as CaCO ₃) (mg/l)	-	158	147	96	-	-	-
Total Alkalinity (as CaCO ₃) (mg/l)	-	235	210	149	-	-	-
Silica (as SiO ₂) (mg/l)	-	28	21	23	-	-	-
Turbidity (NTU)	0.1-1	23.9	16.36	20.6	-	-	-
Suspended Solids (SS) (mg/l)	-	24	16	22.0	-	-	-
Faecal Coliform (/100 ml)	0 in 100ml	328	0	736	0	0	0
Faecal Streptococci (/100 ml)	0 in 100ml	20	4	0	0	0	5

3.3 Evaluation of Water Source for Water Supply

(1) Evaluation of Water Source

River water is a candidate source for the water supply system for Mkanda Market Centre in the request from Malawi. According to the water quality of river water, the water supply system needs a treatment facility with a rapid filtration system and delicate management on disinfection against high and varied level of microbiological contamination as well as related pH control. Regarding quantity issues of river water, further evaluations are required on data collection of river flow and actual abstraction to irrigation water, and negotiation with appropriators of existing water rights is also required to get agreement on new abstraction from the river on the basis of these accurate data.

Comparing to the river water, the groundwater source which confirmed with test boreholes is suitable because of that the quality is not necessary to be treated other than chlorination and the quantity is enough to cover the demands in Mkanda. Therefore the groundwater source is advantageous in respect of simple maintenance and cost effectiveness.

(2) Drawdown of Water Level by Mutual Interference

As mentioned in 3.2 (3) Pumping Test, the maximum drawdown was observed as 58 cm by the neighbouring borehole. This interference is occurred mainly between western 2 boreholes, not in east side. This is indicating some change of hydro-geological characteristics horizontally.

The rate of interfered drawdown against the own drawdown is evaluated as $0.58\text{m}/23.50\text{m} = 2.5\%$ for MK-2 and $0.49\text{m}/17.88\text{m} = 2.7\%$ for MK-3. These are not significant to affect the entire water supply planning.

(3) Discharge Compared with Planned Water Supply Amount

The planned service population in Mkanda Market Centre is estimated as 7,051 (4,666 (in 2008) @ growth rate 3.5%/year), and the planned water supply amount is 544 m³/day as maximum daily as shown in Table A6-1-26.

Regarding groundwater source, as daily discharge from one borehole is expected as 691m³/day (from MK-2 or MK-3), the discharge is cover the planned water supply amount with operation of one borehole from MK-2 or MK-3, the other borehole shall be a standby.

Table A6-1-26 Tentative Planned Water Supply to Mkanda Market Centre

Item	Plan	Remarks
1) Service Population (person)	7,051	2020
2) Per capita consumption in average (lcd)	46.2	For domestic use ^{*1}
3) Daily domestic water consumption (m ³ /day)	325.8	1)×2)÷1000
4) Public water (m ³ /day)	81.5	3)×25% ^{*2}
5) Demands in total (m ³ /day)	407.3	3) + 4)
6) Daily water supply amount in average (m ³ /day)	453	5)÷(1-0.10) ^{*3}
7) Daily maximum water supply (m ³ /day)	544	6)×1.2

* 1: daily consumption per capita $36 \times 68\% + 50 \times 16\% + 80 \times 14\% + 125 \times 2\% = 46.2$ lcd

Calculated based on the specified unit rates by the housing categories shown in Table A6-1- 27

*2: "25%" is an anticipated rate against domestic water, in the normal range adopted in Malawi

*3: "0.10" is an anticipated leakage ratio.

Table A6-1-27 Daily consumption per capita and population rate by each classification (Mkanda)

Classification	Daily consumption per capita (lcd)	Population rate
Traditional Housing Area	36	68%
High Density Housing Area	50	16%
Medium Density Housing Area	80	14%
Low Density Housing Area	125	2%

4. Water Source for Santhe Market Centre

4.1 Source of Surface Water

Surface water is not requested as the candidate source of water supply system for Santhe Market Centre. Bua River runs toward north from southern side to eastern side of the Market Centre, though the Survey Team does not take the surface water as water source.

In the feasibility study¹² for Santhe Market Centre, they proposed construction of dam to secure the water source in dry season which has some months the flow of Bua River goes down to zero (0). Though the Study Report finally recommended to select the groundwater source because the plan of surface water source with construction of a dam would be more costly.

4.2 Groundwater Source

(1) Siting of Drilling Point for Test Borehole

The Feasibility Study (1998) has suggested three (3) candidate areas for well field in surrounding of Santhe Market Centre as shown in Figure A6-1-4. The Team followed the suggestion and requested MoAIWD and CRWB to arrange the area for Test Boreholes in the area of well field No.1.

For siting of test borehole drilling sites in the area arranged by CRWB, the Team carried out vertical electric survey at 10 points in total, selected on the five horizontal survey lines which were crossing the proposed well field No.1. The location and results of horizontal survey are shown in Figure A6-1-33, 34 and 35, and the results of vertical survey is shown in Figure A6-1-36 and 37.

¹² NWDP (1998), 16 New Water Supply Schemes Feasibility Study

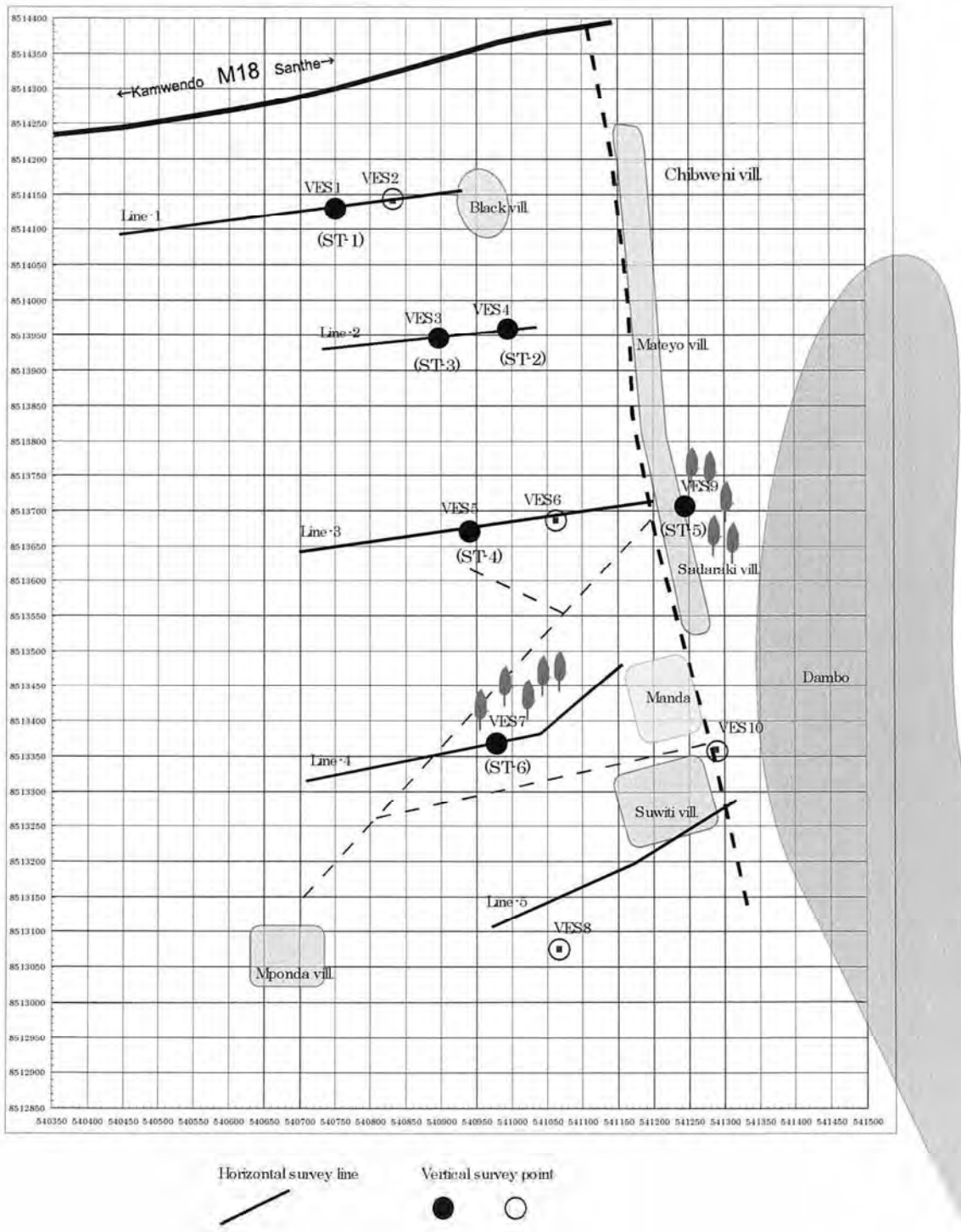


Figure A6-1-33 Location of Geo-physical Survey for Santhe Market Centre
(Horizontal Electric Survey (HES) Lines and Vertical Survey (VES) Points)

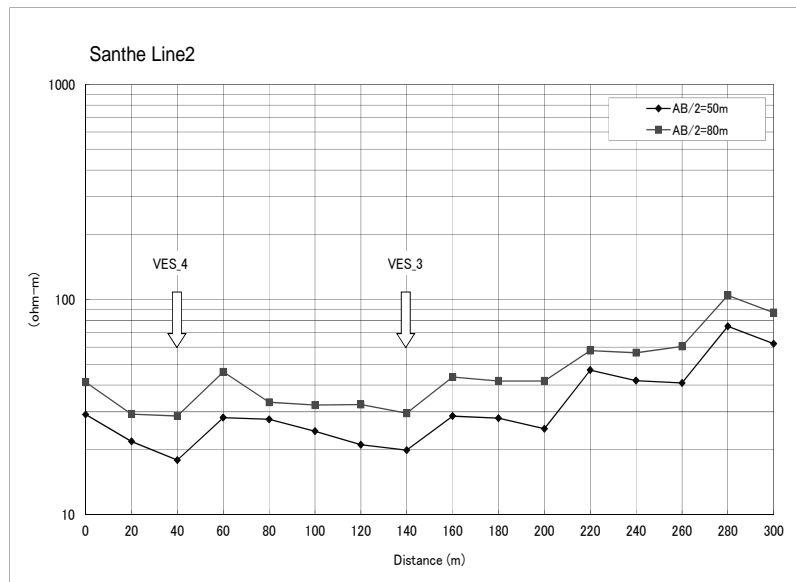
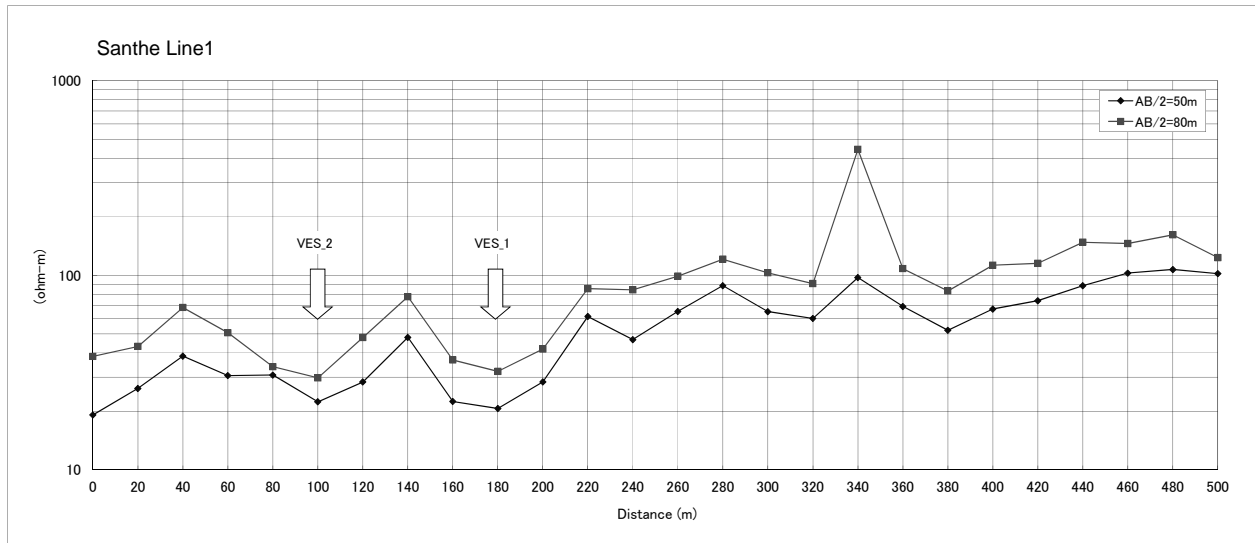


Figure A6-1-34 Horizontal Survey Result and Selection of VES Points (Santhe in 2010)

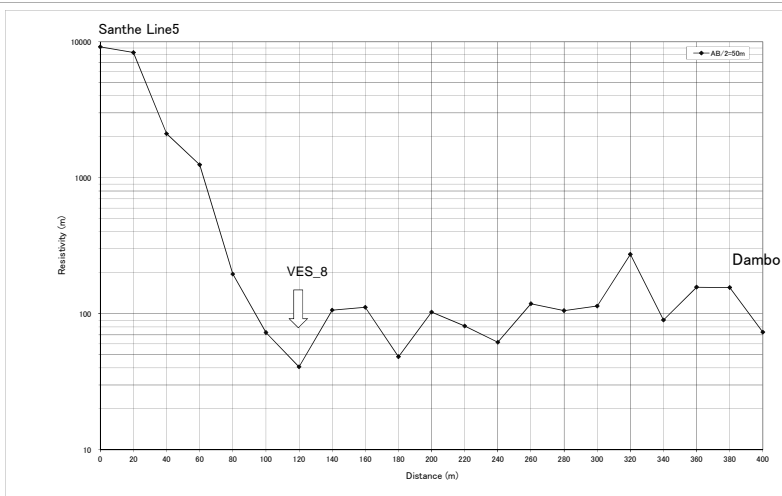
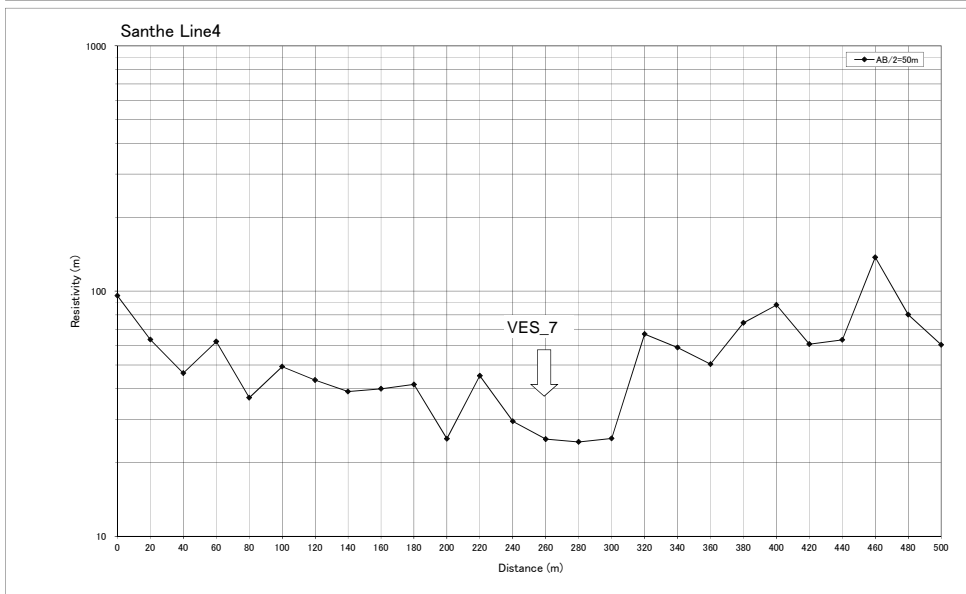
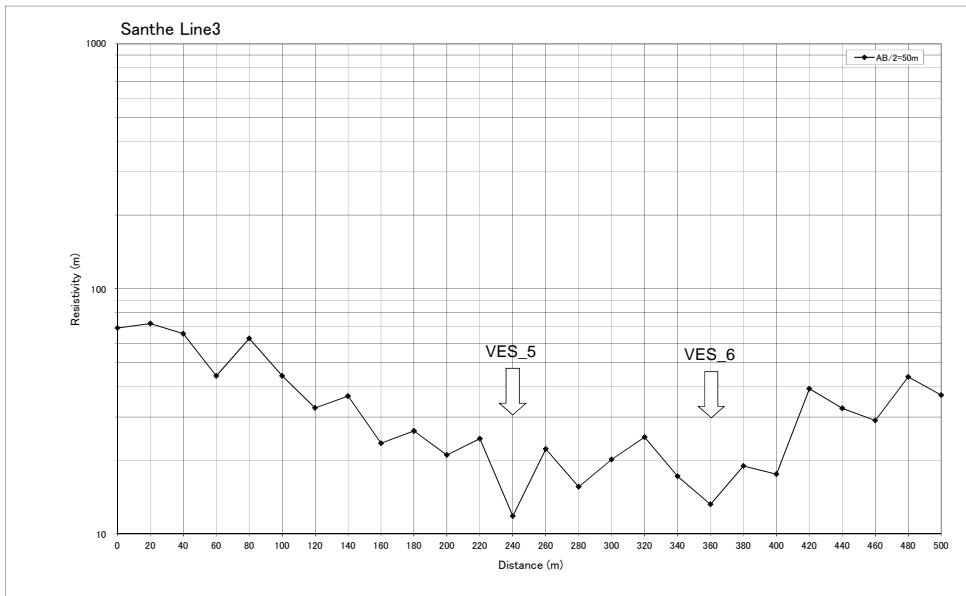


Figure A6-1-35 Horizontal Survey Result and Selection of VES Points (Santhe in 2011)

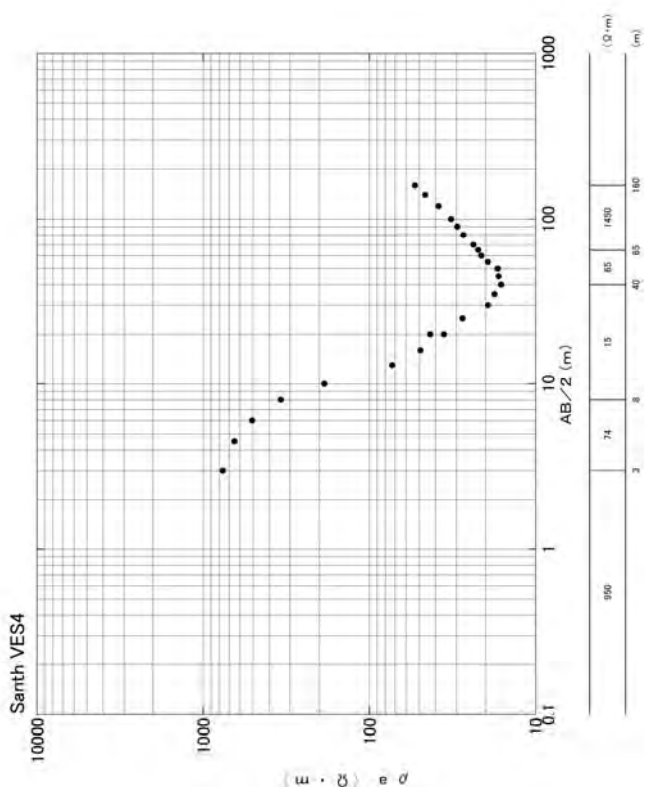
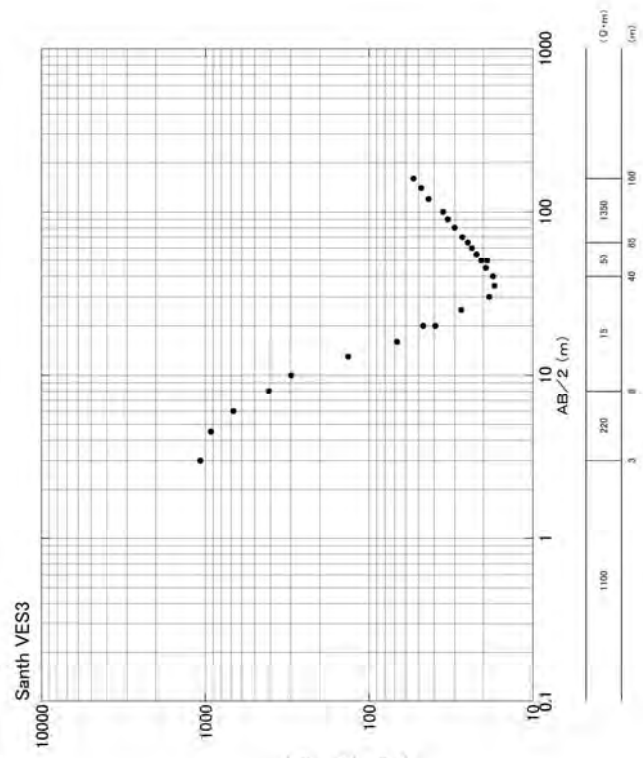
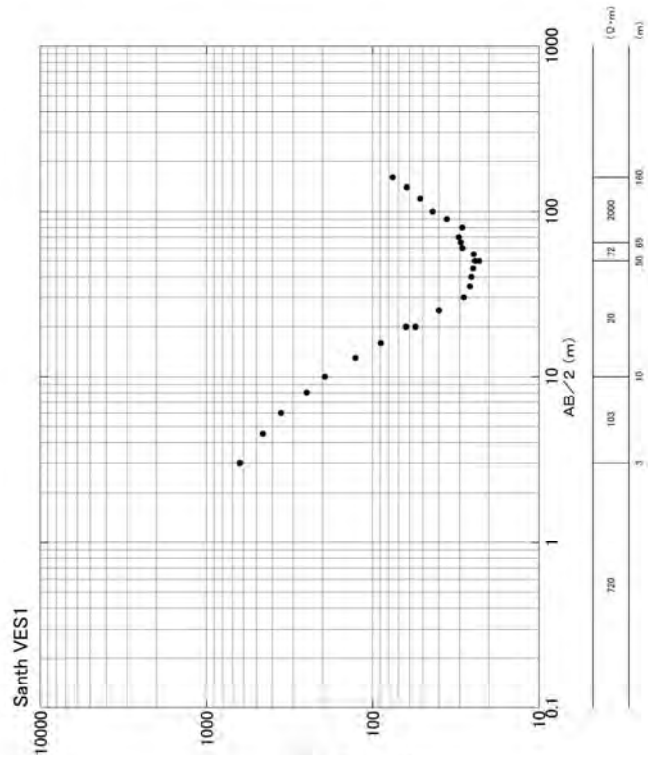


Figure A6-1-36 Result of Vertical Survey in Santhe (VES1,3,4)

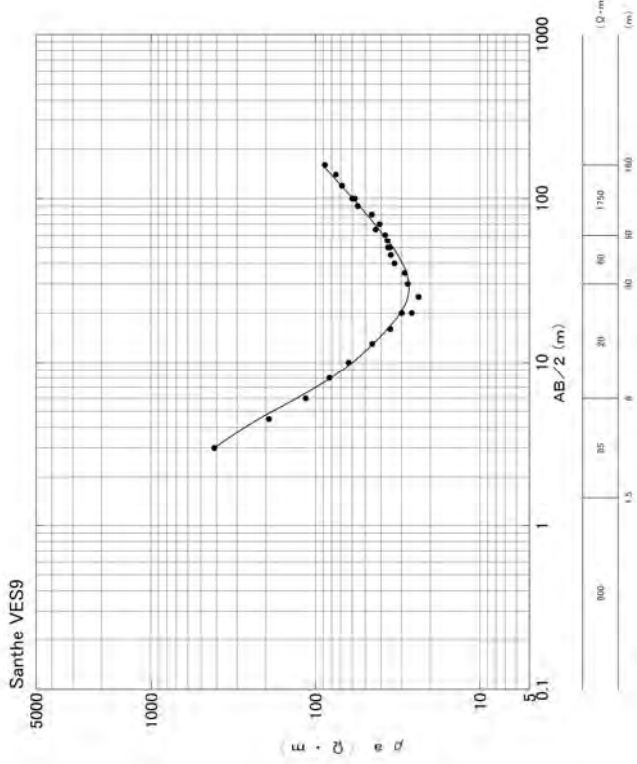
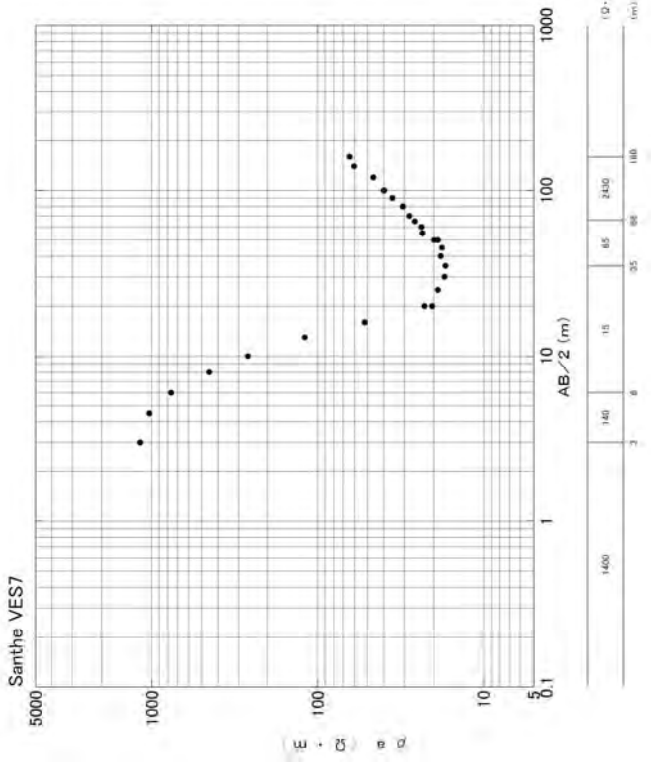
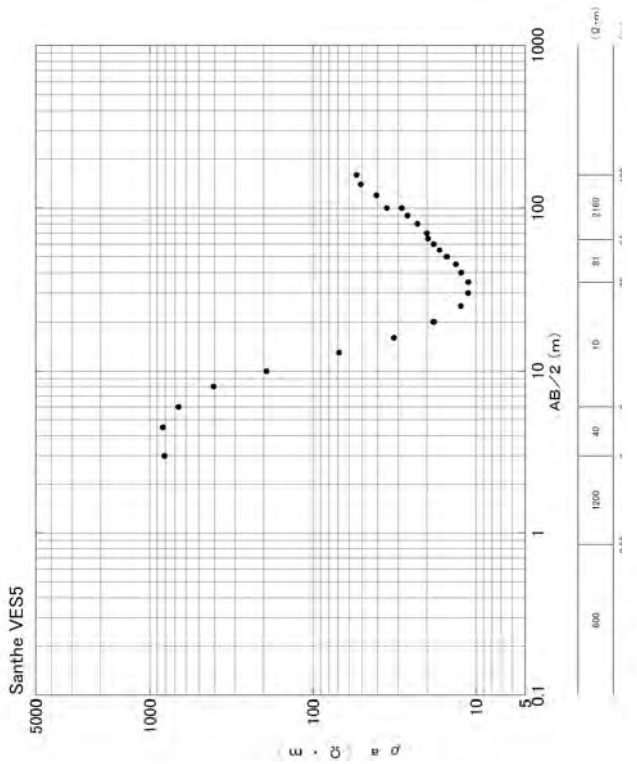


Figure A6-1-37 Result of Vertical Survey in Santhe (VES 5,7,9)

(2) Drilling of Test Borehole

On the basis of geo-electric survey, six sites for test boreholes were decided as shown on Table A6-1-28 and Figure. A6-1-38.

The results of test borehole drilling is shown in Figure.A6-1-39 and Figure.A6-1-40 with encountered geology, borehole structure, static water level and dynamic water level (at continuous pumping test). The targeted depths were set 72 to 74 m, though the drilling was extended to 92 m depth at ST-6 to try to find further aquifer.

Table A6-1-28 Location of Test Boreholes for Santhe Market Centre

BH No.	Coordinate*		Remarks
	Easting	Northing	
ST-1	540752	8514432	VES 1 (2010)
ST-2	540994	8514258	VES4 (2010)
ST-3	540893	8514250	VES 3 (2010)
ST-4	540945	8513678	VES 5 (additional in 2011)
ST-5	541242	8513706	VES 7 (additional in 2011)
ST-6	540980	8513374	VES 9 (additional in 2011)

* WSG 84/ UTM

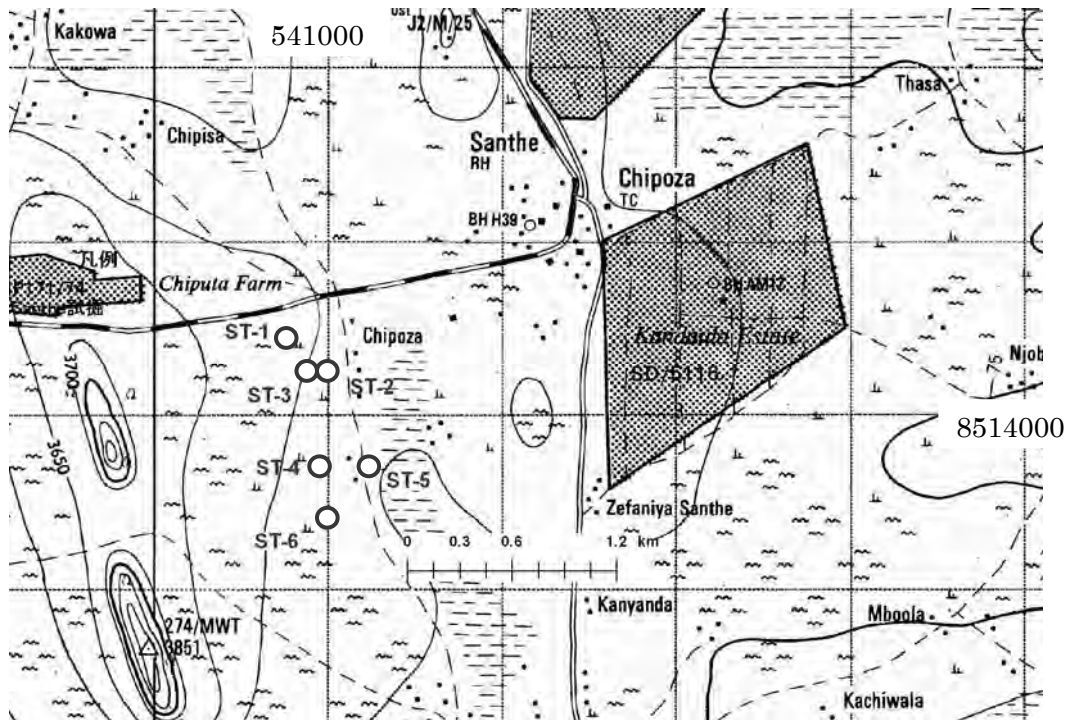
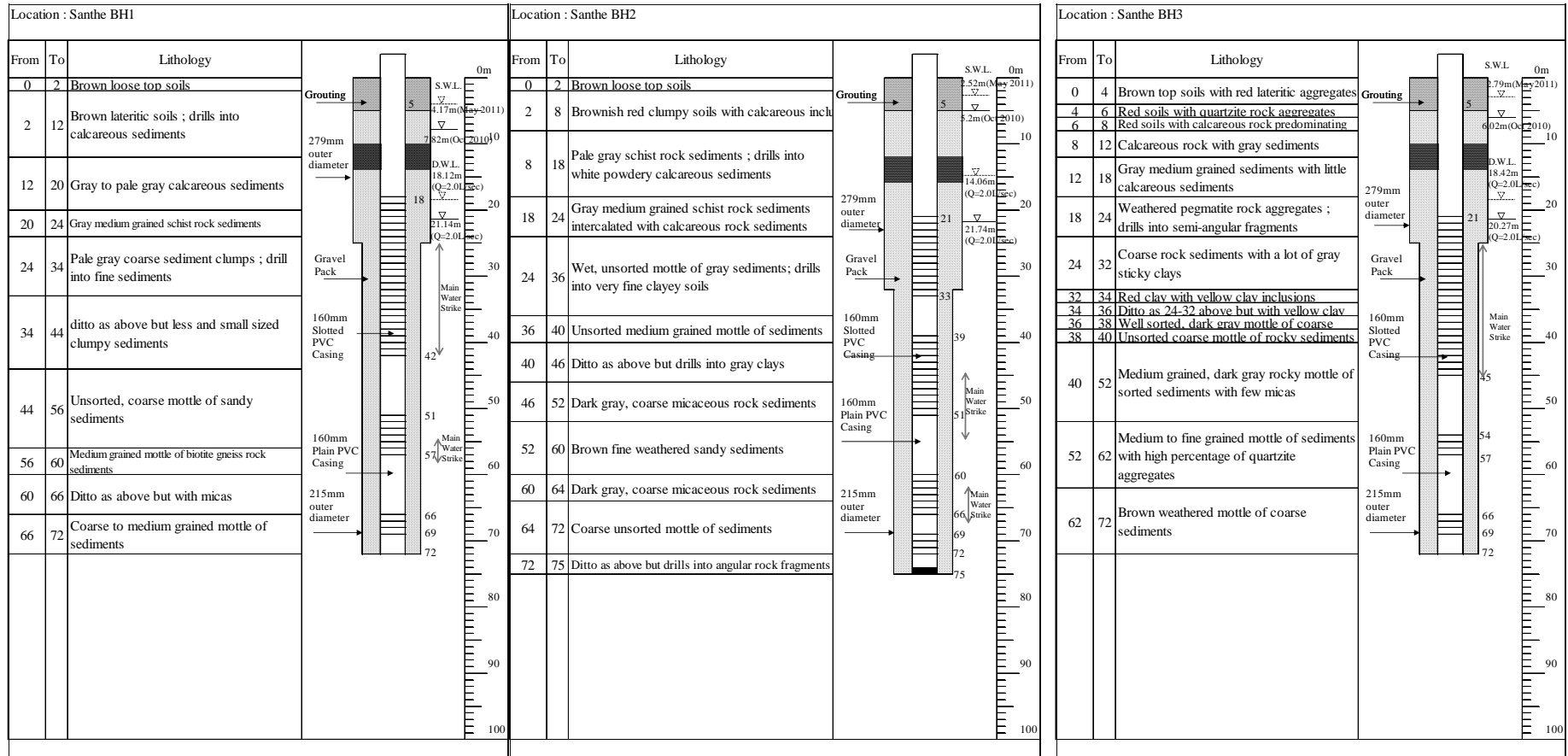


Figure A6-1-38 Location of Test Boreholes (Santhe)

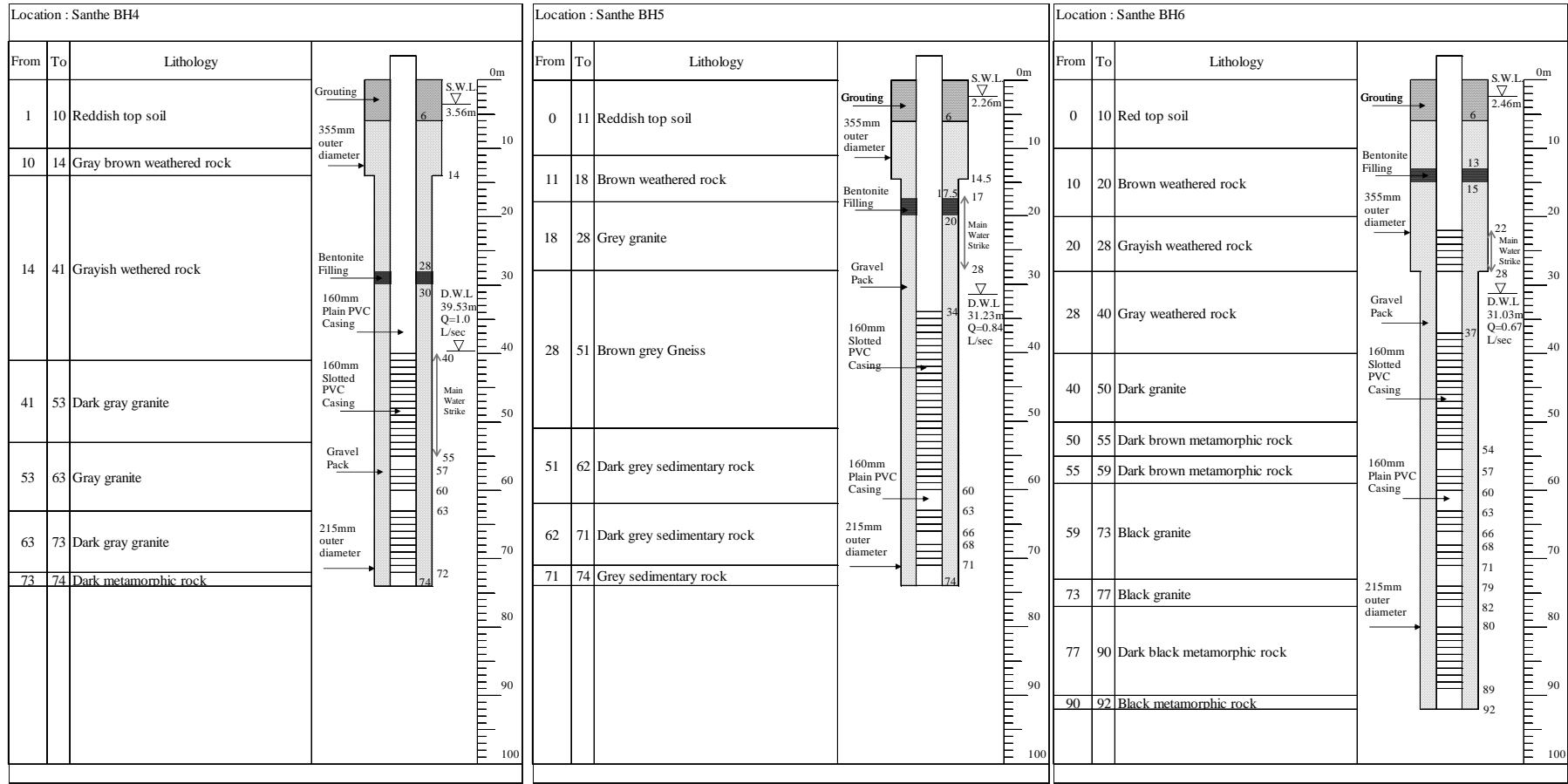


ST-1

ST-2

ST-3

Figure A6-1-39 Borehole Log and Structure (ST-1, ST-2, ST-3)



ST-4

ST-5

ST-6

Figure A6-1-40 Borehole Log and Structure (ST-4, ST-5, ST-6)

(3) Pumping Test

The observed water levels in each test borehole through the step drawdown test and the continuous pumping test are shown in Figure.A6-1-41 to Figure.A6-1-46.

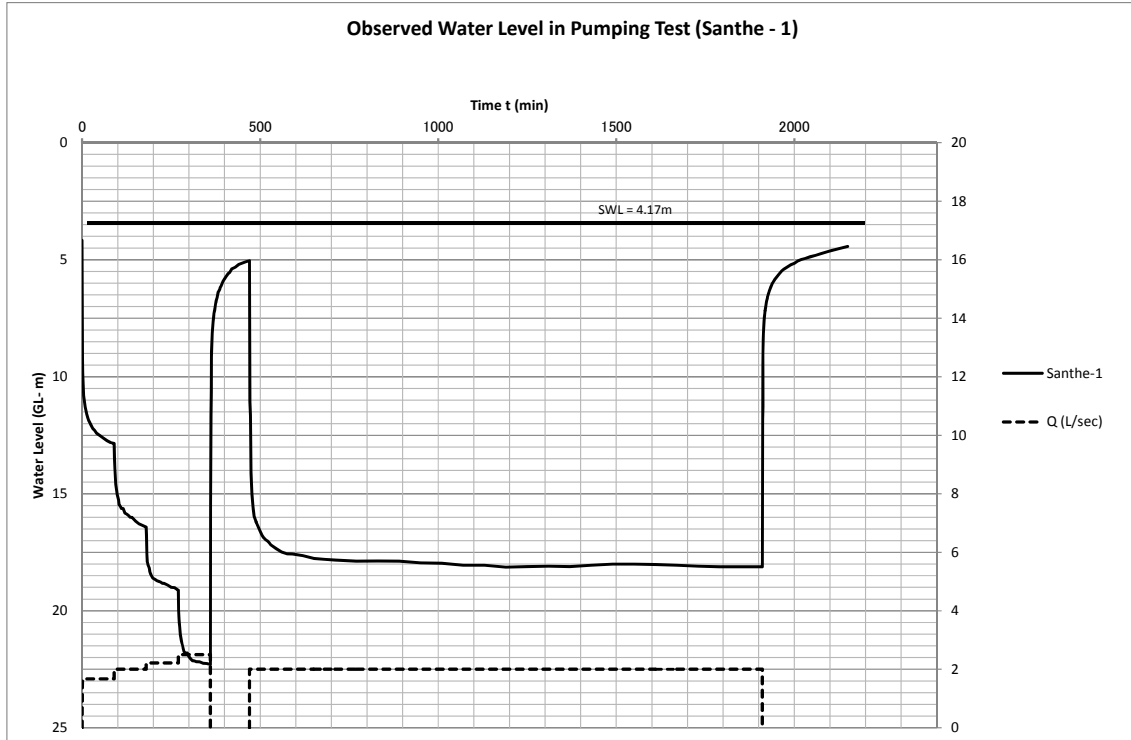


Figure A6-1-41 Drawdown water level observed in pumping test (ST-1)

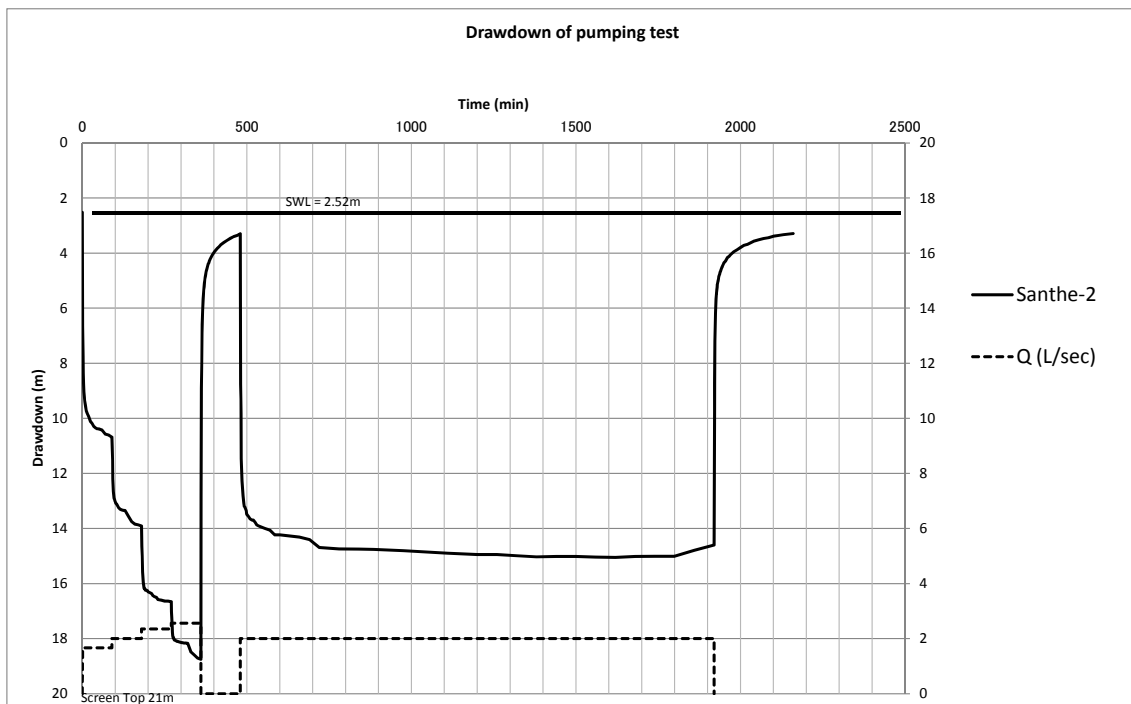


Figure A6-1-42 Drawdown water level observed in pumping test (ST-2)

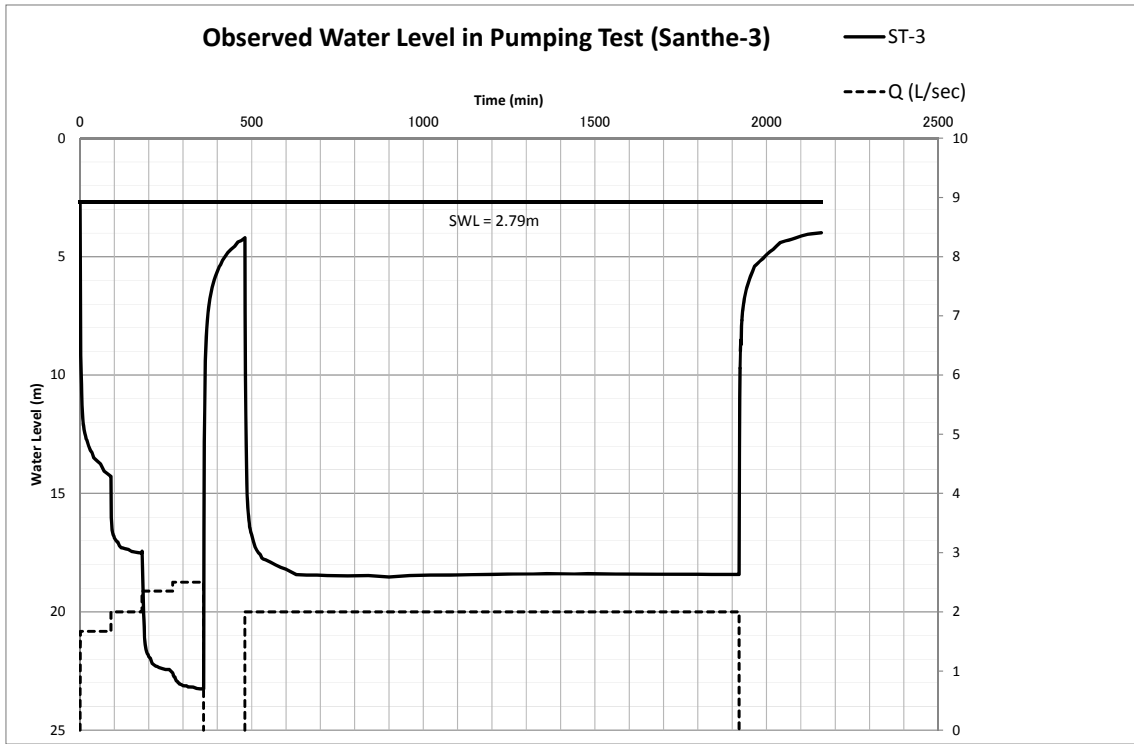


Figure A6-1-43 Drawdown water level observed in pumping test (ST-3)

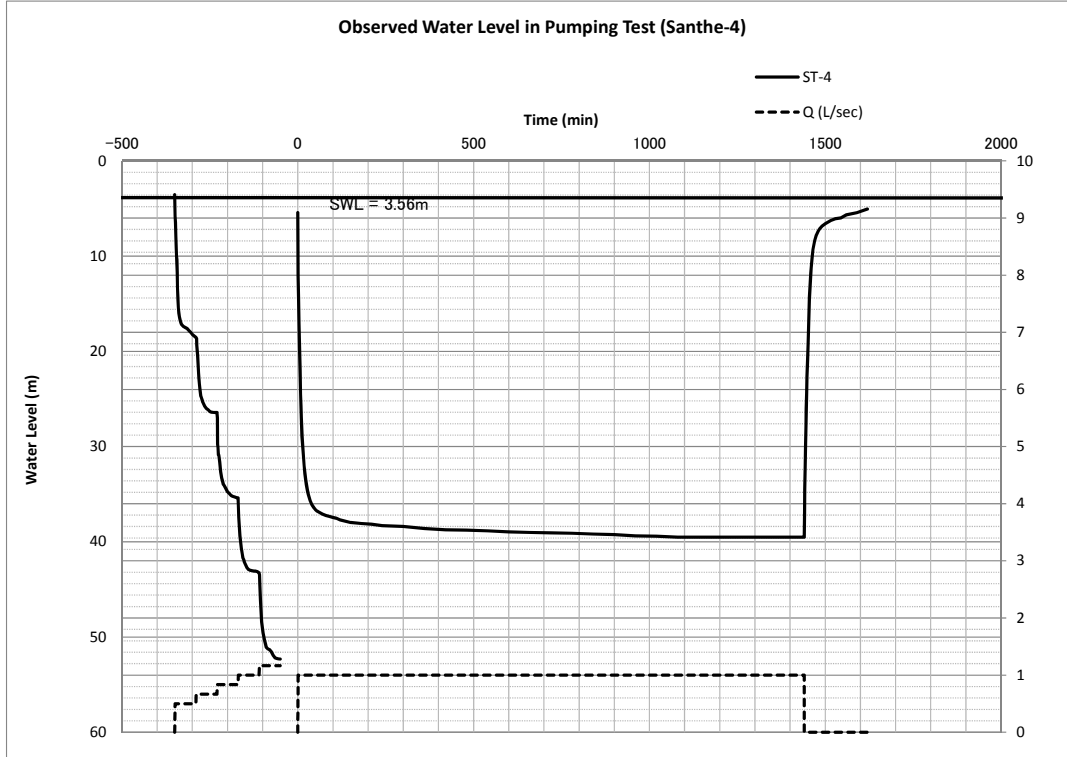


Figure A6-1-44 Drawdown water level observed in pumping test (ST-4)

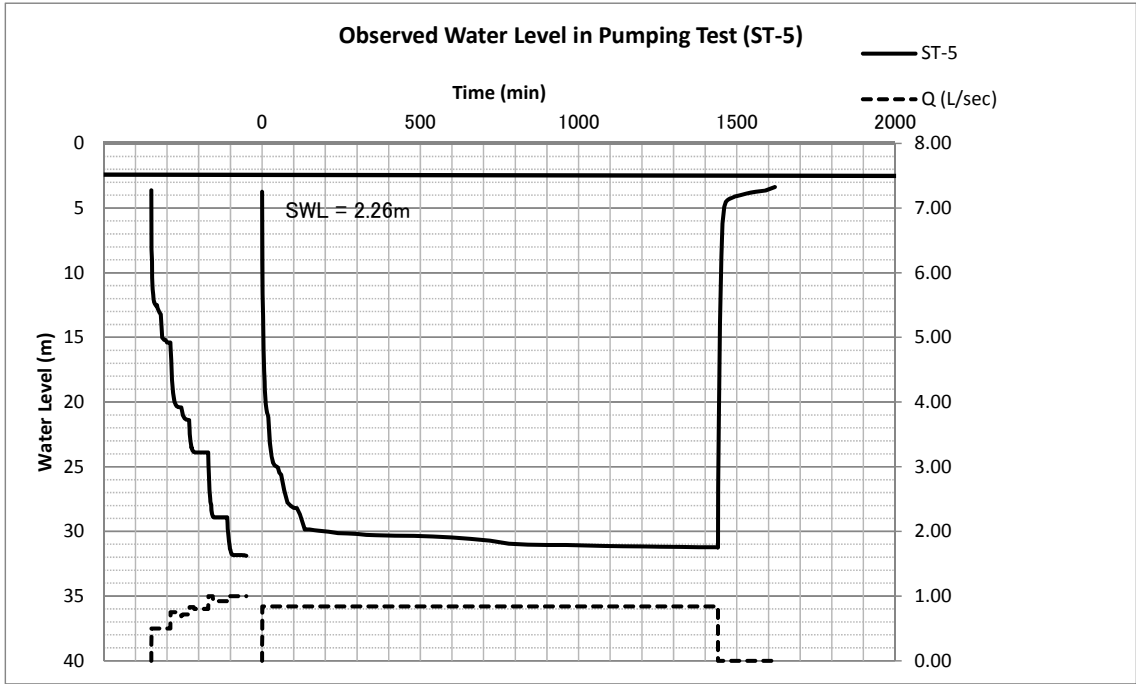


Figure A6-1-45 Drawdown water level observed in pumping test (ST-5)

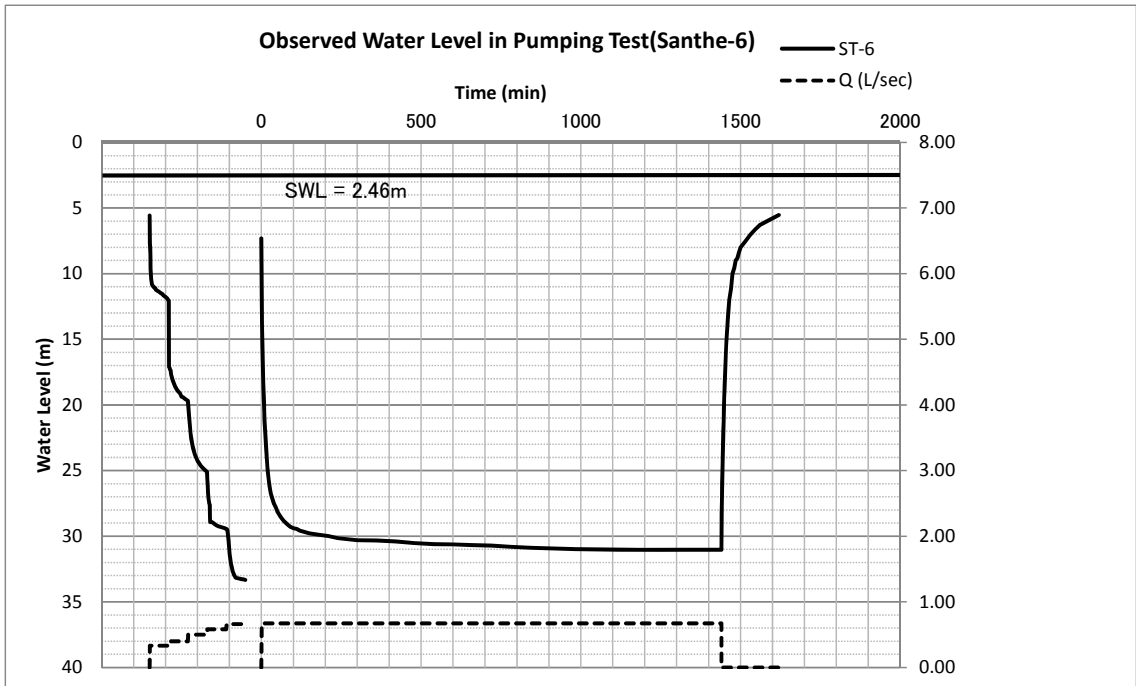


Figure A6-1-46 Drawdown water level observed in pumping test (ST-6)

Sustainable Discharge from Each Borehole

Discharges for continuous pumping test are set as shown in Table A6-1-29 on the basis of the step drawdown tests shown in Table A6-1-30 and Figure A6-1-47 and A6-1-48. Through the continuous test, stable dynamic water levels are confirmed later part of 24 hour's pumping. On the basis of continuous pumping test, sustainable pumping rates are set as same as Table A6-1-29.

Table A6-1-29 Discharge for Continuous Pumping Test (Santhe)

	ST-1	ST-2	ST-3	ST-4	ST-5	ST-6
Discharge (L/sec)	2.00	2.00	2.00	1.00	0.84	0.67

Table A6-1-30 Step Drawdown Test (Santhe)

Santhe (ST-1) Q: Discharge, s: Drawdown

Step No	Time (Hours)	Q (L/sec)	s (m)	Q/s
1	1.50	1.67	8.68	0.19
2	1.50	2.00	12.25	0.16
3	1.50	2.22	14.95	0.15
4	1.50	2.50	18.12	0.14

Santhe (ST-4) Q: Discharge, s: Drawdown

Step No	Time (Hours)	Q (L/sec)	s (m)	Q/s
1	1.00	0.500	14.96	0.0334
2	1.00	0.667	22.86	0.0292
3	1.00	0.833	31.84	0.0262
4	1.00	1.000	39.68	0.0252
5	1.00	1.167	48.76	0.0239

Santhe(ST-2)

Step No	Time (Hours)	Q (L/sec)	s (m)	Q/s
1	1.50	1.67	8.16	0.20
2	1.50	2.00	11.39	0.18
3	1.50	2.35	14.14	0.17
4	1.50	2.56	16.23	0.16

Santhe(ST-5)

Step No	Time (Hours)	Q (L/sec)	s (m)	Q/s
1	1.00	0.500	13.14	0.0381
2	1.00	0.714	19.14	0.0373
3	1.00	0.800	21.64	0.0370
4	1.00	0.909	26.66	0.0341
5	1.00	1.000	29.62	0.0338

Santhe(ST-3)

Step No	Time (Hours)	Q (L/sec)	s (m)	Q/s
1	1.50	1.67	11.49	0.15
2	1.50	2.00	14.73	0.14
3	1.50	2.35	19.79	0.12
4	1.50	2.50	20.46	0.12

Santhe(ST-6)

Step No	Time (Hours)	Q (L/sec)	s (m)	Q/s
1	1.00	0.333	9.62	0.0343
2	1.00	0.400	17.22	0.0232
3	1.00	0.500	22.64	0.0221
4	1.00	0.583	26.98	0.0215
5	1.00	0.667	30.87	0.0214

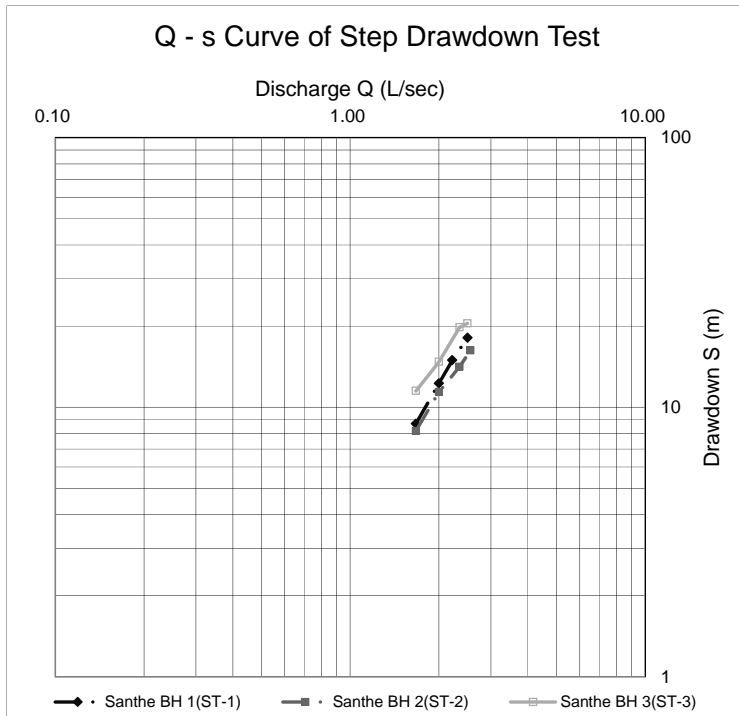


Figure A6-1-47 Discharge (Q)-Drawdown (s) in Step Drawdown Test (ST-1, ST-2, ST-3)

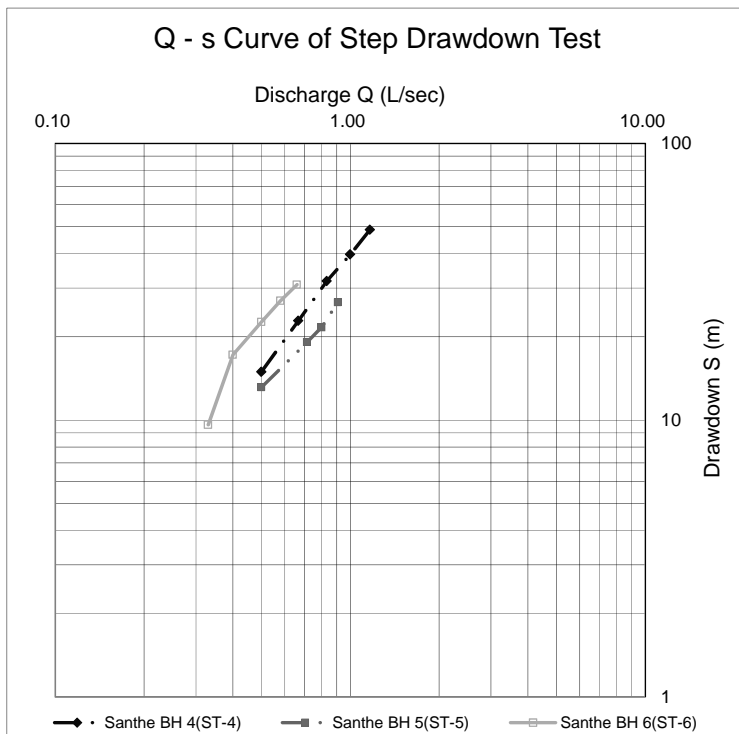


Figure A6-1-48 Discharge (Q)-Drawdown (s) in Step Drawdown Test (ST-4,ST-5,ST-6)

Mutual Interferences among the test boreholes in Mkanda

The team observed water levels at the test boreholes in addition to the pumping borehole, and tried to find the relation between interfered drawdown (s) and distance (d) from the pumping hole.

The observed drawdown in all boreholes at the end of continuous pumping test are shown in Table A6-1-31 included assumed drawdown at proposed points for ST-4 to ST-6 before drilling.

Through the pumping tests at ST-1, ST-2 and ST-3, the maximum interference, 0.56 m was observed at ST-3 against the pumping 2.0 l/sec at ST-1 which has minimum distance (101m) from ST-3.

The relation between drawdown (s) and distance (r) was found as

$$s = -0.58 \log(r) + 1.61$$

in average of three pumping tests under the condition of Q = 2.0 l/sec. And no drawdown should be found at a distance over 600m.

Test boreholes ST-4, ST-5 and ST-6 were drilled keeping distances about 300m or more each other and distances more than 574m to the existing test boreholes. The interferences from the new boreholes to the existing boreholes were more than expectation due to the low yield and deep drawdown in pumping holes.

The total mutual interference was estimated less than 7.5 % of drawdown in each pumping borehole.

Table A6-1-31 Interfered Drawdown observed in pumping test for additional test boreholes

Unit: m

Observation Hole \ Pumping Hole	ST-1	ST-2	ST-3	ST-4	ST-5	ST-6
ST-1(Q=2.0 l/s)	13.95	0.08	0.27	0.00	0.00	0.00
(Distance, m)	0	298	230	778	876	1082
ST-2(Q=2.0 l/s)	0.21	12.18	0.56	0.01	0.00	0.00
(Distance, m)	298	0	101	582	605	884
ST-3(Q=2.0 l/s)	0.27	0.34	15.63	0.01	0.00	0.00
(Distance, m)	230	101	0	574	646	880
ST-4(Q=1.0 l/s)	0.06	0.08	0.20	35.97	0.01	0.21
(Distance, m)	778	582	574	0	298	306
ST-5(Q=0.8 l/s)	0.06	0.08	0.06	0.08	28.80	0.17
(Distance, m)	876	605	604	298	0	423
ST-6(Q=0.67 l/s)	0.02	0.04	0.07	0.35	0.00	28.57
(Distance, m)	1082	884	880	306	423	0
Total drawdown interfered (si)	0.62	0.62	1.16	0.45	0.18	0.41
Total drawdown (dd)	14.57	12.80	16.79	36.42	28.98	28.98
Rate of interference si/(dd-si) (%)	4.4	5.0	7.4	1.3	0.6	1.4

*figures in highlighted columns are assumed before drilling with following relation between s-r
 Drawdown: $s = -0.58 \log(r) + 1.61$ r: distance between boreholes (m)

(4) Water Quality Test

Table A6-1-32 shows the result of water quality test for borehole water sampled after developing up the borehole (October, 2010). Comparing to Malawi Standards (MS 214: 2005 for treated drinking water), the values of fluoride, iron, turbidity, faecal coliform and faecal streptococci are exceeded each standards.

The standard value for iron is set against corrosion of iron pipes, colouring on washed cloths, unpleasant test so on, but not based on affection to health. WHO recommended the limit as 0.3 mg/l, and the results of the test are lower than the WHO standard. For fluoride and iron, as the exceeded samples are one each against 6 samples, the mixed water source from all boreholes will not be exceeded the standards. Turbidity was detected from the samples collected just after the development of borehole and more clean water was confirmed with eyes at the time of pumping test. The periodical checking on turbidity is required as same as other parameters, though reducing turbidity can be expected after longer pumping. The counts of faecal streptococci and faecal coliform are in a range which can be treated with minimum disinfection with chlorine.

Table A6-1-32 Water Quality Test for Borehole Water (Santhe)

LAB No. (Sample No.)	MS 214:2005	764 (ST-1)	762 (ST-2)	763 (ST-3)	493 (ST-4)	494 (ST-5)	495 (ST-6)
Date Sampled		09/11/'10	06/11/'10	07/11/'10	12/07/'11	12/07/'11	12/07/'11
Season		Late Dry	Late Dry	Late Dry	Early Dry	Early Dry	Early Dry
pH Value	5.0-9.5	7.73	6.22	7.59	7.82	7.2	7.44
Conductivity (µS/cm)	700-1500	430	340	410	480	460	485
Total Dissolved Solids (mg/l)	450-1000	215	178	207	271	248	255
Carbonate (as CO ₃ ²⁻) (mg/l)	-	18.8	0	19	28	2.0	4.0
Bicarbonate (as HCO ₃ ⁻) (mg/l)	-	193	194	170	204	258	248
Chloride (as Cl ⁻) (mg/l)	100-200	6.8	10.1	13.5	9.8	10.0	14.5
Sulphate (as SO ₄ ²⁻) (mg/l)	200-400	4.6	5.0	6.0	<0.10	<0.10	<0.10
Nitrate (as NO ₃ ⁻) (mg/l)	6.0-10.0	<0.001	<0.001	<0.001	0.165	0.076	0.058
Fluoride (as F ⁻) (mg/l)	0.7-1.0	0.61	0.58	0.60	1.39	0.83	0.05
Sodium (as Na ⁺) (mg/l)	100-200	30.7	17.9	23.7	12	7.0	13
Potassium (as K ⁺) (mg/l)	25-50	5.1	5.0	5.0	3.1	5.1	2.6
Calcium (as Ca ⁺⁺) (mg/l)	80-150	40	34	40	52	96	52
Magnesium (as Mg ⁺⁺) (mg/l)	30-70	9.7	9.7	9.0	21	26	20
Iron(Fe ⁺⁺) (mg/l)	0.01-0.2	0.466	0.003	0.083	0.276	0.093	0.265
Manganese (Mn ⁺⁺) (mg/l)	0.05-0.1	<0.01	<0.01	<0.01	-	-	-
Total Hardness (as CaCO ₃) (mg/l)	-	140	124	137	217	219	212
Total Alkalinity (as CaCO ₃) (mg/l)	-	189	159	171	214	215	210
Silica (as SiO ₂) (mg/l)	-	26	25	25	-	-	-
Turbidity (NTU)	0.1-1	2.7	<0.01	18.5	2.0	<0.01	<0.01
Suspended Solids (SS) (mg/l)	-	3.0	<0.10	18	<0.10	<0.10	<0.10
Faecal Coliform (/100 ml)	0 in 100ml	2	0	0	0	0	0
Faecal Streptococci (/100 ml)	0 in 100ml	4	0	0	0	0	0

4.3 Evaluation of Water Source for Water Supply

(1) Interference to Other Boreholes

The maximum interference was observed as 56 cm from one borehole to the other. The drawdown caused by the interference is correlative to the distance between the boreholes, and the above maximum drawdown is corresponding to about 3.6% of its own drawdown as pumping hole.

The maximum drawdown due to the mutual interference during simultaneous operation of 6 boreholes was estimated as 116 cm at borehole ST-3, and it is corresponding to 7.5% of its own drawdown. This is indicating the possibility that the dynamic water level in later dry season goes down to 21.5 m (bgl) which is below the top of screen pipe in ST-3. This dynamic water level is less than the level of the ultimate yield, though preferably not to be below the top of screen for sustainable pumping. It is recommended to observe the dynamic water level in late dry season and adjust the pump operation not to make the water level below 21 m in ST-3.

(2) Discharge Compared with Planned Water Supply Amount

The Team initially set a ceiling on the number of test boreholes as three for each market centre. For Santhe Market Centre, the team confirmed in 2010 that the discharge from 3 test boreholes can cover only a half of tentative planned water supply amount, though decided in 2011 to drill another 3 boreholes additionally to pursue the realisation of the Project.

The groundwater source which confirmed with 6 test boreholes is satisfied to a minimum requirement on quality and quantity for supplying piped water to Santhe Market Centre. The water quality is not necessary to be treated other than chlorination and the quantity is just as same as the planed water supply amount for Santhe Market Centre.

The planned service population in Santhe Market Centre is estimated as 7,485 (5,432 (in 2008)@growth rate 2.7 %/year), and the planned water supply amount is 712 m³/day as maximum daily as shown in Table A6-1-33.

As the total daily discharge from six boreholes is expected as 714 m³/day, the discharge can cover the planned water supply amount with operation of all boreholes. As the discharge is merely adequate volume to cover the planed water supply, it shall be considered to construct additional boreholes as standby against the stopping pump for maintenance service or with an incidental breakdown.

Table A6-1-33 Tentative Planned Water Supply to Santhe Market Centre

Item	Plan	Remarks
1. Service Population (person)	7,485	2020
2. Per capita consumption in average (lcd)	57.1	For domestic *1
3. Daily domestic water consumption (m ³ /day)	427	1×2÷1000
4. Public water (m ³ /day)	107	3×25% *2
5. Demands in total (m ³ /day)	534	3+4
6. Daily water supply amount in average (m ³ /day)	593	5÷(1-0.10) *3
7. Daily maximum water supply (m ³ /day)	712	6×1.2

* 1: daily consumption per capita $36 \times 30\% + 50 \times 43\% + 80 \times 20\% + 125 \times 7\% = 57.1$ lcd

Calculated based on the specified unit rates by the housing categories shown in Table A6-1-34

*2: "25%" is an anticipated rate against domestic water, in the normal range adopted in Malawi

*3: "0.10" is an anticipated leakage ratio.

Table A6-1-34 Daily consumption per capita and population rate by each classification (Santhe)

Classification	Daily consumption per capita (lcd)	Population rate
Traditional Housing Area	36	30%
High Density Housing Area	50	43%
Medium Density Housing Area	80	20%
Low Density Housing Area	125	7%

***6- 2 WATER QUALITY TEST
(EXISTING WATER SUPPLY FACILITIES)***

Water quality test for the existing water supply facilities

The results of water quality tests which were carried out for the existing water supply facilities in and around the targeted Market Centres are shown in A6-2-1.

Table A6-2-1 Water quality test result of existing water supply facilities around market centre

LAB No.	Namitete/Chileka						Santhe				Mkanda		
	687	688	686	685	684	717	718	719	721	720	708	707	
DATE SAMPLED	07/10/2010	07/10/2010	07/10/2010	07/10/2010	07/10/2010	10/10/2010	10/10/2010	10/10/2010	10/10/2010	10/10/2010	09/10/2010	09/10/2010	
SOURCE TYPE/LOCATION	Chileka Admarc T/A Kalolo	Chileka Market T/A Kalolo	Namitete Secondary School T/A	Namitete Secondary School in the kitchen T/A Kalolo	Namitete Market at Namitete T/A Kalolo	Chipozza TC T/A Santhe	Chipozza TC at Mps House T/A Santhe	Chigodi CDSS T/A Santhe	Traditional Authority's House T/A Santhe	Santhe FP School T/A Santhe	Mkanda TC Near Post Office BH T/A Mkanda	Mkanda Secondary School BH T/A Mkanda	
pH Value	7.56	7.71	7.67	7.68	6.09	6.78	7.23	7.45	6.99	7.36	7.39	7.42	
CONDUCTIVITY ($\mu\text{S/cm}$ at 25°C)	233	257	262	277	333	475	422	324	388	532	310	506	
TOTAL DISSOLVED SOLIDS, mg/l	117	129	133	139	172	250	221	167	181	270	156	267	
CARBONATE (as CO_3^{2-}), mg/l	9.6	14.4	10	11	0	0	0	0	0	0	0	0	
BICARBONATE (as HCO_3^-), mg/l	112	98	95	102	123	277	244	190	200	275	110	315	
CHLORIDE (as Cl ⁻), mg/l	3	11.9	11.9	8.9	11.9	11.9	11.9	7.4	8.9	23.8	35.7	7.4	
SULPHATE (as SO_4^{2-}), mg/l	0.8	1.01	5.7	12.7	38.5	1.1	<0.01	<0.01	<0.01	<0.01	<0.01	0.2	
NITRATE (as NO_3^-), mg/l	0.119	1.762	1.348	1.15	0.845	0.12	0.925	0.155	0.07	0.154	0.806	0.023	
FLUORIDE (as F ⁻), mg/l	0.58	0.65	0.69	0.69	0.63	0.68	0.7	0.64	0.69	0.54	0.58	0.6	
SODIUM (as Na ⁺), mg/l	14.9	13.4	16.9	8.4	21.7	28.6	30.8	13.8	18.8	36.5	16	36.7	
POTASSIUM (as K ⁺), mg/l	4.9	4.3	2.2	3.4	3.9	7.9	8.1	7.4	8.6	7.8	3.4	3.9	
CALCIUM (as Ca ⁺⁺), mg/l	18	22	25	31	27	54	40	34.4	38.4	60	29	55	
MAGNESIUM (as Mg ⁺⁺), mg/l	7.8	6.7	6.8	7.9	9.7	8.7	9.7	10.4	10.4	9.5	10	9.7	
IRON (Fe ⁺⁺), mg/l	0.015	0.178	0.082	0.051	0.104	0.039	0.153	0.267	0.047	0.121	0.017	0.105	
MANGANESE (Mn ⁺⁺), mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
TOTAL HARDNESS (as CaCO ₃), mg/l	77	82	90	110	107	170	140	129	138	189	113	177	
TOTAL ALKALINITY (as CaCO ₃), mg/l	108	103	94	101	100	227	200	155	164	225	90	258	
SILICA (as SiO ₂), mg/l	38	32	28	31	31	33	32	30	29	35	37	19	
TURBIDITY, NTU	0.2	0.4	0.1	0	0.5	0	0.2	0.5	0	2	0.2	0.5	
SUSPENDED SOLIDS, mg/l	0	0	0	0	0	0	0	0	0	1	0	0	
FAECAL COLIFORM, Count/100 ml	100	60	40	100	90	40	20	170	50	100	220	60	
FAECAL STREPTOCOCCI, Count/100 ml	10	0	0	0	10	10	0	70	0	30	40	0	

6- 3 SOCIAL CONDITION SURVEY FOR MARKET CENTER

1. Scale of interview

Table A6-3-1 Number of surveyed household and population

No.	Community/Market Centre	Population/HH	Target HH	Leader of Centre
1	Santhe Market Centre	3,210/ 535	50	2
2	Mkanda Market Centre	5,381/ 896	51	1
3	Namitete Market Centre	2,991/ 748	50	1
4	Chileka Market Centre	2,344/ 586	51	1
TOTAL			202	5

*HH: Household

2. Result of interview (Market centre leaders)

Table A6 -3-2 Number of Institutions(Schools)

Market Centre	No. of primary schools	No. of Total Students	No. of secondary school	No. of Secondary School Day Attendance	No. of Secondary School Boarding Attendance
Namitete	1	716	1	477	239
Chileka	1	591	1	591	-
Santhe	1	423	1	423	-
Mkanda	1	397	1	397	-

Table A6-3-3 Number of Institutions(Health Centre)

Market Centre	No. of Health Centre	No. of Outpatients per day	No. of Hospitals	No. of Inpatients per day
Namitete	0	N/A	0	N/A
Chileka	1	103	0	-
Santhe	1	67	0	N/A
Mkanda	1	59	0	N/A

Table A6- 3-4 Existence of water committee in Market Centre

Market Centre	No. of WPC
Namitete	Yes
Chileka	Yes
Santhe	Yes
Mkanda	Yes

Table A6-3-5 Water supply infrastructure in the Market Centre

Market Centre	No. of boreholes	No. of standpipes	No. of protected shallow wells
Namitete	1	0	0
Chileka	4	0	0
Santhe	1	0	1
Mkanda	1	0	0

Table A6-3-6 Need for rehabilitation of existing water facilities / Availability of spare parts

Market Centre	Needs for rehabilitation(Yes)	Needs for rehabilitation(No)	Distance to Shop to get Spare Parts (km)
Namitete	✓	N/A	0.2
Chileka	✓	N/A	0.2
Santhe	✓	N/A	0.2
Mkanda	✓	N/A	0.2

3. Result of interview (Market Centre Residents)

Table A6-3-7 Housing categories for the Market Centre

Market Centre	Housing Category	No. of Interviewees	Gender	
			Male	Female
Namitete	Low density	5	3	2
	Medium density	6	2	4
	High density (permanent)	20	2	18
	High density (traditional)	19	5	14
Chileka	Low density	16	4	12
	Medium density	14	7	7
	High density (permanent)	9	4	5
	High density (traditional)	12	2	10
Santhe	Low density	6	1	5
	Medium density	11	3	8
	High density (permanent)	14	6	8
	High density (traditional)	19	3	16
Mkanda	Low density	13	3	10
	Medium density	4	1	3
	High density (permanent)	14	3	11
	High density (traditional)	20	5	15

Table A6-3-8 Age of household (Interviewees) by number

Market Centre	1-20 years	21-40	41-60	61 over	child
Namitete	0	35	13	2	0
Chileka	2	28	15	6	0
Santhe	1	30	16	2	0
Mkanda	1	31	17	2	0
TOTAL	4	124	61	12	0

Table A6-3-9 Occupation of household by number

Market Centre	Employed	Pensioner	Business	Farmer	Other
Namitete	12	0	28	10	0
Chileka	16	2	5	23	5
Santhe	21	0	23	5	1
Mkanda	9	0	22	17	3
TOTAL	58	2	78	55	9

Table A6-3-10 Marital Status

Market Centre	Single	Married	Divorced	Orphaned
Namitete	0	47	3	0
Chileka	4	38	9	0
Santhe	2	45	3	0
Mkanda	1	43	7	0
TOTAL	7	173	22	0

Table A6-3-11 Family size on average

Market Centre	Household Size
Namitete	5.6
Chileka	5.0
Santhe	5.2
Mkanda	5.4
TOTAL	5.3

Table A6-3-12 Average household income and expenditure(on annual basis)

Market Centre	Housing Category	Annual income	Annual expenditure
Namitete	Low density	103,550.00	109,640.66
	Medium density	14,633.33	63,066.67
	High density (permanent)	148,310.00	136,322.65
	High density (traditional)	105,968.42	55,885.26
	AVERAGE	111,703.00	94,297.53
Chileka	Low density	152,562.50	64,486.00
	Medium density	183,642.86	113,758.28
	High density (permanent)	145,111.11	61,982.22
	High density (traditional)	54,500.00	36,686.83
	AVERAGE	136,705.88	71,028.90
Santhe	Low density	281,666.67	230,327.00
	Medium density	236,200.00	211,174.03
	High density (permanent)	118,285.71	76,392.85
	High density (traditional)	127,273.68	58,195.79
	AVERAGE	167,248.00	117,601.93
Mkanda	Low density	83,300.00	56,295.77
	Medium density	38,912.50	25,955.00
	High density (permanent)	146,057.14	81,746.43
	High density (traditional)	208,520.00	118,653.50
	AVERAGE	146,151.96	85,356.57

Table A6-3-13 Breakdown of annual household income

Market Centre	Housing Category	Employment	Agriculture	Small business	Large business	Pension	Transfer	Piece of work	Rents
Chileka	Low density	51,687.50	84,687.50	1,875.00	2,187.50	1,875.00	2,812.50	10,812.50	2,562.50
	Medium density	51,428.57	106,071.42	10,642.85	0.00	3,000.00	6,357.14	5,357.14	0.00
	High density (perm)	71,111.11	39,111.11	26,666.67	0.00	0.00	555.56	3,222.22	0.00
	High density (trad)	2,500.00	66,916.67	5,750.00	0.00	0.00	6,416.67	6,416.67	0.00
Namitete	Low density	0.00	17,200.00	71,910.00	0.00	0.00	1,000.00	480.00	0.00
	Medium density	3,666.67	5,000.00	4,000.00	0.00	0.00	1,166.67	0.00	800.00
	High density (perm)	55,330.00	25,050.00	64,800.00	0.00	0.00	575.00	1,680.00	1,175.00
	High density (trad)	9,473.68	421.05	92,242.10	0.00	0.00	157.89	3,673.68	0.00
Santhe	Low density	26,000.00	333.33	78,666.67	166,666.67	0.00	0.00	10,000.00	0.00
	Medium density	111,236.36	85,545.45	18,909.09	3,181.81	0.00	1,272.72	5,818.18	327.27
	High density (perm)	51,428.57	30,000.00	36,857.14	0.00	0.00	0.00	0.00	0.00
	High density (trad)	22,578.95	37,368.42	31,905.26	35,789.47	0.00	263.16	4,210.52	0.00
Mkanda	Low density	6,153.85	32,615.38	31,838.46	0.00	0.00	4,157.54	153.84	0.00
	Medium density	0.00	37,500.00	750.00	0.00	0.00	0.00	62.50	600.00
	High density (perm)	38,857.14	35,785.71	65,071.43	0.00	0.00	0.00	2,057.14	4,285.71
	High density (trad)	14,000.00	86,150.00	58,030.00	10,000.00	0.00	3,350.00	11,500.00	9,840.00

Table A6-3-14 Breakdown of annual household expenditure

Market Centre	Housing Category	water	electricity	House rent	tax	food	School fees	clothing	medical	farming	groceries	others
Namitete	Low density	10.00	3,600.00	9,760.00	3,600.00	52,640.00	6,660.00	7,500.00	636.66	26,140.00	384.00	0.00
	Medium density	0.00	4,000.00	3,200.00	2,400.00	34,333.00	4,750.00	2,000.00	3,133.33	5,333.33	4,000.00	0.00
	High density (perm)	0.00	6,650.00	6,330.00	0.00	62,730.00	4,140.00	4,850.00	1,381.75	25,202.50	14,558.40	0.00
	High density (trad)	0.00	0.00	6,210.52	0.00	25,710.52	2,210.52	3,500.00	1,378.94	4,789.47	11,690.52	421.05
	TOTAL	10.00	14,250.00	25,500.52	6,000.00	175,413.52	17,760.52	17,850.00	6,530.68	61,465.30	30,632.92	421.05
Chileka	Low density	2,079.75	0.00	6,500.00	0.00	19,250.00	6,250.00	2,500.00	1,062.50	14,937.50	17,156.25	525.00
	Medium density	3,729.71	357.14	571.42	0.00	61,571.43	4,071.42	2,571.42	1,485.71	3,285.71	38,785.71	0.00
	High density (perm)	615.56	166.67	15,666.67	0.00	58,444.44	8,733.33	4,611.11	266.67	13,255.56	18,333.33	0.00
	High density (trad)	1,503.50	0.00	0.00	0.00	17,833.33	583.33	2,083.33	2,033.33	3,275.00	10,208.33	0.00
	TOTAL	7,928.52	523.81	22,738.09	0.00	157,099.20	19,638.08	11,765.86	4,848.21	34,753.77	84,483.62	525.00
Santhe	Low density	25.00	1,572.00	122,900.00	0.00	22,000.00	1,125.00	5,833.33	2,166.67	6,333.33	30,000.00	0.00
	Medium density	1,118.18	4,857.45	7,363.63	2,105.84	100,963.63	16,592.72	14,036.36	8,481.81	20,545.36	34,454.36	4,545.45
	High density (perm)	0.00	3,571.42	9,728.57	0.00	33,428.57	2,928.57	8,071.42	1,821.42	3,928.57	16,071.42	0.00
	High density (trad)	739.47	3,157.89	1,200.00	157.89	27,463.16	5,271.05	2,936.84	1,642.10	5,442.10	11,561.57	1,631.58
	TOTAL	1,882.65	13,158.76	141,192.20	2,263.73	156,392.20	25,917.34	30,877.95	14,112.00	36,249.36	92,087.35	6,177.03
Mkanda	Low density	1.92	0.00	2,953.84	900.00	20,944.61	3,076.92	6,761.53	923.07	8,742.30	12,154.61	0.00
	Medium density	0.00	0.00	1,250.00	75.00	2,600.00	2,100.00	3,550.00	750.00	13,750.00	1,880.00	0.00
	High density (perm)	171.42	0.00	4,390.00	10.00	25,542.85	8,700.00	4,985.71	4,957.85	11,985.71	20,774.28	0.00
	High density (trad)	1,352.50	0.00	1,665.00	150.00	50,990.00	11,750.00	7,970.00	1,065.00	10,825.00	20,136.00	12,950.00
	TOTAL	1,525.84	0.00	10,258.84	1,135.00	100,077.46	25,626.92	23,267.24	7,695.92	45,303.01	54,944.89	12,950.00

Table A6-3-15 Water sources

Market Centre	Housing Category	boreholes		Protected shallow well		Unprotected shallow well		Stream or river		other	
		No.	%	No.	%	No.	%	No.	%	No.	%
Namtete	Low density	4	8.0	0	0	1	2.0	0	0.0	0	0.0
	Medium density	4	8.0	1	2.0	1	2.0	0	0.0	0	0.0
	High density (perm.)	16	32.0	3	6.0	1	2.0	0	0.0	0	0.0
	High density (trad.)	8	16.0	6	12.0	5	10.0	0	0.0	0	0.0
	TOTAL	32	64.0	10	20.0	8	16.0	0	0.0	0	0.0
Chileka	Low density	16	31.4	0	0.0	0	0.0	0	0.0	0	0.0
	Medium density	14	27.5	0	0.0	0	0.0	0	0.0	0	0.0
	High density (perm.)	9	17.6	0	0.0	0	0.0	0	0.0	0	0.0
	High density (trad.)	12	23.5	0	0.0	0	0.0	0	0.0	0	0.0
	TOTAL	51	100.0	0	0.0	0	0.0	0	0.0	0	0.0
Santhe	Low density	5	10.0	1	2.0	0	0.0	0	0.0	0	0.0
	Medium density	9	18.0	0	0.0	2	4.0	0	0.0	0	0.0
	High density (perm.)	6	12.0	6	12.0	1	2.0	1	2.0	0	0.0
	High density (trad.)	13	26.0	5	10.0	0	0.0	1	2.0	0	0.0
	TOTAL	33	66.0	12	24.0	3	6.0	2	4.0	0	0.0
Mkanda	Low density	3	5.8	4	7.8	4	7.8	2	3.8	0	0.0
	Medium density	3	5.8	1	2.0	0	0.0	0	0.0	0	0.0
	High density (perm.)	5	9.8	7	13.7	1	2.0	1	2.0	0	0.0
	High density (trad.)	8	15.9	5	9.8	6	11.8	1	2.0	0	0.0
	TOTAL	19	37.3	17	33.3	11	21.6	4	7.8	0	0.0

Table A6-3-16 Responses to the desire to have piped water

Market Centre	Housing Category	Yes		No		Not sure		TOTAL	Daily Water Consumption (Buckets/day on average)
		No.	%	No.	%	No.	%	No.	
Namtete	Low density	5	10	0	0	0	0	5	4.6
	Medium density	6	12	0	0	0	0	6	7.8
	High density (permanent)	20	40	0	0	0	0	20	5.9
	High density (traditional)	19	38	0	0	0	0	19	6.8
	TOTAL	50	100	0	0	0	0	50	6.4
Chileka	Low density	16	31	0	0	0	0	16	9.4
	Medium density	14	27.5	0	0	0	0	14	10.1
	High density (permanent)	9	17.6	0	0	0	0	9	7.6
	High density (traditional)	11	21.6	1	1.9	0	0	12	6.4
	TOTAL	50	98.1	1	1.9	0	0	51	8.6
Santhe	Low density	6	12	0	0	0	0	6	6.8
	Medium density	11	22	0	0	0	0	11	8.7
	High density (permanent)	14	28	0	0	0	0	14	10.1
	High density (traditional)	19	38	0	0	0	0	19	6.6
	TOTAL	50	100	0	0	0	0	50	8.1
Mkanda	Low density	13	25.5	0	0	0	0	13	6.5
	Medium density	4	7.8	0	0	0	0	4	9
	High density (permanent)	14	27.5	0	0	0	0	14	7.9
	High density (traditional)	18	35.3	2	3.9	0	0	20	6.9
	TOTAL	49	96.1	2	3.9	0	0	51	7.2

Table A6-3-17 Desire for a particular service option

Market Centre	Housing Category	House connection		Stand pipe		Communal points		TOTAL
		No.	%	No.	%	No.	%	No.
Namtete	Low density	1	2.0	1	2.0	3	6.0	5
	Medium density	2	4.0	1	2.0	3	6.0	6
	High density (permanent)	13	26.0	7	14.0	0	0.0	20
	High density (traditional)	4	8.0	2	4.0	13	26.0	19
	TOTAL	20	40.0	11	22.0	19	38.0	50
Chileka	Low density	2	3.9	11	21.5	3	5.8	16
	Medium density	2	3.9	12	23.5	0	0.0	14
	High density (perm.)	2	3.9	6	11.8	1	2.0	9
	High density (trad.)	0	0.0	6	11.8	6	11.8	12
	TOTAL	6	11.8	35	68.6	10	19.6	51
Santhe	Low density	3	6.0	2	4.0	1	2.0	6
	Medium density	4	8.0	7	14.0	0	0.0	11
	High density (perm.)	5	10.0	5	10.0	4	8.0	14
	High density (trad.)	4	8.0	8	16.0	7	14.0	19
	TOTAL	16	32.0	22	44.0	12	24.0	50
Mkanda	Low density	1	2.0	10	19.6	2	3.9	13
	Medium density	1	2.0	3	5.9	0	0.0	4
	High density (perm.)	6	11.8	3	5.9	5	9.8	14
	High density (trad.)	6	11.8	11	21.5	3	5.9	20
	TOTAL	14	27.5	27	52.9	10	19.6	51

Table A6-3-18 Willingness to pay for house connection or standpipe

Market Centre	Housing Category	Yes		No		Not sure		TOTAL
		No.	%	No.	%	No.	%	No.
Namtete	Low density	2	6.5	0	0.0	0	0.0	2
	Medium density	3	9.7	0	0.0	0	0.0	3
	High density (permanent)	17	54.8	1	3.2	2	6.5	20
	High density (traditional)	6	19.3	0	0.0	0	0.0	6
	TOTAL	28	90.3	1	3.2	2	6.5	31
Chileka	Low density	14	28.6	0	0.0	1	2.05	15
	Medium density	13	26.5	1	2.05	0	0.0	14
	High density (permanent)	8	16.3	0	0.0	0	0.0	8
	High density (traditional)	10	20.4	1	2.05	1	2.05	12
	TOTAL	45	91.8	2	4.1	2	4.1	49
Santhe	Low density	6	14.6	0	0.0	0	0.0	6
	Medium density	10	24.4	0	0.0	1	2.4	11
	High density (permanent)	12	29.3	0	0.0	0	0.0	12
	High density (traditional)	12	29.3	0	0.0	0	0.0	12
	TOTAL	40	97.6	0	0.0	1	2.4	41
Mkanda	Low density	11	26.2	1	2.4	1	2.4	13
	Medium density	3	7.1	0	0.0	1	2.4	4
	High density (permanent)	9	21.4	0	0.0	0	0.0	9
	High density (traditional)	11	26.2	3	7.1	2	4.7	16
	TOTAL	34	80.9	4	9.5	4	9.5	42

Table A6-3-19 Ability to pay (assessed on a monthly cost basis)

Market Centre	Housing Category	Yes		No		Not sure		TOTAL
		No.	%	No.	%	No.	%	No.
Namitete	Low density	2	6.5	0	0.0	0	0.0	2
	Medium density	3	9.7	0	0.0	0	0.0	3
	High density (permanent)	18	58.0	0	0.0	2	6.5	20
	High density (traditional)	5	16.1	1	3.2	0	0.0	6
	TOTAL	28	90.3	1	3.2	2	6.5	31
Chileka	Low density	11	22.4	0	0.0	4	8.2	15
	Medium density	13	26.5	0	0.0	1	2.0	14
	High density (permanent)	7	14.3	0	0.0	1	2.0	8
	High density (traditional)	9	18.4	1	2.0	2	4.1	12
	TOTAL	40	81.6	1	2.0	8	16.3	49
Santhe	Low density	4	9.8	0	0.0	2	4.9	6
	Medium density	9	21.9	0	0.0	2	4.9	11
	High density (permanent)	12	29.3	0	0.0	0	0.0	12
	High density (traditional)	9	21.9	1	2.4	2	4.9	12
	TOTAL	34	82.9	1	2.4	6	14.7	41
Mkanda	Low density	10	23.8	2	4.8	1	2.4	13
	Medium density	4	9.5	0	0.0	0	0.0	4
	High density (permanent)	8	19.1	0	0.0	1	2.4	9
	High density (traditional)	9	21.4	4	9.5	3	7.1	16
	TOTAL	31	73.8	6	14.3	5	11.9	42

Table A6-3-20 Reason for no desire to have house connection

Market Centre	Housing Category	Cannot afford		Satisfied with current supply		Not sure about the merits		TOTAL
		No.	%	No.	%	No.	%	No.
Namitete	Low density	0	0.0	0	0.0	0	0.0	0
	Medium density	2	10.5	0	0.0	1	5.2	3
	High density (perm.)	3	15.8	0	0.0	2	10.5	5
	High density (trad.)	4	21.0	1	5.2	6	31.6	11
	TOTAL	9	47.3	1	5.2	9	47.3	19
Chileka	Low density	5	14.3	1	2.8	5	14.3	11
	Medium density	3	8.6	3	8.6	5	14.3	11
	High density (perm.)	4	11.4	1	2.8	2	5.7	7
	High density (trad.)	1	2.8	1	2.8	4	11.4	6
	TOTAL	13	37.1	6	17.1	16	45.7	35
Santhe	Low density	3	11.1	0	0.0	0	0.0	3
	Medium density	4	14.8	0	0.0	0	0.0	4
	High density (perm.)	4	14.8	0	0.0	2	7.4	4
	High density (trad.)	8	29.6	1	3.7	5	18.5	14
	TOTAL	19	70.3	1	3.7	7	25.9	27
Mkanda	Low density	4	12.9	0	0.0	5	16.1	9
	Medium density	3	9.7	0	0.0	0	0.0	3
	High density (perm.)	2	6.4	0	0.0	5	16.1	7
	High density (trad.)	8	25.8	1	3.2	3	9.7	12
	TOTAL	17	54.8	1	3.2	13	41.9	31

Table A6-3-21 Ownership of the toilet

Market Centre	Individual		Communal		Rented		Not use toilet	
	No.	%	No.	%	No.	%	No.	%
Namitete	35	70.0	11	22.0	4	8.0	0	0.0
Chileka	43	84.3	3	5.9	5	9.8	0	0.0
Santhe	35	70.0	11	22.0	3	6.0	1	2.0
Mkanda	38	74.5	7	13.7	6	11.8	0	0.0

Table A6-3-22 Types of toilets

Market Centre	Traditional		Pit Lat with Sanplat		Improved Pit(VIP)		Flush	
	No.	%	No.	%	No.	%	No.	%
Namitete	43	86.0	6	12.0	1	2.0	0	0.0
Chileka	40	78.4	11	21.6	0	0.0	0	0.0
Santhe	35	70.0	12	24.0	3	6.0	0	0.0
Mkanda	49	96.1	2	3.9	0	0.0	0	0.0

Table A6-3-23 Sanitary facilities

Market Centre	Dish rack		Rubbish pit		Clothes line		kitchen		Bath shelter	
	No.	%	No.	%	No.	%	No.	%	No.	%
Namitete	13	9.0	31	21.5	32	22.2	33	23.0	35	24.3
Chileka	15	8.5	36	20.5	44	25.0	42	23.8	39	22.2
Santhe	12	7.3	34	20.7	36	22.0	43	26.2	39	23.8
Mkanda	10	6.6	29	19.1	37	24.3	38	25.0	38	25.0

Table A6-3-24 Illnesses related to water

Market Centre	Malaria		cholera		Diarrhea		Dysentery		Bilharzias	
	No.	%	No.	%	No.	%	No.	%	No.	%
Namitete	47	60.3	1	1.2	29	37.3	1	1.2	0	0.0
Chileka	50	59.5	0	0.0	33	39.2	1	1.2	0	0.0
Santhe	46	57.5	1	1.3	28	35.0	5	6.2	0	0.0
Mkanda	48	52.2	7	7.6	32	34.8	5	5.4	0	0.0

Table A6-3-25 Questionnaire (market centre residents)

Questionnaire for		Resident in Market Centre				Market Centre					
1. GENERAL	District/T.A.	E.A No			Name of Market Centre						
	Respondent Name	Sex	Male	Female	Date	... / . /2010	Time	...	Interviewer		
2. HOUSEHOLD CHARACTERISTICS	1	Housing Category	[1] Low density	[2] Medium density	[3] High density (permanent house)	[4] High density (traditional house)					
	2	the gender of the household (HH) head	[1] Male	[2] Female							
	3	the age of the Householed head	[1] 1-20 yrs old	[2] 21-40 yrs old	[3] 41-60 yrs old	[4] 61 and above	[5] Child				
	4	the Occupation of the HH head	[1] Employed	[2] Pensioner	[3] Business	[4] Farmer	[5] Other (specify)				
	5	the highest education level of the HHH	[1] Primary Standard 1-8	[2] Secondary Form 1-2	[3] Secondary Form 3-4	[4] Tertiary Education					
	6	the marital status of the HHH	[1] Single	[2] Married	[3] Divorced/ Separated/ Widowed	[4] Orphaned					
	7	Total number of people in the family	Male:	Female:	Total						
	8	Goods owned by anyone in the HH	[1] Operational Radio	[2] Bicycle	[3] Television	[4] Car	[5] Other (specify)				
3. HOUSEHOLD INCOME	9	How much did the Householed earn in the past 12 month?	[1] Employment	[2] Agriculture	[3] Small Business	[4] Large Business	[5] Pensions				
			[6] Transfers	[7] Piece work	[8] Rents	[9] Other	[10] TOTAL			0	
	10	How much does the Household spend on the following in a year?	[1] Water	[2] Electricity	[3] House Rent	[4] Tax	[5] Food				
			[6] School Fees	[7] Clothing	[8] Medical Costs	[9] Farming	[10] Groceries				
4. WATER SITUATION AND REMAND	11	Main source of water for the Hh presently	[1] Borehole with Handpump	[2] Protected Shallow Well	[3] Unprotected Shallow Well	[4] Stream/River	[5] Other (specify)				
	12	Water consumption per day for your family	[1]	buckets/day							
	13	Do you desire to have piped water system in the area?	[1] Yes	[2] No	[3] Not sure						
	14	What type of water connection would you prefer?	[1] House Connection	[2] Standpipe (yard connection)	[3] Communal Water Point						
	<p>***** Attention !! The following question 15 and 16 are only for the interviewees answered (1) House Connection and (2) Standpipe (Yard connection).</p>										
	15	Are you willing to pay for water services?	[1] Yes	[2] No	[3] Not sure						
	<p>***** Attention !! For Enumerator>>> Calculate the monthly cost for water consumption for this household. Monthly Cost= (XX buckets/day-from the question 12) * 1.8 * 30 days + 67 as service charge. Then ask the next question!!</p>										
	16	In your case, you will need XXX K per month (you can get the figure from your calculation) with initial deposit as about 1,000 K. Do you still think that you afford to pay for the amount?	[1] Yes	[2] No	[3] Not sure						
	REFERENCE	Example of Water Tariff (other Market Centre) K. /m3 (K. /20 litres)	92 (1.8)	House Connection (Individuals)	148 (3.0)	Institutions, Commercial	52 (1.0)	Communal Water Point	<p>For Individual connection, the minimum monthly charge is K. 324 if the consumption is less than 4 m3 (200 buckets of water, equivalent to 7 buckets per day in average). At Communal Water Point, the price of water selling will be more than MK 1.0 per bucket due to commission to a tap attendant and/or management cost for Water Users' Association.</p>		
		Service Charge K. /Month	67 - 178	High density - Med. / Low Density Houses	625	Institutions, Commercial		Deposit at initial connection	1,018 - 1,528 - 3,126	High density - Med / Low density - Institutions / Commercial	
<p>***** Attention !! The following question 17 is only for the interviewees answered (2) or (3) on question 14 about water connection desire.</p>											
17	Reason of no desire (or unsure) to install house connection of water system	[1] Cannot afford the cost	[2] Satisfied with current water supply	[3] Not sure about merits of house connection	[4] Other (specify)						
18	How far is (are) the water source(s) from your house in minutes (Walking, each way)?	[1] not more than 5 min	[2] 6-15 min	[3] 16 - 30 min	[4] 31 - 60 min	[5] more than 1 hour					
5. HEALTH AND HYGIENE	19	Owner of toilet	[1] Individual	[2] Communal	[3] Rents	[4] not use toilet					
	20	Type of Toilet	[1] Traditional pit latrine	[2] Pit latrine with Sanplat	[3] Improved pit latrine (VIP)	[4] flush					
	21	Which of the following sanitary facilities do you have?	[1] Dish rack	[2] Rubbish pit	[3] Clothes line	[4] Kitchen	[5] Bath shelter				
	22	Did you or someone else from this household visit a clinic last 3 months?	[1] Yes	[2] No							
	23	If YES, who, how many times and why visit clinic?	Who	age	times	why					
24	In your opinion, what are the most common diseases in this market centre?	[1] Malaria	[2] Cholera	[3] Diarrhoea	[4] Dysentery	[5] Common Cold					
		[6] TB	[7] HIV/AIDS	[8] Bilharzias	[9] Others (specify)						
		the 1st	the 2nd	the 3rd	the 4th						

Table A6-3-26 Questionnaire (market centre leaders)

Questionnaire for Leader of Market Centre												
District/T.A.		E.A No.		Name of Market Centre								
Name		Title		Date	Interviewer							
Market Leader / Officer in charge (District Assembly)	Population	Enumeration Area at the census		Number of Households	Men	Women	Total	Change after Census 2008				
	Evolution		Year 2000	Year 2005	Year 2008	Year 2009	Year 2010 (HH)					
	Population by age		0-9 years old	10-19 years old	20-49 years old	more than 50 years old						
	Infrastructure/ Facilities	Education	1. Primary school (day) <input type="checkbox"/> Yes <input type="checkbox"/> No		Water source			Number of students				
			2. Primary school (boarding) <input type="checkbox"/> Yes <input type="checkbox"/> No		Water source			Number of students				
			1. Secondary school (day) <input type="checkbox"/> Yes <input type="checkbox"/> No		Water source			Number of students				
2. Secondary school (boarding) <input type="checkbox"/> Yes <input type="checkbox"/> No			Water source			Number of students						
Health services		1. Health Centre <input type="checkbox"/> Yes <input type="checkbox"/> No		Water Source/ # beds	2. Hospital <input type="checkbox"/> Yes <input type="checkbox"/> No (Name:)		Water Source	Number of bed				
Other Institutions	ADMARC	Water Source	Users	Post Office	Water users	Police	Water users	Other Institution				
* Please Draw a map of the Market Centre with institutions and house distribution.												
Any Committee related to "Water and Sanitation" covering Market Centre	Water point Committee in Market Centre	Establishment	<input type="checkbox"/> No --> Plan for establishment: <input type="checkbox"/> Yes (expected date:) <input type="checkbox"/> No (reason:)									
			<input type="checkbox"/> Yes --> Year of establishment:		Member : Men , Women		Way of establishment: <input type="checkbox"/> elected <input type="checkbox"/> designated					
		Members: <input type="checkbox"/> Chairperson, <input type="checkbox"/> Vice-CP, <input type="checkbox"/> Secretary, <input type="checkbox"/> Treasurer, <input type="checkbox"/> Pump caretaker, <input type="checkbox"/> Other () Year of last member change										
		Replaced members: <input type="checkbox"/> Chairperson, <input type="checkbox"/> Vice-CP, <input type="checkbox"/> Secretary, <input type="checkbox"/> Treasurer, <input type="checkbox"/> Pump caretaker, <input type="checkbox"/> Other ()						Reason:				
		Request for the construction of water facility		<input type="checkbox"/> requested (month/year) <input type="checkbox"/> No (reason:)		Type of requested facility: <input type="checkbox"/> piped water,		To which institution?		<input type="checkbox"/> Regional Water Board, <input type="checkbox"/> District, <input type="checkbox"/> T.A. , <input type="checkbox"/> Others ()		
	Operation and Maintenance Charge for water	Willingness to pay the fee: <input type="checkbox"/> Yes <input type="checkbox"/> No (reason:)										
		Way of collection	<input type="checkbox"/> Decided <input type="checkbox"/> Not yet		Way of payment	<input type="checkbox"/> Per volume (MK/20 litres), <input type="checkbox"/> Fixed monthly fee (MK/HH/month)						
		Willingness of preparatory contribution (10,000 MK)				<input type="checkbox"/> Yes <input type="checkbox"/> No						
		Willingness to open a bank account: <input type="checkbox"/> Yes <input type="checkbox"/> No (Reason:)										
		Place of safekeeping of the money collected:				<input type="checkbox"/> Treasurer (in house) <input type="checkbox"/> Bank <input type="checkbox"/> Post office <input type="checkbox"/> Church <input type="checkbox"/> Other ()						
General Situation of the Market Centre	Market Organization	Name of the existing organizations		1	2	3	4					
		Active? (Yes (Y) or No (N))										
		Collective fund management? (Yes (Y) or No (N))										
		Management of Collective fund (saving)		<input type="checkbox"/> in the village <input type="checkbox"/> Bank <input type="checkbox"/> Post Office <input type="checkbox"/> Church <input type="checkbox"/> Other ()								
		Experience of working with external organizations such as NGO		<input type="checkbox"/> Yes <input type="checkbox"/> No (Name of the organization and Sector of activities:)								
	Security		Security situation (robbery, theft) in the village:		<input type="checkbox"/> Very safe <input type="checkbox"/> Safe <input type="checkbox"/> not really <input type="checkbox"/> bad (reason:)							
Water supply facilities and others	Existing facilities	Infrastructure of water supply in the market centre under functioning: boreholes-() places, standpipe-() places, protected shallow wells-() places										
		Needs of rehabilitation <input type="checkbox"/> Yes (parts/ pump/ development/ drilling) <input type="checkbox"/> No		Spar Parts	Available at distance of km		available parts:					
		Failure/ Repair history										
	Failure (1)(cause: , month/year ____/____), Failure (2) (cause: , month/year ____/____)											
	Repair (repaired by : , month/year ____/____, costs: MK)											
Maintenance (dismantled by: , times/year, recent replacement of parts: in (Month/Yr) : /)												
Hygiene	Toilet utilization: _____% of residents			Number of toilets in the Market Centre: _____places in the M/C								
	Garbage pits: _____places in the Market Centre			Cleanness in the M/C (observation)		<input type="checkbox"/> very clean <input type="checkbox"/> clean <input type="checkbox"/> normal <input type="checkbox"/> slightly dirty <input type="checkbox"/> dirty						

Table A6-3-27 List of survey result (market centre residents)

General	HH characteristics			HH income		Water situation and demand							Health and hygiene							
	Market centre category	Occupation HH head	Highest education level HH head	No. of family	Income per year	Expense per year	Main source of water	Water use bucket /day	desire to have piped water	type of water connection you prefer	willingness to pay	afford to pay	Reason of no desire to install house connection	water source from house	Owner of toilet	Type of toilet	most common diseases in this market center			
																	1st	2nd	3rd	4th
1	Chileka MD	Employed	Secondary form 3-4	5	255,000	105,000	BH with HP	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Chileka HD(PH)	Employed	Tertiary education	5	120,000	24,700	BH with HP	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Chileka MD	Employed	Secondary form 3-4	5	136,000	10,000	BH with HP	10	Yes	SP(YC)	Yes	Yes	N/A	16-30 min not more than 5 min	Individual	PLS	Malaria	Common Cold	Diarrhoea	Dysentery
4	Chileka HD(PH)	Farmer	Secondary form 3-4	5	97,000	63,000	BH with HP	9	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Individual	PLS	Malaria	Diarrhoea	Common Cold	HW/AIDS
5	Chileka HD(PH)	Business	Secondary form 3-4	7	90,000	43,000	BH with HP	7	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Individual	PLS	Malaria	Common Cold	Diarrhoea	Bilharzias
6	Chileka LD	Other	N/A	3	10,000	10,000	BH with HP	4	Yes	SP(YC)	Yes	not sure	Cannot afford the cost	not more than 5 min	Individual	TPL	Malaria	HW/AIDS	N/A	N/A
7	Chileka LD	Farmer	Primary Standard 1-8	7	70,000	40,000	BH with HP	8	Yes	CWP	Yes	not sure	N/A	6-15 min not more than 5 min	Individual	TPL	Malaria	TB	Common Cold	N/A
8	Chileka LD	Farmer	Tertiary education	7	500,000	400,000	BH with HP	10	Yes	HC	Yes	not sure	N/A	not more than 5 min	Individual	TPL	Malaria	Common Cold	N/A	N/A
9	Chileka MD	Farmer	N/A	8	80,000	35,000	BH with HP	8	Yes	HC	Yes	not sure	N/A	16-30 min	Individual	TPL	Malaria	Common Cold	N/A	N/A
10	Chileka LD	Farmer	Secondary form 1-2	6	25,000	50,000	BH with HP	8	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	16-30 min	Individual	TPL	Malaria	HW/AIDS	Common Cold	N/A
11	Chileka LD	Farmer	Primary Standard 1-8	3	54,000	10,000	BH with HP	5	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	16-30 min	Individual	TPL	Common Cold	Malaria	Diarrhoea	N/A
12	Chileka LD	Farmer	Secondary form 1-2	4	5,000	-	BH with HP	4	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	16-30 min	Individual	TPL	Malaria	Common Cold	Diarrhoea	N/A
13	Chileka LD	Employed	Secondary form 3-4	2	130,000	30,000	BH with HP	12	Yes	CWP	Yes	not sure	Not sure about merits of house	not more than 5 min	Communal	TPL	Malaria	Common Cold	N/A	N/A
14	Chileka MD	Employed	Secondary form 3-4	2	-	-	BH with HP	8	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	16-30 min	Individual	TPL	Malaria	Common Cold	N/A	N/A
15	Chileka HD(TH)	Other	Primary Standard 1-8	4	-	-	BH with HP	8	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	31-60 min	Individual	TPL	Malaria	Common Cold	HW/AIDS	N/A
16	Chileka LD	Employed	Tertiary education	3	180,000	21,000	BH with HP	5	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	PLS	Malaria	Diarrhoea	N/A	N/A
17	Chileka HD(TH)	Farmer	Secondary form 1-2	5	30,000	10,000	BH with HP	7	Yes	HC	Yes	Yes	Not sure about merits of house	16-30 min	Individual	TPL	Malaria	Common Cold	HW/AIDS	N/A
18	Chileka LD	Employed	Secondary form 3-4	5	23,000	16,000	BH with HP	5	Yes	SP(YC)	Yes	Yes	N/A	31-60 min not more than 5 min	Rents	TPL	Diarrhoea	Common Cold	Malaria	N/A
19	Chileka LD	Employed	Secondary form 3-4	7	435,000	30,000	BH with HP	7	Yes	SP(YC)	Yes	Yes	N/A	not more than 5 min	Rents	TPL	Common Cold	Malaria	HW/AIDS	N/A
20	Chileka HD(PH)	Business	Secondary form 3-4	6	120,000	15,000	BH with HP	10	Yes	HC	Yes	Yes	N/A	6-15 min not more than 5 min	Individual	PLS	Malaria	HW/AIDS	Common Cold	N/A
21	Chileka HD(TH)	Employed	Secondary form 3-4	5	30,000	15,000	BH with HP	4	No	SP(YC)	No	No	Cannot afford the cost	not more than 5 min	Rents	TPL	Malaria	Common Cold	HW/AIDS	N/A
22	Chileka HD(TH)	Business	Secondary form 3-4	6	80,000	8,000	BH with HP	6	Yes	HC	Yes	Yes	Not sure about merits of house	6-15 min	Individual	TPL	Malaria	Common Cold	N/A	N/A
23	Chileka HD(TH)	Employed	Secondary form 3-4	4	70,000	20,000	BH with HP	6	Yes	HC	Yes	Yes	N/A	31-60 min	Rents	TPL	Malaria	Common Cold	HW/AIDS	N/A
24	Chileka HD(PH)	Employed	Secondary form 3-4	3	100,000	30,000	BH with HP	5	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	6-15 min not more than 5 min	Individual	TPL	Malaria	Diarrhoea	TB	N/A
25	Chileka HD(TH)	Farmer	Primary Standard 1-8	5	55,000	54,988	BH with HP	8	Yes	SP(YC)	Yes	Yes	N/A	not more than 5 min	Individual	TPL	Common Cold	Malaria	Diarrhoea	N/A
26	Chileka HD(TH)	Farmer	Primary Standard 1-8	4	144,000	118,390	BH with HP	4	Yes	SP(YC)	Yes	not sure	N/A	6-15 min	Individual	TPL	Malaria	Diarrhoea	Common Cold	Others
27	Chileka HD(TH)	Farmer	Primary Standard 1-8	4	65,000	61,324	BH with HP	4	Yes	HC	Yes	Yes	N/A	31-60 min	Individual	TPL	Malaria	Diarrhoea	Common Cold	Others
28	Chileka MD	Farmer	Standard 1-8	3	129,000	135,200	BH with HP	10	Yes	SP(YC)	No	Yes	Cannot afford the cost	6-15 min not more than 5 min	Individual	TPL	Malaria	Diarrhoea	Common Cold	Others
29	Chileka MD	Employed	Secondary form 3-4	7	400,000	296,000	BH with HP	8	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	Common Cold	Others
30	Chileka MD	Pensioner	Standard 1-8	5	193,000	137,276	BH with HP	12	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Individual	TPL	Malaria	Common Cold	Diarrhoea	Others

General	HH characteristics				HH income		Water situation and demand							Health and hygiene					
	Housing category	Occupation HH head	Highest education level HH head	No. of family	Income per year	Expense per year	Main source of water	Water use bucket /day	desire to have piped water	type of water connection you prefer	willingness to pay	afford to pay	Reason of no desire to install house connection	water source from house	Owner of toilet	Type of toilet	most common diseases in this market center		
31	Chileka MD	Farmer	Standard 1-8 Primary	7	170,000	156,340	BH with HP	7	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	not more than 5 min	Individual	TPL	Malaria Common	Others	Diarrhoea
32	Chileka HD(TH)	Other	Standard 1-8 Primary	2	119,000	109,840	BH with HP	5	Yes	HC	Yes	Yes	N/A	not more than 5 min	Communal	TPL	Malaria Cold	Diarrhoea	Others
33	Chileka MD	Farmer	Standard 1-8 Primary	11	280,000	220,200	BH with HP	10	Yes	HC	Yes	Yes	N/A	6-15 min	Individual	TPL	Malaria	Diarrhoea	N/A
34	Chileka HD(TH)	Farmer	Standard 1-8 Tertiary	3	20,000	14,700	BH with HP	5	Yes	SP(YC)	Yes	not sure	Satisfied with current water	6-15 min	Individual	TPL	Malaria	Diarrhoea	N/A
35	Chileka HD(PH)	Employed	Secondary education	5	500,000	124,000	BH with HP	6	Yes	CWP	N/A	N/A	Not sure about merits of house	16-30 min	Individual	PLS	Malaria	HIV/AIDS	Diarrhoea
36	Chileka MD	Pensioner	Secondary form 1-2 Tertiary	7	84,000	60,000	BH with HP	9	Yes	SP(YC)	Yes	Yes	Satisfied with current water	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	N/A
37	Chileka LD	Farmer	Standard 1-8 Primary	6	130,000	61,000	BH with HP	20	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	not more than 5 min	Individual	TPL	Malaria	Others	N/A
38	Chileka LD	Farmer	Standard 1-8 Primary	4	26,000	15,500	BH with HP	10	Yes	SP(YC)	Not Sure	Yes	Not sure about merits of house	more than 1 hour	Individual	PLS	Malaria	HIV/AIDS	Diarrhoea
39	Chileka MD	Farmer	Standard 1-8 Primary	6	30,000	26,000	BH with HP	15	Yes	SP(YC)	Yes	Yes	Satisfied with current water	not more than 5 min	Individual	TPL	Malaria	Others	N/A
40	Chileka MD	Farmer	Standard 1-8 Primary	8	90,000	55,600	BH with HP	20	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	6-15 min	Individual	TPL	Malaria	Diarrhoea	N/A
41	Chileka MD	Other	Standard 1-8 Secondary	3	24,000	296,000	BH with HP	8	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	Others
42	Chileka LD	Employed	Tertiary education	4	193,000	137,276	BH with HP	12	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	Others
43	Chileka HD(PH)	Employed	Secondary form 3-4	11	140,000	133,600	BH with HP	7	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	Diarrhoea
44	Chileka HD(PH)	Employed	Secondary form 3-4	4	119,000	109,840	BH with HP	5	Yes	HC	Yes	Yes	N/A	not more than 5 min	Communal	TPL	Malaria Cold	Diarrhoea	Others
45	Chileka HD(TH)	Other	Standard 1-8 Primary	5	15,000	12,500	BH with HP	10	Yes	HC	Yes	Yes	N/A	6-15 min	Individual	TPL	Malaria	Diarrhoea	N/A
46	Chileka HD(PH)	Farmer	Secondary form 3-4	5	20,000	14,700	BH with HP	5	Yes	SP(YC)	Yes	not sure	Satisfied with current water	6-15 min	Individual	TPL	Malaria	Diarrhoea	N/A
47	Chileka LD	Farmer	Standard 1-8 Secondary	2	500,000	124,000	BH with HP	6	Yes	CWP	N/A	N/A	Not sure about merits of house	16-30 min	Individual	PLS	Malaria	HIV/AIDS	Diarrhoea
48	Chileka MD	Farmer	Secondary form 3-4	7	700,000	60,000	BH with HP	9	Yes	SP(YC)	Yes	Yes	Satisfied with current water	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	N/A
49	Chileka LD	Business	Primary form 3-4	3	130,000	61,000	BH with HP	20	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	not more than 5 min	Individual	TPL	Malaria	Others	N/A
50	Chileka HD(TH)	Business	Standard 1-8 Primary	4	26,000	15,500	BH with HP	10	Yes	SP(YC)	Not Sure	Yes	Not sure about merits of house	more than 1 hour	Communal	TPL	Malaria	HIV/AIDS	Diarrhoea
51	Chileka LD	Farmer	Secondary form 3-4	5	30,000	26,000	BH with HP	15	Yes	SP(YC)	Yes	Yes	Satisfied with current water	not more than 5 min	Individual	TPL	Malaria	Others	N/A
52	mkanda HD(TH)	Employed	Secondary form 3-4	5	415,000	408,200	P SW	5	Yes	CWP	N/A	N/A	Cannot afford the cost	not more than 5 min	Communal	TPL	Malaria	Others	N/A
53	mkanda HD(TH)	Business	Standard 1-8 Primary	14	255,000	215,500	UP SW	20	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	6-15 min	Individual	TPL	Malaria	Diarrhoea	N/A
54	mkanda HD(TH)	Farmer	Standard 1-8 Primary	6	240,000	202,000	UP SW	6	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	N/A
55	mkanda HD(TH)	Farmer	Standard 1-8 Primary	3	145,000	94,000	UP SW	5	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	N/A
56	mkanda HD(PH)	Business	Standard 1-8 Tertiary	7	350,000	125,200	BH with HP	12	Yes	HC	Yes	Yes	N/A	31-60 min	Individual	TPL	Malaria	Diarrhoea	Dysentery
57	mkanda HD(PH)	Employed	Primary education	7	216,000	93,700	P SW	10	Yes	HC	Yes	Yes	N/A	31-60 min	Individual	TPL	Malaria	Diarrhoea	N/A
58	mkanda HD(TH)	Business	Standard 1-8 Primary	6	216,000	221,400	UP SW	8	Yes	SP(YC)	Not Sure	not sure	Cannot afford the cost	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	N/A
59	mkanda LD	Farmer	Standard 1-8 Primary	3	80,000	39,000	P SW	6	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	6-15 min	Individual	TPL	Malaria	Others	N/A
60	mkanda LD	Employed	Secondary form 1-2	5	80,000	37,000	P SW	2	Yes	SP(YC)	Yes	Yes	Other	not more than 5 min	Individual	TPL	Malaria	Others	Cholera

General	HH characteristics			HH income		Water situation and demand						Health and hygiene								
	Market centre category	Occupation HH head	Highest education level HH head	No. of family	Income per year	Expense per year	Main source of water	Water use bucket /day	desire to have piped water	type of water connection you prefer	willingness to pay	afford to pay	Reason of no desire to install house connection	water source from house	Owner of toilet	Type of toilet	most common diseases in this market center			
																	1st	2nd	3rd	4th
61	mkanda	LD	Farmer	Primary Standard 1-8	4	90,000	64,000	UP SW	6	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	Individual	TP	Malaria	Common Cold	HIV/AIDS	N/A
62	mkanda	LD	Farmer	Secondary form 1-2	6	50,000	35,000	P SW	10	Yes	SP(YC)	Yes	No	Cannot afford the cost	Individual	TP	Malaria	Others	Cholera	N/A
63	mkanda	LD	Farmer	Secondary form 1-2	5	50,000	32,000	UP SW BH with HP	6	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	Individual	TP	Malaria	Others	Diarrhoea	Dysentery
64	mkanda	MD	Farmer	Standard 1-8	5	150,000	-	HP	10	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	Individual	TP	Malaria	Diarrhoea	HIV/AIDS	N/A
65	mkanda	LD	Business	Tertiary education	7	300,000	121,000	BH with HP	12	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	Individual	TP	Malaria	Diarrhoea	HIV/AIDS	N/A
66	mkanda	MD	Employed	Secondary form 3-4	7	-	31,300	BH with HP	7	Yes	HC	Yes	Yes	Cannot afford the cost	Individual	TP	Malaria	Cholera	Common Cold	N/A
67	mkanda	MD	Business	Secondary form 1-2	3	-	-	BH with HP	10	Yes	SP(YC)	Not Sure	Yes	Cannot afford the cost	Individual	TP	Malaria	Common Cold	HIV/AIDS	N/A
68	mkanda	LD	Farmer	Primary Standard 1-8	3	40,000	25,000	Stream/River	5	Yes	CWP	No	No	Cannot afford the cost	Individual	TP	Diarrhoea	Cholera	HIV/AIDS	N/A
69	mkanda	HD(TH)	Business	Secondary form 1-2	3	15,000	-	BH with HP	8	No	SP(YC)	No	No	Cannot afford the cost	Individual	TP	Cholera	HIV/AIDS	Malaria	N/A
70	mkanda	HD(TH)	Other	Primary Standard 1-8	7	-	-	Stream/River	4	Yes	HC	Yes	Yes	N/A	Individual	TP	HIV/AIDS	Cholera	TB	N/A
71	mkanda	LD	Farmer	Primary Standard 1-8	6	50,000	8,000	Stream/River	8	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	Rents	TP	Malaria	HIV/AIDS	Diarrhoea	N/A
72	mkanda	HD(PH)	Business	Primary Standard 1-8	3	20,000	4,000	Stream/River	6	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	Individual	TP	Diarrhoea	HIV/AIDS	Malaria	N/A
73	mkanda	LD	Business	Primary Standard 1-8	4	180,000	17,000	BH with HP	6	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	Individual	TP	HIV/AIDS	HIV/AIDS	Malaria	Diarrhoea
74	mkanda	HD(TH)	Business	Primary Standard 1-8	4	72,000	56,000	BH with HP	9	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	Communal	TP	Malaria	Common Cold	Diarrhoea	Dysentery
75	mkanda	HD(TH)	Other	Secondary form 3-4	2	-	12,500	UP SW BH with HP	2	Yes	SP(YC)	No	No	Cannot afford the cost	Communal	TP	Malaria	Common Cold	Dysentery	N/A
76	mkanda	HD(TH)	Farmer	Primary Standard 1-8	10	40,000	66,000	UP SW BH with HP	16	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	Communal	TP	Malaria	Common Cold	Diarrhoea	N/A
77	mkanda	HD(TH)	Farmer	Primary Standard 1-8	10	75,000	76,800	UP SW BH with HP	10	Yes	SP(YC)	No	No	Cannot afford the cost	Individual	TP	Malaria	Common Cold	Cholera	Diarrhoea
78	mkanda	HD(PH)	Employed	Primary Standard 1-8	6	100,000	19,000	BH with HP	9	Yes	HC	Yes	Yes	N/A	Individual	TP	Malaria	Diarrhoea	Others	N/A
79	mkanda	HD(TH)	Other	Standard 1-8	2	-	-	HP	6	Yes	HC	Not Sure	No	N/A	Individual	TP	Malaria	Diarrhoea	N/A	N/A
80	mkanda	HD(TH)	Business	Secondary form 1-2	6	100,000	39,000	P SW BH with HP	3	Yes	HC	Yes	not sure	N/A	Individual	PLS	Others	Malaria	N/A	N/A
81	mkanda	HD(TH)	Business	Standard 1-8	4	-	-	HP	10	No	N/A	N/A	N/A	N/A	Individual	TP	Malaria	Others	N/A	N/A
82	mkanda	HD(PH)	Business	Secondary form 1-2	4	40,000	45,000	P SW	5	Yes	CWP	N/A	N/A	Cannot afford the cost	Rents	PLS	Malaria	Diarrhoea	Others	N/A
83	mkanda	MD	Farmer	Primary Standard 1-8	6	5,650	72,520	P SW	6	Yes	SP(YC)	Yes	Yes	Other	Individual	TP	HIV/AIDS	Malaria	Common Cold	N/A
84	mkanda	LD	Business	Secondary form 1-2	6	80,000	101,185	P SW	6	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	Individual	TP	HIV/AIDS	Common Cold	N/A	N/A
85	mkanda	LD	Business	Primary Standard 1-8	6	20,500	40,560	UP SW	8	Yes	SP(YC)	Not Sure	not sure	Other	Individual	TP	Malaria	HIV/AIDS	Others	N/A
86	mkanda	LD	Business	Primary Standard 1-8	5	60,000	164,100	UP SW BH with HP	5	Yes	CWP	Yes	Yes	Other	Communal	TP	Malaria	Common Cold	Others	N/A
87	mkanda	LD	Business	Standard 1-8	4	2,400	49,000	BH with HP	5	Yes	HC	Yes	Yes	N/A	Individual	TP	Diarrhoea	Malaria	Others	N/A
88	mkanda	HD(PH)	Business	Standard 1-8	6	432,000	81,370	BH with HP	8	Yes	HC	Yes	Yes	N/A	Rents	TP	Others	Malaria	HIV/AIDS	N/A
89	mkanda	HD(PH)	Employed	Secondary form 3-4	4	145,000	177,480	P SW	15	Yes	HC	Yes	Yes	N/A	Individual	TP	Malaria	Others	HIV/AIDS	Diarrhoea
90	mkanda	HD(TH)	Employed	Secondary form 3-4	3	350,000	225,660	P SW	5	Yes	HC	Yes	Yes	N/A	Individual	TP	Malaria	Others	HIV/AIDS	Diarrhoea

General	HH characteristics				HH income				Water situation and demand						Health and hygiene							
	Market centre	Housing category	Occupation HH head	Highest education level HH head	No. of family	Income per year	Expense per year	Main source of water	Water use bucket /day	desire to have piped water	type of water connection you prefer	willingness to pay	afford to pay	Reason of no desire to install house connection	water source from house	Owner of toilet	Type of toilet	most common diseases in this market center				
																		1st	2nd	3rd	4th	
91	mkanda	HD(TH)	Business	Primary Standard 1-8	4	379600	161010	BH with HP	6	Yes	CWP	N/A	N/A	Other	16-30 min	Rents	TPL	Others	Diarrhoea	Malaria	N/A	N/A
92	mkanda	HD(PH)	Business	Primary Standard 1-8	3	-	155440	P SW	8	Yes	HC	Yes	Yes	Cannot afford the cost	6-15 min	Rents	TPL	Malaria	HIV/AIDS	Diarrhoea	Others	Others
93	mkanda	HD(PH)	Farmer	Primary Standard 1-8	9	37800	53760	P SW	10	Yes	CWP	N/A	N/A	Not sure about merits of house	6-15 min	Individual	TPL	Malaria	TB	N/A	N/A	N/A
94	mkanda	HD(TH)	Farmer	Secondary form 3-4	4	772800	48000	P SW	1	Yes	CWP	N/A	N/A	Not sure about merits of house	16-30 min	Communal	TPL	Malaria	TB	Diarrhoea	N/A	N/A
95	mkanda	HD(PH)	Farmer	Primary Standard 1-8	7	124000	110000	P SW	5	Yes	CWP	N/A	N/A	Not sure about merits of house	not more than 5 min	Communal	TPL	Malaria	Diarrhoea	N/A	N/A	N/A
96	mkanda	HD(TH)	Farmer	Standard 1-8	9	600000	500000	P SW	5	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	TPL	Malaria	TB	Diarrhoea	N/A	N/A
97	mkanda	HD(PH)	Business	Primary Standard 1-8	5	-	56000	P SW	6	Yes	CWP	N/A	N/A	Not sure about merits of house	not more than 5 min	Individual	TPL	Diarrhoea	Malaria	N/A	N/A	N/A
98	mkanda	HD(PH)	Employed	Primary Standard 1-8	4	260000	50500	HP	3	Yes	CWP	N/A	N/A	Other	6-15 min	Rents	TPL	Malaria	Common Cold	Diarrhoea	N/A	N/A
99	mkanda	HD(PH)	Employed	Secondary form 1-2	5	145000	33000	HP	4	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	6-15 min	Individual	TPL	Malaria	Common Cold	Common Cold	HIV/AIDS	Diarrhoea
100	mkanda	HD(TH)	Business	Primary Standard 1-8	5	125000	31500	HP	4	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	6-15 min	Individual	TPL	Malaria	Common Cold	Common Cold	N/A	N/A
101	mkanda	HD(TH)	Business	Primary Standard 1-8	5	370000	15500	HP	6	Yes	SP(YC)	Yes	not sure	Not sure about merits of house	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	HIV/AIDS	Others	Others
102	mkanda	HD(PH)	Farmer	Primary Standard 1-8	7	175000	140000	UP SW	10	Yes	SP(YC)	Yes	not sure	Not sure about merits of house	not more than 5 min	Individual	TPL	Malaria	Common Cold	HIV/AIDS	Others	Others
103	Namitete	HD(PH)	Employed	Secondary form 3-4	6	480000	165000	HP	8	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	PLS	Malaria	Diarrhoea	Cholera	N/A	N/A
104	Namitete	HD(PH)	Farmer	Secondary form 1-2	6	50000	44000	HP	6	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	PLS	Malaria	Common Cold	Diarrhoea	N/A	N/A
105	Namitete	HD(PH)	Employed	Secondary form 1-2	4	180000	59000	HP	8	Yes	HC	Not Sure	not sure	N/A	6-15 min	Rents	PLS	Malaria	N/A	N/A	N/A	N/A
106	Namitete	HD(TH)	Business	Secondary form 1-2	3	70000	14000	HP	7	Yes	CWP	N/A	N/A	Not sure about merits of house	6-15 min	Rents	TPL	Malaria	Diarrhoea	N/A	N/A	N/A
107	Namitete	HD(PH)	Business	Primary Standard 1-8	7	100000	27200	HP	10	Yes	HC	No	Yes	N/A	6-15 min	Rents	PLS	Malaria	Diarrhoea	Others	N/A	N/A
108	Namitete	HD(PH)	Employed	Secondary form 1-2	6	180500	15200	P SW	4	Yes	HC	Not Sure	Yes	N/A	not more than 5 min	Individual	TPL	Diarrhoea	Malaria	N/A	N/A	N/A
109	Namitete	HD(TH)	Farmer	Primary Standard 1-8	8	80000	90000	P SW	12	Yes	HC	Yes	No	N/A	6-15 min	Individual	TPL	Malaria	Diarrhoea	Others	N/A	N/A
110	Namitete	HD(TH)	Farmer	Primary Standard 1-8	8	-	-	UP SW	15	Yes	CWP	N/A	N/A	Other	not more than 5 min	Individual	TPL	Diarrhoea	Malaria	Others	Others	N/A
111	Namitete	HD(TH)	Business	Secondary form 1-2	5	130000	48000	P SW	4	Yes	CWP	N/A	N/A	Not sure about merits of house	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	N/A	N/A	N/A
112	Namitete	HD(TH)	Business	Primary Standard 1-8	5	80000	39000	P SW	7	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	N/A	N/A	N/A
113	Namitete	HD(PH)	Farmer	Standard 1-8	7	11000	390000	HP	6	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	31-60 min	Individual	TPL	Malaria	Diarrhoea	Common Cold	N/A	N/A
114	Namitete	HD(PH)	Business	Secondary form 1-2	5	800000	210000	HP	5	Yes	HC	Yes	Yes	N/A	16-30 min	Communal	TPL	Malaria	Diarrhoea	Common Cold	N/A	N/A
115	Namitete	HD(TH)	Employed	Primary Standard 1-8	5	90000	32000	P SW	4	Yes	CWP	N/A	N/A	Other	31-60 min	Individual	TPL	Malaria	Common Cold	N/A	N/A	N/A
116	Namitete	HD(PH)	Business	Secondary form 3-4	6	46000	42700	HP	5	Yes	SP(YC)	Yes	Yes	N/A	6-15 min	Communal	TPL	Malaria	Common Cold	Diarrhoea	N/A	N/A
117	Namitete	HD(TH)	Business	Secondary form 1-2	3	71000	18700	HP	4	Yes	CWP	N/A	N/A	Cannot afford the cost	16-30 min	Communal	TPL	Malaria	Common Cold	HIV/AIDS	N/A	N/A
118	Namitete	HD(TH)	Employed	Primary Standard 1-8	6	91800	14000	P SW	6	Yes	HC	Yes	Yes	N/A	not more than 5 min	Communal	TPL	Malaria	Common Cold	Others	N/A	N/A
119	Namitete	HD(PH)	Business	Primary Standard 1-8	6	105000	39000	UP SW	7	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	6-15 min	Individual	TPL	Malaria	Common Cold	Diarrhoea	N/A	N/A
120	Namitete	HD(PH)	Business	Standard 1-8	5	85000	57000	P SW	5	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Individual	TPL	HIV/AIDS	Malaria	Others	Diarrhoea	Diarrhoea

General	HH characteristics				HH income		Water situation and demand						Health and hygiene								
	Market centre	Housing category	Occupation HH head	Highest education level HH head	No. of family	Income per year	Expense per year	Main source of water	Water use bucket /day	desire to have piped water	type of water connection you prefer	willingness to pay	afford to pay	Reason of no house connection	water source from house	Owner of toilet	Type of toilet	most common diseases in this market center			
																		1st	2nd	3rd	4th
121	Namitete	HD(TH)	Business	Standard 1-8	7	20,000	10,300	P SW	5	Yes	CWP	N/A	N/A	Other	6-15 min not more than 5 min	Individual	TPL	Malaria	HIV/AIDS	Common Cold	N/A
122	Namitete	HD(TH)	Farmer	Standard 1-8	5	15,000	8,300	UP SW	8	Yes	SP(YC)	Yes	Yes	Other	not more than 5 min	Individual	TPL	Malaria	HIV/AIDS	Common Cold	Diarrhoea
123	Namitete	LD	Business	Secondary form 3-4	2	155,600	404,500	HP	5	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	PLS	Common Cold	Malaria	TB	N/A
124	Namitete	HD(PH)	Employed	Primary form 1-2	2	30,000	308,400	HP	3	Yes	HC	Yes	Yes	N/A	16-30 min	Communal	TPL	Others	Diarrhoea	N/A	N/A
125	Namitete	LD	Business	Standard 1-8	2	8,000	10,060	HP	2	Yes	SP(YC)	Yes	Yes	Other	6-15 min not more than 5 min	Individual	TPL	Malaria	Diarrhoea	Common Cold	N/A
126	Namitete	MD	Employed	Standard 1-8	6	68,000	142,200	HP	5	Yes	SP(YC)	Yes	Yes	Other	not more than 5 min	Individual	TPL	HIV/AIDS	Common Cold	N/A	N/A
127	Namitete	HD(PH)	Business	Secondary form 3-4	5	-	260,700	P SW	6	Yes	SP(YC)	Yes	Yes	Other	not more than 5 min	Individual	TPL	Malaria	N/A	N/A	N/A
128	Namitete	HD(PH)	Farmer	N/A	6	-	-	HP	6	Yes	HC	Yes	Yes	N/A	16-30 min not more than 5 min	Individual	TPL	Malaria	N/A	N/A	N/A
129	Namitete	LD	Farmer	Standard 1-8	8	79,400	13,000	HP	4	Yes	CWP	N/A	N/A	Other	not more than 5 min	Individual	TPL	Malaria	N/A	N/A	N/A
130	Namitete	LD	Business	Standard 1-8	10	34,750	105,083	HP	7	Yes	CWP	N/A	N/A	Other	16-30 min not more than 5 min	Individual	TPL	Malaria	Diarrhoea	N/A	N/A
131	Namitete	LD	Business	Standard 1-8	4	240,000	155,600	UP SW	5	Yes	CWP	N/A	N/A	Other	not more than 5 min	Communal	TPL	Malaria	Others	Diarrhoea	N/A
132	Namitete	MD	Business	Standard 1-8	4	19,800	101,900	UP SW	7	Yes	HC	Yes	Yes	N/A	6-15 min	Individual	TPL	Malaria	N/A	N/A	N/A
133	Namitete	HD(TH)	Business	Secondary form 1-2	7	12,000	31,000	HP	10	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	16-30 min	Individual	TPL	Malaria	N/A	N/A	N/A
134	Namitete	MD	Business	Standard 1-8	4	-	13,900	HP	5	Yes	CWP	N/A	N/A	Cannot afford the cost	6-15 min	Individual	-9	Malaria	Diarrhoea	TB	N/A
135	Namitete	HD(TH)	Business	Standard 1-8	8	24,000	7,200	HP	7	Yes	CWP	N/A	N/A	Not sure about merits of house	6-15 min not more than 5 min	Communal	TPL	Malaria	N/A	N/A	N/A
136	Namitete	MD	Business	Standard 1-8	4	-	24,000	HP	10	Yes	CWP	N/A	N/A	Cannot afford the cost	not more than 5 min	Individual	TPL	Diarrhoea	Malaria	HIV/AIDS	N/A
137	Namitete	HD(TH)	Farmer	N/A	6	12,000	60,000	HP	5	Yes	CWP	N/A	N/A	Satisfied with current water	6-15 min	Individual	TPL	Malaria	HIV/AIDS	N/A	N/A
138	Namitete	HD(TH)	Business	N/A	12	117,600	10,000	UP SW	10	Yes	CWP	N/A	N/A	Cannot afford the cost	31-60 min	Individual	TPL	Malaria	Diarrhoea	N/A	N/A
139	Namitete	HD(TH)	Business	Secondary form 3-4	5	-	31,200	UP SW	6	Yes	CWP	N/A	N/A	Not sure about merits of house	16-30 min not more than 5 min	Communal	TPL	Diarrhoea	Malaria	TB	N/A
140	Namitete	MD	Business	Standard 1-8	9	-	20,400	P SW	10	Yes	CWP	N/A	N/A	Not sure about merits of house	not more than 5 min	Communal	TPL	Malaria	Diarrhoea	N/A	N/A
141	Namitete	HD(TH)	Employed	Standard 1-8	6	84,000	324,000	UP SW	10	Yes	CWP	N/A	N/A	Cannot afford the cost	31-60 min	Individual	TPL	Malaria	TB	HIV/AIDS	N/A
142	Namitete	HD(TH)	Business	Standard 1-8	3	108,000	6,000	HP	3	Yes	CWP	N/A	N/A	Not sure about merits of house	16-30 min not more than 5 min	Communal	TPL	Malaria	Diarrhoea	N/A	N/A
143	Namitete	MD	Employed	Secondary form 3-4	5	-	76,000	HP	10	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	VIP	Malaria	Others	Diarrhoea	N/A
144	Namitete	HD(PH)	Business	Standard 1-8	8	160,000	28,600	HP	9	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	6-15 min	Individual	TPL	Malaria	Others	N/A	N/A
145	Namitete	HD(PH)	Farmer	Standard 1-8	5	120,000	129,025	HP	6	Yes	HC	Yes	Yes	N/A	16-30 min	Rents	PLS	Others	Malaria	Diarrhoea	N/A
146	Namitete	HD(PH)	Employed	Standard 1-8	3	130,200	215,650	HP	5	Yes	HC	Yes	Yes	N/A	6-15 min	Communal	TPL	Malaria	HIV/AIDS	Diarrhoea	Others
147	Namitete	HD(PH)	Business	N/A	4	337,500	139,808	HP	7	Yes	SP(YC)	Yes	not sure	Not sure about merits of house	6-15 min	Individual	TPL	Others	HIV/AIDS	Malaria	N/A
148	Namitete	HD(PH)	Employed	Secondary form 3-4	8	118,000	412,260	HP	6	Yes	HC	Yes	Yes	N/A	6-15 min	Individual	TPL	Malaria	Dysentery	HIV/AIDS	Others
149	Namitete	HD(TH)	Business	N/A	4	336,000	82,920	HP	3	Yes	CWP	N/A	N/A	Cannot afford the cost	16-30 min	Individual	TPL	HIV/AIDS	Malaria	Diarrhoea	Others
150	Namitete	HD(TH)	Business	Standard 1-8	5	672,000	235,200	HP	3	Yes	HC	Yes	Yes	N/A	6-15 min	Individual	TPL	Others	Malaria	HIV/AIDS	N/A

General	HH characteristics				HH income				Water situation and demand						Health and hygiene						
	Market centre	Housing category	Occupation HH head	Highest education level HH head	No. of family	Income per year	Expense per year	Main source of water	Water use bucket /day	desire to have piped water	type of water connection you prefer	willingness to pay	afford to pay	Reason of no desire to install house connection	water from house	Owner of toilet	Type of toilet	most common diseases in this market center			
																		1st	2nd	3rd	4th
151	Namitete	HD(PH)	Farmer	N/A	3	20,000	98,110	BH with HP	3	Yes	HC	Yes	Yes	N/A	6-15 min	Individual	TPL	N/A	N/A	N/A	N/A
152	Namitete	HD(PH)	Employed	Secondary form 1-2	8	13,000	83,800	BH with HP	4	Yes	HC	Yes	Yes	N/A	6-15 min	Individual	TPL	Others	Malaria	N/A	N/A
153	santhe	MD	Employed	Secondary form 3-4	4	168,000	146,000	HP	5	Yes	HC	Yes	Yes	N/A	not more than 5 min	Communal	TPL	Malaria	Diarrhoea	Common	N/A
154	santhe	MD	Business	Standard 1-8	3	117,000	49,800	UP SW BH with HP	5	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Communal	PLS	Malaria	Diarrhoea	Common	N/A
155	santhe	HD(TH)	Business	Standard 1-8	6	170,000	162,000	HP	12	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	6-15 min	Individual	TPL	Malaria	Diarrhoea	Common	N/A
156	santhe	HD(TH)	Employed	Secondary form 1-2	5	250,000	171,000	HP	6	Yes	HC	Yes	not sure	N/A	not more than 5 min	Communal	TPL	Malaria	Others	Common	N/A
157	santhe	MD	Employed	Secondary form 1-2	7	296,000	189,000	UP SW BH with HP	10	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Individual	TPL	Diarrhoea	Malaria	N/A	N/A
158	santhe	LD	Business	Secondary form 3-4	10	1,000,000	720,000	HP	15	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	VIP	Malaria	Diarrhoea	Common	N/A
159	santhe	LD	Business	Standard 1-8	5	360,000	108,000	HP	5	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Individual	TPL	Malaria	HIV/AIDS	Common	N/A
160	santhe	MD	Business	Standard 1-8	5	180,000	167,850	BH with HP	7	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Individual	TPL	TB	Common	Malaria	N/A
161	santhe	LD	Other	N/A	5	60,000	72,150	HP	6	Yes	CWP	Yes	not sure	Cannot afford the cost	not more than 5 min	Individual	TPL	Malaria	HIV/AIDS	Common	N/A
162	santhe	LD	Business	Standard 1-8	7	112,000	181,000	P SW BH with HP	6	Yes	SP(YC)	Yes	not sure	Cannot afford the cost	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	Common	N/A
163	santhe	MD	Business	Standard 1-8	7	144,000	152,000	HP	5	Yes	HC	Yes	not sure	N/A	6-15 min	Not use toilet	TPL	Malaria	TB	Diarrhoea	N/A
164	santhe	HD(PH)	Employed	Secondary form 3-4	6	500,000	230,000	P SW	25	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	PLS	Malaria	Diarrhoea	N/A	N/A
165	santhe	HD(PH)	Farmer	Secondary form 3-4	5	200,000	150,000	P SW	15	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	PLS	Malaria	Diarrhoea	Common	N/A
166	santhe	HD(PH)	Employed	Secondary form 3-4	7	90,000	90,000	P SW	20	Yes	SP(YC)	Yes	Yes	Other	not more than 5 min	Individual	PLS	Malaria	Diarrhoea	Common	N/A
167	santhe	HD(PH)	Employed	Secondary form 3-4	1	80,000	32,000	UP SW	1	Yes	CWP	Yes	Yes	Other	not more than 5 min	Individual	PLS	Dysentery	Diarrhoea	Malaria	N/A
168	santhe	HD(PH)	Business	Secondary form 3-4	7	300,000	42,000	P SW	10	Yes	CWP	Yes	Yes	Other	not more than 5 min	Individual	TPL	Others	Malaria	N/A	N/A
169	santhe	HD(PH)	Employed	Secondary form 3-4	4	50,000	78,500	Stream/River	8	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Rents	PLS	Diarrhoea	Malaria	Common	N/A
170	santhe	HD(PH)	Employed	Standard 1-8	3	40,000	7,000	HP	4	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	16-30 min	Rents	VIP	HIV/AIDS	Malaria	Diarrhoea	N/A
171	santhe	HD(TH)	Employed	Standard 1-8	4	25,000	8,000	ver	3	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	not more than 5 min	Individual	PLS	Malaria	Diarrhoea	Common	N/A
172	santhe	HD(TH)	Business	Standard 1-8	6	20,000	6,000	HP	8	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	not more than 5 min	Individual	PLS	Malaria	Diarrhoea	TB	N/A
173	santhe	MD	Employed	Tertiary education	6	376,000	120,000	BH with HP	15	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Individual	PLS	Malaria	Diarrhoea	Common	Cholera
174	santhe	MD	Farmer	Standard 1-8	7	100,000	195,000	HP	15	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	6-15 min	Individual	PLS	Others	Diarrhoea	Common	Bilharzias
175	santhe	HD(PH)	Employed	Secondary form 3-4	7	126,000	124,000	HP	10	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	16-30 min	Individual	PLS	Malaria	Diarrhoea	Common	Dysentery
176	santhe	HD(PH)	Business	Standard 1-8	5	40,000	19,000	HP	7	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	not more than 5 min	Rents	TPL	Diarrhoea	Malaria	HIV/AIDS	N/A
177	santhe	HD(TH)	Employed	N/A	7	70,000	75,000	BH with HP	7	Yes	SP(YC)	Yes	Yes	Cannot afford the cost	not more than 5 min	Individual	TPL	Malaria	Diarrhoea	Dysentery	Others
178	santhe	HD(PH)	Business	Secondary form 3-4	7	80,000	20,000	HP	12	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	TPL	Malaria	Others	N/A	N/A
179	santhe	HD(PH)	Business	Standard 1-8	7	-	-	HP	10	Yes	CWP	N/A	N/A	Cannot afford the cost	not more than 5 min	Individual	TPL	Malaria	N/A	N/A	N/A
180	santhe	HD(TH)	Farmer	Standard 1-8	2	100,000	6,000	HP	7	Yes	CWP	N/A	N/A	Cannot afford the cost	not more than 5 min	Individual	TPL	Malaria	N/A	N/A	N/A

General	HH characteristics				HH income		Water situation and demand								Health and hygiene						
	Housing category	Occupation HH head	Highest education level HH head	No. of family	Income per year	Expense per year	Main source of water	Water use bucket/day	desire to have piped water	type of water connection you prefer	willingness to pay	afford to pay	Reason of no desire to install house connection	water source from house	Owner of toilet	Type of toilet	most common diseases in this market center				
																	1st	2nd	3rd	4th	
181	santhe	HD(TH)	Farmer	Primary Standard 1-8	9	50,000	16,000	BH with HP	10	Yes	CWP	N/A	N/A	Cannot afford the cost	not more than 5 min	Individual	TPL	Others	Malaria	N/A	N/A
182	santhe	HD(PH)	Business	Secondary form 1-2	4	30,000	25,000	HP	6	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	TPL	Others	Malaria	Diarrhoea	N/A
183	santhe	MD	Farmer	Primary Standard 1-8	5	78,600	108,000	HP	6	Yes	SP(YC)	Not Sure	not sure	Other	not more than 5 min	Individual	TPL	Malaria	Common Cold	Others	N/A
184	santhe	LD	Employed	Secondary form 3-4	4	158,000	49,000	HP	4	Yes	HC	Yes	Yes	N/A	not more than 5 min	Individual	TPL	HIV/AIDS	Malaria	Diarrhoea	N/A
185	santhe	MD	Employed	Tertiary education	7	858,600	621,458	HP	12	Yes	SP(YC)	Yes	Yes	N/A	not more than 5 min	Individual	TPL	Common Cold	Malaria	N/A	N/A
186	santhe	MD	Employed	Primary Standard 1-8	4	120,000	310,816	HP	6	Yes	HC	Yes	Yes	N/A	6-15 min	Individual	PLS	Diarrhoea	N/A	N/A	N/A
187	santhe	LD	Employed	Secondary form 3-4	6	-	251,812	HP	5	Yes	HC	Yes	Yes	N/A	6-15 min	Individual	TPL	HIV/AIDS	Others	N/A	N/A
188	santhe	HD(PH)	Employed	Secondary form 1-2	6	-	189,000	P SW	10	Yes	HC	Yes	Yes	N/A	not more than 5 min	Communal	TPL	Malaria	TB	Diarrhoea	N/A
189	santhe	HD(TH)	Business	Primary Standard 1-8	1	40,000	51,000	P SW	10	Yes	CWP	N/A	N/A	Cannot afford the cost	not more than 5 min	Individual	TPL	TB	Malaria	Diarrhoea	N/A
190	santhe	HD(TH)	Business	N/A	3	660,000	75,000	P SW	10	Yes	CWP	N/A	N/A	Cannot afford the cost	not more than 5 min	Communal	VIP	Malaria	HIV/AIDS	N/A	N/A
191	santhe	HD(TH)	Business	Primary Standard 1-8	9	-	60,300	HP	10	Yes	CWP	N/A	N/A	Not sure about merits of house	16-30 min	Communal	TPL	Diarrhoea	Malaria	N/A	N/A
192	santhe	HD(PH)	Employed	Secondary form 3-4	4	120,000	60,000	P SW	4	Yes	CWP	N/A	N/A	Cannot afford the cost	not more than 5 min	Communal	TPL	Malaria	TB	N/A	N/A
193	santhe	HD(TH)	Employed	Primary Standard 1-8	3	87,000	10,300	P SW	2	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	16-30 min	Individual	TPL	Diarrhoea	Malaria	Others	HIV/AIDS
194	santhe	HD(TH)	Business	Secondary form 1-2	5	300,000	53,300	HP	6	Yes	SP(YC)	Yes	No	Cannot afford the cost	16-30 min	Individual	TPL	Diarrhoea	Malaria	HIV/AIDS	N/A
195	santhe	HD(TH)	Business	Secondary form 3-4	5	110,000	21,700	HP	6	Yes	SP(YC)	Yes	Yes	Not sure about merits of house	6-15 min	Communal	TPL	Malaria	Others	Common Cold	HIV/AIDS
196	santhe	HD(TH)	Business	Primary Standard 1-8	3	165,000	26,550	HP	5	Yes	CWP	N/A	N/A	Other	not more than 5 min	Individual	TPL	Others	Malaria	N/A	N/A
197	santhe	HD(TH)	Employed	Primary Standard 1-8	8	168,000	84,200	HP	8	Yes	SP(YC)	Yes	not sure	Satisfied with current water	not more than 5 min	Individual	TPL	Common Cold	Malaria	Diarrhoea	N/A
198	santhe	HD(TH)	Business	Primary Standard 1-8	3	67,200	31,370	HP	3	Yes	HC	Yes	Yes	N/A	6-15 min	Communal	TPL	Malaria	Common Cold	Others	N/A
199	santhe	HD(TH)	Business	N/A	3	-	50,050	P SW	2	Yes	HC	Yes	Yes	N/A	6-15 min	Individual	TPL	Malaria	Diarrhoea	HIV/AIDS	N/A
200	santhe	HD(TH)	Employed	Primary Standard 1-8	5	52,000	85,170	P SW	6	Yes	HC	Yes	Yes	N/A	not more than 5 min	Communal	TPL	Others	HIV/AIDS	N/A	N/A
201	santhe	HD(TH)	Business	Primary Standard 1-8	4	84,000	113,780	HP	5	Yes	CWP	N/A	N/A	Cannot afford the cost	16-30 min	Communal	TPL	Others	Malaria	Diarrhoea	N/A
202	santhe	MD	Business	Secondary form 3-4	6	160,000	263,190	HP	10	Yes	HC	Yes	Yes	N/A	6-15 min	Individual	TPL	Others	Dysentery	Malaria	N/A

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[Housing Category] HD(PH):High Density (Permanent House) HD(TH):High Density (Traditional House) MD: Medium Density LD:Low Density

[Highest education level HH head] BH with HP: Bore Hole with Handpump PSW:Protected Shallow Well UFSW:Unprotected Shallow Well

[Type of water connection you prefer] SP(YC):Stand Pipe(Yard Connection) CWP:Communal Water Point HC:House Connection

[Type of Toilet] PLS:Pit latrine with sanplat TPL: Traditional Pit Latrine VIP: Improved Pit Latrine

Table A6-3-28 List of survey result (market centre leaders)

District	Market	Chairman	Population		Infrastructure/Facilities			Water point Committee in Market Centre						General situation					Water supply facilities and others																		
			No. of HH	Total	2010	Type of facility	Exist.	Water source	No. of users	Established MPC	Year establishment	Members Men	Members Women	Way of establishment	Request for construction of water facility	Type of request facility	To which institution request made	Willingness to pay	Security situation in the village	Reason	Functioning infrastructure	Spar parts available at distance (km)	repair date	repair cost	dismantled by	date of replacement of parts	No. of toilet										
1	Lilongwe	Namtete	220	336	Primary school (day)	Yes	BH																														
					Primary school (boarding)	Yes	BH																														
					Secondary school (day)	Yes	BH																														
					Secondary school (boarding)	Yes	BH																														
					Health centre	No																															
					Hospital	No																															
					ADMARC	No																															
					Post Office	Yes	BH																														
					Police	Yes	BH																														
2	Lilongwe	Chileka G.V.H			Primary school (day)	Yes	BH	1700																													
					Primary school (boarding)	No																															
					Secondary school (day)	Yes	BH	1400																													
					Secondary school (boarding)	No	BH																														
					Health centre	Yes	BH	10																													
					Hospital	No																															
					ADMARC	Yes	BH																														
					Post Office	No																															
					Police	No																															
3	Kasungu	Chiposa (New Santhre)	5425	30229	35622	Primary school (day)	Yes	BH																													
						Primary school (boarding)	No																														
						Secondary school (day)	No																														
						Secondary school (boarding)	No																														
						Health centre	No																														
						Hospital	No																														
						ADMARC	Yes	BH																													
						Post Office	No																														
						Police	Yes	BH																													
4	Kasungu	Old Santhre	5425	30229	35622	Primary school (day)	Yes	BH																													
						Primary school (boarding)	No																														
						Secondary school (day)	Yes	BH																													
						Secondary school (boarding)	Yes	BH																													
						Health centre	Yes	BH																													
						Hospital	No																														
						ADMARC	No																														
						Post Office	No																														
						Police	Yes	BH																													
5	Mchiriji	Mkanda	Committee Member	45572		Primary school (day)	Yes	BH	11000																												
						Primary school (boarding)	No																														
						Secondary school (day)	Yes	BH																													
						Secondary school (boarding)	No																														
						Health centre	Yes	BH																													
						Hospital	No																														
						ADMARC	Yes	BH																													
						Post Office	Yes	BH																													
						Police	Yes	BH																													

略語 [Population] HH=Household
[Functioning infrastructure] BH=Borehole PSW=Protected Shallow Well

6- 4 EXAMINATION OF INTAKE PUMP

Examination of intake pump

Design conditions and the planned facility for project for water supply for market centre in Mkanda and Santhe areas are as follows;

(1) Mkanda market centre

1) Borehole MK-2

[Design condition]

- Elevation
Elevated tank HWL = 1108.80m
Borehole (GL) = 1095.55m
Dynamic water level at dry season (DL) = GL - 28.68m
Pump setting position = GL - 38.68m (DL - 10m)
- Length (L)
Pipeline (inside borehole) = 38.68m
Pipeline (ground) = 30m
Transmission pipe = 223m (borehole-elevated tank)
- Velocity coefficient (C) 110 (GSP/DCIP)
- Diameter (D)
Pipeline (inside facilities) = ϕ 75mm
Transmission pipe = ϕ 100mm
- Pumping rate (Q) 0.378m³/min
- Actual head 41.93m (1108.80m - 1095.55m + 28.68m)
- Head loss
 $H_f = 10.666 \times C^{-1.85} \times D^{-4.87} \times Q^{1.85} \times L$
Pipeline (inside facilities) (Hf1) = 3.130m
Transmission pipe (Hf2) = 2.503m
- Total head 47.563m (= 41.93m + 3.130m + 2.503m)

[Planned facility]

- Intake pump 0.38m³/min \times 48m \times 5.5kW \times 1no. (submersible motor pump)
- Accessories Air valve, sluice valve, check valve, pressure valve, flow meter, control valve

2) Borehole MK-3

[Design condition]

- Elevation
Elevated tank HWL = 1108.80m
Borehole (GL) = 1095.25m
Dynamic water level at dry season (DL) = GL - 25.61m
Pump setting position = GL - 35.61m (DL - 10m)
- Length (L)
Pipeline (inside facilities) (inside borehole) = 35.61m
Pipeline (inside facilities) (ground) = 15m

	Transmission pipe=403m(borehole~elevated tank)
- Velocity coefficient (C)	110(GSP/DCIP)
-Diameter(D)	Pipeline(inside facilities) ϕ 75mm Transmission pipe ϕ 100mm
-Pumping rate(Q)	0.378m ³ /min
-Actual head	39.16m(1108.80m-1095.25m+25.61m)
-Head loss	$H_f = 10.666 \times C^{-1.85} \times D^{-4.87} \times Q^{1.85} \times L$ Pipeline(inside facilities)(Hf1)= 2.306m Transmission pipe(Hf2)=4.535m
-Total head	46.001m(=39.16m+2.306m+4.535m)
[Planned facility]	
-Intake pump	0.38m ³ /min \times 48m \times 5.5kW \times 1no. (submersible motor pump)
-Accessories	Air valve, sluice valve, check valve, pressure valve, flow meter, control valve

(2) Santhe market centre

1) Borehole ST-1

[Design condition]	
-Elevation	Ground tankHWL= 1127.43m Borehole(GL)= 1091.77m Dynamic water level at dry season(DL)= GL-21.57m Pump setting position= GL-31.57m(DL-10m)
-Length(L)	Pipeline(inside facilities)(inside borehole)= 31.57m Pipeline(inside facilities)(ground)= 10m Transmission pipe= 1,044m(borehole~Ground tank)
-Velocity coefficient(C)	110(GSP/DCIP)
-Diameter(D)	Pipeline(inside facilities) ϕ 50mm Transmission pipe ϕ 150mm、 ϕ 100mm
-Pumping rate(Q)	0.120m ³ /min
-Actual head	57.23m(1127.43m-1091.77m+21.57m)
-Head loss	$H_f = 10.666 \times C^{-1.85} \times D^{-4.87} \times Q^{1.85} \times L$ Pipeline(inside facilities)(Hf1)= 1.634m Transmission pipe(Hf2)=2.853m(=2.627m+0.226m)
-Total head	61.717m(=57.23m+1.634m+2.853m)
[Planned facility]	
-Intake pump	0.120m ³ /min \times 66m \times 4.0kW \times 1no. (submersible motor pump)
-Accessories	Air valve, sluice valve, check valve, pressure valve, flow meter, control valve

2) Borehole ST-2

[Design condition]

-Elevation	Ground tankHWL= 1127.43m Borehole(GL)= 1089.14m Dynamic water level at dry season(DL)= GL-22.52m Pump setting position= GL-32.52m(DL-10m)
-Length(L)	Pipeline(inside facilities)(inside borehole)= 32.52m Pipeline(inside facilities)(ground)= 10m Transmission pipe= 1,280m(borehole~Ground tank)
-Velocity coefficient(C)	110(GSP/DCIP)
-Diameter(D)	Pipeline(inside facilities) ϕ 50mm Transmission pipe ϕ 150mm、 ϕ 100mm
-Pumping rate(Q)	0.120m ³ /min
-Actual head	60.81m(1127.43m-1089.14m+22.52m)
-Head loss	$H_f = 10.666 \times C^{-1.85} \times D^{-4.87} \times Q^{1.85} \times L$ Pipeline(inside facilities)(Hf1)= 1.671m Transmission pipe(Hf2)=4.066m(=2.627m+0.226m+1.153m)
-Total head	66.487m(=60.81m+1.671m+4.006m)
[Planned facility]	
-Intake pump	0.120m ³ /min \times 66m \times 4.0kW \times 1no. (submersible motor pump)
-Accessories	Air valve, sluice valve, check valve, pressure valve, flow meter, control valve

3) Borehole ST-3

[Design condition]

-Elevation	Ground tankHWL= 1127.43m Borehole(GL)= 1088.51m Dynamic water level at dry season(DL)= GL-20.95m Pump setting position= GL-30.95m(DL-10m)
-Length(L)	Pipeline(inside facilities)(inside borehole)= 30.95m Pipeline(inside facilities)(ground)= 10m Transmission pipe= 1,380m(borehole-Ground tank)
-Velocity coefficient(C)	110(GSP/DCIP)
-Diameter(D)	Pipeline(inside facilities) ϕ 50mm Transmission pipe ϕ 150mm、 ϕ 100mm、 ϕ 75mm
-Pumping rate(Q)	0.120m ³ /min
-Actual head	59.87m(1127.43m-1088.51m+20.95m)
-Head loss	$H_f = 10.666 \times C^{-1.85} \times D^{-4.87} \times Q^{1.85} \times L$

Pipeline(inside facilities)(Hf1)= 1.609m
 Transmission pipe(Hf2)=4.551m(=2.627m+0.226m+1.153m
 +0.545m)
 -Total head 66.030m(=59.87m+1.609m+4.551m)
 [Planned facility]
 -Intake pump 0.120m³/min×66m×4.0kW×1no. (submersible motor pump)
 -Accessories Air valve, sluice valve, check valve, pressure valve, flow meter, control valve

4) Borehole ST-4

[Design condition]
 -Elevation Ground tankHWL= 1127.43m
 Borehole(GL)= 1087.63m
 Dynamic water level at dry season(DL)= GL-43.59m
 Pump setting position= GL-53.59m(DL-10m)
 -Length(L) Pipeline(inside facilities)(inside borehole)= 53.59m
 Pipeline(inside facilities)(ground)= 10m
 Transmission pipe= 1,517m(borehole~Ground tank)
 -Velocity coefficient(C) 110(GSP/DCIP)
 -Diameter(D) Pipeline(inside facilities) φ 32mm
 Transmission pipe φ 150mm、φ 100mm
 -Pumping rate(Q) 0.054m³/min
 -Actual head 83.39m(1127.43m-1087.63m+43.59m)
 -Head loss $H_f = 10.666 \times C^{-1.85} \times D^{-4.87} \times Q^{1.85} \times L$
 Pipeline(inside facilities)(Hf1)= 5.013m
 Transmission pipe(Hf2)=3.469m(=2.627m+0.842m)
 -Total head 91.872m(=83.39m+5.013m+3.469m)
 [Planned facility]
 -Intake pump 0.054m³/min×92m×1.5kW×1no. (submersible motor pump)
 -Accessories Air valve, sluice valve, check valve, pressure valve, flow meter, control valve

5) Borehole ST-5

[Design condition]
 -Elevation Ground tankHWL= 1127.43m
 Borehole(GL)= 1082.48m
 Dynamic water level at dry season(DL)= GL-34.71m
 Pump setting position= GL-44.71m(DL-10m)
 -Length(L) Pipeline(inside facilities)(inside borehole)= 44.71m

Pipeline(inside facilities)(ground)= 10m
Transmission pipe= 1,817m(borehole-Ground tank)

-Velocity coefficient(C) 110(GSP/DCIP)

-Diameter(D) Pipeline(inside facilities) ϕ 32mm
Transmission pipe ϕ 150mm、 ϕ 100mm、 ϕ 75mm

-Pumping rate(Q) 0.046m³/min

-Actual head 79.66m(1127.43m-1082.48m+34.71m)

-Head loss $H_f = 10.666 \times C^{-1.85} \times D^{-4.87} \times Q^{1.85} \times L$
Pipeline(inside facilities)(Hf1)= 3.206m
Transmission pipe(Hf2)= 3.747m(=2.627m+0.842m+0.278m)

-Total head 86.613m(=79.66m+3.206m+3.747m)

[Planned facility]

-Intake pump 0.046m³/min \times 87m \times 1.1kW \times 1no. (submersible motor pump)

-Accessories Air valve, sluice valve, check valve, pressure valve, flow meter, control valve

6) Borehole ST-6

[Design condition]

-Elevation Ground tankHWL= 1127.43m
Borehole(GL)= 1084.84m
Dynamic water level at dry season(DL)= GL-34.74m
Pump setting position= GL-44.74m(DL-10m)

-Length(L) Pipeline(inside facilities)(inside borehole)= 44.74m
Pipeline(inside facilities)(ground)= 10m
Transmission pipe= 1,824m(borehole-Ground tank)

-Velocity coefficient(C) 110(GSP/DCIP)

-Diameter(D) Pipeline(inside facilities) ϕ 32mm
Transmission pipe ϕ 150mm、 ϕ 100mm、 ϕ 75mm

-Pumping rate(Q) 0.036m³/min

-Actual head 77.33m(1127.43m-1084.84m+34.74m)

-Head loss $H_f = 10.666 \times C^{-1.85} \times D^{-4.87} \times Q^{1.85} \times L$
Pipeline(inside facilities)(Hf1)= 2.038m
Transmission pipe(Hf2)= 3.650m(=2.627m+0.842m+0.181m)

-Total head 83.018m(=77.33m+2.038m+3.650m)

[Planned facility]

-Intake pump 0.036m³/min \times 83m \times 1.1kW \times 1no. (submersible motor pump)

-Accessories Air valve, sluice valve, check valve, pressure valve, flow meter, control valve

6- 5 HYDRAULIC CALCULATION FOR DISTRIBUTION PIPE

Table A6-5-1 Hydraulic calculation sheet (Mkanda)

Hydraulic Calculation on Water Pressure in Mkanda

Mkanda East		C	D (mm)	Q (m ³ /min)	L (m)	V (m/sec)	Hf (m)	ΣHf (m)	Elevation (EL-m)	Pressure (m)
	EL Tank	130	150	0.754	170	0.711	0.70		1106.50	
M16	M1	130	150	0.725	722	0.684	2.76	0.70	1097.00	8.80
M17	M2	130	100	0.337	274	0.715	1.83	3.46	1089.86	13.18
M11	M3	130	100	0.169	775	0.359	1.44	5.29	1088.98	12.23
	M4	130	100	0.116	417	0.246	0.39	6.73	1090.64	9.13
	M5	130	100	0.088	175	0.187	0.10	7.12	1088.42	10.96
	M6	130	100	0.076	168	0.161	0.07	7.22	1088.02	11.26
	M7	130	100	0.065	360	0.138	0.11	7.29	1087.28	11.93
M10	M8	130	100	0.020	300	0.075	0.04	7.40	1086.73	12.37
	M9	130	75	0.020	300	0.075	0.04	7.44	1085.60	13.46
	M3	130	100	0.149	139	0.316	0.20	5.29		
M15, M4	M11	130	100	0.113	278	0.240	0.25	5.49	1088.48	12.53
M15	M12	130	100	0.061	80	0.130	0.02	5.74	1087.80	12.96
M5	M13	130	100	0.037	260	0.079	0.03	5.76	1087.97	12.77
M6	M14	130	100	0.011	160	0.023	0.00	5.79	1087.28	13.43
	M7	130	100	0.011	160	0.023	0.00	5.79	1087.28	13.43
	M1	130	100	0.029	428	0.062	0.03	0.70		
	M16	130	100	0.027	272	0.057	0.02	0.73	1100.76	5.01
	M11	130	100	0.027	272	0.057	0.02	5.49		
	M15	130	100	0.008	113	0.017	0.00	5.51	1089.61	11.38
	M4	130	100	0.008	113	0.017	0.00	5.51	1090.64	10.35
	M12	130	100	0.033	478	0.070	0.04	5.74		
	M15	130	100	0.033	478	0.070	0.04	5.78	1089.61	11.11
	M13	130	100	0.019	281	0.040	0.01	5.76		
	M5	130	100	0.019	281	0.040	0.01	5.77	1088.42	12.31
	M14	130	100	0.008	122	0.017	0.00	5.79		
	M6	130	100	0.008	122	0.017	0.00	5.79	1088.02	12.69
	M8	130	75	0.020	300	0.075	0.04	7.40		
	M10	130	75	0.020	300	0.075	0.04	7.44	1087.47	11.59

Mkanda West

	Node No.	C	D (mm)	Q (m3/min)	L (m)	V (m/sec)	Hf (m)	ΣHf (m)	Elevation (EL-m)	Pressure (m)
	M2	130	100	0.339	258	0.720	1.74	3.46		
M25	M17							5.20	1088.89	12.41
	M22	130	100	0.203	379	0.431	0.99	6.19	1087.19	13.12
	M23, M24	130	100	0.168	385	0.357	0.71	6.90	1085.72	13.88
	M23	130	100	0.100	279	0.212	0.20	7.10	1085.10	14.30
	M21	130	100	0.043	626	0.091	0.09	7.19	1084.33	14.98
	M17							5.20		
	M19	130	100	0.118	500	0.251	0.48	6.19	1088.04	12.78
	M25	130	100	0.073	810	0.155	0.32	6.00	1086.42	14.08
	M26	130	100	0.018	270	0.038	0.01	6.01	1084.33	16.16
	M21							6.19		
	M18	130	75	0.009	135	0.034	0.00	6.19	1086.94	13.37
	M22							6.90		
	M19	130	100	0.042	334	0.089	0.05	6.95	1083.75	15.80
	M23	130	75	0.019	280	0.072	0.04	6.99	1083.14	16.37
	M24							7.10		
	M20	130	100	0.038	560	0.081	0.07	7.17	1083.75	15.58
	M23							5.68		
	M25	130	100	0.011	158	0.023	0.00	5.68	1085.72	15.10
	M19							5.68		

Table A6-5-2 Hydraulic calculation sheet (Santhe)

Hydraulic Calculation on Water Pressure in Santhe

Santhe South

	Node No.	C	D (mm)	Q (m3/min)	L (m)	V (m/sec)	Hf (m)	ΣHf (m)	Elevation (EL-m)	Pressure (m)
	Reservoir	130	150	0.988	1420	0.932	9.61		1125.00	
S12	S1							9.61	1089.18	26.21
S13, S24	S2	130	150	0.977	220	0.922	1.46	11.07	1088.52	25.41
S4	S3	130	150	0.597	312	0.563	0.83	11.90	1086.82	26.28
	S4	130	100	0.532	447	1.130	6.93	18.83	1085.77	20.40
S14	S5	130	100	0.502	380	1.066	5.29	24.12	1081.28	19.60
S18	S6	130	100	0.383	240	0.813	2.03	26.15	1079.32	19.53
	S7	130	100	0.351	500	0.745	3.59	29.74	1082.36	12.90
S21	S8	130	100	0.317	940	0.673	5.59	35.33	1079.35	10.32
S22	S9	130	100	0.247	1260	0.524	4.73	40.06	1068.57	16.37
S23	S10	130	100	0.142	921	0.301	1.24	41.30	1065.13	18.57
	S11	130	75	0.015	220	0.057	0.02	41.32	1064.17	19.51
	S1							9.61		
	S12	130	75	0.011	160	0.042	0.01	9.62	1088.74	26.64
	S2							11.07		
	S13	130	75	0.053	781	0.200	0.69	11.76	1082.51	30.73
	S3							11.90		
	S4	130	100	0.044	659	0.093	0.10	12.00	1085.77	27.23
	S5							24.12		
S17	S14	130	100	0.093	170	0.197	0.10	24.22	1083.52	17.26
	S15	130	100	0.047	415	0.100	0.07	24.29	1085.57	15.14
	S16	130	100	0.019	120	0.040	0.00	24.29	1084.52	16.19
	S7	130	100	0.011	160	0.023	0.00	24.29	1082.36	18.35
	S14							24.22		
S15	S17	130	100	0.035	229	0.074	0.02	24.24	1084.17	16.59
	S16	130	100	0.008	120	0.017	0.00	24.24	1084.52	16.24
	S17							24.24		
	S15	130	100	0.012	179	0.025	0.00	24.24	1085.57	15.19
	S6							26.15		
S20	S18	130	75	0.016	17	0.060	0.00	26.15	1079.00	19.85
	S19	130	75	0.007	103	0.026	0.00	26.15	1077.85	21.00

S18							26.15		
	130	75	0.008	120	0.030	0.00			
S20							26.15	1077.75	21.10
S8							35.33		
	130	75	0.007	100	0.026	0.00			
S21							35.33	1077.61	12.06
S9							40.06		
	130	75	0.020	300	0.075	0.04			
S22							40.10	1067.71	17.19
S10							41.30		
	130	75	0.065	960	0.245	1.24			
S23							42.54	1064.86	17.60

Santhe North

	Node No.	C	D (mm)	Q (m3/min)	L (m)	V (m/sec)	Hf (m)	ΣHf (m)	Elevation (EL-m)	Pressure (m)
	S2							11.07		
		130	100	0.312	1100	0.662	6.36			
S29	S24							17.43	1088.22	19.35
		130	100	0.125	493	0.265	0.52			
	S25							17.95	1086.00	21.05
		130	100	0.092	40	0.195	0.02			
	S26							17.97	1086.00	21.03
		130	100	0.089	420	0.189	0.24			
	S27							18.21	1081.19	25.60
		130	100	0.061	900	0.130	0.25			
	S28							18.46	1100.98	5.56
	S24							17.43		
		130	100	0.113	380	0.240	0.34			
S25	S29							17.77	1077.96	29.27
		130	100	0.056	200	0.119	0.05			
S26	S30							17.82	1078.38	28.80
		130	100	0.018	260	0.038	0.01			
	S27							17.83	1081.19	25.98
	S29							17.77		
		130	100	0.031	459	0.066	0.04			
	S25							17.81	1086.00	21.19
	S30							17.82		
		130	100	0.025	365	0.053	0.02			
	S26							17.84	1086.00	21.16

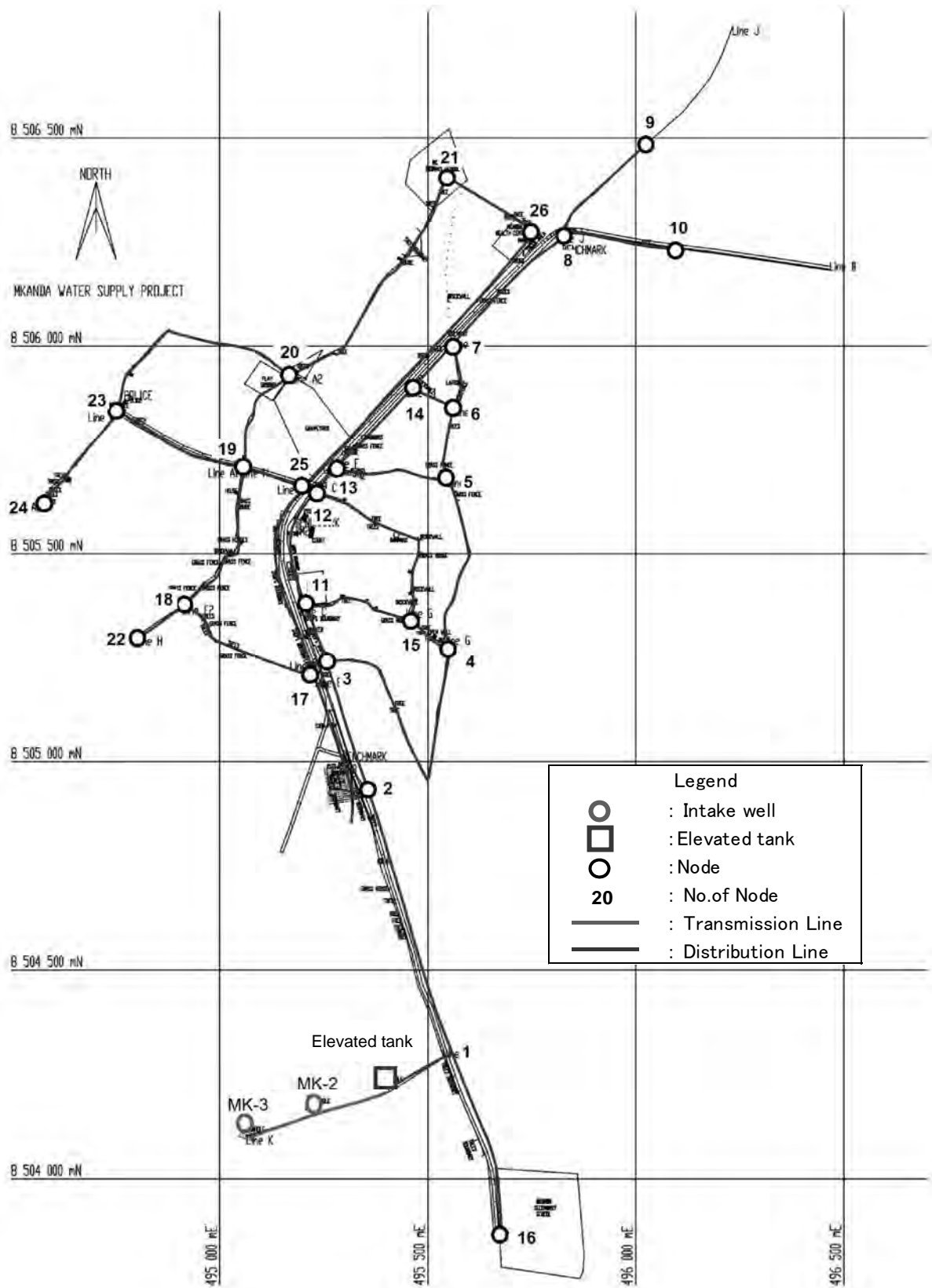


Figure A6-5-1 Drawing of node and facilities (Mkanda)

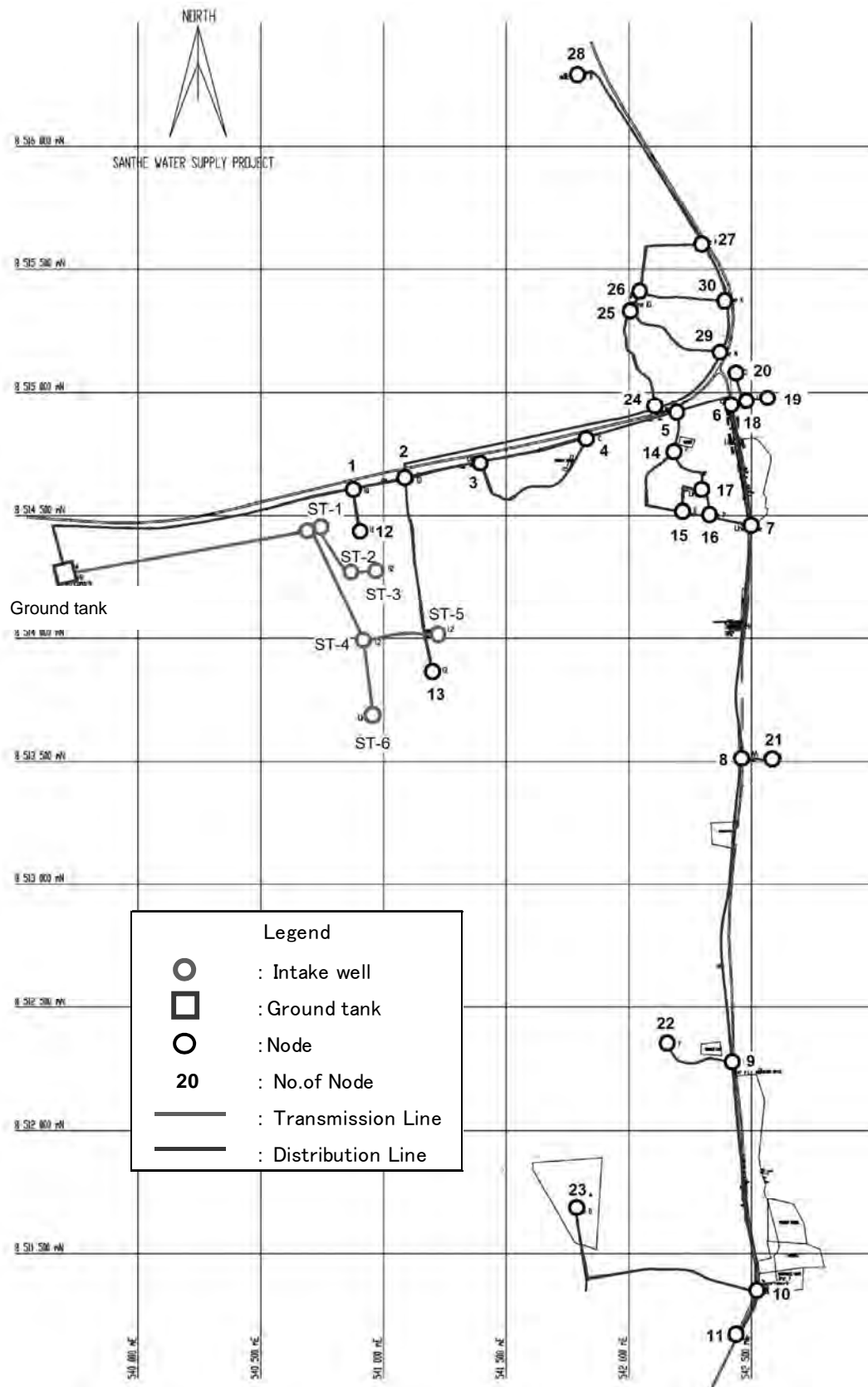


Figure A6-5-2 Drawing of node and facilities (Santhe)

6- 6 BOREHOLE SURVEY

With regards to the existing 300 boreholes, year of completion and duration are shown in Table A6-6-1.

Table A6-6-1 Year of completion and duration of borehole constructed by Mchinji groundwater development project

	No. of borehole	Year of completion	duration
Phase I	80	1993	17
Phase II	110	1994	16
Phase III	110	1995	15

A summary of borehole condition turned out through borehole survey is shown in Table A6-6-2.

Table A6-6-2 Summary of borehole condition

Condition	No.	Judgement	No.	%
Function (Ancillary structure is good contition)	185	Function	211	70
Function (There is drainage problem in ancillary structure)	16			
Yield is not more than 10L/min	10			
Not function (repairable*)	69	Not function	89	30
Not function (possibility of repair is not clear**)	6			
Borehole is closed	14			

* Boreholes which may be recovered by removal of obstacles and/or replacement of riser pipes, pump rods and other consumable parts.

** In those boreholes, the possibility of repair is not clear until trying rehabilitation work using machinery including fishing tools, winch. (Two of them have been repaired by June 2011)

Damaged handpump parts are shown in Figure A6-6-1.

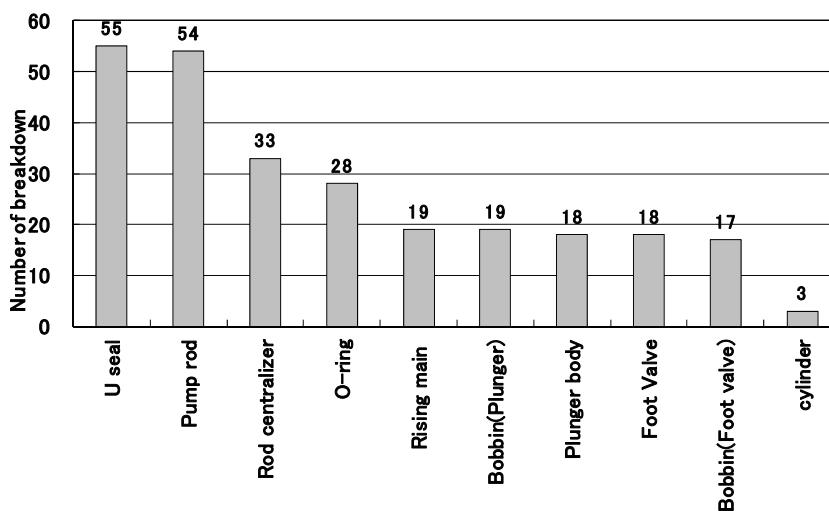


Figure A6-6-1 Histogram of damaged handpump parts

Table A6-6-3 List of borehole survey result

S/N	BH No.	Village	X(UTM)	Y(UTM)	1st Survey F: Function N: Not Function	2nd Survey O: Carried out x: Not carried out	Borehole condition turned out by 1st and 2nd survey	Detailed borehole condition	Borehole rehabilitation plan
11-001	Chidambo	491598	8471678	N	x	6. Borehole is closed	Borehole is closed by stone	new borehole construction	
21-002	Chitue	495444	8468102	F	x	1. Function (Ancillary structure is good condition)		air lift	
31-003	Tsamphale	495383	8466762	F	x	2. Function (Drainage problem in ancillary structure)		air lift	
41-004	Chamveka	494955	8470386	F	x	1. Function (Ancillary structure is good condition)		air lift	
51-005	Maliwane	500506	8469364	F	x	1. Function (Ancillary structure is good condition)		air lift	
61-006	Maliwane	500781	8469150	F	x	1. Function (Ancillary structure is good condition)		air lift	
71-007	Mlenveni	503230	8467912	N	x	4. Not function (repairable)	Borehole is stollen	air lift	
81-008	Zunguze	503364	8466930	F	x	1. Function (Ancillary structure is good condition)		air lift	
91-009	Mkangeni	500110	8461372	F	x	1. Function (Ancillary structure is good condition)		air lift	
101-010	Maganga	506176	8461450	F	x	2. Function (Drainage problem in ancillary structure)		air lift	
111-011	Chiwala	501704	8461936	N	O	4. Not function (repairable)	pump failure	air lift	
121-012	Chabwala	502267	8462714	N	O	4. Not function (repairable)	pump failure	air lift	
131-013	Mbeza	504263	8463184	N	O	4. Not function (repairable)	pump failure	air lift	
141-014	Chaonongeka	499802	8469546	F	x	1. Function (Ancillary structure is good condition)		air lift	
151-015	Mgwende	504331	8459770	F	x	1. Function (Ancillary structure is good condition)		air lift	
161-016	MWandawala	508621	8462458	F	x	1. Function (Ancillary structure is good condition)		air lift	
171-017	Kadzakurmanja	507443	8461054	F	x	1. Function (Ancillary structure is good condition)		air lift	
181-018	Mlonza	503734	8465822	N	x	4. Not function (repairable)	stone is stuck inside rising main	air lift	
191-019	Mzikanda II	500055	8468240	F	x	1. Function (Ancillary structure is good condition)		air lift	
201-020	Mkhalala	496389	8462972	F	x	1. Function (Ancillary structure is good condition)		air lift	
211-021	Chibonyolele (E)	496802	8463004	F	x	1. Function (Ancillary structure is good condition)		air lift	
221-022	Mwanayumo	497688	8461542	F	x	1. Function (Ancillary structure is good condition)		air lift	
231-023	Mphindu	498730	8465098	F	x	1. Function (Ancillary structure is good condition)		air lift	
241-024	Chibonyola (A)	496507	8462764	F	x	1. Function (Ancillary structure is good condition)		air lift	
251-025	Chibonyola (A)	496811	8462802	F	x	1. Function (Ancillary structure is good condition)		air lift	
261-026	Thukuta	503644	8458742	F	x	1. Function (Ancillary structure is good condition)		air lift	
271-027	Kapita	501937	8457400	F	x	1. Function (Ancillary structure is good condition)		air lift	
281-028	Maganga	506056	8461900	F	x	1. Function (Ancillary structure is good condition)		air lift	
291-029	Alfred	501508	8454124	F	O	3. Yield is not more than 10L/min		air lift	
301-030	Pembere	501384	8453148	F	O	3. Yield is not more than 10L/min		air lift	
311-031	Msiliza	503467	8447718	F	x	1. Function (Ancillary structure is good condition)		air lift	
321-032	Mkonda	504661	8449314	F	x	1. Function (Ancillary structure is good condition)		air lift	
331-033	Katsenqa	504961	8450097	F	x	1. Function (Ancillary structure is good condition)		air lift	
341-034	Luka-Luciano	509656	8456060	N	O	6. Borehole is closed	Borehole is closed by stone	air lift	
351-035	Chimetelela	506588	8453162	F	x	1. Function (Ancillary structure is good condition)		air lift	
361-036	Chaluma, Kalombo	504233	8451652	F	x	1. Function (Ancillary structure is good condition)		air lift	
371-037	Mkwezendumba	505859	8450237	N	O	4. Not function (repairable)	pump failure	air lift	
381-038	Galawe	502432	8449660	F	x	1. Function (Ancillary structure is good condition)		air lift	
391-039	Chikaza	501021	8451244	F	O	3. Yield is not more than 10L/min		air lift	
401-040	Kujjawa	503973	8453060	F	x	1. Function (Ancillary structure is good condition)		air lift	
411-041	Kunjawa	503855	8453216	N	x	4. Not function (repairable)	stone is stuck inside rising main	air lift	
421-042	Masukwala	506688	8461330	F	x	2. Function (Drainage problem in ancillary structure)		air lift	
431-043	Mlukwa	507356	8455065	F	x	2. Function (Drainage problem in ancillary structure)		air lift	
441-044	Mlukwa	507654	8455029	F	x	2. Function (Drainage problem in ancillary structure)		air lift	
451-045	Mwenyeanthu	505430	8458644	F	x	2. Function (Drainage problem in ancillary structure)		air lift	
461-046	Dambo	508505	8460020	F	x	2. Function (Drainage problem in ancillary structure)		air lift	

S/N	BH No.	Village	X(UTM)	Y(UTM)	1st Survey F: Function N: Not Function	2nd Survey O: Carried out x: Not carried out	Borehole condition turned out by 1st and 2nd survey	Detailed borehole condition	Borehole rehabilitation plan
47	1-047	Mwanzika	506449	8457382	F	O	3. Yield is not more than 10L/min	stone is stuck inside rising main	pump replacement
48	1-048	Chiganizo	510266	8456594	N	x	4. Not function (repairable)		pump replacement
49	1-049	Chimkoka	510841	8459252	F	x	1. Function (Ancillary structure is good condition)		pump replacement
50	1-050	Gambatiula	512274	8457236	N	O	4. Not function (repairable)	pump failure	pump replacement
51	1-051	Misale T. C.	511538	8457990	F	x	1. Function (Ancillary structure is good condition)		pump replacement
52	1-052	John	509103	8457670	F	O	3. Yield is not more than 10L/min		pump replacement
53	1-053	Mselela	514258	8459059	F	x	1. Function (Ancillary structure is good condition)		pump replacement
54	1-054	Mselela	513754	8458950	F	x	1. Function (Ancillary structure is good condition)		pump replacement
55	1-055	Ngalule	515271	8460426	F	x	1. Function (Ancillary structure is good condition)		pump replacement
56	1-056	Masitola	515559	8459182	F	x	1. Function (Ancillary structure is good condition)		pump replacement
57	1-057	Mzingo	521178	8459329	F	x	1. Function (Ancillary structure is good condition)		pump replacement
58	1-058	Natibola	522138	8461117	F	O	3. Yield is not more than 10L/min		pump replacement
59	1-059	Kachere	522064	8462886	F	x	1. Function (Ancillary structure is good condition)		pump replacement
60	1-060	Simoko	523329	8462043	F	x	1. Function (Ancillary structure is good condition)		pump replacement
61	1-061	Bua T-C	516142	8461170	F	x	1. Function (Ancillary structure is good condition)		pump replacement
62	1-062	Nkhuzo	518987	8460649	N	O	5. Not function (possibility of repair is not clear)	rising main and pump rod fell	At first try to repair pump, if it is not repair, new borehole is constructed
63	1-063	Kazule	516619	8459186	N	O	4. Not function (repairable)	pump failure	pump replacement
64	1-064	Kaole II	517250	8459130	F	x	1. Function (Ancillary structure is good condition)		pump replacement
65	1-065	Kaole I	518599	8458271	F	x	1. Function (Ancillary structure is good condition)		pump replacement
66	1-066	Kamphemu	521097	8456552	F	x	1. Function (Ancillary structure is good condition)		pump replacement
67	1-067	Kamphemu	521131	8457101	F	x	1. Function (Ancillary structure is good condition)		pump replacement
68	1-068	Katsenge A	522462	8456268	N	O	6. Borehole is closed	Borehole is stolen + Borehole is closed by stone	pump replacement
69	1-069	Mambwa	520546	8457811	F	x	1. Function (Ancillary structure is good condition)		pump replacement
70	1-070	Nyongani	523772	8452808	F	x	2. Function (Drainage problem in ancillary structure)		pump replacement
71	1-071	Monywa	524200	8455636	F	x	2. Function (Drainage problem in ancillary structure)		pump replacement
72	1-072	Walirani	529031	8455540	N	x	6. Borehole is closed	car collided and borehole is damaged	new borehole construction
73	1-073	Likungwi	525851	8454579	F	x	2. Function (Drainage problem in ancillary structure)		pump replacement
74	1-074	Mhamizana	528439	8453127	N	x	6. Borehole is closed	Borehole is stolen + Borehole is closed by stone	new borehole construction
75	1-075	Kankhande	524898	8457361	F	x	1. Function (Ancillary structure is good condition)		pump replacement
76	1-076	Kankhande	525259	8456897	F	x	1. Function (Ancillary structure is good condition)		pump replacement
77	1-077	Mkusa	524329	8456852	F	x	1. Function (Ancillary structure is good condition)		pump replacement
78	1-078	Kelwa	528458	8454070	F	x	1. Function (Ancillary structure is good condition)		pump replacement
79	1-079	Mhamizana	527900	8452888	F	x	2. Function (Drainage problem in ancillary structure)		pump replacement
80	1-080	Kanyindulia	522107	8458142	N	O	4. Not function (repairable)	pump failure	pump replacement
81	2-001	Kambard-zuwa	517293	8461876	N	O	4. Not function (repairable)	pump failure	pump replacement
82	2-002	Pinda	515426	8462251	N	O	4. Not function (repairable)	pump failure	pump replacement
83	2-003	Lupanga+Ndulama	517531	8461140	N	O	5. Not function (possibility of repair is not clear)	pump rod fell	pump replacement
84	2-004	Chikuta	515201	8463806	N	O	4. Not function (repairable)	pump failure	pump replacement
85	2-005	Chikuta	515351	8464719	N	O	4. Not function (repairable)	pump failure	pump replacement
86	2-006	Kangwanga	521340	8467230	F	x	1. Function (Ancillary structure is good condition)		pump replacement
87	2-007	Nkhumba	521411	8466892	F	x	1. Function (Ancillary structure is good condition)		pump replacement
88	2-008	Makanda	524080	8466538	F	x	1. Function (Ancillary structure is good condition)		pump replacement

S/N	BH No.	Village	X(UTM)	Y(UTM)	1st Survey F: Function N: Not Function	2nd Survey O: Carried out x: Not carried out	Borehole condition turned out by 1st and 2nd survey	Detailed borehole condition	Borehole rehabilitation plan
89	2-009	Mekanda	524196	8466866	F	x	1.Finction (Ancillary structure is good condition)	air lift	
90	2-010	Wisikoti	521844	8465941	F	x	1.Finction (Ancillary structure is good condition)	air lift	
91	2-011	Manthalu	522349	8470020	F	x	1.Finction (Ancillary structure is good condition)	air lift	
92	2-012	Manthalu	522636	8470169	N	O	6.Borehole is closed	new borehole construction	
93	2-013	Chamosola	523500	8470287	N	x	6.Borehole is closed	new borehole construction	
94	2-014	Kafunsa-Chalimba	525663	8468674	F	x	1.Finction (Ancillary structure is good condition)	air lift	
95	2-015	Mwewera	530905	8459128	F	x	1.Finction (Ancillary structure is good condition)	air lift	
96	2-016	Kamwaza	531093	8459662	F	x	1.Finction (Ancillary structure is good condition)	air lift	
97	2-017	Papa	530960	8458239	F	O	3.Yield is not more than 10L/min	air lift	
98	2-018	Guwende	526774	8468883	F	x	1.Finction (Ancillary structure is good condition)	air lift	
99	2-019	Kamilika	525522	8467121	N	O	4.Not function (repairable)	air lift	
100	2-020	Tankhule	528105	8457731	N	O	4.Not function (repairable)	air lift	
101	2-021	Welesani	529270	8450672	F	x	1.Finction (Ancillary structure is good condition)	air lift	
102	2-022	Temanim-wendo	527738	8451723	N	O	5.Not function (possibility of repair is not clear)	At first try to repair pump, if it is not repair, new borehole is constructed	
103	2-023	Temanim-wendo	529290	8450093	F	x	1.Finction (Ancillary structure is good condition)	air lift	
104	2-024	Nkhono	533858	8457302	F	x	1.Finction (Ancillary structure is good condition)	air lift	
105	2-025	Genti	533379	8457235	F	x	1.Finction (Ancillary structure is good condition)	air lift	
106	2-026	Sinunbe	532808	8454929	F	x	1.Finction (Ancillary structure is good condition)	air lift	
107	2-027	Sinunbe	533056	8455656	F	x	1.Finction (Ancillary structure is good condition)	air lift	
108	2-028	Chikwan-bani	534278	8457217	F	x	1.Finction (Ancillary structure is good condition)	air lift	
109	2-029	Mwesio	534596	8456497	F	x	1.Finction (Ancillary structure is good condition)	air lift	
110	2-030	Njiwa	533342	8453199	F	x	1.Finction (Ancillary structure is good condition)	air lift	
111	2-031	Chitumba	532503	8451862	N	x	6.Borehole is closed	new borehole construction	
112	2-032	Chinyata	531165	8452134	F	x	1.Finction (Ancillary structure is good condition)	air lift	
113	2-033	Lanadi	523518	8464343	F	O	1.Finction (Ancillary structure is good condition)	air lift	
114	2-034	Lumelo	532169	8452375	N	O	3.Yield is not more than 10L/min	air lift	
115	2-035	Lumelo	532178	8452375	F	x	4.Not function (repairable)	air lift	
116	2-036	Silombe	532568	8450377	F	x	1.Finction (Ancillary structure is good condition)	air lift	
117	2-037	Silombe	532568	8449656	F	x	1.Finction (Ancillary structure is good condition)	air lift	
118	2-038	Chinyata	530782	8452171	F	x	1.Finction (Ancillary structure is good condition)	air lift	
119	2-039	Nkokeza	533942	8451119	N	O	4.Not function (repairable)	air lift	
120	2-040	Mkonkha	534872	8450018	F	x	1.Finction (Ancillary structure is good condition)	air lift	
121	2-041	Mkonkha T.C.	534222	8449729	F	x	1.Finction (Ancillary structure is good condition)	air lift	
122	2-042	Mavere	528939	8462117	N	x	6.Borehole is closed	new borehole construction	
123	2-043	Chinkota	510422	8467137	F	x	1.Finction (Ancillary structure is good condition)	air lift	
124	2-044	Mumba	509367	8464894	F	x	1.Finction (Ancillary structure is good condition)	air lift	
125	2-045	Kadzombe	535023	8446862	N	O	4.Not function (repairable)	air lift	
126	2-046	Kadzombe	534332	8446054	F	x	1.Finction (Ancillary structure is good condition)	air lift	
127	2-047	Chimbala-me	511619	8463707	F	x	1.Finction (Ancillary structure is good condition)	air lift	
128	2-048	Chiyese-lana	536655	8444741	F	x	1.Finction (Ancillary structure is good condition)	air lift	
129	2-049	Chamani	536574	8440563	N	O	4.Not function (repairable)	air lift	
130	2-050	Chamani	536293	8440509	F	x	1.Finction (Ancillary structure is good condition)	air lift	

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1312-051		Kabuthu	536446	8442474	F	x	1. Function (Ancillary structure is good condition)		pump replacement
132-052		Kabuthu-Chiluca	536754	8441378	F	x	1. Function (Ancillary structure is good condition)		pump replacement
133-053		Mphonde	535560	8443751	N	O	4. Not function (repairable)	pump failure	pump replacement
134-054		Nkhomphe-la	535559	8440115	F	x	1. Function (Ancillary structure is good condition)		pump replacement
135-055		Manyengo	534213	8438404	F	x	1. Function (Ancillary structure is good condition)		pump replacement
136-056		Kamllika	525422	8468799	F	x	1. Function (Ancillary structure is good condition)		pump replacement
137-057		Mjolombe	524023	8468871	F	x	1. Function (Ancillary structure is good condition)		pump replacement
138-058		M'mania	529381	84587131	N	O	5. Not function (possibility of repair is not clear)	rising main and pump rod fell	At first try to repair pump, if it is not repair, new borehole is constructed
139-059		Gomani 1	508840	8464360	F	x	1. Function (Ancillary structure is good condition)		pump replacement
140-060		Jusi	522964	8463355	F	x	3. Yield is not more than 10L/min		pump replacement
141-061		Maitosi	510417	8468889	N	O	4. Not function (repairable)	pump failure	pump replacement
142-062		Mamad-zongo	511314	8468583	F	x	1. Function (Ancillary structure is good condition)		pump replacement
143-063		Nwandawara	510223	8464080	F	x	1. Function (Ancillary structure is good condition)		pump replacement
144-064		Kachokam-komero	509822	8464596	N	x	4. Not function (repairable)	pump failure	pump replacement
145-065		Mkumba	510033	8470466	F	x	1. Function (Ancillary structure is good condition)		pump replacement
146-066		Jamu	509059	8469766	F	x	1. Function (Ancillary structure is good condition)		pump replacement
147-067		Chimpamba	517604	8472394	N	O	4. Not function (repairable)	pump failure	pump replacement
148-068		Chiwoko	513765	8470833	F	x	1. Function (Ancillary structure is good condition)		pump replacement
149-069		Chiwoko	513687	8471180	F	x	1. Function (Ancillary structure is good condition)		pump replacement
150-070		Mbazawa	513199	8469594	F	x	1. Function (Ancillary structure is good condition)		pump replacement
151-071		Mbachunda	514680	8468041	F	x	1. Function (Ancillary structure is good condition)		pump replacement
152-072		Chintanda	512309	8465675	F	x	1. Function (Ancillary structure is good condition)		pump replacement
153-073		Mbachundu	515212	8468195	N	O	5. Not function (possibility of repair is not clear)	rising main and pump rod fell	At first try to repair pump, if it is not repair, new borehole is constructed
154-074		Kachikon-do	511263	8465364	F	x	1. Function (Ancillary structure is good condition)		pump replacement
155-075		Chiphala	513797	8462094	N	x	6. Borehole is closed	Borehole is closed by stone	new borehole construction
156-076		Mhawira	513770	8462642	N	O	4. Not function (repairable)	pump failure	pump replacement
157-077		Dzidzwa	514041	8467559	F	x	1. Function (Ancillary structure is good condition)		pump replacement
158-078		Chalema	516473	8468003	F	x	1. Function (Ancillary structure is good condition)		pump replacement
159-079		Kalilang-we	518557	8469459	N	O	4. Not function (repairable)	pump failure	pump replacement
160-080		Msemwe	515734	8469665	F	x	1. Function (Ancillary structure is good condition)		pump replacement
161-081		Msemwe	515638	8468898	F	O	3. Yield is not more than 10L/min		pump replacement
162-082		Mando	519113	8473917	F	x	1. Function (Ancillary structure is good condition)		pump replacement
163-083		Gereta	517524	8471297	F	x	1. Function (Ancillary structure is good condition)		pump replacement
164-084		Maimba	523343	8475204	F	x	1. Function (Ancillary structure is good condition)		pump replacement
165-085		Maimba	522818	8475005	F	x	1. Function (Ancillary structure is good condition)		pump replacement
166-086		Jenjewa	507170	8465584	N	O	4. Not function (repairable)	pump failure	pump replacement
167-087		Kanileng	507568	8464314	N	O	4. Not function (repairable)	pump failure	pump replacement
168-088		Kamdaya	525956	8472555	N	O	5. Not function (possibility of repair is not clear)	rising main and pump rod fell	At first try to repair pump, if it is not repair, new borehole is constructed
169-089		Mzati	514686	8475204	N	O	4. Not function (repairable)	pump failure	pump replacement
170-090		Zelalino	512654	8461176	F	x	1. Function (Ancillary structure is good condition)		pump replacement
171-091		Chiphala-A	519128	8471318	F	x	1. Function (Ancillary structure is good condition)		pump replacement
172-092		Chamveka	507273	8470474	F	x	1. Function (Ancillary structure is good condition)		pump replacement
173-093		Kamwendo T. C.	504315	8471442	F	x	1. Function (Ancillary structure is good condition)		pump replacement
174-094		Kamwendo T. C.	504911	8471126	F	x	2. Function (Drainage problem in ancillary structure)		pump replacement
175-095		Chidewa	513031	8474331	F	x	1. Function (Ancillary structure is good condition)		pump replacement
176-096		Chikomani	514377	8477894	F	x	1. Function (Ancillary structure is good condition)		pump replacement

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177	2-097	Mdawa	518034	8478247	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
178	2-098	Kwachaun-name	517268	8477763	N	O	5. Not function (possibility of repair is not clear)	At first try to repair pump, if it is not repair, new borehole is constructed	air lift
179	2-099	Mando	519356	8473172	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
180	2-100	Chikovi-Jombo	518504	8476071	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
181	2-101	Chimteka	518331	8476942	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
182	2-102	Chelamba-la	522175	8479071	F	x	2. Function (Drainage problem in ancillary structure)	pump replacement	air lift
183	2-103	Chwenkha	524656	8480383	N	O	4. Not function (repairable)	pump failure	air lift
184	2-104	Mhanga	528918	8480754	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
185	2-105	Durira	528942	8479588	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
186	2-106	Mphanga	528028	8479218	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
187	2-107	Butawo	527142	8477883	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
188	2-108	Mdunga	526442	8477077	N	O	4. Not function (repairable)	pump failure	air lift
189	2-109	Kaliwenge-je	509828	8472213	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
190	2-110	Kolona	518648	8475650	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
191	3-001	Kachaje	507567	8476148	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
192	3-002	Mchambo-Gunda	507472	8474953	N	O	4. Not function (repairable)	pump failure	air lift
193	3-003	Geresono	508733	8478705	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
194	3-004	Mchambo	506983	8474048	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
195	3-005	Chikoloka	509312	8474215	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
196	3-006	Tika	509421	8474640	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
197	3-007	Chimwere	511769	8471766	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
198	3-008	Kathyuka	508103	8472161	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
199	3-009	Chiwete	511883	8474981	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
200	3-010	Changata	513082	8476319	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
201	3-011	Langwani	515012	8477643	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
202	3-012	Sinosi	513445	8479026	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
203	3-013	Kanvimbo	511433	8479389	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
204	3-014	Machilika	517874	8489745	N	O	4. Not function (repairable)	pump failure	air lift
205	3-015	Chikwekwe	528083	8485752	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
206	3-016	Kanyenda	526864	8483308	N	O	6. Borehole is closed	Borehole is closed by stone	new borehole construction
207	3-017	Meberere	526864	8483305	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
208	3-018	Mkundl T.C.	514999	8484767	N	O	6. Borehole is closed	Borehole is closed by stone	new borehole construction
209	3-019	Kalombo Sch	513442	8482133	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
210	3-020	Tongile	516451	8483150	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
211	3-021	Kalinde	520073	8483132	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
212	3-022	Jesi	521553	8483646	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
213	3-023	Chipumiko-Chimutu	523631	8482579	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
214	3-024	Kadiso	530888	8492376	N	O	4. Not function (repairable)	pump failure	air lift
215	3-025	Makumbi	523318	8490602	N	O	4. Not function (repairable)	pump failure	air lift
216	3-026	Mkangala	514600	8486324	F	x	1. Function (Ancillary structure is good condition)	pump replacement	air lift
217	3-027	Mngona	513932	8489812	N	O	4. Not function (repairable)	pump failure	air lift

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177	2-097	Mdawa	518034	8478247	F	x	1.Finction (Ancillary structure is good condition)	At first try to repair pump, if it is not repair, new borehole is constructed	air lift
178	2-098	Kwacbau-namé	517268	8477763	N	O	5.Not function (possibility of repair is not clear)	rising main is not able to maining main	air lift
179	2-099	Mando	519356	8473172	F	x	1.Finction (Ancillary structure is good condition)		air lift
180	2-100	Chikovi-Jombo	518504	8476071	F	x	1.Finction (Ancillary structure is good condition)		air lift
181	2-101	Chimteka	518331	8476942	F	x	1.Finction (Ancillary structure is good condition)		air lift
182	2-102	Chelamba-la	522175	8479071	F	x	2.Finction (Drainage problem in ancillary structure)		air lift
183	2-103	Chwenkha	524656	8480393	N	O	4.Not function (repairable)	pump failure	air lift
184	2-104	Mphanga	528918	8480754	F	x	1.Finction (Ancillary structure is good condition)		air lift
185	2-105	Dutira	528142	8479588	F	x	1.Finction (Ancillary structure is good condition)		air lift
186	2-106	Mphanaga	528028	8479218	F	x	1.Finction (Ancillary structure is good condition)		air lift
187	2-107	Burawo	527142	8477883	F	x	1.Finction (Ancillary structure is good condition)		air lift
188	2-108	Mlunga	526442	8477077	N	O	4.Not function (repairable)	pump failure	air lift
189	2-109	Kaligweh-je	509828	8472213	F	x	1.Finction (Ancillary structure is good condition)		air lift
190	2-110	Kolona	518648	8475650	F	x	1.Finction (Ancillary structure is good condition)		air lift
191	3-001	Kachale	507567	8476148	F	x	1.Finction (Ancillary structure is good condition)		air lift
192	3-002	Mchambo-Gunda	507472	8474953	N	O	4.Not function (repairable)	pump failure	air lift
193	3-003	Ceresono	508733	8478705	F	x	1.Finction (Ancillary structure is good condition)		air lift
194	3-004	Mchambo	506993	8474048	F	x	1.Finction (Ancillary structure is good condition)		air lift
195	3-005	Chikoloka	509312	8474215	F	x	1.Finction (Ancillary structure is good condition)		air lift
196	3-006	Tika	509421	8474640	F	x	1.Finction (Ancillary structure is good condition)		air lift
197	3-007	Chimwere	511769	8471766	F	x	1.Finction (Ancillary structure is good condition)		air lift
198	3-008	Kathyuka	508103	8472161	F	x	1.Finction (Ancillary structure is good condition)		air lift
199	3-009	Chiwete	511883	8474981	F	x	1.Finction (Ancillary structure is good condition)		air lift
200	3-010	Changata	513082	8476319	F	x	1.Finction (Ancillary structure is good condition)		air lift
201	3-011	Langwani	515012	8477643	F	x	1.Finction (Ancillary structure is good condition)		air lift
202	3-012	Sinosi	513445	8479026	F	x	1.Finction (Ancillary structure is good condition)		air lift
203	3-013	Kanyimbo	511433	8479389	F	x	1.Finction (Ancillary structure is good condition)		air lift
204	3-014	Machilika	517874	8489745	N	O	4.Not function (repairable)	pump failure	air lift
205	3-015	Chikwekwe	528083	8485752	F	x	1.Finction (Ancillary structure is good condition)		air lift
206	3-016	Kanyenda	526864	8483308	N	O	6.Borehole is closed	Borehole is closed by stone	air lift
207	3-017	Mbarere	526864	8483305	F	x	1.Finction (Ancillary structure is good condition)		air lift
208	3-018	Mikundi T. C.	514699	8484767	N	O	6.Borehole is closed	Borehole is closed by stone	air lift
209	3-019	Kalombo Sch	513442	8482133	F	x	1.Finction (Ancillary structure is good condition)		air lift
210	3-020	Tongole	516451	8483150	F	x	1.Finction (Ancillary structure is good condition)		air lift
211	3-021	Kalinde	520073	8483132	F	x	1.Finction (Ancillary structure is good condition)		air lift
212	3-022	Jesi	521553	8483646	F	x	1.Finction (Ancillary structure is good condition)		air lift
213	3-023	Chipunitko-Chimutu	523631	8482579	F	x	1.Finction (Ancillary structure is good condition)		air lift
214	3-024	Kadiso	530888	8492376	N	O	4.Not function (repairable)	pump failure	air lift
215	3-025	Makumbi	523318	8490602	N	O	4.Not function (repairable)	pump failure	air lift
216	3-026	Mkangala	514600	8486324	F	x	1.Finction (Ancillary structure is good condition)		air lift
217	3-027	Mng'ona	513932	8489812	N	O	4.Not function (repairable)	pump failure	air lift

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260	3-070	Kuthethe	491154	8493152	F	x	1.Finction (Ancillary structure is good condition)		air lift
261	3-071	Dina	495969	8504326	N	O	4.Not function (repairable)	pump failure	pump replacement
262	3-072	Tengo	495229	8504415	N	O	4.Not function (repairable)	pump failure	air lift
263	3-073	Lameki	498032	8501844	N	O	4.Not function (repairable)	pump failure	pump replacement
264	3-074	Kaledza	501846	8499521	N	O	4.Not function (repairable)	pump failure	air lift
265	3-075	Malungo	499854	8501014	N	O	4.Not function (repairable)	pump failure	pump replacement
266	3-076	Mphunda	501285	8494894	F	x	1.Finction (Ancillary structure is good condition)		air lift
267	3-077	Kadevale-Mbeawa	501271	8495628	F	x	1.Finction (Ancillary structure is good condition)		air lift
268	3-078	Kangulu	500787	8493872	F	x	2.Finction (Drainage problem in ancillary structure)		air lift
269	3-079	Mkanda	495083	8505778	F	x	1.Finction (Ancillary structure is good condition)		air lift
270	3-080	Mkanda	494923	8505343	N	O	4.Not function (repairable)	pump failure	air lift
271	3-081	Mazombwe	494121	8491435	N	O	4.Not function (repairable)	pump failure	air lift
272	3-082	Chimkolokota	496273	8492474	N	O	4.Not function (repairable)	pump failure	air lift
273	3-083	Masiwa	495180	8494633	F	x	1.Finction (Ancillary structure is good condition)		air lift
274	3-084	kambandekha	492893	8493177	F	x	1.Finction (Ancillary structure is good condition)		air lift
275	3-085	Jirru	496461	8500973	F	x	1.Finction (Ancillary structure is good condition)		air lift
276	3-086	Lupva	495666	8496503	N	O	4.Not function (repairable)	pump failure	air lift
277	3-087	Chisauka	495626	8496915	N	O	4.Not function (repairable)	pump failure	air lift
278	3-088	Kawere	494869	8498331	F	x	1.Finction (Ancillary structure is good condition)		air lift
279	3-089	Msanda	493958	8503572	N	O	4.Not function (repairable)	pump failure	air lift
280	3-090	Zandana	493104	8500941	N	x	6.Borehole is closed	Borehole is closed by stone	new borehole construction
281	3-091	Khwere	510693	8508721	F	x	1.Finction (Ancillary structure is good condition)		air lift
282	3-092	Khwere T.C.	510198	8507537	F	x	1.Finction (Ancillary structure is good condition)		air lift
283	3-093	Mkumbi	516970	8504086	F	x	1.Finction (Ancillary structure is good condition)		air lift
284	3-094	Kambuwe	506692	8506167	N	O	4.Not function (repairable)	pump failure	air lift
285	3-095	Kambuwe	506805	8505984	N	O	4.Not function (repairable)	pump failure	air lift
286	3-096	Kankhwende	499264	8497510	F	x	1.Finction (Ancillary structure is good condition)		air lift
287	3-097	Mndaka	500104	8498184	N	O	4.Not function (repairable)	pump failure	air lift
288	3-098	Jowelo	503380	8501235	N	O	4.Not function (repairable)	pump failure	air lift
289	3-099	Mulira	508051	8497074	F	x	1.Finction (Ancillary structure is good condition)		air lift
290	3-100	Kalanga	504057	8491160	N	O	4.Not function (repairable)	pump failure	air lift
291	3-101	Diti	513481	8501318	N	O	4.Not function (repairable)	pump failure	air lift
292	3-102	Chitonde	507512	8495003	F	x	1.Finction (Ancillary structure is good condition)		air lift
293	3-103	Kalulu Sch	502456	8497652	N	O	4.Not function (repairable)	pump failure	air lift
294	3-104	Kalulu T.C.	502543	8496820	F	x	1.Finction (Ancillary structure is good condition)		air lift
295	3-105	Katsompho	505311	8496649	F	x	1.Finction (Ancillary structure is good condition)		air lift
296	3-106	Msalanyama	507004	8497474	F	x	1.Finction (Ancillary structure is good condition)		air lift
297	3-107	Mchankwe	506693	8495677	F	x	1.Finction (Ancillary structure is good condition)		air lift
298	3-108	Chiti	502429	8490946	F	x	1.Finction (Ancillary structure is good condition)		air lift
299	3-109	Chiti	502228	8491364	F	x	2.Finction (Drainage problem in ancillary structure)	Borehole is stolen	air lift
300	3-110	Mphako	502125	8494020	N	x	4.Not function (repairable)		air lift

6- 7 WATER QUALITY TEST

Water quality test was carried out for some of the boreholes constructed under “The Porject for Groundwater Development in Mchinji” , and for the other boreholes and unprotected shallow wells which are used as alternate water points near above boreholes. Details of water quality test site are shown in Table A6-7-1 and water quality test results are shown in Table A6-7-2.

Table A6-7-1 Details of water quality test site

No.	Type	No.of test
1	Functioning boreholes constructed under ” The Project for Groundwater Development in Mchinji”	13
2	Other boreholes near the mal-functioning boreholes constructed under the Project	3
3	Unprotected shallow wells near the mal-functioning boreholes constructed under the Project	8
	total	24

Table A6-7-2 List of water quality test result

LAB No.	699	701	702	693	691	690	697	695	698	696	712	713
DATE SAMPLED	08/10/2010	09/10/2010	09/10/2010	08/10/2010	07/10/2010	07/10/2010	08/10/2010	08/10/2010	08/10/2010	08/10/2010	10/10/2010	10/10/2010
LOCATION	Chute Village	Chimiteka Village	Chimkoka Village	Bua TC	Mtonya Village	Mbwerera Village	Mazawa Village	Malimba Village	Kamwendo TC	Chelambata Village	Mikuwa II Village	Kabvunguli School
SOURCE TYPE	JICA BH 1-002	JICA BH 1-035	JICA BH 1-049	JICA BH 1-061	JICA BH 1-071	JICA BH 2-015	JICA BH 2-070	JICA BH 2-085	JICA BH 2-094	JICA BH 2-102	USW near JICA BH 3-035	JICA BH 3-062
pH Value	Mtonyeni 7.34	Mtonyeni 6.98	Mtonyeni 7.47	Mtonyeni 6.44	Mavware 7.75	Mavware 7.65	Zulu 7.01	Zulu 7.62	Zulu 7.23	Zulu 7.02	Zulu 7.5	Miduwa 7.59
CONDUCTIVITY ($\mu\text{S/cm at } 25^{\circ}\text{C}$)	123.3	149	165	205	456	222	192	217	242	238	166	470
TOTAL DISSOLVED SOLIDS, mg/l	63	75	83	106	208	110	97	108	122	120	83	237
CARBONATE (as CO_3^{2-}), mg/l	0	0	0	0	21	12	0	9.6	0	0	0	19
BICARBONATE (as HCO_3^-), mg/l	65	88	78.1	127	213	97	109	90	133	138	95	230
CHLORIDE (as Cl ⁻), mg/l	5.9	3	11.9	1.1	8.9	5.9	5.9	8.9	8.9	5.9	3	6.9
SULPHATE (as SO_4^{2-}), mg/l	<0.01	<0.01	<0.01	2.1	<0.01	<0.01	1.5	<0.01	<0.01	<0.01	<0.01	<0.01
NITRATE (as NO_3^-), mg/l	0.212	0.021	0.63	0.034	0.031	0.263	<0.0	0.541	1.381	0.009	0.297	0.028
FLUORIDE (as F ⁻), mg/l	0.56	0.66	0.69	0.7	0.61	0.61	0.7	0.66	0.55	0.6	0.66	0.66
SODIUM (as Na ⁺), mg/l	10.4	6.4	7.6	8.8	19.9	5.4	12.1	7.2	14	12	6.5	11.3
POTASSIUM (as K ⁺), mg/l	0.8	1.3	1.2	1.7	4.8	0.4	1.1	1.4	1.6	1.3	1	1.4
CALCIUM (as Ca ⁺⁺), mg/l	10.2	13.2	16	22	53	21	17	22.5	24.2	27	18.6	65
MAGNESIUM (as Mg ⁺⁺), mg/l	3.9	7.7	5.6	8	9.5	9.7	7	7.7	8	7.6	6.7	10.6
IRON (Fe ⁺⁺), mg/l	0.016	0.012	0.041	0.3	0.051	0.059	0.042	0.088	0.047	0.016	0.095	0.033
MANGANESE (Mn ⁺⁺), mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TOTAL HARDNESS (as CaCO ₃), mg/l	41	64	63	87	171	92	71	88	93	98	74	205
TOTAL ALKALINITY (as CaCO ₃), mg/l	53	72	63	104	209	99	89	90	109	113	77	220
SILICA (as SiO ₂) mg/l	30	28	26	29	23	25	28	26	36	31	23	31
TURBIDITY, NTU	0.2	0.4	0	0.1	1	0.3	0.5	0.6	1	0	0	2
SUSPENDED SOLIDS, mg/l	0	0	0	0	0	0	0	0	0	0	0	0
FAECAL COLIFORM, Count/100 ml	690	300	340	50	210	40	50	80	350	110	460	150
FAECAL STREPTOCOCCI, Count/100 ml	20	40	10	0	30	50	0	10	40	40	50	10

LAB No.	715	705	706	711	704	714	700	692	689	694	716	703
DATE SAMPLED	10/10/2010	09/10/2010	09/10/2010	09/10/2010	09/10/2010	10/10/2010	09/10/2010	07/10/2010	07/10/2010	08/10/2010	10/10/2010	09/10/2010
LOCATION	Mphunda Village	Dina Village	Thengo Village	Mkanda TC at Nanganiani House	Msanda Village	Chilonde Village	Chiganizo Village	Chimosola Village	Chihumba Village	Chiphala J P School	Kapiri Roman Catholic	Zandana Village
SOURCE TYPE	JICA BH 3-076	USW near JICA BH	USW near JICA BH	USW near JICA BH	USW near JICA BH	JICA BH 3-102	USW near JICA BH	BH near JICA BH	USW near JICA BH	BH near JICA BH	BH near JICA BH	USW near JICA BH
pH Value	Mkanda 6.88	Mkanda 7.34	Mkanda 7.82	Mkanda 7.41	Mkanda 7.21	Kapandia 6.98	Mlonyeni 6.11	Mawwere 5.46	Mawwere 6.2	Zulu 6.29	Dambe 7.07	Mkanda 7.77
CONDUCTIVITY ($\mu\text{S}/\text{cm}$ at 250C)	250	122	139	135	135	413	49.7	55.9	102	64	282	288
TOTAL DISSOLVED SOLIDS, mg/l	131	62	69	67	70	210	25	28	53	32	144	145
CARBONATE (as CO_3^{2-}), mg/l	0	0	9	0	0	0	0	0	0	0	0	11
BICARBONATE (as HCO_3^-), mg/l	155	53	47	73	53	237	12	22	54	27	167	140
CHLORIDE (as Cl ⁻), mg/l	1	11.9	7.4	5.9	5.9	8.9	8.9	5.9	5.9	5.9	5.9	5.9
SULPHATE (as SO_4^{2-}), mg/l	<0.01	<0.01	<0.01	<0.01	13.9	<0.01	<0.01	1.3	<0.01	<0.01	<0.01	<0.01
NITRATE (as NO_3^-), mg/l	0.048	0.07	0.209	0.05	0.006	0.02	0.283	0.087	0.092	0.095	0.032	0.269
FLUORIDE (as F ⁻), mg/l	0.65	0.59	0.66	0.18	0.6	0.61	0.75	0.6	0.69	0.59	0.59	0.59
SODIUM (as Na ⁺), mg/l	16.9	3.4	3.7	3.7	8.9	29.4	2.8	3.6	5.6	4.1	18.3	3.8
POTASSIUM (as K ⁺), mg/l	8.5	0.8	0.4	0.6	0.9	7.7	0.6	0.2	0.9	0.2	7.3	0.3
CALCIUM (as Ca ⁺⁺), mg/l	22	11	11.2	15	11.6	43	4	5	9	6	26.4	35
MAGNESIUM (as Mg ⁺⁺), mg/l	7.6	5.8	6.8	5.7	3.8	9	1.9	1.5	4.4	1.7	7.7	11.7
IRON (Fe ⁺⁺), mg/l	0.243	0.31	0.341	0.738	0.313	0.013	0.03	0.13	0.232	0.14	0.019	0.34
MANGANESE (Mn ⁺⁺), mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TOTAL HARDNESS (as CaCO ₃), mg/l	86	51	56	62	45	144	17	18	40	22	97	136
TOTAL ALKALINITY (as CaCO ₃), mg/l	127	43	53	59	43	194	9	18	44	22	136	133
SILICA (as SiO ₂) mg/l	33	21	23	23	25	22	17	20	21	22	34	23
TURBIDITY, NTU	2	8	17	20	40	1	6	2	12	52	1	120
SUSPENDED SOLIDS, mg/l	0	6	15	20	30	0	6	1	10	49	0	117
FAECAL COLIFORM, Count/100 ml	230	550	490	330	950	60	500	150	110	300	50	1000
FAECAL STREPTOCOCCI, Count/100 ml	20	60	100	80	50	0	30	0	40	20	0	20

6- 8 BOREHOLE CONDITION SURVEY

Borehole Condition Survey

1. Background

All of 13 borehole water quality tests of which sampling points were selected randomly from 300 boreholes detected faecal coliforms through the Central Water Laboratory in 2010. To secure the safe water supply after the planned rehabilitation of boreholes, all of the boreholes targeted for rehabilitation shall be tested on microbiological characteristics while the adopted testing methodology will be verified. And the possible sources of contamination shall be identified in the surrounding area of each borehole for provision of safe water.

2. Purpose of Survey

- To find microbiological contamination of groundwater at all of the working boreholes which were constructed under the Mchinji Groundwater Development Project (1993-1995).
- To find the possible source of microbiological contamination in surrounding area of the above boreholes

3. Methodology of Microbiological Water Quality Test

1st Step (verification of testing method)

Cross checking with two inspectors at 13 sites which tested in 2010.

The water currently used by the people was sampled followed by drawing for 5 minutes and cleaning of spout of the pump.

Targeted microbe: Faecal Coliform (FC) and Faecal Streptococci (FS).

The equipment and the media of each inspector is as shown in the Table A6-8-1

Table A6-8-1 Testing Method for Cross Checking (1st Step)

Inspector	Equipment	Medium
Consultant hired by the Survey Team	Field Water Testing Kit (Oxfam-DelAgua Dual)	MFC Broth (Ready-made pack for each sample)
Central Water Laboratory	Millepore Filtering Kit and Portable Incubator	Lauryl Membrane Sulphate Broth (prepared in the laboratory and preserved in its refrigerator)

2nd Step (test for all working boreholes)

The Consultant continued the same test for Faecal Coliforms for all other remaining boreholes.

Test for FS was carried out at some suspicious sites for contamination.

3rd Step (re-inspection against boreholes in which FC and/or FS detected)

Through the 1st and the 2nd steps, all of boreholes were disinfected with Chloline*.

(*: After initial sampling, 4 g of chlorine agent (HTH; chlorine content of 70%) was diluted in 350 ml of water before pouring the mixture into each borehole for sterilisation.)

At those boreholes where the presence of FC and/or FS was confirmed with the 1 st and 2 nd Steps, further sampling was conducted after at least two days of normal operation since sterilisation for fresh analysis. This procedure was employed to determine whether the positive detection of FC and/or FS was attributable to a contaminated borehole or contaminated groundwater.

4. Sanitary Facilities near Boreholes

The distribution of sanitary facilities was checked as part of the present survey to determine the present conditions of such facilities around those boreholes constructed under the Groundwater Development Project in Mchinji. The types of facilities checked were pit latrines, rubbish pits and animal kraals (sheds).

The result of borehole condition survey for microbiological watrr quality test and distribution of sanitary facilities are shown in Table A6 – 8 – 2.

Table 6-8-2 List of survey result

BH No.	Village	T.A.	pH	EC (μ S/cm)	temp	Faecal Coliform		Faecal Streptococci		Remarks	Distribution of Possible Source of Contamination							
						No.1	No.2	CWL	No.1		No.2	CWL	Toilet (Latrine)	Rubbish pit	Pen (Cattle, Goat, Poultry etc.)			
											D < 15 m	15 <= D <= 30 m	30 <= D <= 45 m	45 <= D <= 60 m	60 <= D <= 75 m	75 <= D <= 90 m	90 <= D <= 105 m	
1-001	Chidambo	Mlonveni	-	-	-													
1-002	Chute	Mlonveni	5.86	125	22.9	0	0	0				2	1					
1-003	Tsamphale	Mlonveni	6.29	161	26.4	0												
1-004	Chamveka	Mlonveni	6.05	134	23.5	0						2	3	1				
1-005	Maliwane	Mlonveni	6.56	175	26.1	0						1						
1-006	Maliwane	Mlonveni	6.42	215	26.9	0						2						
1-007	Mlonveni	Mlonveni	-	-	-	N												
1-008	Zunguze	Mlonveni	-	-	-	N												
1-009	Mkangeni	Mlonveni	6.28	163	25.4	0												
1-010	Maganja	Mlonveni	6.21	161	26.7	0						1	6					
1-011	Chiwaula	Mlonveni	5.51	75	25.9	0												
1-012	Chabwela	Mlonveni	7.41	267	25.8	0						1	3	1				
1-013	Mbeza	Mlonveni	6.68	292	25	0						3						
1-014	Chamongeka	Mlonveni	5.91	79	26.9	0						1	3					
1-015	Mgwende	Mlonveni	7.18	232	26.7	0						1	4					
1-016	MWandawala	Mlonveni	6.15	163	24.5	0						1	1					
1-017	Kadzakumatiya	Mlonveni	-	-	-	N												
1-018	Mlonga	Mlonveni	-	-	-	N												
1-019	MziIsola II	Mlonveni	7.12	223	24.3	0												
1-020	Mkhala	Mlonveni	6.57	202	25.2	0	11	0				1	3	1				
1-021	Chibonyola (B)	Mlonveni	6.26	80	26.5	0												
1-022	Mwanayumbo	Mlonveni	6.18	139	24.6	0						2						
1-023	Mphindu	Mlonveni	5.4	86	24.9	0												
1-024	Chibonyola (A)	Mlonveni	5.94	150	25.4	0						3						
1-025	Chibonyola (A)	Mlonveni	6.56	180	25.1	5						1	1					
1-026	Thukuta	Mlonveni	6.11	132	24.8	0												
1-027	Kapita	Mlonveni	6.51	189	24.1	0						1	4	3				
1-028	Maganja	Mlonveni	6.52	103	26.1	0						1	3					
1-029	Alfred	Mlonveni	6.02	103	26.1	0												
1-030	Pembere	Mlonveni	5.42	63	24.8	0												
1-031	Mtsiliza	Mlonveni	6.27	264	24.6	0						1	6	2				
1-032	Mkonda	Mlonveni	5.68	112	24.8	0						2	5	9				
1-033	Katsenga	Mlonveni	5.8	147	25.6	0												
1-034	Luka Luciano	Mlonveni	6.21	129	25.1	0												
1-035	Chimeteke	Mlonveni	6.27	153	24.8	0												
1-036	Chalumba, Kalombo	Mlonveni	5.74	60	24.7	0	0	0										
1-037	Mkwezendumba	Mlonveni	6.01	132	25.1	0												
1-038	Galawe	Mlonveni	7.42	309	23.5	0						2	2					
1-039	Chikaza	Mlonveni	6.48	198	25	0						3	4					
1-040	Kunjawa	Mlonveni	6.65	171	23.6	0						1	4	1				
1-041	Kunjawa	Mlonveni	6.18	151	24.1	0												
1-043	Mtrakwa	Mlonveni	-	-	-	N												
1-044	Mtrakwa	Mlonveni	-	-	-	N												
1-045	Mwenzenthu	Mlonveni	6.61	184	23.9	0						1	8	5				
1-046	Dambo	Mlonveni	-	-	-	0												
1-047	Mwanzika	Mlonveni	6.75	198	24.9	0												
1-048	Chigamizo	Mlonveni	6.46	191	25	0						1	1					
1-049	Chimkoka	Mlonveni	5.8	-	25.6	0												
1-050	Gambatula	Mlonveni	6.05	149	25.7	0						2	2					
1-051	Misale T. C.	Mlonveni	6.1	166	25	0						1	2	1				
1-052	John	Mlonveni	7.31	216	23.9	0						3	1					
1-054	Mselela	Mlonveni	6.55	164	26.4	0												
1-055	Ngelile	Mlonveni	6.53	253	25.3	0						1	1					
1-056	Masitela	Mlonveni	6.67	213	26.4	0												
1-060	Simoko	Mlonveni	6.08	169	25	0						2	10					
1-061	Bua T. C	Mlonveni	6.53	203	25.9	0						1	3					
1-063	Kazule	Mlonveni	6.55	249	26.2	0						2	4					
1-064	Kaale II	Mlonveni	6.55	208	24	0												
1-065	Kaale I	Mlonveni	6.48	176	25.2	0						1	2	2				
2-001	Kambandzuwa	Mlonveni	-	-	-	N												
2-002	Pinda	Mlonveni	6.16	172	25.6	0						1	1	2				
2-003	Lupenger Ndulama	Mlonveni	-	-	-	N												
2-004	Chikuta	Mlonveni	6.6	268	24.9	0												
2-005	Chikuta	Mlonveni	6.8	394	24.8	0												
2-043	Chinkota	Mlonveni	6.59	330	23.2	0						1	1					
2-065	Mkumba	Mlonveni	6.9	235	25.6	0	0	0										
											10	66	127	0	5	8	3	14

BH No.	Village	T.A.	pH	EC (μ S/cm)	Faecal Coliform		Faecal Streptococci		Remarks	Distribution of Possible Source of Contamination								
					No.1	No.2	No.1	No.2		CWL	Toilet (Latrine)							
											D < 15 m	15 = < D < 30m	30 = < D < 45m	D < 15 m	15 = < D < 30m	30 = < D < 45m	Rubbish pit	Pen (Cattle, Goat, Poultry etc.)
1-042	Muskwala	Mawere	6.14	107	0	0					4	7						
1-053	Mselela	Mawere	-	-	N	0												
1-057	Mzingo	Mawere	7.03	424	24.7	0					1							
1-058	Nathwola	Mawere	6.77	302	25.1	0												
1-059	Kachere	Mawere	6.16	207	24.7	0												
1-062	Nihwaa	Mawere	6.29	230	25.3	0												
1-066	Kamphevu	Mawere	6.58	195	26.3	0												
1-067	Kamphevu	Mawere	-	-	N	0												
1-068	Katsenga A	Mawere	6.55	186	24.7	0												
1-069	Mamba	Mawere	6.42	296	25.1	0												
1-070	Nyongani	Mawere	7.38	26	0	0	1											
1-071	Mtonya	Mawere	6.61	275	26.2	0												
1-072	Walirani	Mawere	6.63	258	25.1	0												
1-073	Likungwi	Mawere	-	-	N	0												
1-074	Mnamizana	Mawere	6.33	228	25.9	0												
1-075	Kankhande	Mawere	7.01	346	25	0												
1-076	Kankhande	Mawere	6.39	281	24.2	0												
1-077	Mkusa	Mawere	7.26	243	25.4	0												
1-078	Kajiwa	Mawere	6.83	332	26	0												
1-079	Mnamizana	Mawere	6.76	289	25.5	0												
1-080	Kanyindula	Mawere	-	-	N	0												
2-006	Kangwanga	Mawere	6.54	275	26.2	0												
2-007	Nkhumba	Mawere	6.4	197	25.7	0												
2-008	Makanda	Mawere	6.52	210	26	0												
2-009	Makanda	Mawere	6.97	349	25.9	0												
2-010	Wiskoti	Mawere	6.16	154	26.4	0												
2-011	Mantshu	Mawere	-	-	N	0												
2-012	Mantshu	Mawere	-	-	N	0												
2-013	Chamosola	Mawere	6.19	211	25.9	0												
2-014	Rafunest-Chalimba	Mawere	6.74	276	0	0	3											
2-015	Mbwerera	Mawere	7.44	365	26.4	0												
2-016	Kamwaza	Mawere	7.27	318	27.3	0												
2-017	Papa	Mawere	6.37	268	27.6	0												
2-018	Guwende	Mawere	6.21	222	26.8	0												
2-019	Kamhlika	Mawere	6.25	240	25.9	0												
2-020	Tankhule	Mawere	6.75	151	26.1	0												
2-021	Welesani	Mawere	-	-	N	0												
2-022	Temamin-wendo	Mawere	6.72	279	24	0												
2-023	Temamin-wendo	Mawere	6.74	267	25.9	0												
2-024	Nkhono	Mawere	6.43	206	26.1	0												
2-025	Gemi	Mawere	6.73	367	25.9	0												
2-026	Sinunbe	Mawere	6.51	257	25.4	0												
2-027	Sinunbe	Mawere	6.33	207	26.7	0												
2-028	Chikwan-bani	Mawere	6.42	242	26.4	0												
2-029	Mwesio	Mawere	-	-	N	0												
2-030	Niwa	Mawere	-	-	N	0												
2-031	Chitumba	Mawere	6.47	244	26.1	0												
2-032	Chinyata	Mawere	6.22	175	27.1	0												
2-033	Lanadi	Mawere	7.78	317	26.7	0												
2-034	Lamelo	Mawere	6.45	199	23.6	0												
2-035	Lamelo	Mawere	6.95	341	22.8	0												
2-036	Shombe	Mawere	6.6	342	25.3	0												
2-037	Shombe	Mawere	6.51	129	26.4	0												
2-038	Chinyata	Mawere	6.69	198	24.7	0												
2-039	Nikokeza	Mawere	7.14	351	23.6	0												
2-040	Mkoncha	Mawere	-	-	N	0												
2-041	Mkoncha T.C.	Mawere	6.99	179	24.7	0												
2-042	Mawere	Mawere	6.54	76	25	0												
2-049	Chamani	Mawere	6.34	111	25.2	0												
2-050	Chamani	Mawere	6.34	111	25.2	0												
2-051	Kabuthu	Mawere	6.34	111	25.2	0												
2-052	Kabuthu-Chifua	Mawere	-	-	N	0												
2-053	Mphonde	Mawere	-	-	N	0												

BBH No.	Village	T.A.	pH	EC (µ S/cm)	temp	Faecal Coliform		Faecal Streptococci		Remarks	Distribution of Possible Source of Contamination								
						No.1	No.2	CWL	No.1		No.2	CWL	Toilet (Latrine)	Rubbish pit	Pen (Cattle, Goat, Poultry etc)				
3-004	Mchambo	Zulu	6.33	221	24.6	0					D < 15 m 15 =D<30m 30=>D<45m D < 15 m 15 =D<30m 30=>D<45m D < 15 m 15 =D<30m 30=>D<45m								
3-005	Chikoloka	Zulu	6.72	473	24.7	0				Washing basin is in use									
3-006	Tika	Zulu	6.78	338	24.7	0				Washing basin is not in use									
3-007	Chimwere	Zulu	7.51	448	24.6	0				Washing basin not in use									
3-008	Kathyuuka	Zulu	6.7	191	24.2	0				Washing basin not in use									
3-009	Chiwewe	Zulu	7.23	430	25.5	0				Washing basin is in use									
3-010	Changata	Zulu	6.11	131	26.4	0				Washing basin is in use									
3-011	Lanwani	Zulu	6.81	234	27.8	0				Washing basin in use									
3-012	Sinesi	Zulu	6.35	208	25.1	0				Washing basin not in use									
3-013	Kanvimbo	Zulu	6.06	230	25.1	0					17	56	90	0	4	4	12	25	30

3-014	Machilika	Mduwa	6.48		23.8	0													
3-015	Chikweke	Mduwa	6.64		26	0				Washing basin is in use									
3-016	Kanvenda	Mduwa	-		-	N				BH was vandalised in 1997									
3-017	Mberere	Mduwa	6.58		25.2	0				Washing basin not in use									
3-018	Mikundi T.C.	Mduwa	-		-	N				BH not working since 2009									
3-019	Kalumbo Sch	Mduwa	7		23.7	0				Washing basin not in use									
3-020	Tungole	Mduwa	7.17		25.1	0				Washing basin not in use									
3-021	Kalinde	Mduwa	6.61		25.4	0				Washing basin is in use									
3-022	Jasi	Mduwa	6.56		15.9	0				Washing basin not in use									
3-023	Chipuntik-Chimutu	Mduwa	6.58		26	0				Washing basin is in use									
3-024	Kadiso	Mduwa	-		-	N				Not functioning since January 2011									
3-025	Makumbi	Mduwa	6.97		25.3	0				BH not fenced									
3-026	Mkangala	Mduwa	6.46		22.8	0				Washing basin not in use									
3-027	Mngona	Mduwa	6.77		25.6	0				Washing basin is in use									
3-028	Lezani	Mduwa	6.66		24.8	0				Washing basin is in use									
3-029	Gesani	Mduwa	6.6		24.5	0				Washing basin not in use									
3-030	Tinoti	Mduwa	6.75		24.5	0				Washing basin is in use									
3-031	Sigereza	Mduwa	7.35		25.3	0				Washing basin is in use									
3-032	Chisamba	Mduwa	6.11		25.1	0				Washing basin not in use									
3-033	Maele	Mduwa	6.34		23.7	0				Washing basin is in use									
3-034	Saidi	Mduwa	6.69		22	0				Washing basin is in use									
3-035	Mikawa ii	Mduwa	7.3		25.4	0				Washing basin not in use									
3-036	Sundwe	Mduwa	6.32		25.9	1	0			Washing basin is in use									
3-037	Mphonwe	Mduwa	6.64		22.6	0				Washing basin is in use									
3-038	Laisi	Mduwa	6.57		24	0				Washing basin not in use									
3-039	Kabungewe-Dravvo	Mduwa	6.15		23.8	0				Washing basin is in use									
3-040	Machakulo	Mduwa	6.38		25	0				Washing basin is in use									
3-045	Mfemankhlope	Mduwa	7		25.9	0				Washing basin is in use									
3-053	Chivvera	Mduwa	7.1		24.3	0				Washing basin is in use									
3-052	Chimkolokaza	Mduwa	7.44		24.1	0				Washing basin not in use									
											12	30	36	0	2	2	6	17	6

3-041	Kapiri	Dambe	6.67		26.3	0				Washing basin not in use									
3-042	Mthema T.C.	Dambe	6.35		25.8	0				Washing basin not in use									
3-043	Chalunda T.C.	Dambe	6.94		26	26	30			Washing Basin in use									
3-044	Kasanda	Dambe	6.69		25.3	0				Washing basin is in use									
3-046	Katonda Sch	Dambe	6.78		25.4	0				Washing basin is in use									
3-047	Kamera	Dambe	6.06		25.9	0				Washing basin is in use									
3-048	Chisenga	Dambe	-		-	0				Washing basin is in use									
3-049	Kamphambale	Dambe	6.5		23.7	0				Washing basin is in use									
3-050	Kabvuta	Dambe	6.69		26	0				Washing basin is in use									
3-051	Nkhumbu	Dambe	6.68		24.6	0				Washing basin is in use									
3-052	Mphonda-Masinja	Dambe	-		-	N				Washing basin is in use									
3-054	Marten	Dambe	6.68		23.2	0				Washing basin is in use									
3-055	Kanzimbi	Dambe	-		-	N				Washing basin is in use									
3-056	Gardali	Dambe	7.21		25.7	0				Washing basin is in use									
3-058	Ifesani	Dambe	-		-	N				BH abandoned									
3-059	Kapiri Hospital	Dambe	-		-	N				Wash Slab is used									
3-060	Japana	Dambe	6.64		24.6	0				Washing basin is in use									
3-061	Gong'ontha	Dambe	-		-	N				Washing basin is in use									
3-062	Kavunguti School	Dambe	6.66		25	0				Washing basin is in use									
3-063	Kachere	Dambe	-		-	0				Washing basin is in use									

6- 9 SOCIAL CONDITION SURVEY FOR MCHINJI PROJECT

1. Scale of interview

Table A6-9-1 Number of surveyed household and population

No.	Community/Market Centre	Population/HH	Target HH	Leader of Centre
1	Mchinji Rural Communities	289,747/87436	600	300

2. Result of interview (Rural community leaders)

Table A6-9-2 Villages that do not satisfy given criteria(one water point for every 250 persons)

Village	Total Population	Boreholes	protected shallow wells
Msanda	900	0	0
Thengo	520	0	0
Lubayini	700	1	0
Lameke	1030	1	2
Milonga	320	0	0
Ndawala zefelino	600	0	1
Chetambala	550	0	1
Dulira	1500	0	0
katonda	193		0

Village	Total Population	Boreholes	protected shallow wells
butao	400	0	0
kamphamale	50		0
Felankhope	250	0	0
Chinyera	213	0	1
Maliseni	273	0	0
Kadzakumanja	200		
mtemadzongo	88	0	0
Kachikondo	500	0	0
Mazombwe	375	0	1
poko	2320	0	1

Table A6-9-3 Distribution of responses on method of collecting O&M funds

Borehole condition	Decided		Not decided	
	No.	%	No.	%
Functioning	162	72.6	13	5.8
Non-functioning	40	17.9	8	3.6
TOTAL	202	90.5	21	9.4

Table A6-9-4 Responses on method of payment of O&M funds

Borehole condition	Fixed fee		In-kind		Adhoc	
	No.	%	No.	%	No.	%
Functioning	110	42.8	50	19.5	50	19.5
Non-functioning	26	10.1	12	4.6	9	3.5
TOTAL	136	52.9	62	24.1	59	23.0

Table A6-9-5 Average savings (in reserve) for borehole O&M

Borehole condition	Average Amount (MK)
Functioning	1,027.57
Non-functioning	251.13
TOTAL	639.35

Table A6-9-6 List of villages with plans to install/rehabilitate borehole

LIST OF VILLAGES					
Kanyimbo	Mandawala	Jim	Diti	Kalulu TC	Dina
Thengo	Kalilangwe	Bololo	Mndaka	Mikundi	Kandaya
Lubayini	Tika	Chinkhale	Joel	Japana	Chemveka
Mkhala	Msemwe	Gunda	Temanimwendo	Kawele	Kamanga
Mphindu	Mazombwe	Sinos	Saidi	Lenadi	Khwere
Chibonyole	Poko	Langwani	Pinda	Zandana	Tsibwe
Ndawala zefelino	Chimkolokota	Chamveka	Malungo	Mphomwa	Kalulu
Chidzanja	Mbachundu	Geresomo	Machilika	Mkangala	Nkumbi
Chetambala	Galeta	Kanjelengo	Chiphala	Mng'ona	Lombo
Dulira	Mando	Kalinde	Chioko	Drawo	Chitande
Nkhunumbu	Mailosi	Goseni	Mzingo	Chalema	Kambuwe
Kamphamale	Mumba	Lezani	Manthala	Dzidzwa	Kadzakumanja
Felankhope	Chiphala	Jasi	Chiwaula	Tankhule	Mtemadzongo
Kanzimbi	Chambakata	Laisi	Maganga	Mthawira	Chidewa
Chinyera	Nkhotamo	Tongole	Chimwere	Milonga	Nkumba
Luka	Matimba	Mtsukunya	Bua TC		

Table A6-9-7 Reasons some borehole are not function

Reasons	No.	%
WPC unable to maintain and repair	17	5.8
Inadequate funds	140	47.7
Lack of trained mechanics	15	5.2
Vandalism/Theft	21	7.2
Non-availability of spare parts	92	31.4
Unsatisfied with other water sources (such as boreholes)	3	1.0
Others	5	1.7

Table A6-9-8 Responses on necessity of training for WPC

Borehole condition	Necessary		Not necessary	
	No.	%	No.	%
Functioning	224	80.0	2	0.7
Non-functioning	53	18.9	1	0.4
TOTAL	277	98.9	3	1.1

Table A6-9-9 Disired training content

Training Contents	No.	%
Repairs and Maintenance	273	42.0
Money Collection and Financial Management	95	14.6
Awareness Campaigns on Water Usage	81	12.5
Hygiene and Sanitation Promotion	201	30.9
others	0	0.0

Table A6-9-10 Responses on the necessity to have wash-basin at the WPC

Borehole condition	Necessary		Not necessary	
	No.	%	No.	%
Functioning	147	54.0	73	26.8
Non-functioning	40	14.7	12	4.5
TOTAL	187	68.7	85	31.3

3.Result of the interview (rural community villagers)

Table A6-9-11 Status of the boreholes

Condition /status of Borehole	No.	%
Functioning	247	84.1
Non-functioning	47	15.9
TOTAL	294	100

Table A6-9-12 Volume satisfaction with JICA's borehole

Volume	No.	%
Sufficient	476	81.8
Insufficient	106	18.2

Table A6-9-13 Satisfaction on quality with JICA boreholes

Quality	No.	%
Good	533	92.2
Salty	33	5.8
Ferrous	6	1.0
Coloured	6	1.0
Other	0	0.0

Table A6-9-14 Trial to repair a borehole

Borehole condition	Have tried repair before		Have not tried to repair before	
	No.	%	No.	%
Functioning	471	82.1	11	1.9
Non-functioning	81	14.1	11	1.9

Table A6-9-15 repair organization

Borehole condition	Community		Donor		WMA		Neighbors		Area mechanics		Other	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Functioning	231	42.5	24	4.4	41	7.5	12	2.2	121	22.2	34	6.3
Non-functioning	49	9.0	6	1.1	3	0.6	5	0.9	14	2.6	4	0.7

Table A6-9-16 Alternative water resource

Borehole Condition	River/Da mbo	Spring	UP SW	Protected SW	Borehole	Tap	Other
	No.	No.	No.	No.	No.	No.	No.
Functioning	184	0	121	98	82	2	5
Non-functioning	31	0	26	18	19	0	0

Table A6-9-17 List of borehole which is not function and using alternative water resource

No.	Village	TA	Code
1	Bua T.C.	Mlonyeni	1-061
2	Katsenga	Mlonyeni	1-068
3	Kankhande	Mlonyeni	1-076
4	Papa	Mlonyeni	2-017
5	Kamlilika	Mlonyeni	2-019
6	Kabuthu-Chituka	Mlonyeni	2-052
7	Nkhomphola	Mlonyeni	2-054
8	Matimba	Zulu	2-084
9	Mphonda-Masinja	Dambe	3-052
10	Thengo	Mkanda	3-072
11	Kangulu	Mkanda	3-078
12	Mkanda	Mkanda	3-080
13	Kammbadekha	Mkanda	3-084
14	Zandana	Mkanda	3-090
15	Khwere	Dambe	3-091
16	Kambuwe	Dambe	3-094
17	Kambuwe	Dambe	3-095

Table A6-9-18 Need for rehabilitation

Borehole condition	Necessary		Unnecessary	
	No.	%	No.	%
Functioning	403	69.4	85	14.6
Non-functioning	83	14.3	10	2.1
TOTAL	486	83.7	95	16.7

Table A6-9-19 Reasons boreholes were not functioning

Reasons	No.	%
WPC unable to maintain and repair	34	6.2
Inadequate funds	238	43.7
Lack of trained mechanics	32	5.9
Vandalism/Theft	28	5.1
Non-availability of spare parts	197	36.1
Unsatisfied with other water sources (such as boreholes)	13	2.4
Others	3	0.6

Table A6-9-20 Evaluation of WPC

Borehole Condition	Excellent		good		moderate		Not-good		Very bad	
	No.	%	No.	%	No.	%	No.	%	No.	%
Functioning	124	23.3	210	39.4	68	12.8	45	8.4	7	1.3
Non-functioning	17	3.2	30	5.6	21	3.9	9	1.7	2	0.4
TOTAL	141	26.5	240	45.0	89	16.7	54	10.1	9	1.7

Table A6-9-21 Willingness to contribute towards O&M

Borehole Condition	Willing		Not willing	
	No.	%	No.	%
Functioning	453	77.2	40	6.8
Non-functioning	77	13.1	17	2.9
TOTAL	530	90.3	57	9.7

Table A6-9-22 Responses on ability to pay(on annual basis)

Borehole Condition	MK30 /less	50K	100K	150K	200K	300K	400K	500K	More	Average
	No.	No.	No.	No.	No.	No.	No.	No.	No.	MK/year
Functioning	42	153	120	29	37	13	7	36	14	145.04
Non-functioning	6	20	25	4	11	7	1	5	0	146.00
TOTAL	48	173	145	33	48	20	8	41	14	145.18

Table A6-9-23 Past monetary contributions(annually)

Borehole Condition	Contributed (No.)		Average Amount (MK)
	Yes	No	
Functioning	438	55	521.10
Non-functioning	78	16	210.13
TOTAL	516	71	365.61

Table A6-9-24 Hygiene and sanitation practices

Practices	RESPONSES			
Boiling drinking water	Always (17) answers (3.0) %	Normally (37) answers (6.5) %	Never (513) answers (90.5) %	-
Storage of water	Pot with filter (26) answers (4.6) %	Pot (40)answers (7.1) %	Bucket (489) answers (86.2) %	Other (12) answers (2.1) %
Scooping water	A cup (417)answers (73.5) %	A Dipper (8)answers (1.4) %	Two cups (120)answers (21.2) %	Dipper and cup (22) answers (3.9) %
Wash hands	Always w/soap (72) answers (12.7) %	Always (398) answers (70.2) %	Sometimes (88) answers (15.5) %	Seldom (9) answers (1.6) %
Toilet excretion place	Toilet (534) answers (94.2) %	Garden (33) answers (5.8) %	River (0) answers (0.0) %	Other (0) answers (0.0) %
Owner of toilet	Individual (471) answers (88.2) %	Community (41)answers (7.8) %	Rent (11)answers (2.0) %	Other (11)answers (2.0) %
Type of toilet	VIP (1)answers (0.2) %	Pit w/san plat (12)answers (2.2) %	Pit latrine (521)answers (97.6) %	-
Wash hand after toilet	Always w/soap (135)answers (23.8) %	Always (269)answers (47.4) %	Sometimes (154)answers (27.2) %	Seldom/never (9)answers (1.6) %
Hygiene education	Never taken (247)answers (43.6) %	Taken (319)answers (56.4) %	-	-

Table A6-9-25 Existence of water related illnesses

Borehole Condition	Diarrhea		Dysentery		Typhoid		cholera		Eye disease		Skin disease		other	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Functioning	161	34.9	63	13.7	3	0.6	11	2.3	28	6.1	65	14.1	57	12.3
Non-functioning	31	6.7	15	3.2	1	0.3	1	0.3	8	1.7	9	1.9	8	1.7
TOTAL	192	41.6	78	16.9	4	0.9	12	2.6	36	7.8	74	16.0	65	14.0

Table A6-9-26 Household income(on average in MK on annual basis)

Borehole Condition	From Primary Occupation	From Secondary Occupation	Total(MK)
Functioning	52,437.30	12,873.45	64,980.90
Non-functioning	51,494.70	14,876.12	66,081.17
TOTAL	51,966.00	13,874.79	65,531.04

Table A6-9-27 Questionnaire (rural community villagers)

Questionnaire for		VILLAGERS (House wives/ Family chiefs)					Mchinji Rehabili	
District		TA		G.V.H		WARD		
VILLAGE		NAME		DATE		Inter-viewer		
BH No.	<input type="checkbox"/> JICA, <input type="checkbox"/> Other ()	Drilled in (yr)		<input type="checkbox"/> Functioning <input type="checkbox"/> Not Functioning	Broken in (yr)	Other BH	<input type="checkbox"/> Functioning <input type="checkbox"/> Not Functioning	
JICA Borehole	<input type="checkbox"/> Excellent, <input type="checkbox"/> Good, <input type="checkbox"/> moderate, <input type="checkbox"/> not-good, <input type="checkbox"/> very bad			Desirable Improvement				
Functioning	JICA borehole	Satisfaction	Volume: <input type="checkbox"/> Sufficient <input type="checkbox"/> insufficient Quality: <input type="checkbox"/> Good <input type="checkbox"/> Salty <input type="checkbox"/> Ferrous <input type="checkbox"/> Colour <input type="checkbox"/> Other()					
		Daily Consumption	buckets/day *20L bucket					
Trial of repair (actually repaired): <input type="checkbox"/> Yes <input type="checkbox"/> No		Repaired by:	<input type="checkbox"/> by ourselves	<input type="checkbox"/> by donor, NGO	<input type="checkbox"/> by WMA (Gov't)	<input type="checkbox"/> by neiborings	<input type="checkbox"/> Area Mech. <input type="checkbox"/> other	
Currently Not-Functioning	alternative water source	Water Source	<input type="checkbox"/> River/ Dambo <input type="checkbox"/> Spring <input type="checkbox"/> U-p SW <input type="checkbox"/> Protected SW <input type="checkbox"/> Borehole <input type="checkbox"/> Tap <input type="checkbox"/> Other()					
		Distance to source: m	Frequency: <input type="checkbox"/> Every day <input type="checkbox"/> Other()	Times a day:		times/day		
	Main Transport	<input type="checkbox"/> On foot <input type="checkbox"/> Bicycle <input type="checkbox"/> Cart <input type="checkbox"/> Motor bike <input type="checkbox"/> Domestic Animal <input type="checkbox"/> Other()						
	Satisfaction	Volume: <input type="checkbox"/> Sufficient <input type="checkbox"/> insufficient Quality: <input type="checkbox"/> Good <input type="checkbox"/> Salty <input type="checkbox"/> Ferrous <input type="checkbox"/> Colour <input type="checkbox"/> Other()						
	Daily Consumption	buckets/day *20L bucket						
	Need of rehabilitation: <input type="checkbox"/> Yes <input type="checkbox"/> No		Expectations: <input type="checkbox"/> Saving time <input type="checkbox"/> Lighten Labour <input type="checkbox"/> Secure Quality <input type="checkbox"/> Less Expense <input type="checkbox"/> Other					
Trial of repair (trial only, not actually): <input type="checkbox"/> Yes <input type="checkbox"/> No								
Trial of repair (actually repaired in the past): <input type="checkbox"/> Yes <input type="checkbox"/> No		Repaired by (check multi):	<input type="checkbox"/> by ourselves	<input type="checkbox"/> by donor, NGO	<input type="checkbox"/> by WMA (Gov't)	<input type="checkbox"/> by neiborings	<input type="checkbox"/> Area Mech. <input type="checkbox"/> other	
Reasons of not-functioning now (multiple answer):		<input type="checkbox"/> WPC not know how to maintaine and repair <input type="checkbox"/> not have enough money <input type="checkbox"/> difficult to find mechanic						
		<input type="checkbox"/> vandalism/theft <input type="checkbox"/> difficult to get spareparts <input type="checkbox"/> can be satisfied with other water supplies (such as other boreholes) <input type="checkbox"/> others						
Willingness/Affordability	Water Point Committee	<input type="checkbox"/> Exist <input type="checkbox"/> not exist	Evaluation of WPC's Activity: <input type="checkbox"/> Excellent, <input type="checkbox"/> Good, <input type="checkbox"/> moderate, <input type="checkbox"/> not-good, <input type="checkbox"/> very bad					
	Your willingness to pay for pump maintenance: <input type="checkbox"/> Yes <input type="checkbox"/> No							
	Affordability to pay for pump maintenance per HH (annual):		<input type="checkbox"/> 30 K <input type="checkbox"/> 50 K <input type="checkbox"/> 100 K <input type="checkbox"/> 150 K <input type="checkbox"/> 200 K <input type="checkbox"/> 300K <input type="checkbox"/> 400K <input type="checkbox"/> 500K <input type="checkbox"/> More					
	Have you ever provided monetary contribution for maintenance of the JICA's borehole? <input type="checkbox"/> Yes <input type="checkbox"/> No		If Yes, how much? _____ K					
Hygiene & Sanitation	Boiling drinking water	to drink water after boiling <input type="checkbox"/> always <input type="checkbox"/> normally <input type="checkbox"/> never						
	Storage of Water	Water Storage in house <input type="checkbox"/> Pot with filter <input type="checkbox"/> Pot <input type="checkbox"/> Bucket <input type="checkbox"/> Other()						
	Scooping water	by <input type="checkbox"/> a cup <input type="checkbox"/> a dipper <input type="checkbox"/> two cups <input type="checkbox"/> a dipper and a cup <input type="checkbox"/> Other(,)						
	Washing hands before eat?	<input type="checkbox"/> always wash with soap or ash <input type="checkbox"/> always <input type="checkbox"/> sometimes <input type="checkbox"/> seldom <input type="checkbox"/> never						
	Toilet	Excretion place	<input type="checkbox"/> toilet <input type="checkbox"/> garden <input type="checkbox"/> river <input type="checkbox"/> Other()			Owner of toilet: <input type="checkbox"/> individual <input type="checkbox"/> community <input type="checkbox"/> rent <input type="checkbox"/> other		
		Type of Toilet	<input type="checkbox"/> VIP toilet <input type="checkbox"/> Pit Latrine with SanPlat <input type="checkbox"/> Pit Latrine					
	Washing hands	after excretion <input type="checkbox"/> wash with soap <input type="checkbox"/> always <input type="checkbox"/> sometimes <input type="checkbox"/> seldom <input type="checkbox"/> never						
Hygiene Education	<input type="checkbox"/> never taken <input type="checkbox"/> taken (place: at _____, frequency: _____ / year, trained by: _____)							
Previous illness (persons in Family/year)	<input type="checkbox"/> Diarrhoea() <input type="checkbox"/> Dysentery() <input type="checkbox"/> Typhoid() <input type="checkbox"/> Cholera() <input type="checkbox"/> Eye disease() <input type="checkbox"/> Skin disease()							
Socio-Economic Situation	Family	() persons /family	Occupation: <input type="checkbox"/> Agri. <input type="checkbox"/> Breeder, <input type="checkbox"/> Merchant, <input type="checkbox"/> Civil Servant, <input type="checkbox"/> Agri. Labourer, <input type="checkbox"/> Wage Earner, <input type="checkbox"/> Other()					
			Side Job: <input type="checkbox"/> Agri. <input type="checkbox"/> Breeder, <input type="checkbox"/> Merchant, <input type="checkbox"/> Civil Servant, <input type="checkbox"/> Agri. Labourer <input type="checkbox"/> Wage Earner, <input type="checkbox"/> Other()					
	Income	Primary occupation		K/year				
	Side job		K/year					
	Total Income		K/year					

Table A6-9-28 Questionnaire (Rural community leaders)

Questionnaire for		VLLAGE HEADMAN / VLLAGE HEALTH WATER COMMITTEE						Mchinji Rehabili	
District/T.A			G.V.H		Village				
Name			Title		Date		Interviewer		
Village info.	Population	Population & Housing Census of 2008	Village Name at the census	Number of Households	Men	Women	Total	Change after Census 2008	
		Evolution	Year 1995 (at BH construction)	Year 2000	Year 2005	Year 2010 (at present)	Event: Division, Merger, Changing Name etc. (HH) (year)		
	Infrastructure/ Facilities	Population by age	0-9 years old	10-19 years old	20-49 years old	more than 50 years old			
		Education	1. Primary school <input type="checkbox"/> Yes <input type="checkbox"/> No			2. Secondary school <input type="checkbox"/> Yes <input type="checkbox"/> No			
Village Health Water Committee	Health services	1. Health Centre <input type="checkbox"/> Yes <input type="checkbox"/> No			Location:	(_____ hours by walk to go)			
		2. Dispensary <input type="checkbox"/> Yes <input type="checkbox"/> No	3. Hospital <input type="checkbox"/> Yes <input type="checkbox"/> No		name:	(_____ hours by walk to go)			
	Draw a map of the village which shows water supply facilities such as JICA's borehole and others with village boundary.								
Water point Committee of JICA's borehole	Establishment	<input type="checkbox"/> No -->	Plan for establishment: <input type="checkbox"/> Yes (expected date: _____) <input type="checkbox"/> No (reason: _____)						
		<input type="checkbox"/> Yes -->	Year of establishment:	Member : Men _____, Women _____		Way of establishment: <input type="checkbox"/> elected <input type="checkbox"/> designated			
	Members:	<input type="checkbox"/> Chairperson, <input type="checkbox"/> Vice-CP, <input type="checkbox"/> Secretary, <input type="checkbox"/> Treasurer, <input type="checkbox"/> Pump caretaker, <input type="checkbox"/> Other (_____)						Year of last member change	
	Replaced members:	<input type="checkbox"/> President, <input type="checkbox"/> Vice-president, <input type="checkbox"/> Secretary, <input type="checkbox"/> Treasurer, <input type="checkbox"/> Pump caretaker, <input type="checkbox"/> Other (_____)						Reason:	
	OK M Change	Way of collection	<input type="checkbox"/> Decided <input type="checkbox"/> Not yet		Way of payment	<input type="checkbox"/> Fixed fee (_____ MK/HH/year) <input type="checkbox"/> Piece Work (_____ days/year) <input type="checkbox"/> when repair necessary			
Current amount of the reserve for maintenance (estimated amount is acceptable): _____ K (at present) <input type="checkbox"/> do not know									
Place of safekeeping of the money collected:				<input type="checkbox"/> Treasurer (village) <input type="checkbox"/> Bank <input type="checkbox"/> Post office <input type="checkbox"/> Church <input type="checkbox"/> Other (_____)					
Water supply facilities	Infra.	Infrastructure of water supply in the village except JICA's borehole <u>under functioning</u> : boreholes-(_____) places, standpipe-(_____) places, protected shallow wells-(_____) places							
		Does your village have plans to install and/or rehabilitate boreholes by your own effort and/or by external support? <input type="checkbox"/> Yes <input type="checkbox"/> No							
	Condition of the JICA's borehole	Condition of the JICA's borehole	<input type="checkbox"/> function <input type="checkbox"/> Not function						
		In the case of JICA's borehole is now not functioning, what are the reasons? (multiple answers)							
		<input type="checkbox"/> WPC does not know how to maintain and repair <input type="checkbox"/> not have enough money <input type="checkbox"/> difficult to find mechanic							
		<input type="checkbox"/> vandalism/theft <input type="checkbox"/> difficult to get spareparts <input type="checkbox"/> can be satisfied with other water supplies (such as other boreholes) <input type="checkbox"/> others							
		Has the JICA's borehole got repaired before? <input type="checkbox"/> Yes <input type="checkbox"/> No							
	Detailed info on Failure/ Repair history	Repaired by (check multi):	<input type="checkbox"/> by ourselves		<input type="checkbox"/> by donor, NGO	<input type="checkbox"/> by WMA	<input type="checkbox"/> by neiborings	<input type="checkbox"/> Area Mech.	<input type="checkbox"/> by other
		Failure (1)(cause: _____, month/year _____/____), Failure (2) (cause: _____, month/year _____/____)							
		Repair (repaired by: _____, month/year _____/____, costs: _____ MK)							
training	Maintenance (dismantled by: _____, times/year, recent replacement of parts: _____ in (Month/Yr) : /)								
	Do you think that WPC now has enough capacity to maintain the JICA's borehole in sustainable manner? <input type="checkbox"/> Yes <input type="checkbox"/> No								
	Do you think that WPC now needs to receive training for better maintainance of the JICA's borehole? <input type="checkbox"/> Yes <input type="checkbox"/> No								
If Yes, what categories are necessary to receive trainings? (check multiple)									
<input type="checkbox"/> mechanical techniques <input type="checkbox"/> money collection and management <input type="checkbox"/> promotion of local people's awareness on water usage <input type="checkbox"/> hygiene and sanitation <input type="checkbox"/> others									
Hygiene and sanitation	Toilet	Toilet utilization: _____% of villagers			Number of toilets in the village: _____places in the village				
	Garbage	Garbage pits: _____places in the village			Cleanness in the village (observation) <input type="checkbox"/> very clean <input type="checkbox"/> clean <input type="checkbox"/> normal <input type="checkbox"/> slightly dirty <input type="checkbox"/> dirty				
	Wash	Communal Wash Basin at Water Point: <input type="checkbox"/> necessary <input type="checkbox"/> not necessary			Frequency: <input type="checkbox"/> everyday <input type="checkbox"/> 2-3 times/week <input type="checkbox"/> less than once/week <input type="checkbox"/> other				
	Bathing	<input type="checkbox"/> River/ Dambo <input type="checkbox"/> Bath shelter (at home) <input type="checkbox"/> other (_____)							
Education	Visit of Health Surveillance Assistant:			times/ month	Opportunities of Sanitation and Hygiene education:			<input type="checkbox"/> Yes <input type="checkbox"/> No	
	Frequency of Sanitation and Hygiene education			times/ year	Sanitation and Hygiene education given by:				

Table A6-7-29 List of survey results (rural community villagers)

BH No.	TA	Village	General			JICA Borehole				Alternative Water source				Willingness/Affordability				Hygiene & Sanitation			Socio-Economic Situation		
			rating	Volume	Satisfaction	Daily use buckets/day	Trial repair	Repaired by	Alternati ve Water source	Times a day	Need of rehab	Expectations	WPC	Evaluation WPC activities	Willingness to pay	Affordability to pay pump maintenance per hh	money contribution for maintenance of JICA BH	How much (MK)	Excretion place	Type of illness	No. of person in family	Occupation	Total income
I-001	Mionveni	Chidambo	Excellent	S	Good	4	Yes	Village	BH	4	Yes	Secure Quality	Exist	Good	No	N/A	Yes	20	Toilet	Skin disease	7	Agri	100,000
I-001	Mionveni	Chidambo	Very bad	S	Good	7	Yes	Village	BH	4	Yes	Secure Quality	Exist	Not-Good	Yes	100K	Yes	100	Toilet	Skin disease	6	Agri	24,000
I-002	Mionveni	Chute	Excellent	S	Good	8	Yes	Area Mech.	BH	4	Yes	Save Time	Exist	Very bad	Yes	100K	Yes	2,200	Toilet	Cholera	5	Agri	120,000
I-002	Mionveni	Chute	Excellent	S	Good	5	Yes	Area Mech.	BH	2	Yes	Secure Quality	Exist	Good	Yes	150K	Yes	100	Toilet	Cholera	6	Agri	80,000
I-003	Mionveni	Tsamphale	Excellent	S	Good	4	Yes	N/A	R/D	1	Yes	Secure Quality	Exist	Good	N/A	Yes	4,000	Toilet	Skin disease	4	Agri	167,000	
I-003	Mionveni	Tsamphale	Excellent	S	Good	5	Yes	Area Mech.	PSW	3	Yes	Secure Quality	Exist	Good	Yes	100K	Yes	4,000	Toilet	Skin disease	6	Agri	40,000
I-004	Mionveni	Chamwaka	Very bad	S	Good	5	Yes	Village	Up SW	5	Yes	Save Time	Not exist	N/A	No	N/A	No	N/A	Toilet	N/A	5	Agri	105,000
I-004	Mionveni	Chamwaka	Excellent	S	Good	4	Yes	Village	R/D	3	Yes	Save Time	Exist	Excellent	Yes	100K	Yes	100	Toilet	Dysentery	4	Agri	10,000
I-005	Mionveni	Maliwane	Good	S	Good	5	Yes	Village	R/D	2	Yes	Secure Quality	Exist	Good	Yes	150K	Yes	5,000	Toilet	Diarrhoea	3	Merchant	230,000
I-005	Mionveni	Maliwane	Excellent	S	Good	3	Yes	Village	R/D	2	Yes	Secure Quality	Exist	Good	Yes	50K	Yes	10,000	Toilet	Diarrhoea	5	Agri	113,000
I-006	Mionveni	Maliwane	Excellent	S	Good	6	Yes	Area Mech.	BH	2	No	N/A	Not exist	Not-Good	Yes	50K	Yes	50	Toilet	Skin disease	7	Agri	80,000
I-006	Mionveni	Maliwane	Excellent	S	Good	6	Yes	Area Mech.	PSW	1	Yes	Secure Quality	Exist	Excellent	Yes	200K	Yes	10,000	Toilet	Skin disease	6	Agri	59,000
I-007	Mionveni	Mionveni	Moderate	S	Good	2	Yes	WMA	R/D	3	No	N/A	Exist	Good	Yes	30K	Yes	50	Toilet	Eye disease	6	Agri	13,000
I-007	Mionveni	Mionveni	Excellent	S	Good	2	Yes	N/A	R/D	4	Yes	Less Expense	Exist	Good	No	N/A	Yes	100	Toilet	Diarrhoea	3	Agri	13,000
I-008	Mionveni	Zungruze	Good	S	Sally	4	Yes	Nborings	R/D	3	No	N/A	Exist	Good	Yes	30K	Yes	50	Toilet	N/A	5	Agri	5,000
I-008	Mionveni	Zungruze	Good	S	Good	4	Yes	Area Mech.	Up SW	10	Yes	Lighten Labour	Not exist	N/A	Yes	100K	Yes	50	Toilet	N/A	6	Merchant	20,000
I-009	Mionveni	Miangeni	Excellent	S	Good	7	Yes	Village	R/D	4	Yes	Less Expense	Exist	Good	Yes	500K	Yes	20	Toilet	Dysentery	8	Agri	10,000
I-010	Mionveni	Manganga	Good	S	Good	6	Yes	Area Mech.	BH	5	Yes	Save Time	Exist	Good	Yes	More	Yes	300	Toilet	Dysentery	8	Agri	8,500
I-010	Mionveni	Manganga	Excellent	S	Good	6	Yes	Village	R/D	4	Yes	Save Time	Exist	Excellent	Yes	50K	Yes	50	Toilet	Diarrhoea	4	Agri	30,000
I-011	Mionveni	Chiwaula	Good	S	Good	10	Yes	Village	N/A	4	No	N/A	Exist	Excellent	Yes	50K	Yes	200	Toilet	Diarrhoea	5	Agri	65,000
I-011	Mionveni	Chiwaula	Excellent	S	Good	2	Yes	Village	Up SW	5	Yes	Secure Quality	Exist	Good	Yes	50K	Yes	20	Garden	N/A	5	Agri	10,000
I-012	Mionveni	Chiabwala	Excellent	S	Good	N/A	Yes	Village	Up SW	4	Yes	Lighten Labour	Exist	Moderate	Yes	100K	Yes	100	Toilet	Diarrhoea	6	Agri	45,000
I-012	Mionveni	Chiabwala	Excellent	S	Good	13	Yes	Village	BH	4	Yes	Save Time	Exist	Good	Yes	150K	Yes	150	Toilet	Diarrhoea	7	Agri	10,000
I-013	Mionveni	Mbeza	Moderate	S	Good	10	Yes	WMA	PSW	2	N/A	N/A	Exist	Good	Yes	100K	Yes	100	Toilet	Diarrhoea	7	Merchant	72,000
I-013	Mionveni	Mbeza	Good	S	Good	4	Yes	Village	R/D	4	No	N/A	Exist	Excellent	Yes	500K	Yes	300	Toilet	Skin disease	11	Agri	32,000
I-014	Mionveni	Chaonongeka	Moderate	S	Good	8	Yes	Area Mech.	PSW	3	Yes	Secure Quality	Exist	Good	Yes	100K	Yes	25,000	Toilet	Diarrhoea	8	Agri	72,000
I-015	Mionveni	Mkwende	Not-good	S	Good	6	Yes	Area Mech.	R/D	9	No	N/A	Exist	Very bad	No	N/A	Yes	50	Toilet	Eye disease	8	Agri	1,000
I-015	Mionveni	Mkwende	Excellent	S	Good	9	Yes	Area Mech.	R/D	5	No	N/A	Exist	Good	Yes	More	Yes	100	Toilet	Skin disease	6	Agri	80,000
I-016	Mionveni	Mwandawala	Excellent	S	Good	36	Yes	Area Mech.	BH	6	Yes	Lighten Labour	Exist	Excellent	Yes	200K	Yes	100	Toilet	Skin disease	5	Agri	75,000
I-016	Mionveni	Mwandawala	Excellent	S	Good	7	Yes	Area Mech.	R/D	8	Yes	Secure Quality	Exist	Excellent	Yes	50K	Yes	50	Toilet	Cholera	8	Agri	10,000
I-017	Mionveni	Kadakumanya																					
I-018	Mionveni	Mlonga	Very bad	S	Good	10	Yes	Village	R/D	N/A	Yes	Save Time	Exist	Good	Yes	300K	Yes	100	Toilet	Diarrhoea	8	Agri	200,000
I-018	Mionveni	Mlonga	Good	S	Good	4	Yes	Area Mech.	BH	8	Yes	Secure Quality	Exist	Excellent	No	30K	Yes	10	Toilet	Eye disease	4	Agri	9,000
I-019	Mionveni	Mkaka II	Excellent	S	Good	4	Yes	Village	R/D	6	Yes	Save Time	Exist	Excellent	Yes	50K	Yes	150	Toilet	Diarrhoea	3	Agri	35,000
I-019	Mionveni	Mkaka II	N/A	S	Good	10	Yes	Village	R/D	3	No	N/A	Exist	Good	Yes	50K	Yes	50	Toilet	Diarrhoea	6	Agri	17,000
I-020	Mionveni	Mkhala	Excellent	S	Good	4	Yes	Area Mech.	R/D	4	No	N/A	Exist	Good	Yes	30K	Yes	50	Toilet	Diarrhoea	4	Agri	10,000
I-020	Mionveni	Mkhala	Excellent	S	Good	4	Yes	Area Mech.	R/D	6	No	N/A	Exist	Excellent	Yes	50K	Yes	50	Toilet	Diarrhoea	4	Agri	10,000
I-021	Mionveni	Chibonyola(B)																					
I-022	Mionveni	Mwanayimo	Excellent	S	Good	4	Yes	Village	R/D	4	No	N/A	Exist	Not-Good	Yes	More	Yes	20	Toilet	N/A	5	Agri	6,000
I-022	Mionveni	Mwanayimo	Excellent	S	Good	3	Yes	Donor	R/D	4	No	N/A	Exist	Not-Good	Yes	50K	No	N/A	Toilet	N/A	4	Agri	25,000
I-023	Mionveni	Mphindu	Good	S	Good	7	Yes	Area Mech.	R/D	3	No	N/A	Exist	Excellent	Yes	500K	Yes	100	Toilet	Diarrhoea	4	Agri	26,000
I-023	Mionveni	Mphindu	Good	S	Good	7	Yes	Area Mech.	R/D	N/A	Yes	Secure Quality	Exist	Good	Yes	500K	Yes	200	Toilet	Eye disease	4	Agri	49,500
I-024	Mionveni	Chibonyola (A)	Very bad	S	Good	6	Yes	Village	BH	6	No	N/A	Exist	N/A	Yes	100K	Yes	1,000	Toilet	Diarrhoea	5	Agri	80,000
I-024	Mionveni	Chibonyola (A)	Very bad	S	Good	6	Yes	Village	BH	6	Yes	Secure Quality	Exist	N/A	Yes	100K	Yes	1,000	Toilet	Diarrhoea	5	Agri	80,000
I-025A	Mionveni	Chibonyola (A)	Very bad	S	Good	8	Yes	Village	R/D	N/A	Yes	Secure Quality	Exist	Good	Yes	300K	Yes	100	Toilet	Diarrhoea	4	Agri	200,000
I-025A	Mionveni	Chibonyola (A)	Good	S	Good	8	Yes	Area Mech.	Up SW	3	Yes	Lighten Labour	Exist	Good	Yes	More	Yes	150	Toilet	Diarrhoea	4	Agri	10,500
I-026	Mionveni	Thukuta	Good	S	Good	8	Yes	Village	R/D	4	No	N/A	Exist	Excellent	No	N/A	Yes	400	Toilet	Dysentery	7	Agri	16,000
I-026	Mionveni	Thukuta	Moderate	S	Good	7	Yes	Village	R/D	3	Yes	Lighten Labour	Exist	Excellent	Yes	50K	Yes	80	Toilet	Dysentery	4	Agri	5,000
I-027	Mionveni	Kapita	Excellent	S	Good	7	Yes	Village	R/D	3	Yes	Save Time	Exist	Excellent	Yes	100K	Yes	50	Toilet	Diarrhoea	3	Agri	15,000
I-028	Mionveni	Kapita	Excellent	S	Good	4	Yes	Village	R/D	4	Yes	Save Time	Exist	Excellent	Yes	100K	Yes	50	Toilet	Diarrhoea	3	Agri	50,000
I-028	Mionveni	Maganaga	Moderate	S	Good	N/A	Yes	Village	BH	3	No	N/A	Exist	Good	Yes	30K	Yes	20	Toilet	Diarrhoea	6	Agri	6,000
I-028	Mionveni	Maganaga	Excellent	S	Good	50	Yes	Area Mech.	BH	2	No	N/A	Not exist	Not-Good	Yes	50K	Yes	10,000	Toilet	Skin disease	6	Agri	59,000
I-029	Mawvere	Alfred	Good	S	Good	5	Yes	Village	R/D	4	No	N/A	Exist	Excellent	Yes	500K	Yes	50	Toilet	Diarrhoea	11	Agri	32,000
I-029	Mawvere	Alfred	Not-good	IS	Good	5	Yes	Area Mech.	R/D	2	Yes	Secure Quality	Exist	Excellent	Yes	50K	Yes	50	Toilet	Diarrhoea	4	Agri	44,000
I-030	Mawvere	Pembere	Good	S	Good	40	Yes	Village	R/D	4	Yes	Less Expense	Exist	Moderate	Yes	50K	Yes	100	Toilet	Typeid	4	Agri	18,000
I-030	Mawvere	Pembere	Good	S	Good	5	Yes	Area Mech.	R/D	N/A	Yes	Save Time	Exist	Not-Good	Yes	50K	Yes	100	Toilet	Diarrhoea	4	Agri	5,000

BH No.	TA	Village	JICA Borehole			Alternative Water source				Willingness/Affordability					Hygiene & Sanitation			Socio-Economic Situation					
			rating	Volume	Quality	Daily use buckets /day	Trial repair	Repaired by	Alternati ve Water source	Times a day	Need of rehab	Expectations	WPC	Evaluation WPC activities	Willingness to pay	Affordability to pay pump maintenance per hh	money contribution for maintenance of JICA BH	How much (MK)	Excretion place	Type of illness	No. of person in family	Occupation	Total income
1-031	Mavwere	Mtaliza	Excellent	S	Good	10	Yes	Area Mech.	R/D	5	No	N/A	Exist	Good	Yes	More	Yes	100	Toilet	Eye disease	6	Agri.	80,000
1-031	Mavwere	Mtaliza	Excellent	S	Good	10	Yes	Area Mech.	R/D	10	Yes	Less Expense	Exist	Excellent	Yes	50K	Yes	50	Toilet	Skin disease	9	Agri/Labourer	7,000
1-032	Mavwere	Mkonda	Excellent	S	N/A	5	Yes	Area Mech.	R/D	2	Yes	Secure Quality	Exist	Excellent	No	N/A	Yes	50	Toilet	Cholera	5	Agri.	22,000
1-032	Mavwere	Mkonda	Excellent	S	Good	7	Yes	Area Mech.	R/D	8	Yes	Secure Quality	Exist	Excellent	Yes	50K	Yes	50	Toilet	Cholera	8	Agri.	10,000
1-033	Mavwere	Katsenga	Moderate	S	Good	7	Yes	Area Mech.	R/D	7	Yes	Less Expense	Exist	Moderate	Yes	200K	Yes	200	Toilet	Eye disease	5	Agri.	30,000
1-033	Mavwere	Katsenga	Good	S	Good	3	Yes	Area Mech.	R/D	N/A	Yes	Lighten Labour	Exist	Good	Yes	More	Yes	150	Toilet	Diarrhoea	3	Agri.	16,000
1-034	Mavwere	Luka-luciano	Excellent	S	Good	6	Yes	Area Mech.	BH	6	Yes	Lighten Labour	Exist	Excellent	Yes	200K	Yes	100	Toilet	Skin disease	5	Agri.	75,000
1-034	Mavwere	Luka-luciano	Good	S	Good	11	Yes	Area Mech.	PSW	1	Yes	Lighten Labour	Exist	Excellent	Yes	500K	Yes	170	Toilet	Diarrhoea	11	Agri.	384,950
1-035	Mavwere	Chimteteka	Excellent	S	Good	50	Yes	Village	R/D	3	Yes	Secure Quality	Exist	Good	Yes	200K	Yes	100	Toilet	Diarrhoea	7	Agri.	60,000
1-035	Mavwere	Chimteteka	Good	S	Good	4	No	N/A	R/D	3	Yes	Secure Quality	Exist	Moderate	Yes	300K	Yes	500	Garden	Diarrhoea	6	Agri.	24,550
1-036	Mavwere	Chaluma-Kalombo	Moderate	S	Good	10	Yes	Village	R/D	4	Yes	Save Time	Exist	Excellent	Yes	100K	Yes	100	Toilet	Eye disease	4	Agri.	99,600
1-036	Mavwere	Chaluma-Kalombo	Good	S	Good	5	Yes	Area Mech.	R/D	N/A	Yes	Secure Quality	Exist	Good	Yes	500K	Yes	200	Toilet	Eye disease	4	Agri.	49,500
1-037	Mavwere	Mkwazindimba																					
1-038	Mavwere	Galawe	Excellent	S	Good	15	Yes	Area Mech.	R/D	2	No	N/A	Exist	Good	Yes	30K	Yes	100	Toilet	N/A	8	Agri.	60,000
1-038	Mavwere	Galawe	Excellent	S	Good	10	Yes	Area Mech.	R/D	2	No	N/A	Exist	Good	Yes	30K	Yes	100	Toilet	N/A	7	Agri.	100,000
1-039	Mavwere	Chikaza	Not-good	S	Good	9	Yes	Area Mech.	R/D	9	Yes	Secure Quality	Exist	Very bad	No	N/A	Yes	50	Toilet	Eye disease	8	Agri/Labourer	1,000
1-039	Mavwere	Chikaza	Excellent	S	Good	2	Yes	Area Mech.	R/D	4	No	N/A	Exist	Good	Yes	30K	Yes	50	Toilet	Diarrhoea	3	Agri.	70,000
1-040	Mavwere	Kunjawa	Excellent	S	Good	60	Yes	N/A	R/D	1	Yes	Secure Quality	Exist	Good	Yes	4,000	Yes	4,000	Toilet	Skin disease	4	Agri.	167,000
1-040	Mavwere	Kunjawa	Excellent	S	Good	N/A	Yes	Area Mech.	BH	2	Yes	Secure Quality	Exist	Good	Yes	150K	Yes	100	Toilet	Cholera	6	Agri.	80,000
1-041	Mavwere	Kunjawa	Good	S	Good	3	Yes	Area Mech.	BH	8	Yes	Secure Quality	Exist	Excellent	No	30K	Yes	100	Toilet	Eye disease	4	Agri.	9,000
1-041	Mavwere	Kunjawa	Good	S	Good	4	Yes	Area Mech.	BH	2	Yes	Secure Quality	Exist	Excellent	Yes	50K	Yes	50	Toilet	Diarrhoea	4	Agri.	18,000
1-042	Mavwere	Mukwala	Excellent	S	Good	9	N/A	PSW	R/D	3	No	N/A	Exist	Good	Yes	200K	Yes	40	Toilet	Dysentery	8	Agri.	52,160
1-042	Mavwere	Mukwala	Good	S	Good	5	Yes	Area Mech.	R/D	3	No	N/A	Exist	Excellent	Yes	500K	Yes	100	Toilet	Diarrhoea	4	Agri.	26,000
1-043	Mavwere	Mukwa	Good	IS	Good	8	Yes	Village	R/D	1	Yes	Secure Quality	Exist	Not-Good	Yes	150K	Yes	250	Toilet	Cholera	5	Agri.	42,900
1-043	Mavwere	Mukwa	Excellent	S	Good	3	Yes	Neighbourings	R/D	7	Yes	Save Time	Exist	Not-Good	Yes	300K	Yes	100	Toilet	Cholera	5	Agri.	50,000
1-044	Mavwere	Mukwa	Excellent	S	Good	400	Yes	Village	R/D	4	Yes	N/A	Exist	Excellent	Yes	100K	Yes	100	Toilet	Diarrhoea	6	Agri.	48,000
1-044	Mavwere	Mukwa	Excellent	S	Good	8	Yes	Village	BH	4	No	Save Time	Exist	Excellent	Yes	50K	Yes	150	Toilet	Dysentery	6	Agri.	25,000
1-044	Mavwere	Mukwa	Excellent	S	Good	5	Yes	Area Mech.	R/D	4	Yes	Save Time	Exist	Excellent	Yes	50K	Yes	100	Toilet	Skin disease	6	Agri.	50,000
1-045	Mavwere	Mwenzamthi	Excellent	S	Good	3	Yes	Area Mech.	PSW	7	Yes	Save Time	Not exist	N/A	No	N/A	N/A	N/A	Toilet	N/A	6	Agri.	80,000
1-045	Mavwere	Mwenzamthi	Good	S	Good	7	Yes	Village	PSW	2	Yes	Secure Quality	Exist	Excellent	Yes	200K	Yes	100	Toilet	Eye disease	4	Other	102,000
1-046	Mavwere	Dambo	Good	IS	Good	Good	Yes	Village	Tap	N/A	Yes	Secure Quality	Exist	Good	Yes	300K	No	N/A	Toilet	Diarrhoea	3	Merchant	N/A
1-046	Mavwere	Dambo	Good	S	Good	4	Yes	Neighbourings	Up/SW	4	Yes	Lighten Labour	Exist	Moderate	Yes	500K	Yes	60	Toilet	Dysentery	2	Merchant	291,500
1-047	Mavwere	Mwanzika	Moderate	S	Good	7	Yes	Area Mech.	R/D	N/A	No	N/A	Exist	Good	Yes	150K	Yes	150	Toilet	Skin disease	3	Agri.	26,500
1-047	Mavwere	Mwanzika	Excellent	S	Good	4	Yes	Area Mech.	R/D	4	No	N/A	Exist	Good	Yes	30K	Yes	50	Toilet	Diarrhoea	4	Agri.	10,000
1-048	Mavwere	Chiganzizo	Good	S	Good	6	Yes	Village	Up/SW	3	Yes	Secure Quality	Exist	Not-Good	No	N/A	No	N/A	Toilet	Diarrhoea	3	Agri/Labourer	6,000
1-048	Mavwere	Chiganzizo	Good	S	Good	4	Yes	Village	R/D	7	Yes	Secure Quality	Exist	Moderate	Yes	300K	Yes	35	Toilet	Diarrhoea	5	Agri.	16,500
1-049	Mavwere	Chimkoka	Good	S	Good	5	Yes	Area Mech.	BH	3	Yes	Save Time	Exist	Good	Yes	150K	Yes	100	Toilet	Diarrhoea	4	Agri.	40,000
1-049	Mavwere	Chimkoka	Moderate	S	Good	5	Yes	Village	BH	2	Yes	Save Time	Exist	Not-Good	Yes	200K	No	N/A	Toilet	Diarrhoea	4	Wage Earner	27,000
1-050	Mavwere	Gambatula	Good	S	Good	N/A	Yes	WMA	Up/SW	6	Yes	Less Expense	Exist	Good	Yes	400K	Yes	150	Toilet	Dysentery	8	Other	103,000
1-050	Mavwere	Gambatula	Good	S	Good	3	Yes	WMA	Up/SW	6	Yes	N/A	Exist	Good	Yes	More	No	N/A	Toilet	Dysentery	4	Agri.	59,070
1-051	Mavwere	Misale T. C.	Excellent	IS	Good	9	Yes	Village	R/D	4	Yes	N/A	Exist	Excellent	Yes	100K	Yes	100	Toilet	Diarrhoea	6	Agri.	48,000
1-051	Mavwere	Misale T. C.	Good	S	Good	8	Yes	Village	Up/SW	6	Yes	Lighten Labour	Exist	Moderate	Yes	100K	Yes	100	Toilet	Diarrhoea	4	Agri.	30,000
1-052	Mavwere	John	Excellent	S	Good	6	Yes	Village	Up/SW	3	Yes	Save Time	Exist	Excellent	Yes	100K	Yes	200	Toilet	Diarrhoea	4	Agri.	20,000
1-052	Mavwere	John	Not-good	S	Good	6	Yes	Village	Up/SW	3	Yes	Lighten Labour	Exist	Moderate	Yes	100K	Yes	100	Toilet	Diarrhoea	4	Agri.	160,000
1-053	Mavwere	Misale	Good	S	Good	6	Yes	Area Mech.	PSW	3	Yes	Secure Quality	Exist	Good	Yes	100K	Yes	25,000	Toilet	Skin disease	8	Agri.	72,000
1-053	Mavwere	Misale	Very bad	S	Good	4	Yes	Village	BH	10	Yes	Save Time	Exist	Moderate	Yes	200K	Yes	200	Toilet	Diarrhoea	6	Agri.	90,000
1-054	Mavwere	Misale	Excellent	S	Good	2	Yes	Area Mech.	R/D	4	No	N/A	Exist	Good	Yes	30K	Yes	50	Toilet	Diarrhoea	3	Agri.	70,000
1-054	Mavwere	Misale	Not-good	S	Good	2	Yes	Area Mech.	R/D	2	Yes	Secure Quality	Exist	Excellent	Yes	50K	Yes	50	Toilet	Diarrhoea	4	Agri.	44,000
1-055	Mavwere	Ngalule	Excellent	S	Good	4	Yes	Village	R/D	8	Yes	Save Time	Exist	Excellent	Yes	100K	Yes	25	Toilet	Diarrhoea	5	Agri.	25,000
1-055	Mavwere	Ngalule	Excellent	S	Good	3	Yes	Village	Up/SW	6	Yes	Less Expense	Exist	Moderate	Yes	100K	No	N/A	Toilet	Eye disease	6	Agri.	65,000
1-055	Mavwere	Ngalule	Excellent	S	Good	4	Yes	Village	R/D	2	Yes	Save Time	Exist	Excellent	Yes	50K	Yes	100	Toilet	N/A	4	Agri.	20,000
1-056	Mavwere	Masitila	Excellent	S	Good	7	Yes	Area Mech.	R/D	10	Yes	Secure Quality	Exist	Excellent	No	N/A	Yes	50	Toilet	Skin disease	5	Agri.	22,000
1-056	Mavwere	Masitila	Excellent	S	Good	7	Yes	Area Mech.	R/D	10	Yes	Less Expense	Exist	Excellent	Yes	400K	Yes	150	Toilet	Dysentery	9	Agri/Labourer	7,000
1-057	Mavwere	Mzimbo	Excellent	S	Good	2	Yes	WMA	Up/SW	6	Yes	Less Expense	Exist	Good	Yes	30K	Yes	50	Toilet	Eye disease	2	Agri.	14,500
1-057	Mavwere	Mzimbo	Excellent	S	Good	N/A	Yes	Village	Up/SW	4	No	N/A	Exist	Excellent	Yes	400K	Yes	50	Toilet	Eye disease	4	Agri.	7,500
1-058	Mavwere	Nathiyola	Moderate	S	Good	50	Yes	Village	BH	N/A	No	N/A	Exist	Excellent	Yes	500K	Yes	170	Toilet	Diarrhoea	11	Agri.	384,950
1-058	Mavwere	Nathiyola	Good	S	Good	5	Yes	Area Mech.	PSW	1	Yes	Lighten Labour	Exist	Excellent	Yes	100K	Yes	100	Toilet	Eye disease	4	Agri.	99,600
1-059	Mavwere	Kachere	Moderate	S	Good	5	Yes	Village	R/D	4	Yes	Save Time	Exist	Excellent	Yes	150K	Yes	150	Toilet	Skin disease	3	Agri.	26,500
1-059	Mavwere	Kachere	Moderate	S	Good	5	Yes	Area Mech.	R/D	N/A	No	N/A	Exist	Good	Yes	500K	Yes	300	Toilet	Skin disease	5	Agri.	7,600
1-060	Mavwere	Simoko	Moderate	IS	Good	10	Yes	Area Mech.	R/D	5	Yes	Less Expense	Exist	Excellent	Yes	30K	Yes	100	Toilet	Diarrhoea	6	Agri.	40,000
1-060	Mavwere	Simoko	Excellent	S	Good	5	Yes	Area Mech.	R/D	5	Yes	Less Expense	Exist	Excellent	Yes	30K	Yes	100	Toilet	Diarrhoea	6	Agri.	40,000

BH No.	TA	Village	rating	JICA Borehole			Alternative Water source				Willingness/Affordability					Hygiene & Sanitation			Socio-Economic Situation			
				Daily use buckets /day	Trials repaired by	Repairs by	Alternatd ve Water source	Times a Need of rehab	Expectations	WPC	Evaluation WPC activities	Willingness to pay	Affordability to pay pump maintenance per h	money contribution for maintenance of JICA BH	How much (MK)	Excretion place	Type of illness person in family	No. of person in family	Occupation	Total income		
1-081	Mavere	Bua T-C	Moderate	S	Good	4	Yes	Village	R/D	2	Yes	Lighen Labour	Exist	Good	Yes	500K	Yes	Toilet	Diarrhoea	2	Merchant	10,400
1-081	Mavere	Bua T-C	Excellent	S	Good	5	Yes	Village	R/D	5	No	Less Expense	Exist	Good	Yes	50K	Yes	Toilet	Diarrhoea	3	Agri.	150,000
1-082	Mavere	Nkhuzu	Excellent	S	Good	5	N/A	N/A	PSW	N/A	No	N/A	Exist	Good	Yes	200K	Yes	Toilet	Dysentery	8	Agri.	52,160
1-082	Mavere	Nkhuzu	Excellent	S	Good	8	Yes	Area Mech.	Up SW	2	No	Lighen Labour	Exist	Good	Yes	500K	Yes	Toilet	Dysentery	3	Agri.	80,000
1-083	Mavere	Kazule	Good	IS	Good	6	Yes	Village	R/D	4	No	N/A	Exist	Excellent	No	N/A	Yes	Toilet	Eye disease	7	Agri.	16,000
1-083	Mavere	Kazule	Excellent	IS	Good	6	Yes	Village	Up SW	4	No	N/A	Exist	Excellent	Yes	30K	Yes	Toilet	Eye disease	4	Agri.	20,000
1-084	Mavere	Kaole II	Good	S	Good	7	Yes	Neiborings	R/D	3	No	N/A	Exist	Good	Yes	30K	Yes	Toilet	N/A	5	Agri.	5,000
1-084	Mavere	Kaole II	Excellent	S	Good	5	Yes	Village	R/D	2	Yes	Secure Quality	Exist	Good	Yes	50K	Yes	Toilet	Diarrhoea	5	Agri.	113,000
1-085	Mavere	Kaole I	Moderate	IS	Good	5	Yes	WMA	BH	6	Yes	Lighen Labour	Exist	Excellent	Yes	100K	Yes	Toilet	Dysentery	7	Agri.	8,000
1-085	Mavere	Kaole I	Excellent	IS	Good	5	Yes	Area Mech.	R/D	2	No	N/A	Exist	Good	Yes	30K	Yes	Toilet	N/A	7	Agri.	100,000
1-086	Mavere	Kamphemvu	Excellent	S	Good	4	Yes	Village	Up SW	4	Yes	Less Expense	Exist	Excellent	Yes	100K	Yes	Toilet	Skin disease	4	Agri.	69,000
1-086	Mavere	Kamphemvu	Excellent	S	Good	4	Yes	Village	Up SW	4	Yes	Less Expense	Exist	Excellent	Yes	100K	Yes	Toilet	Skin disease	5	Agri.	150,000
1-087	Mavere	Kamphemvu	Excellent	S	Good	1	Yes	Area Mech.	R/D	3	Yes	Lighen Labour	Exist	Moderate	Yes	500K	Yes	Toilet	Diarrhoea	6	Agri.	410,000
1-087	Mavere	Kamphemvu	Excellent	S	Good	7	Yes	Village	Up SW	4	No	N/A	Exist	Excellent	Yes	30K	Yes	Toilet	Eye disease	4	Agri.	20,000
1-088	Mavere	Katsenga A	Excellent	S	Good	N/A	Yes	Village	R/D	4	Yes	Secure Quality	Exist	Good	No	N/A	Yes	Toilet	Skin disease	3	Agri.	25,000
1-088	Mavere	Katsenga A	Excellent	S	Good	4	Yes	Village	R/D	4	Yes	Secure Quality	Exist	N/A	Yes	100K	Yes	Toilet	Diarrhoea	4	Agri.	80,000
1-089	Mavere	Miamba	Excellent	IS	Salty	8	Yes	Neiborings	R/D	4	Yes	Less Expense	Exist	Good	Yes	100K	Yes	Toilet	Dysentery	7	Agri.	2,000
1-089	Mavere	Miamba	Excellent	IS	Salty	8	Yes	Village	Up SW	4	Yes	Less Expense	Exist	Good	Yes	300K	Yes	Toilet	Dysentery	14	Agri.	30,000
1-090	Mavere	Nyongani	Excellent	S	Good	5	Yes	Village	Up SW	4	Yes	Less Expense	Exist	Excellent	Yes	100K	Yes	Toilet	Skin disease	5	Agri.	150,000
1-090	Mavere	Nyongani	Excellent	S	Good	5	Yes	Area Mech.	R/D	3	Yes	Less Expense	Exist	Excellent	Yes	50K	Yes	Toilet	Dysentery	3	Agri.	110,000
1-091	Mavere	Mntonya	Excellent	S	Good	2	Yes	Area Mech.	BH	5	Yes	Less Expense	Exist	Excellent	Yes	500K	Yes	Toilet	Diarrhoea	4	Agri.	103,000
1-091	Mavere	Mntonya	Moderate	S	Good	2	Yes	Area Mech.	R/D	5	Yes	Less Expense	Exist	Excellent	Yes	500K	Yes	Toilet	Diarrhoea	5	Agri.	7,600
1-092	Mavere	Walirani	Excellent	S	Good	5	Yes	Area Mech.	R/D	3	No	N/A	Exist	Good	No	N/A	Yes	Toilet	Diarrhoea	9	Agri.	100,000
1-092	Mavere	Walirani	N/A	S	Good	N/A	Yes	Village	R/D	3	No	N/A	Exist	Good	Yes	50K	Yes	Toilet	Diarrhoea	6	Agri.	17,000
1-093	Mavere	Likungwi	Good	S	Good	6	Yes	Area Mech.	Up SW	2	Yes	Lighen Labour	Exist	Good	Yes	500K	Yes	Toilet	Diarrhoea	2	Agri.	55,000
1-093	Mavere	Likungwi	Excellent	S	Good	6	Yes	Area Mech.	Up SW	2	Yes	Lighen Labour	Exist	Good	Yes	500K	Yes	Toilet	Diarrhoea	3	Agri.	80,000
1-074	Mavere	Miamtana	Excellent	S	Good	6	Yes	Village	Up SW	4	Yes	Less Expense	Exist	Excellent	Yes	100K	Yes	Toilet	Skin disease	5	Agri.	150,000
1-074	Mavere	Miamtana	Excellent	S	Good	10	Yes	Area Mech.	R/D	3	Yes	Less Expense	Exist	Excellent	Yes	50K	Yes	Toilet	Dysentery	3	Agri.	110,000
1-075	Mavere	Kankhanda	Excellent	S	Good	5	Yes	Village	R/D	4	Yes	Less Expense	Exist	Excellent	No	N/A	Yes	Toilet	Diarrhoea	4	Agri.	16,000
1-075	Mavere	Kankhanda	Excellent	S	Good	6	Yes	Area Mech.	BH	5	Yes	Less Expense	Exist	Excellent	Yes	500K	Yes	Toilet	Diarrhoea	4	Agri.	103,000
1-076	Mavere	Kankhanda	Excellent	S	Good	4	Yes	Area Mech.	R/D	3	Yes	Less Expense	Exist	Excellent	Yes	50K	Yes	Toilet	Dysentery	3	Agri.	110,000
1-076	Mavere	Kankhanda	Excellent	S	Good	3	Yes	Area Mech.	R/D	3	Yes	Less Expense	Exist	Excellent	Yes	50K	Yes	Toilet	Dysentery	3	Agri.	110,000
1-077	Mavere	Musa	Very bad	IS	Good	8	Yes	Village	BH	4	Yes	Secure Quality	Exist	Not-Good	Yes	100K	Yes	Toilet	Skin disease	6	Agri.	24,000
1-077	Mavere	Musa	Excellent	IS	Good	8	Yes	Area Mech.	BH	2	Yes	Lighen Labour	Exist	Good	Yes	50K	Yes	Toilet	Skin disease	7	Agri.	80,000
1-078	Mavere	Kajwa	Excellent	S	Good	30	Yes	Area Mech.	R/D	4	Yes	Less Expense	Exist	Excellent	Yes	30K	Yes	Toilet	Dysentery	6	Agri.	26,000
1-078	Mavere	Kajwa	Excellent	S	Ferrous	3	Yes	Area Mech.	R/D	3	Yes	Less Expense	Exist	Good	Yes	30K	Yes	Toilet	Dysentery	6	Agri.	26,000
1-079	Mavere	Miamtana	Excellent	S	Good	5	Yes	Area Mech.	PSW	3	Yes	Secure Quality	Exist	Good	Yes	100K	Yes	Toilet	Skin disease	6	Agri.	40,000
1-079	Mavere	Miamtana	Excellent	S	Good	5	Yes	Area Mech.	BH	4	Yes	Save Time	Exist	Very bad	Yes	100K	Yes	Toilet	Cholera	5	Agri.	120,000
1-080	Mavere	Kanyindula	Good	S	Good	4	Yes	Area Mech.	BH	2	Yes	Secure Quality	Exist	Excellent	Yes	50K	Yes	Toilet	Diarrhoea	4	Agri.	18,000
1-080	Mavere	Kanyindula	Excellent	S	Good	4	Yes	Village	R/D	4	Yes	Less Expense	Exist	Excellent	Yes	50K	Yes	Toilet	Diarrhoea	5	Agri.	7,000
2-001	Mavere	Kambam-zuwa	Excellent	IS	Good	2	Yes	Village	Up SW	6	Yes	Less Expense	Exist	Moderate	Yes	100K	No	Toilet	Eye disease	6	Agri.	65,000
2-001	Mavere	Kambam-zuwa	Excellent	IS	Good	2	Yes	Village	Up SW	4	Yes	Less Expense	Exist	Excellent	Yes	50K	Yes	Toilet	Diarrhoea	5	Agri.	7,000
2-002	Mavere	Pinda	Very bad	S	Good	4	Yes	Village	Up SW	5	Yes	Save Time	Exist	Not exist	No	N/A	No	Toilet	N/A	5	Agri.	105,000
2-002	Mavere	Pinda	Good	S	Good	4	Yes	Village	Up SW	6	Yes	Lighen Labour	Exist	Moderate	Yes	100K	Yes	Toilet	Diarrhoea	4	Agri.	30,000
2-003	Mavere	Lupanga-Ndulama	Excellent	IS	Salty	N/A	Yes	N/A	PSW	1	Yes	Secure Quality	Exist	Good	No	N/A	Yes	Toilet	Diarrhoea	3	Agri.	13,000
2-003	Mavere	Lupanga-Ndulama	Excellent	IS	Salty	N/A	Yes	Area Mech.	BH	5	Yes	Less Expense	Exist	Excellent	Yes	200K	Yes	Toilet	Eye disease	6	Agri.	13,000
2-004	Mavere	Chikuta	Excellent	IS	Salty	N/A	Yes	Village	BH	5	Yes	Less Expense	Exist	Excellent	Yes	500K	Yes	Toilet	Diarrhoea	4	Agri.	103,000
2-004	Mavere	Chikuta	Excellent	IS	Salty	N/A	Yes	Village	R/D	4	Yes	Less Expense	Exist	Good	Yes	500K	Yes	Toilet	Dysentery	8	Agri.	100,000
2-005	Mavere	Chikuta	Excellent	IS	Ferrous	N/A	Yes	Area Mech.	R/D	3	Yes	Less Expense	Exist	Good	No	N/A	Yes	Toilet	Diarrhoea	9	Agri.	100,000
2-005	Mavere	Chikuta	Moderate	IS	Ferrous	N/A	Yes	Area Mech.	R/D	5	Yes	Less Expense	Exist	Excellent	Yes	500K	Yes	Toilet	Diarrhoea	5	Agri.	7,600
2-006	Mavere	Kamwanga	N/A	S	Good	N/A	Yes	Village	R/D	3	No	N/A	Exist	Good	Yes	50K	Yes	Toilet	Diarrhoea	6	Agri.	17,000
2-006	Mavere	Kamwanga	Excellent	S	Good	8	Yes	Area Mech.	BH	2	Yes	Lighen Labour	Exist	Good	Yes	50K	Yes	Toilet	Skin disease	7	Agri.	80,000
2-007	Mavere	Nkhumba	Very bad	S	Good	8	Yes	Village	BH	4	Yes	Secure Quality	Exist	Not-Good	Yes	100K	Yes	Toilet	Skin disease	6	Agri.	24,000
2-007	Mavere	Nkhumba	Excellent	S	Good	8	Yes	Area Mech.	BH	4	Yes	Save Time	Exist	Very bad	Yes	100K	Yes	Toilet	Cholera	5	Agri.	120,000
2-008	Mavere	Makanda	Excellent	S	Good	5	Yes	Area Mech.	PSW	3	Yes	Secure Quality	Exist	Good	Yes	100K	Yes	Toilet	Skin disease	6	Agri.	40,000
2-008	Mavere	Makanda	Excellent	S	Good	5	Yes	Village	R/D	4	Yes	Less Expense	Exist	Excellent	Yes	50K	Yes	Toilet	Diarrhoea	5	Agri.	7,000
2-009	Mavere	Makanda	Excellent	S	Good	6	Yes	Village	R/D	3	Yes	Save Time	Exist	Excellent	Yes	100K	Yes	Toilet	Diarrhoea	4	Agri.	30,000
2-009	Mavere	Makanda	Excellent	S	Good	4	Yes	Village	R/D	4	Yes	Save Time	Exist	Excellent	Yes	50K	Yes	Toilet	Diarrhoea	3	Agri.	30,000
2-010	Mavere	Wiskoti	Excellent	IS	Good	4	Yes	Village	Up SW	6	Yes	Less Expense	Exist	Moderate	Yes	100K	No	Toilet	Eye disease	6	Agri.	65,000
2-010	Mavere	Wiskoti	Good	IS	Good	4	Yes	Village	Up SW	6	Yes	Lighen Labour	Exist	Moderate	Yes	100K	Yes	Toilet	Diarrhoea	4	Agri.	30,000

BH No.	TA	Village	JICA Borehole			Alternative Water sources			Willingness/Affordability				Hygiene & Sanitation			Socio-Economic Situation							
			rating	Satisfaction	Daily use buckets /day	Trial repair	Repaired by	Alternati ^v ve Water source	Times a Need of rehab day	Expectations	WPC	Evaluation WPC activities	Willingness to pay	Affordability to pay pump maintenance per hh	money contribution for maintenance of JICA BH	How much (MK)	Excretion place	Type of illness	No. of person in family	Occupation	Total income		
2-011	Mavwere	Manthulu	Excellent	IS	Good	6	Yes	Village	Up SW	4	No	N/A	Exist	Excellent	Yes	30K	Yes	50	Toilet	Eye disease	2	Agri	14,500
2-012	Mavwere	Manthulu	Moderate	S	Good	4	Yes	Village	R/D	3	Yes	Lighten Labour	Exist	Excellent	Yes	50K	Yes	80	Toilet	Dysentery	4	Agri	5,000
2-013	Mavwere	Manthulu	Good	S	Good	6	Yes	Village	R/D	2	Yes	Secure Quality	Exist	Good	Yes	150K	Yes	5,000	Toilet	Diarrhoea	3	Merchant	230,000
2-014	Mavwere	Manthulu	Good	S	Good	5	Yes	Neighbourings	R/D	3	No	N/A	Exist	Good	Yes	30K	Yes	150	Toilet	N/A	5	N/A	N/A
2-015	Mavwere	Chamosola	Excellent	S	Good	6	Yes	Area Mech.	PSW	7	Yes	Save Time	Not exist	N/A	No	N/A	No	N/A	Toilet	N/A	6	Agri	80,000
2-016	Mavwere	Kafunsa-Chalimba	Very bad	S	Good	7	Yes	Village	Up SW	5	Yes	Save Time	Not exist	N/A	No	N/A	No	N/A	Toilet	N/A	5	Agri	105,000
2-017	Mavwere	Mbwera	Not-good	S	Good	5	Yes	WMA	BH	2	Yes	Save Time	Exist	Excellent	Yes	100K	Yes	200	Toilet	Dysentery	4	Merchant	51,000
2-018	Mavwere	Mbwera	Excellent	S	Good	4	Yes	Area Mech.	R/D	2	No	N/A	Exist	Good	Yes	30K	Yes	100	Toilet	N/A	8	Agri	60,000
2-019	Mavwere	Kanwaza	Good	S	Good	5	Yes	WMA	Up SW	6	Yes	Save Time	Exist	Moderate	Yes	100K	Yes	70	Toilet	Diarrhoea	8	Agri	44,000
2-020	Mavwere	Kanwaza	Good	S	Good	5	Yes	WMA	Up SW	5	Yes	N/A	Exist	Good	Yes	More	No	N/A	Toilet	Dysentery	4	Agri	59,070
2-021	Mavwere	Papa	Excellent	S	Good	3	Yes	Area Mech.	BH	3	Yes	Secure Quality	Exist	Good	Yes	150K	Yes	50	Toilet	Skin disease	5	Agri	37,200
2-022	Mavwere	Papa	Excellent	S	Good	6	Yes	Village	R/D	5	Yes	Less Expense	Exist	Good	Yes	50K	Yes	50	Toilet	Diarrhoea	3	Agri	150,000
2-023	Mavwere	Guweride	Excellent	S	Ferrous	N/A	No	N/A	R/D	4	Yes	Less Expense	Exist	Excellent	No	N/A	Yes	20	Toilet	Dysentery	4	Agri	13,000
2-024	Mavwere	Guweride	Very bad	S	Good	2	Yes	Village	BH	6	No	N/A	Exist	N/A	Yes	100K	Yes	1,000	Toilet	Diarrhoea	5	Agri	50,000
2-025	Mavwere	Kanjilika	Excellent	S	Good	4	Yes	Neighbourings	R/D	4	Yes	Less Expense	Exist	Good	No	N/A	Yes	150	Toilet	Dysentery	6	Agri	20,000
2-026	Mavwere	Kanjilika	Excellent	S	Good	6	Yes	Area Mech.	R/D	3	Yes	Less Expense	Exist	Excellent	Yes	50K	Yes	20	Toilet	Dysentery	3	Agri	150,000
2-027	Mavwere	Tankhule	Excellent	S	Good	4	Yes	Village	R/D	4	Yes	Less Expense	Exist	Excellent	No	N/A	Yes	100	Toilet	Diarrhoea	4	Agri	16,000
2-028	Mavwere	Tankhule	Good	S	Good	5	Yes	Village	Up SW	4	Yes	Less Expense	Exist	Excellent	Yes	100K	Yes	50	Toilet	Skin disease	4	Agri	69,000
2-029	Mavwere	Walesani	Good	S	Good	15	Yes	Area Mech.	Up SW	3	Yes	Lighten Labour	Exist	Good	Yes	More	Yes	150	Toilet	Diarrhoea	4	Agri	10,500
2-030	Mavwere	Walesani	Excellent	S	Good	4	Yes	Area Mech.	R/D	5	Yes	Less Expense	Exist	Excellent	Yes	30K	Yes	100	Toilet	Diarrhoea	6	Agri	40,000
2-031	Mavwere	Temanim-wendo	Excellent	S	Good	4	No	N/A	R/D	4	Yes	Less Expense	Exist	Excellent	No	N/A	Yes	20	Toilet	Dysentery	4	Agri	13,000
2-032	Mavwere	Temanim-wendo	Excellent	S	Colbour	N/A	Yes	Village	Up SW	4	Yes	Less Expense	Exist	Excellent	Yes	300K	Yes	50	Toilet	Dysentery	14	Agri	30,000
2-033	Mavwere	Temanim-wendo	Very bad	S	Good	6	Yes	Village	R/D	2	No	N/A	Exist	Good	Yes	50K	Yes	100	Toilet	Diarrhoea	8	Agri	200,000
2-034	Mavwere	Temanim-wendo	Excellent	S	Good	N/A	Yes	Area Mech.	BH	4	Yes	Save Time	Not exist	Not-Good	No	N/A	Yes	100,000	Toilet	Skin disease	6	Agri	59,000
2-035	Mavwere	Nkhono	Excellent	S	Good	10	Yes	Village	R/D	4	Yes	Secure Quality	Exist	Good	No	N/A	Yes	20	Toilet	Skin disease	7	Agri	100,000
2-036	Mavwere	Geni	Good	S	Good	5	Yes	Area Mech.	BH	2	Yes	Secure Quality	Exist	Good	Yes	150K	Yes	20	Toilet	Skin disease	7	Agri	100,000
2-037	Mavwere	Geni	Good	S	Good	3	Yes	Area Mech.	R/D	4	Yes	Secure Quality	Exist	Good	No	N/A	Yes	20	Toilet	Skin disease	7	Agri	100,000
2-038	Mavwere	Geni	Good	S	Good	5	Yes	Area Mech.	R/D	3	Yes	Secure Quality	Exist	Good	Yes	100K	Yes	20	Toilet	Skin disease	7	Agri	100,000
2-039	Mavwere	Shurube	Excellent	S	Good	7	Yes	Area Mech.	BH	1	N/A	N/A	Exist	Not-Good	No	N/A	Yes	100	Toilet	Cholera	6	Agri	80,000
2-040	Mavwere	Shurube	Good	S	Good	6	Yes	Village	BH	3	Yes	Lighten Labour	Exist	Good	Yes	200K	Yes	200	Toilet	Skin disease	4	Agri	21,000
2-041	Mavwere	Shurube	Good	S	Good	4	Yes	Area Mech.	BH	8	Yes	Secure Quality	Exist	Excellent	No	30K	Yes	10	Toilet	Skin disease	4	Agri	130,000
2-042	Mavwere	Shurube	Good	S	Good	4	Yes	Area Mech.	BH	2	Yes	Secure Quality	Exist	Excellent	Yes	50K	Yes	20	Toilet	Diarrhoea	4	Agri	9,000
2-043	Mavwere	Chikwan-bani	Excellent	S	Good	5	Yes	Area Mech.	R/D	4	Yes	Less Expense	Exist	Excellent	No	N/A	Yes	50	Toilet	Diarrhoea	6	Agri	18,000
2-044	Mavwere	Chikwan-bani	Excellent	S	Good	10	Yes	Village	R/D	4	Yes	Less Expense	Exist	Excellent	Yes	100K	Yes	100	Toilet	Diarrhoea	6	Agri	205,000
2-045	Mavwere	Mweso	Excellent	S	Good	3	Yes	Area Mech.	R/D	3	Yes	Less Expense	Exist	Excellent	Yes	100K	Yes	100	Toilet	Dysentery	3	Agri	80,000
2-046	Mavwere	Mweso	Good	S	Good	6	Yes	Area Mech.	R/D	3	Yes	Lighten Labour	Exist	Good	No	N/A	Yes	50	Toilet	Diarrhoea	9	Agri	100,000
2-047	Mavwere	Njiva	Good	S	Good	N/A	Yes	WMA	Up SW	5	Yes	Save Time	Exist	Moderate	Yes	100K	Yes	70	Toilet	Diarrhoea	8	Agri	44,000
2-048	Mavwere	Njiva	Good	S	Good	6	Yes	WMA	Up SW	5	Yes	Lighten Labour	Exist	Moderate	Yes	500K	Yes	150	Toilet	Diarrhoea	6	Agri	410,000
2-049	Mavwere	Chitumba	Excellent	S	Good	N/A	Yes	Neighbourings	R/D	4	Yes	Less Expense	Exist	Good	No	N/A	Yes	150	Toilet	Dysentery	6	Agri	20,000
2-050	Mavwere	Chitumba	Excellent	S	Good	N/A	Yes	Neighbourings	R/D	4	Yes	Less Expense	Exist	Good	Yes	100K	Yes	100	Toilet	Dysentery	6	Agri	2,000
2-051	Mavwere	Chinyata	Excellent	S	Good	4	Yes	Area Mech.	PSW	7	Yes	Save Time	Not exist	N/A	No	N/A	No	N/A	Toilet	N/A	6	Agri	80,000
2-052	Mavwere	Chinyata	Good	S	Good	4	Yes	Village	PSW	2	Yes	Secure Quality	Exist	Excellent	Yes	200K	Yes	100	Toilet	Eye disease	4	Other	102,000
2-053	Mavwere	Chinyata	Good	S	Good	6	Yes	Village	Up SW	8	No	N/A	Exist	Excellent	Yes	100K	Yes	100	Toilet	Skin disease	5	Agri	45,000
2-054	Mavwere	Lanadi	Moderate	IS	Good	10	Yes	Area Mech.	Up SW	6	Yes	Save Time	Exist	Good	Yes	200K	Yes	100	Toilet	Diarrhoea	6	Agri	66,000
2-055	Mavwere	Lanadi	Excellent	S	Good	2	Yes	WMA	Up SW	2	Yes	Secure Quality	Exist	Excellent	Yes	100K	Yes	50	Toilet	Diarrhoea	3	Agri	18,000
2-056	Mavwere	Lumelo	Moderate	IS	Good	2	Yes	Area Mech.	BH	1	Yes	Less Expense	Exist	Good	Yes	More	Yes	N/A	Toilet	Diarrhoea	1	Agri	4,500
2-057	Mavwere	Lumelo	Good	S	Good	6	Yes	N/A	PSW	6	Yes	Secure Quality	Exist	Excellent	Yes	More	Yes	40	Toilet	Dysentery	5	Merchant	46,000
2-058	Mavwere	Lumelo	Good	S	Good	5	Yes	N/A	-Other	N/A	Yes	Secure Quality	Exist	Good	Yes	More	Yes	40	Toilet	Diarrhoea	3	Agri	18,000
2-059	Mavwere	Silombe	Not-good	S	Good	50	Yes	WMA	BH	2	Yes	Save Time	Exist	Excellent	Yes	100K	Yes	200	Toilet	Dysentery	4	Merchant	51,000
2-060	Mavwere	Silombe	Moderate	IS	Good	5	Yes	WMA	BH	6	Yes	Lighten Labour	Exist	Excellent	Yes	100K	Yes	500	Toilet	Dysentery	7	Agri	8,000
2-061	Mavwere	Silombe	Not-good	S	Good	8	Yes	Village	Up SW	5	Yes	Lighten Labour	Exist	Moderate	Yes	100K	Yes	100	Toilet	Diarrhoea	4	Agri	160,000
2-062	Mavwere	Silombe	Good	S	Good	8	Yes	Area Mech.	BH	3	Yes	Save Time	Exist	Good	Yes	150K	Yes	100	Toilet	Diarrhoea	4	Wage Earner	40,000
2-063	Mavwere	Chinyata	Very bad	S	Good	7	Yes	Village	Up SW	10	Yes	Save Time	Exist	Moderate	Yes	200K	Yes	200	Toilet	Diarrhoea	6	Agri	90,000
2-064	Mavwere	Chinyata	Excellent	S	Good	4	Yes	Village	Up SW	3	Yes	Save Time	Exist	Excellent	Yes	50K	Yes	150	Toilet	Dysentery	3	Agri	4,050
2-065	Mavwere	Chinyata	Excellent	S	Good	7	Yes	Area Mech.	BH	4	Yes	Less Expense	Exist	Excellent	Yes	50K	Yes	500	Toilet	Diarrhoea	8	Agri	25,000
2-066	Mavwere	Nkokeza	Good	S	Good	10	Yes	Area Mech.	Up SW	10	Yes	Lighten Labour	Not exist	N/A	Yes	100K	Yes	50	Toilet	Skin disease	6	Merchant	20,000
2-067	Mavwere	Nkokeza	Moderate	IS	Salty	6	Yes	Village	BH	2	Yes	Save Time	Exist	Not-Good	Yes	200K	No	N/A	Toilet	Skin disease	4	Agri	27,000
2-068	Mavwere	Mkonkha	Good	S	Good	5	Yes	Area Mech.	PSW	3	Yes	Secure Quality	Exist	Good	Yes	100K	Yes	25,000	Toilet	Skin disease	8	Agri	72,000
2-069	Mavwere	Mkonkha	Not-good	S	Good	6	Yes	Area Mech.	R/D	2	Yes	Secure Quality	Exist	Excellent	Yes	50K	Yes	50	Toilet	Diarrhoea	4	Agri	44,000

BH No.	TA	General	Village	rating	JICA Borehole			Alternative Water source			Willingness/Affordability				Hygiene & Sanitation			Socio-Economic Situation						
					Volume	Quality	Daily use buckets /day	Trial use buckets /day	Repaired by	Alternative Water source	Times a day	Need of rehab	Expectations	WPC	Evaluation WPC activities	Willingness to pay	Affordability to pay pump maintenance per fh	money contribution for maintenance of JICA BH	How much (MK)	Excretion place	Type of illness	No. of person in family	Occupation	Total income
2-041	Mavwere	Mkonkha T.C.	Excellent	S	Good	5	Yes	Area Mech.	R/D	4	No	N/A	Exist	Good	Yes	30K	Yes	50K	Toilet	Diarrhoea	3	Agri.	70,000	
2-041	Mavwere	Mkonkha T.C.	Excellent	S	Good	15	Yes	Area Mech.	R/D	10	Yes	Less Expense	Exist	Excellent	Yes	50K	Yes	50K	Toilet	Eye disease	9	Agri/Labourer	7,000	
2-042	Mavwere	Mabwere	Excellent	S	Good	3	Yes	Area Mech.	R/D	2	Yes	Secure Quality	Exist	Excellent	No	N/A	Yes	50	Toilet	Skin disease	5	Agri.	22,000	
2-042	Mavwere	Mabwere	Good	S	Good	6	Yes	Area Mech.	PSW	1	Yes	Lighten Labour	Exist	Excellent	Yes	500K	Yes	170	Toilet	Diarrhoea	11	Agri.	384,950	
2-043	Mavwere	Chinkota	Excellent	S	Good	4	Yes	Village	R/D	4	Yes	Less Expense	Exist	Good	Yes	500K	Yes	20	Toilet	Dysentery	8	Agri.	10,000	
2-043	Mavwere	Chinkota	Good	S	Good	2	Yes	Neibonges	Up SW	4	Yes	Lighten Labour	Exist	Moderate	Yes	500K	Yes	60	Toilet	Dysentery	2	Merchant	291,500	
2-044	Mavwere	Mumba	Moderate	S	Good	15	Yes	Area Mech.	R/D	N/A	No	N/A	Exist	Good	Yes	150K	Yes	150	Toilet	Skin disease	3	Agri.	26,500	
2-044	Mavwere	Mumba	Moderate	S	Salty	3	Yes	Village	BH	N/A	No	N/A	Exist	Excellent	Yes	400K	Yes	50	Toilet	Skin disease	4	Agri.	7,500	
2-045	Mavwere	Kadzombe																						
2-046	Mavwere	Kadzombe																						
2-047	Mavwere	Chimbala-me	Good	S	Good	7	Yes	Donor	PSW	4	Yes	Secure Quality	Not exist	N/A	Yes	500K	No	N/A	Toilet		2	Agri.	25,000	
2-048	Mavwere	Chyese-lana	Moderate	S	Good	4	Yes	Village	R/D	4	Yes	Save Time	Exist	Excellent	Yes	100K	Yes	100	Toilet	Eye disease	4	Agri.	99,600	
2-048	Mavwere	Chyese-lana	Excellent	S	Good	4	N/A	N/A	PSW	N/A	No	N/A	Exist	Good	Yes	200K	Yes	40	Toilet	Dysentery	8	Agri.	52,160	
2-049	Mavwere	Chamani	Excellent	S	Good	6	Yes	Village	BH	4	Yes	Save Time	Exist	Good	Yes	150K	Yes	150	Toilet	Diarrhoea	7	Agri.	10,000	
2-049	Mavwere	Chamani	Very bad	S	Good	10	Yes	Village	BH	10	Yes	Save Time	Exist	Moderate	Yes	200K	Yes	30	Toilet	Diarrhoea	6	Agri.	90,000	
2-050	Mavwere	Chamani	Excellent	S	Good	8	Yes	Area Mech.	Up SW	2	Yes	Lighten Labour	Exist	Good	Yes	500K	Yes	30	Toilet		3	Agri.	80,000	
2-050	Mavwere	Chamani	Excellent	S	Good	8	Yes	Village	Up SW	4	No	N/A	Exist	Excellent	Yes	30K	Yes	20	Toilet	Eye disease	4	Agri.	20,000	
2-051	Mavwere	Kabuthu	Good	IS	Good	7	Yes	Village	R/D	4	No	N/A	Exist	Excellent	No	N/A	Yes	400	Toilet	Dysentery	7	Agri.	16,000	
2-051	Mavwere	Kabuthu	Excellent	S	Good	5	Yes	Village	R/D	2	Yes	Secure Quality	Exist	Good	Yes	50K	Yes	10,000	Toilet	Diarrhoea	5	Agri.	113,000	
2-052	Mavwere	Kabuthu-Chifusa	Excellent	S	Good	6	Yes	Area Mech.	BH	4	Yes	Lighten Labour	Exist	Good	Yes	150K	Yes	150	Toilet	Diarrhoea	4	Agri.	50,000	
2-052	Mavwere	Kabuthu-Chifusa	Moderate	S	Good	4	Yes	Village	Up SW	4	No	N/A	Exist	Excellent	Yes	50K	Yes	50	Toilet	Diarrhoea	7	Merchant	135,000	
2-053	Mavwere	Mphonde	Good	S	Good	3	Yes	Area Mech.	BH	3	Yes	Save Time	Exist	Good	Yes	150K	Yes	100	Toilet		4	Wage Earner	40,000	
2-053	Mavwere	Mphonde	Good	IS	Good	10	Yes	Village	BH	5	Yes	Save Time	Exist	Good	Yes	More	Yes	300	Toilet		8	Agri.	8,500	
2-054	Mavwere	Nkhompho-la	Moderate	IS	Good	6	Yes	Area Mech.	BH	4	Yes	Other	Exist	Good	Yes	150K	Yes	250	Toilet	N/A	3	Agri.	76,400	
2-054	Mavwere	Nkhompho-la	Excellent	IS	Good	5	Yes	Village	R/D	4	Yes	Less Expense	Exist	Good	Yes	150K	Yes	150	Toilet	Dysentery	8	Agri.	12,500	
2-055	Mavwere	Manyengo																						
2-056	Mavwere	Kamilla	Good	S	Good	2	Yes	Area Mech.	BH	5	Yes	Secure Quality	Exist	Good	No	N/A	Yes	100	Toilet	Skin disease	3	Agri.	25,000	
2-056	Mavwere	Kamilla	Excellent	S	Good	6	Yes	Area Mech.	BH	3	Yes	Secure Quality	Exist	Good	Yes	150K	Yes	50	Toilet	Skin disease	5	Agri.	37,200	
2-057	Mavwere	Mphomobe	Not-good	S	Good	5	Yes	Village	Up SW	5	Yes	Lighten Labour	Exist	Moderate	Yes	100K	Yes	100	Toilet	Diarrhoea	4	Agri.	160,000	
2-057	Mavwere	Mphomobe	Excellent	S	Good	6	Yes	Village	Up SW	4	Yes	Lighten Labour	Exist	Moderate	Yes	100K	Yes	100	Toilet	Diarrhoea	6	Agri.	45,000	
2-058	Mavwere	M'anjia																						
2-059	Mavwere	Gomani 1	Excellent	S	Good	3	Yes	N/A	R/D	4	Yes	Less Expense	Exist	Good	No	N/A	Yes	100	Toilet	Diarrhoea	3	Agri.	13,000	
2-059	Mavwere	Gomani 1	Good	S	Good	6	Yes	Village	Tap	N/A	Yes	Secure Quality	Exist	Good	Yes	300K	No	N/A	Toilet	Diarrhoea	3	Merchant	N/A	
2-060	Mavwere	Jusi	Moderate	S	Good	6	Yes	Village	BH	N/A	No	N/A	Exist	Excellent	Yes	400K	Yes	50	Toilet		4	Agri.	7,500	
2-060	Mavwere	Jusi	Excellent	S	Good	5	Yes	Area Mech.	R/D	6	No	N/A	Exist	Excellent	Yes	50K	Yes	50	Toilet	Diarrhoea	4	Agri.	10,000	
2-061	Zulu	Malosi	Good	S	Salty	5	Yes	Village	PSW	5	Yes	Save Time	Exist	Moderate	Yes	200K	Yes	500	Toilet	Dysentery	1	Agri.	30,000	
2-061	Zulu	Malosi	Excellent	S	Salty	4	Yes	Village	PSW	3	Yes	Secure Quality	Exist	Good	Yes	30K	Yes	500	Toilet	Skin disease	6	Agri.	N/A	
2-062	Zulu	Mamad-zongo	Good	S	Good	6	Yes	Area Mech.	R/D	1	Yes	Secure Quality	Exist	Moderate	Yes	100K	No	N/A	Toilet	Diarrhoea	6	Agri.	13,000	
2-062	Zulu	Mamad-zongo	Excellent	S	Good	8	Yes	Area Mech.	PSW	4	No	N/A	Exist	Very bad	Yes	50K	Yes	1,500	Garden	Skin disease	6	Agri.	50,000	
2-063	Zulu	Nwardawara	Excellent	S	Good	8	Yes	Village	PSW	1	Yes	Secure Quality	Exist	N/A	Yes	100K	Yes	100	Toilet	Diarrhoea	6	Agri.	38,500	
2-063	Zulu	Nwardawara	Good	S	Good	5	Yes	Village	Up SW	3	Yes	Lighten Labour	Exist	Not-Good	Yes	50K	Yes	50	Toilet	Diarrhoea	5	Agri.	82,000	
2-064	Zulu	Kachokam-komero	Good	S	Good	4	Yes	Village	PSW	2	Yes	Secure Quality	Exist	Excellent	Yes	200K	Yes	100	Toilet	Eye disease	4	Other	102,000	
2-064	Zulu	Kachokam-komero	Excellent	S	Good	4	Yes	Village	PSW	1	Yes	Secure Quality	Exist	Excellent	Yes	200K	Yes	50	Toilet	Eye disease	6	Agri.	13,000	
2-064	Zulu	Kachokam-komero	Good	S	Good	4	Yes	Village	PSW	3	Yes	Save Time	Exist	Moderate	Yes	500K	Yes	400	Toilet	Eye disease	1	Agri.	10,000	
2-064	Zulu	Kachokam-komero	Very bad	N/A	N/A	N/A	N/A	N/A	Up SW	3	No	N/A	Exist	Not-Good	Yes	50K	Yes	50	Toilet	Diarrhoea	3	Agri.	75,000	
2-065	Zulu	Mkumba	Not-good	IS	Good	3	Yes	Area Mech.	PSW	4	No	N/A	Exist	Moderate	Yes	100K	Yes	100	Toilet	Diarrhoea	2	Agri.	37,000	
2-065	Zulu	Mkumba	Excellent	IS	Good	4	Yes	Village	R/D	4	Yes	Secure Quality	Exist	Not-Good	Yes	50K	Yes	100	Garden	Skin disease	2	Agri.	44,000	
2-066	Zulu	Janu	Excellent	S	Good	35	Yes	Village	PSW	4	Yes	Secure Quality	Exist	Excellent	Yes	50K	Yes	50	Toilet	Skin disease	5	Other	60,000	
2-067	Zulu	Janu	Good	S	Good	7	Yes	WMA	R/D	4	Yes	Save Time	Exist	Save Time	Yes	50K	Yes	300	Toilet	Diarrhoea	3	Agri.	87,000	
2-067	Zulu	Chimpanba	Not-good	IS	Good	12	Yes	Area Mech.	Up SW	6	Yes	Secure Quality	Exist	Not-Good	No	N/A	No	N/A	Toilet	Diarrhoea	6	Agri.	55,000	
2-067	Zulu	Chimpanba	Excellent	IS	Good	5	Yes	Donor	R/D	4	Yes	Secure Quality	Exist	Good	No	N/A	Yes	20	Toilet	N/A	4	Wage Earner	20,000	
2-068	Zulu	Chiwoke	Good	S	Salty	7	Yes	Village	Up SW	4	Yes	Lighten Labour	Exist	Moderate	No	N/A	No	N/A	Toilet	Dysentery	3	Agri.	25,000	
2-068	Zulu	Chiwoke	Very bad	S	Good	4	No	Area Mech.	Up SW	5	No	N/A	Exist	Not-Good	Yes	30K	Yes	30K	Toilet	Dysentery	7	Merchant	48,000	
2-069	Zulu	Chiwoke	Good	IS	Good	5	Yes	Village	Up SW	5	Yes	Save Time	Exist	Good	Yes	100K	Yes	100	Toilet	Diarrhoea	4	Agri.	200,000	
2-069	Zulu	Chiwoke	Excellent	S	Good	8	Yes	Area Mech.	Up SW	2	No	N/A	Exist	N/A	Yes	200K	Yes	200	Toilet	Diarrhoea	3	Agri.	16,000	
2-070	Zulu	Mazawa	Excellent	S	Good	3	Yes	Donor	R/D	4	Yes	Secure Quality	Exist	Good	No	N/A	Yes	30K	Toilet	N/A	4	Wage Earner	20,000	
2-070	Zulu	Mazawa	Moderate	S	Good	150	Yes	Village	PSW	4	Yes	Save Time	Exist	Good	Yes	30K	Yes	20	Garden	Diarrhoea	6	Agri.	16,000	

BH No.	TA	Village	JICA Borehole				Alternative Water source				Willingness/Affordability				Hygiene & Sanitation			Socio-Economic Situation					
			rating	Volume	Quality	Daily use buckets /day	Trial repair	Repaired by	Alternat ve Water source	Times a Need of rehab day	Expectations	WPC	Evaluation WPC activities	Willingness to pay maintenance per hh	Affordability to pay pump maintenance JICA BH	How much (MK)	Excretion place	Type of illness	No. of person in family	Occupation	Total income		
2-071	Zulu	Mbachunda	Excellent	S	Good	3	Yes	Village	PSW	3	Yes	Secure Quality	Exist	Good	Yes	30K	Yes	Toilet	Skin disease	6	Agri.	N/A	
2-071	Zulu	Mbachunda	Excellent	S	Good	6	Yes	Village	PSW	4	Yes	Secure Quality	Exist	Excellent	Yes	50K	Yes	Toilet	Skin disease	5	Other	60,000	
2-072	Zulu	Mbachunda	Good	S	Good	3	Yes	Area Mech.	R/D	1	Yes	Lighten Labour	Exist	Good	Yes	100K	Yes	Toilet	Diarrhoea	7	Agri.	18,000	
2-072	Zulu	Mbachunda	Good	S	Good	6	Yes	WMA	R/D	3	Yes	Lighten Labour	Exist	Good	Yes	50K	No	Toilet	Diarrhoea	1	Agri.	20,000	
2-073	Zulu	Chintanda	Good	S	Good	4	Yes	WMA	PSW	4	Yes	Save Time	Exist	Good	Yes	500K	Yes	Toilet	Diarrhoea	2	Agri.	78,000	
2-073	Zulu	Chintanda	Very bad	S	Good	5	No	Area Mech.	Up SW	5	No	N/A	Exist	Not-Good	Yes	30K	No	Toilet	Dysentery	7	Merchant	48,000	
2-073	Zulu	Chintanda	Very bad	S	Good	4	Yes	WMA	Up SW	4	Yes	Less Expense	Exist	Moderate	Yes	50K	Yes	Toilet	Diarrhoea	4	Agri.	72,000	
2-074	Zulu	Kachikoni-do	Excellent	S	Good	4	Yes	Village	R/D	4	Yes	Secure Quality	Exist	Not-Good	Yes	50K	Yes	Garden	Skin disease	1	Agri.	44,000	
2-074	Zulu	Kachikoni-do	Good	S	Good	3	Yes	Area Mech.	PSW	5	Yes	Lighten Labour	Not exist	N/A	Yes	50K	No	Garden		1	Agri.	N/A	
2-075	Zulu	Chiphala	Very bad	S	Good	3	No	N/A	Up SW	3	Yes	Secure Quality	Exist	N/A	Yes	50K	Yes	Toilet	Dysentery	3	Agri.	48,000	
2-075	Zulu	Chiphala	Very bad	S	Good	8	Yes	Village	Up SW	4	Yes	Lighten Labour	Not exist	N/A	Yes	50K	Yes	Toilet	Dysentery	7	Agri.	11,000	
2-076	Zulu	Mhaxira	Not-good	S	Good	10	Yes	WMA	Up SW	10	No	N/A	Exist	Not-Good	Yes	100K	No	Toilet	Dysentery	7	Agri.	45,000	
2-076	Zulu	Mhaxira	Excellent	S	Good	5	Yes	WMA	PSW	5	Yes	Save Time	Exist	Good	Yes	200K	No	Toilet	Diarrhoea	4	Merchant	6,000	
2-077	Zulu	Dzidwa	Moderate	IS	Good	4	Yes	Village	PSW	4	Yes	Save Time	Exist	Good	Yes	30K	Yes	Garden	Diarrhoea	6	Agri.	16,000	
2-077	Zulu	Dzidwa	Moderate	IS	Good	10	Yes	WMA	R/D	8	Yes	Save Time	Not exist	N/A	Yes	50K	Yes	Toilet	Diarrhoea	5	Agri.	300,000	
2-078	Zulu	Chakama	Good	S	Good	6	Yes	Area Mech.	R/D	3	Yes	Lighten Labour	Exist	Excellent	Yes	100	Yes	Toilet	Diarrhoea	2	Agri.	14,000	
2-078	Zulu	Chakama	Very bad	S	Good	4	N/A	N/A	Up SW	3	No	N/A	Exist	Not-Good	Yes	50K	Yes	Toilet	Diarrhoea	3	Agri.	75,000	
2-079	Zulu	Kailang-we	Very bad	S	Good	4	Yes	Area Mech.	Up SW	2	Yes	Secure Quality	Exist	Moderate	Yes	100K	Yes	Toilet	N/A	3	Agri.	35,000	
2-079	Zulu	Kailang-we	Very bad	S	Good	2	No	N/A	R/D	3	Yes	Lighten Labour	Not exist	N/A	Yes	500K	Yes	Toilet	Diarrhoea	1	Agri.	99,000	
2-080	Zulu	Msemwe	Good	S	Good	6	Yes	Village	Up SW	3	Yes	Save Time	Not exist	N/A	Yes	100K	No	Garden	Diarrhoea	6	Agri.	48,000	
2-080	Zulu	Msemwe	Excellent	S	Good	8	Yes	Area Mech.	PSW	4	No	Save Time	Exist	Very bad	Yes	50K	Yes	Garden	Skin disease	6	Agri.	50,000	
2-081	Zulu	Msemwe	Not-good	IS	Good	7	Yes	Area Mech.	Up SW	6	Yes	Secure Quality	Exist	Good	No	N/A	No	Toilet	Diarrhoea	6	Agri.	55,000	
2-081	Zulu	Msemwe	Moderate	S	Good	5	Yes	Donor	R/D	3	Yes	Secure Quality	Exist	Good	Yes	30K	Yes	Garden	N/A	5	Agri.	24,000	
2-082	Zulu	Mando	Good	S	Good	6	Yes	Area Mech.	Up SW	4	Yes	Lighten Labour	Exist	Moderate	No	N/A	No	Toilet	Dysentery	3	Agri.	25,000	
2-082	Zulu	Mando	Good	S	Good	10	Yes	Area Mech.	PSW	5	Yes	Save Time	Exist	Good	Yes	50K	Yes	Toilet	N/A	8	Agri.	50,000	
2-083	Zulu	Gereta	Excellent	S	Good	4	Yes	Village	PSW	5	Yes	Save Time	Exist	Good	Yes	200K	No	Toilet	Dysentery	4	Merchant	6,000	
2-083	Zulu	Gereta	Good	S	Good	4	Yes	Village	PSW	5	Yes	Save Time	Exist	Moderate	Yes	200K	Yes	Toilet	Dysentery	1	Agri.	30,000	
2-084	Zulu	Matimba	Good	IS	Good	4	Yes	Area Mech.	R/D	5	Yes	Secure Quality	Exist	Excellent	Yes	100K	Yes	Toilet	Dysentery	3	Wage Earner	10,000	
2-084	Zulu	Matimba	Good	IS	Good	10	Yes	Village	PSW	8	Yes	Save Time	Exist	Excellent	Yes	200K	Yes	Toilet	Diarrhoea	6	Agri.	N/A	
2-085	Zulu	Matimba	Good	S	Good	3	Yes	Village	Up SW	3	Yes	Save Time	Not exist	N/A	Yes	100K	No	Garden	Diarrhoea	6	Agri.	48,000	
2-085	Zulu	Matimba	Good	S	Good	4	Yes	Village	Up SW	3	Yes	Lighten Labour	Exist	Not-Good	Yes	50K	Yes	Toilet	Diarrhoea	5	Agri.	82,000	
2-086	Zulu	Jenjewa	Not-good	S	Good	12	Yes	Area Mech.	PSW	3	No	N/A	Exist	Moderate	Yes	100K	Yes	Toilet	Diarrhoea	2	Agri.	37,000	
2-086	Zulu	Jenjewa	Very bad	S	Good	20	Yes	Village	Up SW	4	Yes	Lighten Labour	Not exist	N/A	Yes	50K	Yes	Toilet	Dysentery	7	Agri.	48,000	
2-087	Zulu	Kanjileng	Good	S	Good	10	Yes	Village	Up SW	3	Yes	Lighten Labour	Exist	Good	Yes	100K	Yes	Toilet	Dysentery	4	Agri.	N/A	
2-087	Zulu	Kanjileng	Good	S	Good	6	Yes	Village	Up SW	5	Yes	Save Time	Exist	Good	Yes	100K	Yes	Toilet		4	Agri.	200,000	
2-088	Zulu	Kamdaya	Excellent	IS	Good	8	Yes	Area Mech.	Up SW	2	Yes	Area Mech.	Exist	N/A	Yes	200K	Yes	Toilet	Diarrhoea	3	Agri.	16,000	
2-088	Zulu	Kamdaya	Excellent	S	Good	15	Yes	Area Mech.	Up SW	1	3	N/A	Exist	Moderate	Yes	50K	Yes	Toilet	Diarrhoea	5	Agri.	14,800	
2-089	Zulu	Mzati	Good	S	Good	6	Yes	Area Mech.	R/D	1	Yes	Secure Quality	Exist	Moderate	Yes	100K	No	Toilet	Diarrhoea	6	Agri.	13,000	
2-089	Zulu	Mzati	Good	IS	Good	3	Yes	Neiborings	PSW	8	No	Secure Quality	Exist	Excellent	Yes	50K	Yes	Toilet		6	Agri.	110,000	
2-090	Zulu	Zefalino	Very bad	S	Good	4	Yes	Area Mech.	Up SW	2	Yes	Secure Quality	Exist	Moderate	Yes	100K	Yes	Toilet	N/A	3	Agri.	35,000	
2-090	Zulu	Zefalino	Very bad	S	Good	4	Yes	WMA	Up SW	4	Yes	Less Expense	Exist	Moderate	Yes	50K	Yes	Toilet	Diarrhoea	4	Agri.	72,000	
2-091	Zulu	Chiphala-A	Good	IS	Salty	6	Yes	Area Mech.	PSW	6	Yes	Save Time	Exist	Excellent	Yes	100K	No	Toilet	Eye disease	1	Agri.	20,000	
2-091	Zulu	Chiphala-A	Not-good	IS	Colour	3	Yes	Donor	Up SW	3	Yes	Save Time	Exist	Good	Yes	30K	No	Toilet	Diarrhoea	2	Merchant	110,000	
2-092	Zulu	Chamveka	Good	S	Good	10	Yes	Village	R/D	4	Yes	Lighten Labour	Exist	Good	Yes	200K	Yes	Toilet		7	Agri.	73,000	
2-092	Zulu	Chamveka	Good	S	Good	6	Yes	WMA	R/D	6	Yes	Secure Quality	Exist	N/A	Yes	500K	Yes	Toilet	Diarrhoea	5	Agri.	95,000	
2-093	Zulu	Kamwendo T. C.																					
2-093	Zulu	Kamwendo T. C.	Excellent	S	Good	5	Yes	Village	PSW	1	Yes	Secure Quality	Exist	N/A	Yes	100K	Yes	Toilet	Diarrhoea	6	Agri.	38,500	
2-094	Zulu	Kamwendo T. C.	Very bad	S	Good	10	No	N/A	Up SW	3	Yes	Secure Quality	Exist	N/A	Yes	50K	Yes	Toilet	Dysentery	3	Agri.	11,000	
2-095	Zulu	Chidwea	Excellent	S	Good	4	Yes	Donor	Up SW	4	No	N/A	Exist	Good	Yes	50K	Yes	Toilet	Diarrhoea	5	Merchant	48,000	
2-095	Zulu	Chidwea	Not-good	IS	Good	6	Yes	Donor	Up SW	6	No	N/A	Not exist	N/A	Yes	50K	Yes	Garden	Diarrhoea	6	Breeder	50,000	
2-096	Zulu	Chikomani	Excellent	S	Good	4	Yes	Donor	Up SW	4	No	N/A	Exist	Good	Yes	50K	Yes	Toilet	Diarrhoea	5	Merchant	48,000	
2-096	Zulu	Chikomani	Moderate	S	Good	10	Yes	WMA	R/D	8	Yes	Save Time	Not exist	N/A	Yes	50K	Yes	Toilet	N/A	5	Agri.	300,000	
2-097	Zulu	Mdawa	Moderate	IS	Salty	7	Yes	Donor	R/D	3	Yes	Secure Quality	Exist	Good	Yes	30K	Yes	Garden	N/A	5	Agri.	24,000	
2-097	Zulu	Mdawa	Good	IS	Good	8	Yes	Area Mech.	R/D	N/A	No	N/A	Exist	Good	Yes	50K	Yes	Toilet	N/A	8	Agri.	90,000	
2-098	Zulu	Kwachau-name	Very bad	S	Good	8	Yes	Village	BH	6	Yes	Save Time	Exist	Good	Yes	100K	Yes	Toilet		4	Agri/Labourer	115,000	
2-098	Zulu	Kwachau-name	Very bad	S	Good	4	No	N/A	BH	3	No	N/A	Exist	Moderate	Yes	50K	No	Toilet		4	Agri/Labourer	115,000	
2-099	Zulu	Mando	Moderate	S	Good	5	Yes	Village	BH	2	Yes	Save Time	Exist	N/A	Yes	50K	Yes	Toilet	Diarrhoea	5	Agri.	18,700	
2-099	Zulu	Mando	Good	S	Good	8	Yes	WMA	R/D	4	Yes	Save Time	Exist	Not-Good	Yes	50K	Yes	Toilet	Diarrhoea	3	Agri.	87,000	
2-100	Zulu	Chikoyi-Jombo	Good	S	Good	8	Yes	Village	PSW	3	Yes	Save Time	Exist	Moderate	Yes	500K	Yes	Toilet	Eye disease	1	Agri.	10,000	
2-100	Zulu	Chikoyi-Jombo	Very bad	S	Good	5	No	N/A	R/D	3	Yes	Lighten Labour	Not exist	N/A	Yes	500K	Yes	Toilet	Diarrhoea	1	Agri.	99,000	

BH No.	TA	Village	JICA Borehole			Alternative Water source			Willingness/Affordability			Hygiene & Sanitation			Socio-Economic Situation									
			rating	Volume	Quality	Daily use buckets /day	Triel repair	Repaired by	Alternati- ve Water source	Times a day	Need of rehab	Expectations	WPC	Evaluation WPC activities	Willingness to pay	Affordability to pay pump maintenance per fh	money contribution for maintenance of JICA BH	How much (MK)	Excretion place	Type of illness person in family	No. of person in family	Occupation	Total income	
2-101	Zulu	Chiméka	Good	IS	Salty	3	Yes	Village	R/D	3	Yes	Save Time	Exist	Good	500K	Yes	500K	Yes	120	Toilet	Diarrhoea	2	Agri.	78,000
2-102	Zulu	Chiméka	Moderate	S	Good	5	Yes	Village	BH	3	Yes	Lighten Labour	Exist	Good	50K	No	50K	No	N/A	Toilet	Diarrhoea	1	Agri.	20,000
2-103	Zulu	Chitamba-la	Not-good	S	Colour	3	Yes	Area Mech.	Up SW	6	Yes	Secure Quality	Exist	Good	N/A	No	N/A	No	N/A	Toilet	Diarrhoea	6	Agri.	55,000
2-104	Zulu	Chitamba-la	Excellent	S	Good	4	Yes	Village	PSW	4	Yes	Secure Quality	Exist	Excellent	50K	Yes	50K	Yes	50	Toilet	Skin disease	5	Other	60,000
2-105	Zulu	Chiwénkha	Not-good	IS	Good	3	Yes	Village	PSW	3	Yes	Lighten Labour	Exist	Good	100K	Yes	100K	Yes	200	Toilet		2	Agri.	20,000
2-106	Zulu	Chiwénkha	Very bad	S	Good	3	Yes	Donor	PSW	2	Yes	Lighten Labour	Exist	Good	100K	Yes	100K	Yes	200	Toilet		2	Agri.	20,000
2-107	Zulu	Mphanga	Good	S	Good	5	Yes	Village	Up SW	4	Yes	Lighten Labour	Exist	Moderate	No	N/A	No	N/A	Toilet	Dysentery		3	Agri.	25,000
2-108	Zulu	Mphanga	Very bad	S	Good	6	No	Area Mech.	Up SW	5	No	N/A	Exist	Not-Good	30K	Yes	30K	No	N/A	Toilet	Dysentery	7	Merchant	48,000
2-109	Zulu	Durra	Moderate	IS	Salty	10	Yes	Village	PSW	4	Yes	Save Time	Exist	Good	30K	Yes	30K	Yes	20	Garden	Diarrhoea	6	Agri.	16,000
2-110	Zulu	Durra	Very bad	IS	Colour	3	N/A	N/A	Up SW	10	No	N/A	Exist	Not-Good	50K	Yes	50K	Yes	50	Toilet	Diarrhoea	3	Agri.	75,000
2-111	Zulu	Mphanga	Not-good	S	Good	5	Yes	WMA	Up SW	10	No	N/A	Exist	Not-Good	100K	Yes	100K	No	N/A	Toilet	Dysentery	7	Agri.	45,000
2-112	Zulu	Mphanga	Excellent	S	Good	3	Yes	WMA	PSW	5	Yes	Save Time	Exist	Good	200K	Yes	200K	No	N/A	Toilet	Dysentery	4	Merchant	6,000
2-113	Zulu	Bulawo	Good	IS	Good	5	Yes	Area Mech.	PSW	N/A	Yes	Secure Quality	Exist	Excellent	Yes	100K	Yes	50	Toilet	Dysentery	3	Wage Earner	10,000	
2-114	Zulu	Bulawo	Good	IS	Good	5	Yes	Area Mech.	PSW	N/A	Yes	Secure Quality	Exist	Excellent	Yes	200K	Yes	500	Toilet	Dysentery	1	Agri.	30,000	
2-115	Zulu	Mdunga	Good	IS	Good	6	Yes	Village	Up SW	3	Yes	Save Time	Exist	Moderate	Yes	100K	Yes	500	Toilet	Dysentery	3	Agri.	48,000	
2-116	Zulu	Mdunga	Good	IS	Good	3	Yes	Village	Up SW	3	Yes	Save Time	Exist	N/A	Yes	100K	No	N/A	Garden	Diarrhoea	6	Agri.	82,000	
2-117	Zulu	Kaligweni-je	Good	S	Good	7	Yes	Village	Up SW	3	Yes	Lighten Labour	Exist	Not-Good	50K	Yes	50K	Yes	50	Toilet		5	Agri.	82,000
2-118	Zulu	Kaligweni-je	Excellent	S	Good	6	Yes	Area Mech.	Up SW	1	3	N/A	Exist	Moderate	Yes	50K	Yes	150	Toilet		5	Agri.	14,800	
2-119	Zulu	Kolona	Moderate	S	Good	10	Yes	Area Mech.	R/D	3	Yes	Lighten Labour	Exist	Excellent	Yes	50K	Yes	100	Toilet	Diarrhoea	2	Agri.	14,000	
2-120	Zulu	Kolona	Good	IS	Good	5	Yes	Village	Up SW	4	Yes	Lighten Labour	Not exist	N/A	Yes	50K	Yes	50	Toilet	Dysentery	7	Agri.	48,000	
3-001	Zulu	Kachaje	Good	IS	Good	8	Yes	Village	Up SW	3	Yes	Lighten Labour	Exist	Good	Yes	100K	Yes	100	Toilet		4	Agri.	37,000	
3-002	Zulu	Kachaje	Not-good	IS	Good	10	Yes	Area Mech.	PSW	3	No	N/A	Exist	Moderate	Yes	100K	Yes	100	Toilet	Diarrhoea	2	Agri.	200,000	
3-003	Zulu	Mchambo-Gunda	Good	IS	Good	4	Yes	Village	Up SW	5	Yes	Save Time	Exist	Good	Yes	50K	Yes	50	Toilet	Diarrhoea	4	Agri.	48,000	
3-004	Zulu	Mchambo-Gunda	Excellent	IS	Good	3	Yes	Donor	Up SW	4	No	N/A	Exist	Good	Yes	50K	Yes	50	Toilet	Diarrhoea	5	Merchant	48,000	
3-005	Zulu	Geresono	Moderate	S	Good	10	Yes	WMA	R/D	8	Yes	Save Time	Not exist	N/A	Yes	50K	Yes	50	Toilet	N/A	5	Agri.	300,000	
3-006	Zulu	Geresono	Moderate	S	Good	8	Yes	Village	R/D	4	Yes	Lighten Labour	Exist	Excellent	Yes	50K	Yes	50	0		4	Merchant	48,000	
3-007	Zulu	Mchambo	Good	S	Good	3	Yes	Village	PSW	3	Yes	Save Time	Exist	Moderate	Yes	500K	Yes	400	Toilet	Eye disease	1	Agri.	10,000	
3-008	Zulu	Mchambo	Good	S	Good	3	Yes	Village	PSW	3	Yes	Secure Quality	Exist	Good	Yes	30K	Yes	200	Toilet	N/A	5	Agri.	24,000	
3-009	Zulu	Mchambo	Very bad	S	Salty	4	No	N/A	R/D	3	Yes	Lighten Labour	Not exist	N/A	Yes	500K	Yes	100	Toilet	Diarrhoea	1	Agri.	98,000	
3-010	Zulu	Chikoboka	Good	S	Good	10	Yes	Area Mech.	R/D	3	Yes	Lighten Labour	Exist	Excellent	Yes	50K	Yes	100	Toilet	Diarrhoea	2	Agri.	14,000	
3-011	Zulu	Tika	Good	S	Good	150	Yes	WMA	PSW	4	Yes	Save Time	Exist	Good	Yes	500K	Yes	120	Toilet	Diarrhoea	2	Agri.	78,000	
3-012	Zulu	Tika	Good	S	Good	8	Yes	WMA	R/D	3	Yes	Lighten Labour	Exist	Good	Yes	500K	Yes	100	Toilet	Diarrhoea	2	Agri.	20,000	
3-013	Zulu	Chimwere	Excellent	S	Good	4	Yes	Area Mech.	R/D	1	Yes	Lighten Labour	Exist	Good	Yes	100K	Yes	N/A	Toilet	Diarrhoea	1	Agri.	18,000	
3-014	Zulu	Chimwere	Good	S	Good	6	Yes	Donor	PSW	4	Yes	Secure Quality	Not exist	N/A	Yes	500K	No	N/A	Toilet	Diarrhoea	7	Agri.	25,000	
3-015	Zulu	Kathyuka	Good	S	Good	2	Yes	Area Mech.	PSW	N/A	Yes	Secure Quality	Exist	Excellent	Yes	100K	Yes	50	Toilet	Dysentery	3	Wage Earner	10,000	
3-016	Zulu	Kathyuka	Good	S	Good	5	Yes	Neighbourings	PSW	8	No	Secure Quality	Exist	Excellent	Yes	50K	Yes	50	Toilet					11,000
3-017	Zulu	Chiwete	Excellent	S	Good	3	Yes	Area Mech.	Up SW	2	No	N/A	Exist	N/A	Yes	200K	Yes	200	Toilet	Diarrhoea	3	Agri.	16,000	
3-018	Zulu	Chiwete	Excellent	S	Good	4	Yes	WMA	PSW	2	Yes	N/A	Exist	Good	Yes	50K	Yes	50	Toilet	Skin disease	8	Agri.	160,000	
3-019	Zulu	Changata	Good	S	Good	2	Yes	Area Mech.	R/D	1	Yes	Secure Quality	Exist	Moderate	Yes	100K	No	N/A	Toilet	Diarrhoea	6	Agri.	13,000	
3-020	Zulu	Changata	Good	S	Good	4	Yes	Neighbourings	PSW	8	No	Secure Quality	Exist	Excellent	Yes	50K	Yes	50	Toilet					11,000
3-021	Zulu	Langwani	Very bad	S	Good	7	Yes	Area Mech.	Up SW	2	Yes	Secure Quality	Exist	Moderate	Yes	100K	Yes	100	Toilet	N/A	3	Agri.	35,000	
3-022	Zulu	Langwani	Very bad	S	Good	10	Yes	WMA	Up SW	4	Yes	Less Expense	Exist	Moderate	Yes	50K	Yes	900	Toilet	Diarrhoea	4	Agri.	72,000	
3-023	Zulu	Snosoi	Good	S	Good	10	Yes	Donor	PSW	1	Yes	N/A	Exist	Moderate	No	N/A	No	N/A	Toilet	Diarrhoea	8	Agri.	130,000	
3-024	Zulu	Snosoi	Good	S	Good	8	Yes	Area Mech.	R/D	2	Yes	Save Time	N/A	N/A	Yes	50K	Yes	20	Garden		11	Agri.	100,000	
3-025	Zulu	Kanyimbo	Excellent	S	Good	5	Yes	Village	PSW	1	Yes	Secure Quality	Exist	N/A	Yes	100K	Yes	100	Toilet	Diarrhoea	6	Agri.	38,500	
3-026	Zulu	Kanyimbo	Very bad	S	Salty	4	No	N/A	Up SW	3	Yes	Secure Quality	Exist	N/A	Yes	60	Yes	60	Toilet	Dysentery	3	Agri.	11,000	
3-027	Zulu	Machilika	Very bad	S	Good	6	Yes	Village	R/D	5	Yes	Secure Quality	Exist	Moderate	Yes	100K	Yes	50	Toilet	Skin disease	7	Agri.	52,000	
3-028	Zulu	Machilika	Net-good	N/A	N/A	4	Yes	Village	R/D	N/A	Yes	Secure Quality	Exist	Moderate	Yes	50K	Yes	100	Toilet	Diarrhoea	6	Agri.	38,000	
3-029	Zulu	Chikweke	Moderate	IS	Good	3	Yes	Village	PSW	N/A	Yes	Secure Quality	Exist	Good	No	N/A	No	N/A	Toilet		13	Merchant	115,000	
3-030	Zulu	Chikweke	Not-good	IS	Good	12	Yes	Village	R/D	N/A	Yes	Secure Quality	Exist	Moderate	Yes	100K	Yes	150	Toilet	Diarrhoea	3	Merchant	89,000	
3-031	Zulu	Kanyenda	Very bad	S	Good	5	No	N/A	R/D	3	Yes	Save Time	Exist	Not-Good	100K	No	N/A	No	N/A	Toilet	Diarrhoea	4	Agri.	120,000
3-032	Zulu	Kanyenda	Very bad	N/A	N/A	4	No	N/A	R/D	3	Yes	Save Time	Exist	Very bad	Yes	100K	Yes	30	Toilet	Skin disease	3	Agri.	95,000	
3-033	Zulu	Mberere	Moderate	IS	Good	5	Yes	Village	R/D	N/A	Yes	Less Expense	Exist	Good	Yes	50K	Yes	50	Toilet	N/A	3	Agri.	38,000	
3-034	Zulu	Mberere	Moderate	IS	Good	1	Yes	Village	R/D	N/A	Yes	Less Expense	Exist	Moderate	Yes	50K	Yes	50	Toilet		4	Other	145,000	
3-035	Zulu	Mberere	Very bad	IS	Good	3	No	N/A	BH	N/A	Yes	Secure Quality	Not exist	N/A	No	N/A	No	N/A	Toilet	Diarrhoea	7	Other	40,000	
3-036	Zulu	Mikundi T.C.	Very bad	IS	Salty	4	No	N/A	BH	N/A	Yes	Secure Quality	Not exist	N/A	No	N/A	No	N/A	Toilet	Dysentery	9	Agri.	70,000	
3-037	Zulu	Mikundi T.C.	Very bad	IS	Salty	5	Yes	Village	N/A	N/A	Yes	Secure Quality	Exist	Moderate	No	N/A	No	N/A	Toilet	Dysentery	7	Agri.	50,000	
3-038	Zulu	Kalombo Sch	Moderate	IS	Good	5	Yes	Village	N/A	N/A	Yes	Secure Quality	Exist	Not-Good	Yes	50K	Yes	20	Toilet	Diarrhoea	6	Agri.	20,000	
3-039	Zulu	Kalombo Sch	Moderate	IS	Good	4	Yes	Village	N/A	N/A	Yes	Secure Quality	Exist	Not-Good	Yes	50K	Yes	20	Toilet	N/A	6	Agri.	82,000	
3-040	Zulu	Tongole	Moderate	S	Good	3	Yes	Village	PSW	1	Yes	Secure Quality	Exist	Good	Yes	300K	Yes	50	Toilet	N/A	5	Agri.	42,000	

General		JICA Borehole				Alternative Water source				Willingness/Affordability				Hygiene & Sanitation			Socio-Economic Situation				
BH No.	TA	Village	rating	Satisfaction		Tripl repair	Repaired by	Alternati ve Water source	Times a Need of rehab day	Expectations	WPC	Evaluation WPC activities	Willingness to pay	Affordability to pay pump maintenance per h	money contribution for maintenance of JICA BH	How much (MK)	Excretion place	Type of illness	No. of person in family	Occupation	Total income
				Volume	Quality																
3-021	Mdwa	Kalinde	Good	S	Good	6	N/A	N/A	R/D	N/A	Yes	50K	No	Yes	20	Toilet	Skin disease	6	Agri.	60,000	
3-021	Mdwa	Kalinde	N/A	S	Good	5	Yes	Village	R/D	N/A	Yes	50K	Yes	50K	Yes	100	Toilet	N/A	5	Agri.	37,000
3-022	Mdwa	Jasi	Good	S	Good	8	Yes	Village	R/D	Yes	Less Expense	Yes	50K	Yes	100	Toilet	Skin disease	6	Agri.	52,000	
3-022	Mdwa	Jasi	Good	S	Good	10	Yes	Village	R/D	Yes	Secure Quality	Yes	50K	Yes	100	Toilet	Skin disease	5	Agri.	48,000	
3-023	Mdwa	Chipurinko-Chimutu	Good	S	Good	6	Yes	Village	R/D	3	Yes	Secure Quality	Yes	50K	Yes	70	Toilet	N/A	5	Agri.	22,000
3-023	Mdwa	Chipurinko-Chimutu	Good	S	Good	4	Yes	Village	R/D	3	Yes	Secure Quality	Yes	50K	Yes	70	Toilet	N/A	4	Agri.	18,000
3-024	Mdwa	Kadiso	Not-good	IS	Good	9	Yes	N/A	R/D	5	Yes	Save Time	No	N/A	N/A	Garden	Diarrhoea	8	Agri.	103,000	
3-025	Mdwa	Makumbi	Moderate	S	Good	5	Yes	Village	R/D	N/A	Yes	50K	Yes	50K	Yes	50	Toilet	N/A	8	Agri.	48,000
3-025	Mdwa	Makumbi	Moderate	S	Good	8	Yes	N/A	PSW	N/A	Yes	50K	Yes	50K	Yes	100	Toilet	N/A	9	Agri.	102,000
3-026	Mdwa	Mkangala	Moderate	IS	Good	8	Yes	Village	R/D	N/A	Yes	50K	Yes	50K	Yes	50	Toilet	N/A	7	Agri.	50,000
3-026	Mdwa	Mkangala	Moderate	IS	Good	5	Yes	Village	BH	2	Yes	Secure Quality	Yes	50K	Yes	20	Garden	Skin disease	4	Agri.	19,000
3-027	Mdwa	Mng'ona	Not-good	N/A	Good	5	Yes	Village	BH	5	Yes	Save Time	Yes	100K	Yes	100	Toilet	N/A	6	Agri.	N/A
3-027	Mdwa	Mng'ona	Not-good	S	Good	N/A	N/A	N/A	BH	4	Yes	Save Time	Yes	50K	Yes	100	Toilet	Typoid	5	Agri.	N/A
3-028	Mdwa	Lezani	Moderate	S	Good	6	Yes	Village	Up-SW	N/A	Yes	Secure Quality	No	N/A	N/A	Toilet	Diarrhoea	4	Agri.	135,000	
3-029	Mdwa	Goseni	Good	S	Good	9	Yes	Village	Up-SW	2	Yes	Less Expense	Yes	50K	Yes	100	Toilet	Diarrhoea	2	Agri.	44,000
3-029	Mdwa	Goseni	Good	S	Good	8	Yes	Village	PSW	N/A	Yes	Less Expense	Yes	50K	Yes	50	Toilet	Diarrhoea	6	Agri.	18,000
3-030	Mdwa	Timoti	Good	IS	Good	3	Yes	Village	PSW	N/A	Yes	Secure Quality	Yes	N/A	Yes	50	Toilet	Skin disease	7	Agri.	46,000
3-030	Mdwa	Timoti	Moderate	S	Good	8	Yes	Village	PSW	N/A	Yes	Secure Quality	Yes	30K	Yes	50	Toilet	Skin disease	7	Agri.	46,000
3-031	Mdwa	Sipereta	Good	S	Good	6	Yes	Village	PSW	N/A	Yes	Secure Quality	Yes	100K	Yes	200	Toilet	Diarrhoea	6	Agri.	35,000
3-031	Mdwa	Sipereta	Good	S	Good	5	Yes	Village	PSW	N/A	Yes	Less Expense	Yes	100K	Yes	50	Toilet	N/A	3	Agri.	220,000
3-031	Mdwa	Sipereta	Good	S	Good	8	Yes	Area Mech.	R/D	N/A	No	N/A	Yes	50K	Yes	50	Toilet	N/A	4	Agri.	155,000
3-032	Mdwa	Chisamba	Moderate	S	Good	9	Yes	Village	R/D	1	Yes	Secure Quality	Yes	150K	Yes	100	Toilet	Diarrhoea	10	Agri.	50,000
3-032	Mdwa	Chisamba	Moderate	S	Good	7	Yes	Village	R/D	1	Yes	Secure Quality	Yes	150K	Yes	100	Toilet	Diarrhoea	10	Agri.	50,000
3-033	Mdwa	Male	Good	S	Good	11	Yes	WMA	Up-SW	6	Yes	Less Expense	Yes	400K	Yes	150	Toilet	Dysentery	8	Other	103,000
3-033	Mdwa	Male	Good	S	Good	5	Yes	Village	R/D	N/A	Yes	Secure Quality	Yes	50K	Yes	100	Toilet	N/A	4	Agri.	48,000
3-034	Mdwa	Saidi	Good	S	Good	5	Yes	Village	PSW	N/A	Yes	Secure Quality	Yes	50K	Yes	50	Toilet	N/A	6	Agri.	45,000
3-034	Mdwa	Saidi	Moderate	S	Good	10	No	N/A	R/D	N/A	Yes	Secure Quality	Yes	50K	Yes	50	Toilet	N/A	8	Agri.	54,000
3-035	Mdwa	Mikawa ii	Good	IS	Good	4	Yes	Village	Up-SW	2	Yes	Secure Quality	Yes	50K	Yes	100	Garden	N/A	5	Merchant	N/A
3-035	Mdwa	Mikawa ii	Good	IS	Good	5	Yes	Village	Up-SW	2	Yes	Secure Quality	Yes	50K	Yes	100	Garden	N/A	4	Agri.	N/A
3-036	Mdwa	Sundwe	Moderate	S	Good	7	Yes	Village	PSW	N/A	Yes	Secure Quality	Yes	50K	Yes	20	Garden	N/A	3	Agri.	29,000
3-036	Mdwa	Sundwe	Moderate	S	Good	5	Yes	Village	R/D	N/A	Yes	Secure Quality	Yes	50K	Yes	50	Garden	N/A	3	Agri.	18,000
3-037	Mdwa	Mphomwe	Moderate	S	Good	7	Yes	Village	R/D	N/A	Yes	Secure Quality	Yes	30K	Yes	20	Toilet	N/A	5	Agri.	18,000
3-037	Mdwa	Mphomwe	Moderate	S	Good	3	Yes	Village	Up-SW	2	Yes	Secure Quality	Yes	50K	Yes	20	Toilet	Skin disease	6	Agri.	17,000
3-038	Mdwa	Laisi	Moderate	S	Good	6	Yes	Village	PSW	3	Yes	Secure Quality	Yes	50K	Yes	20	Toilet	Diarrhoea	7	Agri.	35,000
3-038	Mdwa	Laisi	Moderate	S	Good	10	Yes	Village	BH	3	Yes	Secure Quality	Yes	50K	Yes	50	Toilet	N/A	5	Merchant	50,000
3-039	Mdwa	Kabungwe-Drawo	Moderate	S	Good	10	Yes	Village	Up-SW	N/A	Yes	Secure Quality	Yes	100K	Yes	100	Toilet	N/A	4	Agri.	42,000
3-039	Mdwa	Kabungwe-Drawo	N/A	IS	Good	6	Yes	Donor	PSW	4	Yes	Secure Quality	Yes	150K	Yes	80	Toilet	N/A	6	Agri.	19,000
3-040	Mdwa	Machakulu	Moderate	S	Good	4	Yes	Village	Up-SW	N/A	Yes	N/A	No	N/A	N/A	Toilet	N/A	8	Agri.	N/A	
3-040	Mdwa	Machakulu	N/A	S	Good	6	Yes	Village	Up-SW	N/A	Yes	Less Expense	Yes	50K	Yes	30	Toilet	Diarrhoea	4	Agri.	N/A
3-041	Dambe	Kapiri	Good	S	Good	3	Yes	Village	BH	3	Yes	Save Time	Yes	100K	Yes	100	Toilet	Dysentery	7	Agri.	210,000
3-041	Dambe	Kapiri	Moderate	S	Good	6	Yes	Village	BH	6	Yes	Lighten Labour	Yes	150K	Yes	100	Toilet	Dysentery	3	Agri.	26,000
3-042	Dambe	Mihema T.C.	Good	S	Good	5	Yes	Village	BH	3	Yes	Lighten Labour	Yes	100K	Yes	100	Toilet	Diarrhoea	2	Merchant	140,000
3-042	Dambe	Mihema T.C.	Excellent	N/A	Good	6	Yes	Village	BH	4	Yes	Save Time	Yes	100K	Yes	100	Toilet	Diarrhoea	5	Merchant	200,000
3-043	Dambe	Chaulunda T.C.	Moderate	IS	Good	5	Yes	Village	Up-SW	N/A	Yes	Secure Quality	Yes	50K	Yes	100	Toilet	Dysentery	7	Agri.	118,000
3-043	Dambe	Chaulunda T.C.	Moderate	IS	Good	5	Yes	Village	Up-SW	N/A	Yes	Secure Quality	Yes	50K	Yes	100	Toilet	Dysentery	5	Agri.	30,000
3-044	Dambe	Kasanda	Moderate	S	Good	12	Yes	Area Mech.	PSW	4	Yes	Lighten Labour	Yes	100K	Yes	100	Toilet	Skin disease	9	Agri.	84,000
3-044	Dambe	Kasanda	Good	S	Good	4	Yes	WMA	PSW	8	No	N/A	Yes	50K	Yes	100	Toilet	Skin disease	8	Agri.	100,000
3-045	Dambe	Melankhope	Good	S	Good	8	Yes	WMA	PSW	5	Yes	Secure Quality	Yes	200K	Yes	200	Toilet	N/A	4	Agri.	110,000
3-045	Dambe	Melankhope	Good	S	Good	5	Yes	WMA	PSW	5	Yes	Secure Quality	Yes	200K	Yes	150	Toilet	N/A	6	Agri.	51,000
3-046	Dambe	Katonda Sch	Good	S	Salty	6	Yes	Village	PSW	4	Yes	Lighten Labour	Yes	200K	Yes	250	Toilet	Eye disease	4	Civil servant	56,000
3-046	Dambe	Katonda Sch	Moderate	S	Good	3	Yes	Village	Up-SW	3	Yes	Secure Quality	Yes	50K	Yes	50	Toilet	Diarrhoea	5	Agri.	300,000
3-047	Dambe	Kamera	Not-good	S	Good	10	Yes	Village	PSW	10	Yes	Save Time	Yes	100K	Yes	500	Toilet	Diarrhoea	3	Agri.	200,000
3-047	Dambe	Kamera	Very bad	S	Good	8	Yes	Donor	Up-SW	8	Yes	Lighten Labour	Yes	200K	Yes	200	Toilet	Cholera	7	Civil servant	144,000
3-048	Dambe	Chisenga	Not-good	S	Good	5	Yes	Area Mech.	R/D	5	Yes	Secure Quality	Yes	300K	Yes	150	Toilet	Diarrhoea	6	Agri.	16,000
3-048	Dambe	Chisenga	Very bad	S	Good	15	Yes	Village	Up-SW	10	Yes	Less Expense	Yes	50K	Yes	50	Toilet	Diarrhoea	7	Agri.	75,000
3-048	Dambe	Kampharabale	Excellent	IS	Good	4	Yes	Village	PSW	3	Yes	Secure Quality	Yes	300K	Yes	100	Toilet	Diarrhoea	3	Agri.	80,000
3-049	Dambe	Kampharabale	Good	S	Good	12	Yes	Village	Up-SW	12	Yes	Secure Quality	Yes	50K	Yes	50	Toilet	Diarrhoea	3	Agri.	87,500
3-050	Dambe	Kabvuta	Good	IS	Good	6	Yes	Village	Up-SW	3	Yes	Secure Quality	Yes	100K	No	N/A	Toilet	N/A	3	Agri.	47,200
3-050	Dambe	Kabvuta	Moderate	IS	Good	5	Yes	Village	Up-SW	3	Yes	Lighten Labour	Yes	300K	Yes	500	Toilet	Diarrhoea	3	Agri.	53,000

General		JICA Borehole				Alternative Water source				Willingness/Affordability				Hygiene & Sanitation			Socio-Economic Situation					
BH No.	TA	Village	rating	Satisfaction	Daily use buckets /day	Trial repair	Repaired by	Alternati ve Water source	Times a Need of rehab day	Expectations	WPC	Evaluation WPC activities	Willingness to pay maintenance per lh	Affordability to pay pump maintenance of JICA BH	How much (MK)	Excretion place	Type of illness	No. of person in family	Occupation	Total income		
3-051	Dambe	Nkhumbu	Moderate	S	Good	5	Yes	Donor	Up/SW	5	No	N/A	Exist	Moderate	Yes	150K	Yes	Toilet	Dysentery	3	Agri.	20000
3-051	Dambe	Nkhumbu	Good	S	Good	6	Yes	Neighbours	R/D	3	Yes	Lighten Labour	Exist	Excellent	Yes	50K	No	Toilet	Dysentery	4	Agri.	N/A
3-052	Dambe	Mphonda-Masinja	Very bad	S	Good	6	Yes	Area Mech.	Up/SW	3	Yes	Secure Quality	Exist	Not-Good	Yes	200K	Yes	Toilet	Toilet	3	Agri.	17000
3-052	Dambe	Mphonda-Masinja	Excellent	S	Good	3	Yes	Village	R/D	2	Yes	Lighten Labour	Exist	Good	Yes	300K	Yes	Toilet	N/A	6	Agri.	7000
3-053	Dambe	Kampamb	Moderate	IS	N/A	6	Yes	Village	Up/SW	6	Yes	Save Time	Exist	Good	Yes	100K	Yes	Toilet	Dysentery	3	Agri.	50000
3-053	Dambe	Kampamb	Good	IS	Good	5	Yes	Neighbours	R/D	7	Yes	Save Time	Exist	Not-Good	Yes	300K	Yes	Toilet	Skin disease	5	Agri.	70000
3-054	Dambe	Marten	Moderate	S	Good	10	Yes	Area Mech.	R/D	8	Yes	Lighten Labour	Exist	Not-Good	Yes	100K	Yes	Toilet	Diarrhoea	7	Agri.	31000
3-054	Dambe	Marten	Good	S	Good	10	Yes	Village	R/D	8	No	N/A	Exist	Good	Yes	30K	Yes	Toilet	Toilet	4	Agri.	18000
3-055	Dambe	Kanzimbi	Good	S	Good	5	Yes	Area Mech.	R/D	3	Yes	Lighten Labour	Exist	Good	Yes	200K	Yes	Toilet	Dysentery	4	Agri.	40000
3-055	Dambe	Kanzimbi	Good	S	Good	6	Yes	Village	Up/SW	6	No	N/A	Exist	Good	Yes	30K	Yes	Toilet	Diarrhoea	3	Agri.	65000
3-056	Dambe	Gandali	Moderate	IS	Good	12	Yes	Village	R/D	4	Yes	Secure Quality	Exist	Good	Yes	100K	Yes	Toilet	Diarrhoea	8	Agri.	90000
3-056	Dambe	Gandali	Not-good	S	Good	4	Yes	Village	Up/SW	4	Yes	Secure Quality	Exist	Good	Yes	100K	Yes	Toilet	N/A	7	Agri.	80000
3-057	Dambe	Chinkokota	Moderate	S	Good	2	Yes	Donor	PSW	3	Yes	Secure Quality	Exist	Good	Yes	50K	No	Toilet	N/A	5	Agri.	23000
3-057	Dambe	Chinkokota	Good	S	Good	6	Yes	Donor	PSW	N/A	Yes	Secure Quality	Exist	Good	Yes	20	Yes	Toilet	Diarrhoea	3	Agri.	8000
3-058	Dambe	Elesami	Very bad	S	Good	4	Yes	Village	BH	3	Yes	Secure Quality	Exist	Good	No	N/A	No	Toilet	Skin disease	8	Agri.	64000
3-059	Dambe	Kapiri Hosp. Miss.	Very bad	S	Good	4	Yes	Village	PSW	4	Yes	Save Time	Exist	N/A	No	N/A	No	Toilet	Toilet	4	Agri.	N/A
3-060	Dambe	Kapiri Hosp. Miss.	Not-good	S	Good	8	Yes	Village	R/D	8	No	N/A	Exist	Moderate	Yes	200K	Yes	Toilet	Eye disease	12	Wage Earner	131000
3-060	Dambe	Japania	Good	IS	Good	15	Yes	Area Mech.	R/D	10	Yes	Lighten Labour	Exist	Not-Good	Yes	200K	Yes	Toilet	Dysentery	7	Agri.	50000
3-061	Dambe	Gong' ontha	Good	S	Good	10	Yes	WMA	R/D	5	No	N/A	Exist	Good	Yes	100K	Yes	Garden		4	Agri.	96000
3-061	Dambe	Gong' ontha	Good	S	Good	3	Yes	Area Mech.	R/D	3	Yes	Save Time	Exist	Good	Yes	200K	Yes	Toilet		3	Agri.	38000
3-062	Mwava	Kavunguti School	N/A	IS	Good	6	Yes	Village	N/A	N/A	Yes	Secure Quality	Exist	Moderate	Yes	50K	Yes	Toilet	Diarrhoea	3	Agri.	N/A
3-062	Mwava	Kavunguti School	N/A	IS	Good	8	Yes	Village	R/D	N/A	Yes	Secure Quality	Exist	Moderate	Yes	50K	Yes	Toilet	Diarrhoea	6	Agri.	N/A
3-063	Dambe	Kechere	Not-good	S	Good	6	Yes	Area Mech.	R/D	6	Yes	Lighten Labour	Exist	Moderate	Yes	100K	Yes	Toilet	Diarrhoea	5	Agri.	72000
3-063	Dambe	Kechere	Moderate	S	Good	4	Yes	Donor	Up/SW	4	Yes	Save Time	Exist	Very bad	Yes	100K	Yes	Toilet	Diarrhoea	6	Agri.	60000
3-064	Dambe	Kakunga	Moderate	S	Good	6	Yes	Village	BH	2	Yes	Lighten Labour	Exist	Good	Yes	100K	Yes	Toilet	Diarrhoea	6	Agri.	60000
3-064	Dambe	Kakunga	Not-good	S	Good	5	Yes	Village	PSW	N/A	Yes	Secure Quality	Exist	Moderate	Yes	100K	Yes	Toilet	N/A	5	Agri.	N/A
3-065	Dambe	Kamenya	Moderate	IS	Good	8	Yes	Donor	R/D	8	Yes	Save Time	Exist	Moderate	Yes	100K	Yes	Toilet		4	Agri.	103000
3-065	Dambe	Kamenya	Very bad	S	Good	7	Yes	Donor	R/D	5	Yes	Secure Quality	Exist	Good	Yes	50K	No	Toilet	Skin disease	4	Agri.	20000
3-066	Dambe	Nthema T.C.	Good	S	Good	10	Yes	Village	BH	7	No	N/A	Exist	Excellent	Yes	100K	Yes	Toilet		5	Merchant	65000
3-066	Dambe	Nthema T.C.	Moderate	S	Good	10	Yes	Area Mech.	Up/SW	7	Yes	Lighten Labour	Exist	Moderate	Yes	100K	Yes	Toilet		8	Merchant	50000
3-067	Mkanda	Lubani	Good	S	Good	6	Yes	Neighbours	R/D	3	Yes	Lighten Labour	Exist	Excellent	Yes	50K	No	Toilet	Dysentery	4	Agri.	N/A
3-067	Mkanda	Lubani	Good	S	Good	10	Yes	Donor	PSW	N/A	Yes	Secure Quality	Exist	Good	Yes	20	Yes	Toilet	Diarrhoea	3	Agri.	8000
3-068	Mkanda	Chinkhali	Very bad	S	Salty	4	Yes	Village	PSW	3	Yes	Secure Quality	Exist	Not-Good	Yes	100K	Yes	Toilet		1	Agri.	95000
3-068	Mkanda	Chinkhali	Moderate	S	Good	5	Yes	Village	R/D	4	Yes	Lighten Labour	Exist	Not-Good	Yes	100K	Yes	Toilet	Diarrhoea	7	Agri.	45000
3-069	Mkanda	Chang'amba	Good	S	Good	5	Yes	Village	BH	1	Yes	Lighten Labour	Exist	Good	Yes	100K	No	Toilet		1	Civil servant	55000
3-069	Mkanda	Chang'amba	Good	S	Good	10	Yes	Area Mech.	Up/SW	6	Yes	Lighten Labour	Exist	Good	Yes	50K	Yes	Toilet	Diarrhoea	2	Agri.	120000
3-070	Mkanda	Kuthethe	Moderate	S	Good	10	Yes	Area Mech.	Up/SW	4	Yes	Save Time	Exist	Good	Yes	50K	Yes	Toilet		5	Agri.	38000
3-071	Mkanda	Dina	Very bad	S	Good	6	Yes	Village	R/D	8	Yes	Save Time	Exist	Excellent	Yes	100K	Yes	Garden	Diarrhoea	2	Agri.	32000
3-071	Mkanda	Dina	Good	S	Good	4	No	N/A	PSW	4	Yes	Secure Quality	Exist	Excellent	Yes	150K	Yes	Toilet		4	Merchant	N/A
3-072	Mkanda	Thengo	Good	S	Good	3	Yes	Area Mech.	R/D	2	Yes	Lighten Labour	Exist	Excellent	Yes	300K	Yes	Toilet		3	Agri.Labourer	N/A
3-072	Mkanda	Thengo	Moderate	IS	Salty	8	Yes	Donor	PSW	3	Yes	Secure Quality	Exist	Good	Yes	50K	No	Toilet		5	Agri.	23000
3-073	Mkanda	Lameki	Not-good	IS	Salty	4	Yes	Village	PSW	10	Yes	Save Time	Exist	Good	Yes	100K	Yes	Toilet	Diarrhoea	3	Agri.	200000
3-073	Mkanda	Lameki	Excellent	S	Good	10	Yes	Village	PSW	3	Yes	Secure Quality	Exist	Good	Yes	300K	Yes	Toilet	Diarrhoea	3	Agri.	80000
3-074	Mkanda	Kaledza	Good	S	Good	6	Yes	Village	BH	3	Yes	Lighten Labour	Exist	Excellent	Yes	100K	Yes	Toilet		2	Merchant	140000
3-074	Mkanda	Kaledza	Good	S	Good	10	Yes	Village	PSW	4	Yes	Lighten Labour	Exist	Moderate	Yes	200K	Yes	Toilet	Eye disease	4	Civil servant	56000
3-075	Mkanda	Mlungo	Excellent	IS	Good	8	Yes	Village	BH	4	N/A	Save Time	Exist	Good	Yes	100K	Yes	Toilet	Diarrhoea	5	Merchant	200000
3-075	Mkanda	Mlungo	Good	S	Good	5	Yes	Area Mech.	R/D	3	Yes	Lighten Labour	Exist	Good	Yes	200K	Yes	Toilet		4	Agri.	40000
3-076	Mkanda	Mphunda	Good	S	Good	4	Yes	Village	BH	2	Yes	Lighten Labour	Exist	Good	Yes	100K	Yes	Toilet	Diarrhoea	6	Agri.	60000
3-076	Mkanda	Kadwele-Mbava	Moderate	S	Good	4	Yes	Village	PSW	N/A	Yes	Secure Quality	Exist	Moderate	Yes	100K	Yes	Toilet	N/A	5	Agri.	N/A
3-077	Mkanda	Kadwele-Mbava	Very bad	S	Good	4	Yes	Village	BH	3	Yes	Secure Quality	Exist	Good	No	N/A	No	Toilet	Skin disease	8	Agri.	64000
3-077	Mkanda	Kadwele-Mbava	Not-good	S	Good	12	Yes	Village	BH	8	Yes	Lighten Labour	Exist	Moderate	Yes	50K	Yes	Toilet		6	Agri.	38000
3-078	Mkanda	Kangulu	Moderate	S	Good	15	Yes	Village	Up/SW	10	Yes	Save Time	Exist	Not-Good	Yes	150K	Yes	Toilet	Diarrhoea	10	Agri.	168000
3-078	Mkanda	Kangulu	Good	S	Good	6	Yes	Village	BH	5	Yes	Lighten Labour	Exist	Moderate	Yes	50K	Yes	Toilet	Diarrhoea	6	Merchant	30000
3-079	Mkanda	Mkanda	Moderate	S	Good	12	Yes	Area Mech.	Up/SW	7	Yes	Save Time	Exist	Good	Yes	100K	Yes	Toilet		8	Agri.	61000
3-079	Mkanda	Mkanda	Moderate	S	Salty	10	Yes	Village	PSW	3	Yes	Save Time	Exist	Good	Yes	400K	Yes	Toilet		4	Agri.	200000

BH No.	TA	Village	General			JICA Borehole				Alternative Water source				Willingness/Affordability				Hygiene & Sanitation			Socio-Economic Situation		
			rating	Satisfaction	Daily use buckets/day	Trial repair	Repaired by	Altern. vs Water source	Times a day	Need of rehab	Expectations	WPC	Evaluation WPC activities	Willingness to pay	Affordability to pay pump maintenance	How much (MK)	Excretion place	Type of illness	No. of person in family	Occupation	Total income		
3-080	Mkanda	Mkanda	Good	S	Good	2	Yes	WMA	PSW	N/A	Yes	Lighten Labour	Exist	Good	Yes	150K	Yes	600	Garden	Eye disease	1	Agri/Labourer	6,000
3-080	Mkanda	Mkanda	Good	S	Good	8	Yes	Village	R/D	8	Yes	Save Time	Exist	Excellent	Yes	200K	Yes	100	Toilet	Diarrhoea	7	Agri.	N/A
3-081	Mkanda	Makombwe	Very bad	S	Good	7	Yes	WMA	Up SW	2	Yes	Secure Quality	Exist	Good	Yes	200K	Yes	200	Toilet	Diarrhoea	4	Agri.	46,000
3-082	Mkanda	Chimklobota	Good	IS	Good	4	Yes	Village	Up SW	8	Yes	Secure Quality	Exist	Good	Yes	50K	Yes	50	Toilet	Skin disease	3	Agri.	102,000
3-082	Mkanda	Chimklobota	Good	IS	Good	10	Yes	Area Mech.	BH	3	No	N/A	Exist	Good	Yes	50K	Yes	50	Toilet	Diarrhoea	8	Wage Earner	50,800
3-083	Mkanda	Masiwa	Excellent	S	Good	4	Yes	Village	PSW	5	Yes	Less Expense	Exist	Excellent	Yes	500K	Yes	500	Toilet	Eye disease	1	Merchant	11,000
3-084	Mkanda	Kambandekha	Very bad	S	Good	8	Yes	Village	R/D	3	Yes	Secure Quality	Exist	Good	Yes	30K	Yes	20	Toilet	N/A	4	Agri.	2,000
3-084	Mkanda	Kambandekha	Very bad	S	Good	14	Yes	Village	Up SW	8	Yes	Secure Quality	Exist	Moderate	Yes	50K	Yes	100	Toilet	Skin disease	6	Agri.	270,000
3-085	Mkanda	Jhru	Moderate	S	Silly	4	Yes	Donor	BH	10	No	N/A	Exist	Good	Yes	100K	Yes	100	Toilet	Dysentery	11	Agri.	60,000
3-085	Mkanda	Jhru	Good	IS	Silly	4	Yes	WMA	BH	5	No	N/A	Exist	Not-Good	Yes	50K	Yes	60	Toilet	Skin disease	5	Agri.	44,000
3-086	Mkanda	Lupya	Very bad	S	Good	5	Yes	Donor	Up SW	8	Yes	Lighten Labour	Not exist	N/A	Yes	200K	Yes	200	Toilet	Cholera	7	Civil servant	140,000
3-086	Mkanda	Lupya	Good	S	Good	5	Yes	Village	Up SW	6	No	N/A	Exist	Good	Yes	30K	Yes	20	Toilet	Diarrhoea	3	Agri.	65,000
3-087	Mkanda	Chisauka	Moderate	IS	Good	4	Yes	Donor	Up SW	5	No	N/A	Exist	Moderate	Yes	150K	Yes	150	Toilet	Dysentery	3	Agri.	20,000
3-087	Mkanda	Chisauka	Good	IS	Good	4	Yes	Donor	Up SW	12	Yes	Secure Quality	Exist	Excellent	Yes	50K	Yes	50	Toilet	Diarrhoea	3	Agri.	87,500
3-088	Mkanda	Kawere	Not-good	S	Good	8	Yes	Village	BH	4	Yes	Lighten Labour	Exist	Excellent	Yes	30K	Yes	20	Toilet	Typhoid	5	Merchant	252,000
3-088	Mkanda	Kawere	Moderate	S	Good	5	Yes	Village	Up SW	3	Yes	Secure Quality	Exist	Good	Yes	50K	Yes	50	Toilet	Diarrhoea	3	Agri.	300,000
3-088	Mkanda	Mandi	Very bad	S	Good	7	No	N/A	PSW	4	Yes	Save Time	Exist	Moderate	Yes	100K	Yes	100	Toilet	Eye disease	7	Civil servant	268,000
3-089	Mkanda	Mandi	Not-good	IS	Cojour	4	Yes	Village	R/D	8	No	N/A	Exist	Moderate	Yes	200K	Yes	100	Toilet	Eye disease	12	Wage Earner	131,000
3-090	Mkanda	Zandana	Good	S	Good	8	Yes	Area Mech.	R/D	10	Yes	Lighten Labour	Exist	Not-Good	Yes	200K	Yes	100	Toilet	Dysentery	7	Agri.	50,000
3-090	Mkanda	Zandana	Excellent	S	Good	6	Yes	Village	R/D	2	Yes	Lighten Labour	Exist	Good	Yes	300K	Yes	100	Toilet	N/A	6	Agri.	7,000
3-091	Dambe	Kwera	Moderate	IS	Silly	12	Yes	Village	R/D	2	Yes	Lighten Labour	Exist	Not-Good	Yes	100K	Yes	50	Toilet	Diarrhoea	7	Agri.	45,000
3-091	Dambe	Kwera	Good	S	Good	8	Yes	Area Mech.	R/D	2	Yes	Lighten Labour	Exist	Excellent	Yes	300K	Yes	300	Toilet	N/A	3	Agri/Labourer	N/A
3-092	Dambe	Kwera T.C.	Not-good	IS	Good	10	Yes	Village	BH	4	Yes	Lighten Labour	Exist	Excellent	Yes	30K	Yes	20	Toilet	Typhoid	5	Merchant	252,000
3-092	Dambe	Kwera T.C.	Good	S	Good	4	Yes	Village	R/D	3	Yes	Secure Quality	Exist	Good	Yes	50K	Yes	100	Toilet	Skin disease	6	Agri.	270,000
3-093	Dambe	Mumbi	Good	S	Good	1	Yes	Village	BH	1	Yes	Lighten Labour	Exist	Good	Yes	100K	Yes	N/A	Toilet	N/A	1	Civil servant	55,000
3-093	Dambe	Mumbi	Moderate	IS	Good	6	Yes	Village	PSW	3	Yes	Save Time	Exist	Good	Yes	400K	Yes	350	Toilet	N/A	4	Agri.	200,000
3-094	Dambe	Kambuwe	Very bad	S	Silly	3	Yes	Village	PSW	3	Yes	Secure Quality	Exist	Not-Good	Yes	100K	Yes	300	Toilet	N/A	1	Agri.	95,000
3-094	Dambe	Kambuwe	Moderate	S	Good	15	Yes	Village	Up SW	10	Yes	Save Time	Exist	Not-Good	Yes	150K	Yes	50	Toilet	Diarrhoea	10	Agri.	168,000
3-095	Dambe	Kambuwe	Very bad	IS	Good	4	No	N/A	PSW	4	Yes	Save Time	Exist	Moderate	Yes	100K	Yes	100	Toilet	Eye disease	7	Civil servant	268,000
3-095	Dambe	Kambuwe	Very bad	S	Good	6	Yes	Village	Up SW	8	Yes	Secure Quality	Exist	Moderate	Yes	50K	Yes	200	Toilet	N/A	4	Agri.	60,000
3-096	Dambe	Kankhwenda	Good	IS	Good	4	Yes	Area Mech.	PSW	N/A	Yes	Lighten Labour	Exist	Good	Yes	50K	Yes	50	Toilet	Diarrhoea	2	Agri.	120,000
3-096	Dambe	Kankhwenda	Good	S	Good	5	Yes	Village	BH	2	Yes	Secure Quality	Exist	Good	Yes	50K	Yes	100	Garden	N/A	2	Agri.	23,000
3-096	Dambe	Kankhwenda	N/A	IS	Good	8	Yes	Village	PSW	6	Yes	Less Expense	Exist	Moderate	Yes	50K	Yes	20	Toilet	N/A	4	Agri.	50,000
3-097	Dambe	Minda	Moderate	S	Good	5	N/A	N/A	PSW	3	Yes	Less Expense	Exist	N/A	Yes	50K	Yes	30	Toilet	N/A	4	Agri.	75,000
3-098	Dambe	Jowelo	Good	IS	Good	2	Yes	Area Mech.	BH	5	Yes	Secure Quality	Exist	Good	No	N/A	Yes	100	Toilet	Skin disease	3	Agri.	25,000
3-098	Dambe	Jowelo	Very bad	S	Good	8	Yes	Village	Up SW	8	Yes	Secure Quality	Exist	Good	Yes	50K	Yes	50	Toilet	Skin disease	8	Agri.	102,000
3-099	Dambe	Mulira	Very bad	S	Good	4	Yes	Village	BH	6	Yes	Secure Quality	Exist	N/A	Yes	100K	Yes	100	Toilet	Diarrhoea	4	Agri.	80,000
3-099	Dambe	Mulira	Very bad	S	Good	4	Yes	Village	Up SW	2	Yes	Secure Quality	Exist	Good	Yes	50K	Yes	100	Toilet	Skin disease	4	Agri.	46,000
3-100	Dambe	Kalanga	Good	S	Good	2	N/A	N/A	PSW	2	Yes	Secure Quality	Exist	Moderate	Yes	100K	Yes	100	Toilet	N/A	6	Agri.	51,000
3-100	Dambe	Kalanga	Good	S	Good	4	Yes	Donor	PSW	2	Yes	Secure Quality	Exist	Good	Yes	150K	Yes	150	Garden	Diarrhoea	4	Agri.	41,000
3-101	Dambe	Diti	Moderate	S	Good	10	Yes	Donor	BH	10	No	N/A	Exist	Good	Yes	100K	Yes	100	Toilet	Dysentery	11	Agri.	150,000
3-101	Dambe	Diti	Good	S	Good	6	Yes	WMA	BH	5	Yes	Save Time	Exist	Not-Good	Yes	50K	Yes	60	Toilet	Skin disease	5	Agri.	44,000
3-102	Dambe	Chikonde	Good	IS	Good	3	Yes	Area Mech.	PSW	5	Yes	Less Expense	Exist	Excellent	Yes	500K	Yes	500	Toilet	Eye disease	5	Merchant	11,000
3-102	Dambe	Chikonde	Moderate	IS	Cojour	4	Yes	Area Mech.	Up SW	4	Yes	Save Time	Exist	Good	Yes	50K	Yes	50	Toilet	Eye disease	5	Agri.	35,000
3-103	Dambe	Kaluli Sch	Very bad	S	Silly	4	Yes	Village	Up SW	4	Yes	Less Expense	Exist	Excellent	Yes	300K	Yes	300	Toilet	Dysentery	14	Agri.	30,000
3-103	Dambe	Kaluli Sch	Excellent	S	Silly	6	Yes	Village	BH	3	Yes	Lighten Labour	Exist	Not-Good	Yes	30K	Yes	20	Toilet	N/A	4	Agri.	2,000
3-104	Dambe	Kaluli T.C.	Good	S	Good	9	Yes	Area Mech.	BH	3	No	N/A	Exist	Good	Yes	50K	Yes	50	Toilet	Diarrhoea	3	Wage Earner	50,800
3-104	Dambe	Kaluli T.C.	Good	S	Silly	10	Yes	Area Mech.	BH	5	Yes	Lighten Labour	Exist	Moderate	Yes	50K	Yes	100	Toilet	Diarrhoea	6	Merchant	30,000
3-105	Dambe	Katsompo	Good	S	Good	5	Yes	Neighbouring	R/D	4	Yes	Less Expense	Exist	Good	Yes	100K	Yes	100	Toilet	Dysentery	7	Agri.	2,000
3-105	Dambe	Katsompo	Good	S	Good	5	Yes	WMA	Up SW	5	Yes	Secure Quality	Exist	Good	Yes	200K	Yes	200	Toilet	Diarrhoea	7	Agri.	84,000
3-106	Dambe	Msalanyama	Good	S	Good	10	Yes	Area Mech.	Up SW	6	Yes	Lighten Labour	Exist	Good	Yes	100K	Yes	400	Toilet	N/A	7	Agri.	40,000
3-107	Dambe	Msalanyama	Good	S	Silly	5	Yes	WMA	PSW	N/A	Yes	Lighten Labour	Exist	Good	Yes	150K	Yes	600	Garden	Eye disease	1	Agri/Labourer	6,000
3-107	Dambe	Msalanyama	Moderate	S	Favours	5	Yes	Area Mech.	Up SW	7	Yes	Save Time	Exist	Good	Yes	100K	Yes	100	Toilet	N/A	8	Agri.	61,000
3-107	Dambe	Msalanyama	Good	S	Good	3	No	N/A	PSW	4	Yes	Secure Quality	Exist	Excellent	Yes	150K	Yes	200	Toilet	N/A	4	Merchant	N/A
3-108	Dambe	Chiti	Good	S	Good	7	Yes	Village	BH	2	Yes	Secure Quality	Exist	Good	Yes	50K	Yes	100	Garden	N/A	2	Agri.	25,000
3-108	Dambe	Chiti	N/A	IS	Good	3	Yes	Village	PSW	6	Yes	Less Expense	Exist	Moderate	Yes	50K	Yes	20	Toilet	N/A	6	Agri.	50,000
3-109	Dambe	Chiti	Good	S	Good	6	N/A	N/A	PSW	N/A	Yes	Less Expense	Exist	N/A	Yes	50K	Yes	30	Garden	N/A	4	Agri.	75,000
3-109	Dambe	Chiti	Moderate	S	Good	5	N/A	N/A	PSW	3	Yes	Save Time	Exist	Moderate	Yes	50K	Yes	30	Garden	N/A	4	Agri.	32,000
3-110	Dambe	Mphako	Very bad	S	Good	10	Yes	Village	R/D	8	Yes	Save Time	Exist	Excellent	Yes	100K	Yes	100	Garden	Diarrhoea	2	Agri.	32,000
3-110	Dambe	Mphako	Not-good	S	Good	10	Yes	Village	BH	8	Yes	Lighten Labour	Exist	Moderate	Yes	50K	Yes	25	Toilet	N/A	6	Agri.	38,000

附錄
 [JICA Borehole Volume satisfaction] \$\$Satisfaction IS=Insatisfaction
 [Alternative Water Source] BH: Borehole, PSW: Protected Shallow Well, Up SW: Unprotected Shallow Well, R/D: River/Dambo

Table A6-9-30 List of survey result(rural community leaders)

General information		Village Information		Village Health Water Committee						Water Supply Facilities						Hygiene and Sanitation							
ID No	BH No.	Village Name	T.A.	No. of HH	HH year of HH	WPC			Way of payment	current amount of the reserve for maintenance	place of safe keeping of the money collected	Infrastructure of water supply in the village except JICA's BH under functioning		Condition of JICA BH		capacity maintain JICA BH	need training	necessary categories	No. of toilets in village	No. of garbage pits in village	communal wash basin at water point		
						year of establishment	men	women	way of establishment			No. of BH	No. of SP	No. of PSW	plans to install/rehabilitation BH by own effort/external support	reason why JICA BH not functioning	JICA BH got repaired before	repaired by					
1	1-001	Chidambo	Mlonyeni	412		Yes	01.01.93	4	6	elected	Fixed fee	0	0	0	No	15	Yes	Villager	Yes	1	350	Yes	
2	1-002	Chilute	Mlonyeni	108		Yes	01.01.95	6	3	elected	Piece Work	12,000	0	7	Yes	2	Yes	Villager	Yes	13	35	No	
3	1-003	Tsamphale	Mlonyeni	99		Yes	01.01.93	5	3	elected	When repair necessary	0	0	3	Yes	2	Yes	Villager	Yes	8	30	No	
4	1-004	Chamveka	Mlonyeni	237		Yes		2	3	elected	When repair necessary	0	0	5	Yes	Yes	Other	Yes	7	150	0	Yes	
5	1-005	Maliwane	Mlonyeni												Yes	2	Yes	Villager	Yes	7	100	90	Yes
6	1-006	Maliwane	Mlonyeni	325		Yes	01.01.94	6	3	elected	Fixed fee	0	0	0	Yes	1	Yes	Villager	Yes	8	20	10	No
7	1-007	Mlonyeni	Mlonyeni	240		Yes	01.01.94	4	6	elected		200	0	0	No	2	Yes	Villager	No	1	63	Yes	
8	1-008	Zunguze	Mlonyeni																				
9	1-009	Mkangeni	Mlonyeni	81.4		Yes	01.01.96	6	4	elected	When repair necessary		0	1	No	2	Yes	Villager	No	10	40	9	
10	1-010	Maganga	Mlonyeni	50	55	Yes	01.01.95	6	4	elected	Fixed fee	0	0	0	Yes	2	Yes	Villager	No	10		Yes	
11	1-011	Chiwala	Mlonyeni	78		Yes	01.01.96	5	5	elected	Fixed fee	500	0	0	Yes	8	Yes	Villager Area	No	1	28	30	Yes
12	1-012	Chabwela	Mlonyeni	80		Yes	01.01.95	5	5	elected	When repair necessary	0	0	0	Yes	5	Yes	Mechani	No	1	80	55	Yes
13	1-013	Mbeza	Mlonyeni	115	170	Yes	01.01.95	5	5	elected	Fixed fee	100	0	2	No	1	Yes	Villager	No	8	45		Yes
14	1-014	Chaongeka	Mlonyeni	85		Yes	01.01.93	8	2	elected	Fixed fee	0	6	6	Yes	2	Yes		Yes	10	100	80	Yes
15	1-015	Mwende	Mlonyeni	50	150	Yes		5	5	elected	Fixed fee		1	2	No	Yes	Yes	WMA	No	7	37	50	No
16	1-016	MWandawala	Mlonyeni	100		Yes	01.01.10	6	4	elected		200			No	Yes	Yes	Donor	Yes	3	26	330	Yes
17	1-017	Kadzakurnanja	Mlonyeni																				
18	1-018	Mlonga	Mlonyeni	65		Yes	01.01.94	4	6	elected	Piece Work	0	0	0	No	2	Yes	Villager	No	1	63		
19	1-019	Mzikaola II	Mlonyeni																				
20	1-020	Mkhala	Mlonyeni	276		Yes	01.01.93	5	5	elected	Fixed fee	0	0	0	Yes	2	Yes	Villager	No	9		Yes	
21	1-021	Chibonyola(B)	Mlonyeni			Yes	01.01.93	4	6		Fixed fee	0	0	0	No	10	Yes	Villager	No	8		Yes	
22	1-022	Mwanayumo	Mlonyeni	61	45	Yes	01.01.95	6	4		Fixed fee	1,300	0	1	Yes	11	Yes	Villager	Yes	7	7	21	Yes
23	1-023	Mphindu	Mlonyeni	135		Yes	01.01.93	8	4	elected	Fixed fee	4,000	0	4	Yes	5	Yes	Villager	No	7	150		
24	1-024	Chibonyola (A)	Mlonyeni	124		Yes	01.01.93	6	4	elected	Fixed fee	0	0	0	Yes	2	Yes	Villager	No	7		Yes	
25	1-025(a)	Chibonyola (A)	Mlonyeni																				
26	1-026	Thukuta	Mlonyeni	55		Yes	01.01.92	5	5	elected	When repair necessary		0	0	Yes	2	No	Villager	Yes	10	55	70	No
27	1-027	Kapita	Mlonyeni	19	240	Yes	01.01.97	4	4	elected	Piece Work	1,000	0	0	No	2	Yes	Villager	Yes	1	19	0	Yes
28	1-028	Maganga	Mlonyeni	208		Yes		3	7	elected	Fixed fee		0	5	Yes	5	Yes	Villager	Yes	6		Yes	
29	1-029	Alfred	Mavwera	75		Yes	01.01.95	3	5	elected	Piece Work	8,000	0	0	Yes	2	Yes	Villager Area	No	10		Yes	
30	1-030	Pembere	Mavwera	84	78	Yes	01.01.94	4	6	elected	Piece Work	0	0	3	Yes	8	Yes	Mechani	No	10	32	18	Yes

6- 10 BOREHOLE REHABILITATION AND CONSTRUCTION PLAN

Table A6-10-1 Table of borehole rehabilitation and construction plan

Legend: F:Function, N: Not function L:Low yield(<10L/min), R: temporary Repairs, ICWP: Number of water point per one thousand persons *:population is estimated from sanitation facilities.

Hatching (such as F-N, N-R-N, L-R): Borehole is estimated that it recovers function with temporary repair by study team or area mechanic although those pumps were not functioned temporarily or were low yield during Oct.2010-May. 2011. The cause of breakdown is assumed overage and it is possible to repair function by air lift and replacement of pump parts.

S/N	Borehole No.	Village Name	Functionality			Rehabilitation Plan: A: Air lifting and pump renewal, B: Replacing pump Stand, C: Drilling substitute borehole unless trial rehabilitation is successful D: Drilling substitute borehole, E: Excluded from rehabilitation plan, Construction of additional borehole: F						Projected Population (2015)	ICWP (2015)
			1st visit Overview	2nd visit Inspection	3rd visit Water Sampling	A	B	C	D	E	F		
			Sep.-Oct. 2010	May 2011									
1	1-001	Chidambo	N	-	N				⊙		⊙	2,451	1.2
2	1-002	Chiute	F	-	F	⊙						643	3.1
3	1-003	Tsamphale	F	-	F	⊙						589	3.4
4	1-004	Chamveka	F	-	F	⊙					⊙	1,410	2.1
5	1-005	Maliwane	F	-	F	⊙					⊙	1,934	2.1
6	1-006	Maliwane	F	-	F	⊙							
7	1-007	Mlonyeni	N	-	N	⊙					⊙	1,428	2.1
8	1-008	Zunguze	F	-	N	⊙							
9	1-009	Mkangeni	F	-	F	⊙						484	2.1
10	1-010	Maganga	F	-	F	⊙						298	10.1
11	1-011	Chiwaula	N	R	F	⊙						464	4.3
12	1-012	Chabwela	N	R	F	⊙						476 *	4.2
13	1-013	Mbeza	N	R	F	⊙					⊙	684	1.5
14	1-014	Chaonongeka	F	-	F	⊙						506	9.9
15	1-015	Mgwende	F	-	F	⊙						298	6.7
16	1-016	MWandawala	F	-	F	⊙					⊙	595	1.7
17	1-017	Kadzakurnanja	F	-	N	⊙							
18	1-018	Milonga	N	-	N	⊙						387	2.6
19	1-019	Mzikaola II	F	-	F	⊙							
20	1-020	Mkhala	F	-	F	⊙					⊙	1,642	1.8
21	1-021	Chibonyola(B)	F	-	F	⊙							
22	1-022	Mwanayumo	F	-	F	⊙						363	5.5
23	1-023	Mphindu	F	-	F	⊙						803	2.5
24	1-024	Chibonyola (A)	F	-	F	⊙						738	4.1
25	1-025	Chibonyola (A)	F	-	F	⊙							

S/N	Borehole No.	Village Name	Functionality			Rehabilitation Plan: A: Air Lifting and Pump Renewal, B: Replacing Pump Stand, C: Drilling substitute borehole unless trial rehabilitation is successful D: Drilling substitute borehole, E: Excluded from rehabilitation plan, Construction of additional borehole: F						Projected Population (2015)	ICWP (2015)	
			1st visit Overview	2nd visit Inspection	3rd visit Water Sampling	A	B	C	D	E	F			
			Sep.-Oct. 2010	May 2011										
26	1-026	Thukuta	F	-	N	⊙							327 *	6.1
27	1-027	Kapita	F	-	F	⊙							119 *	8.4
28	1-028	Maganga	F	-	F	⊙					⊙		1,238	1.6
29	1-029	Alfred	L	R	F	⊙							446	4.5
30	1-030	Pembere	L	R	F	⊙							500	4.0
31	1-031	Mtsiliza	F	-	F	⊙							440	6.8
32	1-032	Mkonda	F	-	F	⊙							268 *	3.7
33	1-033	Katsenga	F	-	F	⊙	⊙				⊙		595	1.7
34	1-034	Luka-Luciano	N	N	F	⊙							119 *	16.8
35	1-035	Chimteteka	F	-	F	⊙							119 *	16.8
36	1-036	Chaluma, Kalombo	F	-	F	⊙							357	5.6
37	1-037	Mkwezendumba	N	R	F	⊙								
38	1-038	Galawe	F	-	F	⊙							238	8.4
39	1-039	Chikaza	L	R	F	⊙					⊙		904	1.1
40	1-040	Kunjawa	F	-	F	⊙							637	4.7
41	1-041	Kunjawa	N	-	F	⊙								
42	1-042	Msukwala	F	-	F	⊙							202 *	9.9
43	1-043	Mtukwa	F	-	N	⊙							119 *	25.2
44	1-044	Mtukwa	F	-	N	⊙	⊙							
45	1-045	Mwenyeanthu	F	-	F	⊙							500	4.0
46	1-046	Dambo	F	-	F	⊙	⊙						476	4.2
47	1-047	Mwanzika	L	R	F	⊙							226	8.8
48	1-048	Chiganizo	N	-	F	⊙	⊙						351	5.7
49	1-049	Chimkoka	F	-	F	⊙							161 *	12.4
50	1-050	Gambatula	N	R	F	⊙							268 *	7.5
51	1-051	Misale T. C.	F	-	F	⊙	⊙						595	3.4
52	1-052	John	L	R	F	⊙	⊙							
53	1-053	Mselela	F	-	N	⊙							625	6.4
54	1-054	Mselela	F	-	F	⊙								
55	1-055	Ngalule	F	-	F	⊙							1,190 *	3.4
56	1-056	Masitala	F	-	F	⊙							405	4.9

S/N	Borehole No.	Village Name	Functionality			Rehabilitation Plan: A: Air Lifting and Pump Renewal, B: Replacing Pump Stand, C: Drilling substitute borehole unless trial rehabilitation is successful D: Drilling substitute borehole, E: Excluded from rehabilitation plan, Construction of additional borehole: F						Projected Population (2015)	ICWP (2015)
			1st visit Overview	2nd visit Inspection	3rd visit Water Sampling	A	B	C	D	E	F		
			Sep.-Oct. 2010	May 2011									
57	1-057	Mzingo	F	-	F	⊙						119 *	16.8
58	1-058	Nathyola	L	R	F	⊙							
59	1-059	Kachere	F	-	F	⊙						119 *	16.8
60	1-060	Simoko	F	-	F	⊙						119 *	8.4
61	1-061	Bua T•C	F	-	F	⊙						928	2.2
62	1-062	Nkhuzu	N	N	F	⊙						119 *	16.8
63	1-063	Kazule	N	R	F	⊙						500	4.0
64	1-064	Kaole	F	-	F	⊙						1,309	2.3
65	1-065	Kaole	F	-	F	⊙						809	2.5
66	1-066	Kamphemvu	F	-	N	⊙						411	9.7
67	1-067	Kamphemvu	F	-	F	⊙							
68	1-068	Katsenga A	N	-	N				⊙				
69	1-069	Mlamba	F	-	F	⊙					⊙	1,261	1.6
70	1-070	Nyongani	F	-	F	⊙						1,131	2.7
71	1-071	Mtonya	F	-	F	⊙						333	9.0
72	1-072	Waliranji	N	-	F	⊙						208 *	9.6
73	1-073	Likungwi	F	-	F	⊙						631	6.3
74	1-074	Mnamizana	N	-	N				⊙			464 *	4.3
75	1-075	Kankhande	F	-	F	⊙						119 *	25.2
76	1-076	Kankhande	F	-	F	⊙							
77	1-077	Mkusa	F	-	F	⊙						250	8.0
78	1-078	Kajiwa	F	-	F	⊙						595 *	3.4
79	1-079	Mnamizana	F	-	F	⊙	⊙						
80	1-080	Kanyindula	N	R	F	⊙							
81	2-001	Kambamd-zuwa	N	R	N	⊙						208	9.6
82	2-002	Pinda	N	R	F	⊙					⊙	1,434	1.4
83	2-003	Lupenga-Ndulama	N	N	N	⊙						488	8.2
84	2-004	Chikuta	N	N	F	⊙						428	16.3
85	2-005	Chikuta	N	R	F	⊙							
86	2-006	Kamgwanga	F	-	F	⊙						179 *	11.2
87	2-007	Nkhumba	F	-	F	⊙						333	6.0

S/N	Borehole No.	Village Name	Functionality			Rehabilitation Plan: A: Air Lifting and Pump Renewal, B: Replacing Pump Stand, C: Drilling substitute borehole unless trial rehabilitation is successful D: Drilling substitute borehole, E: Excluded from rehabilitation plan, Construction of additional borehole: F						Projected Population (2015)	ICWP (2015)
			1st visit Overview	2nd visit Inspection	3rd visit Water Sampling	A	B	C	D	E	F		
			Sep.-Oct. 2010	May 2011									
88	2-008	Makanda	F	-	F	⊙						619	6.5
89	2-009	Makanda	F	-	F	⊙							
90	2-010	Wisikoti	F	-	F	⊙						476 *	8.4
91	2-011	Manthalu	F	-	F	⊙						655	4.6
92	2-012	Manthalu	N	N	N				⊙				
93	2-013	Chamosola	N	-	N				⊙			244	4.1
94	2-014	Kafunsa-Chalimba	F	-	F	⊙							
95	2-015	Mbwerera	F	-	F	⊙						119 *	16.8
96	2-016	Kamwaza	F	-	F	⊙						595 *	5.0
97	2-017	Papa	L	R	F	⊙						119 *	16.8
98	2-018	Guwende	F	-	F	⊙						149 *	13.4
99	2-019	Kamililika	N	R	F	⊙						137 *	21.9
100	2-020	Tankhule	N	R	F	⊙						179 *	11.2
101	2-021	Welesani	F	-	F	⊙						440	6.8
102	2-022	Temanim-wendo	N	N	N			⊙				417 *	9.6
103	2-023	Temanim-wendo	F	-	F	⊙							
104	2-024	Nkhono	F	-	F	⊙						280	7.2
105	2-025	Geni	F	-	F	⊙						173 *	11.6
106	2-026	Sinunbe	F	-	F	⊙						345 *	8.7
107	2-027	Sinunbe	F	-	F	⊙							
108	2-028	Chikwan-bani	F	-	F	⊙						928	3.2
109	2-029	Mweso	F	-	F	⊙						440	9.1
110	2-030	Njiwa	F	-	N	⊙						833	3.6
111	2-031	Chitumba	N	-	N				⊙			315	9.5
112	2-032	Chinyata	F	-	F	⊙						268 *	3.7
113	2-033	Lanadi	L	R	F	⊙						357 *	5.6
114	2-034	Lumelo	N	R	N	⊙						250 *	12.0
115	2-035	Lumelo	F	-	F	⊙							
116	2-036	Silombe	F	-	F	⊙						1,190	5.0
117	2-037	Silombe	F	-	F	⊙							
118	2-038	Chinyata	F	-	F	⊙						238 *	8.4

S/N	Borehole No.	Village Name	Functionality			Rehabilitation Plan: A: Air Lifting and Pump Renewal, B: Replacing Pump Stand, C: Drilling substitute borehole unless trial rehabilitation is successful D: Drilling substitute borehole, E: Excluded from rehabilitation plan, Construction of additional borehole: F						Projected Population (2015)	ICWP (2015)
			1st visit Overview	2nd visit Inspection	3rd visit Water Sampling	A	B	C	D	E	F		
			Sep.-Oct. 2010		May 2011								
119	2-039	Nkokeza	N	R	F	⊙						381	5.3
120	2-040	Mkonkha	F	-	F	⊙						994	3.0
121	2-041	Mkonkha T.C.	F	-	F	⊙						167 *	
122	2-042	Mabvere	N	-	N				⊙			506	4.0
123	2-043	Chinkota	F	-	F	⊙						119 *	25.2
124	2-044	Mumba	F	-	F	⊙						595	3.4
125	2-045	Kadzombe	N	N	N	⊙							
126	2-046	Kadzombe	F	-	F	⊙							
127	2-047	Chimbala-me	F	-	F	⊙							
128	2-048	Chiyese-lana	F	-	F	⊙						149 *	13.4
129	2-049	Chamani	N	R	F	⊙						262	11.5
130	2-050	Chamani	F	-	F	⊙							
131	2-051	Kabuthu	F	-	F	⊙						666	3.0
132	2-052	Kabuthu-Chifuca	F	-	F	⊙						119 *	16.8
133	2-053	Mphonde	N	R	N	⊙						238 *	8.4
134	2-054	Nkhompho-la	F	-	F	⊙						536	5.6
135	2-055	Manyengo	F	-	F	⊙							
136	2-056	Kamlilika	F	-	F	⊙						125 *	8.0
137	2-057	Mjolomobe	F	-	F	⊙						119 *	8.4
138	2-058	M'manja	N	N	N			⊙					
139	2-059	Gomani 1	F	-	F	⊙					⊙	1,369	1.5
140	2-060	Jusi	L	R	F	⊙						346	5.8
141	2-061	Mailosi	N	R	N	⊙						256	7.8
142	2-062	Mtamad-zongo	F	-	F	⊙						232	8.6
143	2-063	Nwandawa-ra	F	-	N	⊙							
144	2-064	Kachokam-komero	N	-	F	⊙						119 *	16.8
145	2-065	Mkumba	F	-	F	⊙						238 *	8.4
146	2-066	Jamu	F	-	F	⊙						179	5.6
147	2-067	Chimpanba	N	R	F	⊙						309	9.7
148	2-068	Chiwoko	F	-	F	⊙						530	5.7
149	2-069	Chiwoko	F	-	F	⊙							

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			1st visit Overview	2nd visit Inspection	3rd visit Water Sampling	A	B	C	D	E	F		
			Sep.-Oct. 2010	May 2011									
150	2-070	Mazawa	F	-	F	⊙					⊙	893	2.2
151	2-071	Mbachunda	F	-	F	⊙						184	21.7
152	2-072	Mbachundu	F	-	F	⊙							
153	2-073	Chintanda	N	N	N			⊙			⊙		
154	2-074	Kachikon-do	F	-	F	⊙					⊙	619	1.6
155	2-075	Chiphala	N	-	N				⊙			595	3.4
156	2-076	Mthawira	N	R	F	⊙						119 *	16.8
157	2-077	Dzidzwa	F	-	F	⊙						2,678 *	1.5
158	2-078	Chalema	F	-	F	⊙						238 *	8.4
159	2-079	Kalilang-we	N	R	N	⊙						173 *	11.6
160	2-080	Msemwe	F	-	F	⊙					⊙	3,868 *	1.6
161	2-081	Msemwe	L	R	F	⊙							
162	2-082	Mando	F	-	F	⊙						595 *	8.4
163	2-083	Gereta	F	-	F	⊙						893 *	2.2
164	2-084	Matimba	F	-	F	⊙					⊙	1,785	2.2
165	2-085	Matimba	F	-	F	⊙							
166	2-086	Jenjewa	N	R	F	⊙						357	8.4
167	2-087	Kanjeleng	N	R	N	⊙						179	11.2
168	2-088	Kamndaya	N	N	F	⊙						155	19.4
169	2-089	Mzati	N	R	F	⊙						119 *	16.8
170	2-090	Zefalino	F	-	F	⊙						369	5.4
171	2-091	Chipha-la A	F	-	F	⊙						387 *	5.2
172	2-092	Chamveka	F	-	F	⊙						381	5.3
173	2-093	Kamwendo T. C.	F	-		⊙						2,202	0.9
174	2-094	Kamwendo T. C.	F	-	F	⊙							
175	2-095	Chidewa	F	-	F	⊙						1,785 *	1.7
176	2-096	Chikomani	F	-	F	⊙						440 *	4.5
177	2-097	Mdawa	F	-	F	⊙						1,488 *	1.3
178	2-098	Kwachau-name	N	N	N			⊙				393	7.6
179	2-099	Mando	F	-	F	⊙							
180	2-100	Chikoyi-Jombo	F	-	F	⊙						143 *	14.0

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			1st visit Overview	2nd visit Inspection	3rd visit Water Sampling	A	B	C	D	E	F		
			Sep.-Oct. 2010	May 2011									
181	2-101	Chimteka	F	-	F	⊙						893 *	2.2
182	2-102	Chetamba-la	F	-	F	⊙						250	8.0
183	2-103	Chiwenkha	N	R	F	⊙					⊙	577	1.7
184	2-104	Mphanga	F	-	F	⊙						268	11.2
185	2-105	Durira	F	-	F	⊙						446	4.5
186	2-106	Mphanga	F	-	F	⊙						119 *	33.6
187	2-107	Butawo	F	-	N	⊙						202	4.9
188	2-108	Mdungu	N	R	F	⊙						179 *	11.2
189	2-109	Kaligwen-je	F	-	F	⊙						345 *	2.9
190	2-110	Kolona	F	-	F	⊙							
191	3-001	Kachaje	F	-	F	⊙						1,666	2.4
192	3-002	Mchambo-Gunda	N	R	N	⊙						119 *	25.2
193	3-003	Geresono	F	-	F	⊙						268 *	7.5
194	3-004	Mchambo	F	-	F	⊙					⊙	1,964	1.0
195	3-005	Chikoloka	F	-	F	⊙						309	9.7
196	3-006	Tika	F	-	F	⊙						298	6.7
197	3-007	Chimwere	F	-	F	⊙						446 *	4.5
198	3-008	Kathyuka	F	-	F	⊙						595 *	3.4
199	3-009	Chiwete	F	-	F	⊙						774	2.6
200	3-010	Changata	F	-	F	⊙						220 *	9.1
201	3-011	Langwani	F	-	F	⊙						256 *	11.7
202	3-012	Sinosi	F	-	F	⊙						250	8.0
203	3-013	Kanyimbo	F	-	F	⊙						274 *	7.3
204	3-014	Machilika	N	R	F	⊙						446	4.5
205	3-015	Chikwekwe	F	-	F	⊙						315	6.3
206	3-016	Kanyenda	N	N	N				⊙		⊙	714	1.4
207	3-017	Mberere	F	-	F	⊙						565	3.5
208	3-018	Mikundi T.C.	N	N	N				⊙		⊙	4,760	1.7
209	3-019	Kalombo Sch	F	-	F	⊙						476	6.3
210	3-020	Tongole	F	-	F	⊙						714	2.8
211	3-021	Kalinde	F	-	F	⊙						714	2.8

S/N	Borehole No.	Village Name	Functionality			Rehabilitation Plan: A: Air Lifting and Pump Renewal, B: Replacing Pump Stand, C: Drilling substitute borehole unless trial rehabilitation is successful D: Drilling substitute borehole, E: Excluded from rehabilitation plan, Construction of additional borehole: F						Projected Population (2015)	ICWP (2015)
			1st visit Overview	2nd visit Inspection	3rd visit Water Sampling	A	B	C	D	E	F		
			Sep.-Oct. 2010	May 2011									
243	3-053	Kampando	F	-	F	⊙						253	7.9
244	3-054	Marten	F	-	F	⊙						488	4.1
245	3-055	Kanzimbi	F	-	N	⊙					⊙	1,012	2.0
246	3-056	Gandali	F	-	F	⊙						315	6.3
247	3-057	Chinkolokota	N	R	N	⊙						440	4.5
248	3-058	Elesani	F	-	N	⊙							
249	3-059	Kapiri Hosp. Miss.	N	-	N					⊙	⊙	1,369	2.2
250	3-060	Japana	N	R	F	⊙						119 *	16.8
251	3-061	Gong' ontha	N	R	N	⊙							
252	3-062	Kavunguti School	F	-	F	⊙					⊙	893	1.1
253	3-063	Kachere	N	N	N	⊙						119 *	16.8
254	3-064	Kakunga	F	-	F	⊙						298	10.1
255	3-065	Kamenya	N	R	N	⊙					⊙	506	2.0
256	3-066	Nthema T.C.	F	-	F	⊙					⊙	1,160	1.7
257	3-067	Lubani	N	R	N	⊙						476	6.3
258	3-068	Chinkhali	F	-	F	⊙						595 *	8.4
259	3-069	Chang' amba	F	-	F	⊙						458	4.4
260	3-070	Kuthethe	F	-	F	⊙					⊙	1,309	1.5
261	3-071	Dina	N	R	N	⊙						208 *	9.6
262	3-072	Thengo	N	R	F	⊙						387	5.2
263	3-073	Lameki	N	R	F	⊙					⊙	1,273	1.6
264	3-074	Kaledza	N	R	N	⊙					⊙	547	1.8
265	3-075	Malungo	N	R	N	⊙						179 *	11.2
266	3-076	Mphunda	F	-	F	⊙					⊙	928	2.2
267	3-077	Kadewele-Mbewa	F	-	F	⊙						518	3.9
268	3-078	Kangulu	F	-	F	⊙					⊙	952	2.1
269	3-079	Mkanda	F	-	N					⊙		619 *	6.5
270	3-080	Mkanda	N	N	N					⊙			
271	3-081	Mazombwe	N	R	F	⊙						250	8.0
272	3-082	Chimkolokota	N	R	F	⊙					⊙	1,488	1.3
273	3-083	Masiwa	F	-	F	⊙					⊙	1,071	1.9

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			1st visit Overview	2nd visit Inspection	3rd visit Water Sampling	A	B	C	D	E	F		
			Sep.-Oct. 2010	May 2011									
274	3-084	kambandekha	F	-	F	⊙						446	4.5
275	3-085	Jimu	F	-	N	⊙						595 *	5.0
276	3-086	Lupiya	N	R	F	⊙						506	4.0
277	3-087	Chisauka	N	R	F	⊙						446	4.5
278	3-088	Kawere	F	-	N	⊙						226 *	8.8
279	3-089	Msanda	N	R	N	⊙						190	5.3
280	3-090	Zandana	N	-	N				⊙			131 *	15.3
281	3-091	Khwere	F	-	F	⊙						488	6.1
282	3-092	Khwere T.C.	F	-	F	⊙					⊙	1,190	1.7
283	3-093	Mkumbi	F	-	F	⊙	⊙						
284	3-094	Kambuwe	N	R	N	⊙						1,529	2.6
285	3-095	Kambuwe	N	N	F	⊙							
286	3-096	Kankhwende	F	-	N	⊙						309	3.2
287	3-097	Mndaka	N	R	F	⊙						238	8.4
288	3-098	Jowelo	N	R	F	⊙						518	11.6
289	3-099	Mtulira	F	-	N	⊙					⊙	482	2.1
290	3-100	Kalonga	N	R	F	⊙						565	3.5
291	3-101	Diti	N	R	F	⊙						389	5.1
292	3-102	Chitonde	F	-	F					⊙		238	8.4
293	3-103	Kalulu Sch	N	N	N	⊙						440	9.1
294	3-104	Kalulu T.C.	F	-	F	⊙						440	9.1
295	3-105	Katsompho	F	-	F	⊙						214	9.3
296	3-106	Msalanyama	F	-	F	⊙						833	2.4
297	3-107	Mchonkwe	F	-	F	⊙						119	16.8
298	3-108	Chiti	F	-	F	⊙						196	15.3
299	3-109	Chiti	F	-	F	⊙							
300	3-110	Mphako	N	-	N	⊙						595	5.0

7. References

番号 No.	資料の名称 Name of Documents	形態 Org./Copy	種類 Type	発行機関 Origination of Publication	発行年月 Published
1	Afridev Hand Pump Parts	Org	Hard	Intec Tools PVT.LTD	不明
2	Afridev Hand Pump Installation and Maintenance Manual (チチエワ語)	Org	Hard	Save the Children Fund	不明
3	GEOHYGICAL REPORT Detailed Design for New Urban and Rural Gravity Fed Water Supply Schemes	copy	Hard Copy	SNC-LAVALIN INTERNATIONAL INC.	December 1998
4	Gravity Fed Rural Piped Water Schemes Design Engineer's Manual	Copy	Soft Copy	Republic of Malawi	-
5	MS 214(2005) Drinking Water	Copy	Soft Copy	Malawi Standards Board	2005
6	MS 532(1999) BH construction - Code of practice	Copy	Soft Copy	Malawi Standards Board	1999
7	MS 678(2005) Drink Water Quality - Control & Surveillance	Copy	Soft Copy	Malawi Standards Board	2005
8	MS 733-2005 WQ-BH&SW	Copy	Soft Copy	Malawi Standards Board	2005
9	ENVIRONMENT MANAGEMENT ACT 1996	Copy	Soft Copy	Ministry of Forestry, Fisheries and Environmental Affairs, Department of Environmental Affairs	1996
10	Environmental Impact Assessment Guidelines	Copy	Soft Copy	-	-
11	ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK	Copy	Soft Copy	MINISTRY OF IRRIGATION AND WATER DEVELOPMENT/ NATIONAL WATER DEVELOPMENT PROGRAMME (NWDPI) II	March, 2007
12	Census Population 2008	Copy	Soft Copy	National Statistic Office	2010
13	Shape files (Chipoza TPA (Santhe), Mchiriji Boma, Mkanda TPA, Namitete TPA, Santhe, Santhe TPA, STA Mduwa, Dambe, Kalolo, Marwere, Mkanda, Mlonyeni, Zulu)	Copy	Soft Copy	National Statistic Office	2010
14	Water Quality Data for Namitete & Liwerezzi Rivers (1998~2005年)	Copy	Soft Copy	Central Water Laboratory	
15	Water Flow data of Namitete station (50501) (1993年~2002年)	Copy	Soft Copy	MINISTRY OF IRRIGATION AND WATER DEVELOPMENT	

番号 No.	資料の名称 Name of Documents	形態 Org./Copy	種類 Type	発行機関 Origination of Publication	発行年月 Published
16	Water Flow data of Matuwamba station(50603) (1992年~2001年)	Copy	Soft Copy	MINISTRY OF IRRIGATION AND WATER DEVELOPMENT	
17	List of authorized water right(Namitete river, Liwerezi river)	Copy	Soft Copy	MINISTRY OF IRRIGATION AND WATER DEVELOPMENT	
18	Conceptual Design Report SANTHE, Feasibility studies for 16 New Water Supply Schemes	Copy	Soft Copy	METAFERIA CONSULTING ENGINEERS plc,	April 1998
19	16 New Water Supply Schemes Feasibility Study Report Volume III, Part 10, Santhe Water Supply Scheme	Copy	Soft Copy	METAFERIA CONSULTING ENGINEERS plc,	July 1998
20	Tender Documents for Construction of Water Supply Schemes Volume IV: Drawings	Copy	Soft Copy	SNC-LAVALIN INTERNATIONAL INC. in association with Water Resources & Engineering Consultants (Pty) Ltd.	August 1999
21	Design of Rehabilitation and Expansion Works for Kasungu Water Supply Scheme, Detailed Engineering Design Report, Vol. I Main Report DETAILED ENGINEERING DESIGN REPORT	Copy	Soft Copy	METAFERIA CONSULTING ENGINEERS in association with Hydro Consult	2010
22	Detailed Design Report for Rehabilitation and Expansion Works for Mponela Water Supply Scheme Volume I, Volume III	Copy	Soft Copy	MOIWD/Central Region Water Board/NWDP II	30th March 2010
23	Detailed Design Report for Rehabilitation and Expansion Works for Mponela Water Supply Scheme Drawings	Copy	Soft Copy	MOIWD/Central Region Water Board/NWDP II	2010
24	National Water Resources Master Plan Annex 4, hydrological Data Part II WRE 4 to 8	Copy	Hard copy	Department of Water, Ministry of Works and Supplies/ United Nations Department of Technical Cooperation for Development	March, 1986
25	Application for A Grant of Water Right/ Certificate of Existing Water Right	Copy	Hard copy	Water Resources Board	-
26	Central Region Water Board Tariff and Service Charges Adjustment Schedule Water Works Acts (No.17 of 1995)	Copy	Hard copy	Central Region Water Board	2010
27	Performance Indicators for DEDZA Zone for the Month of June 2010	Copy	Hard copy	Central Region Water Board	June 2010