Attachment 6: Results of Topographic Survey

Topographic survey was carried out at the pump stations for raw water wells and the candidate sites of WTPs in order to obtain the basic information for the construction plan of facilities.

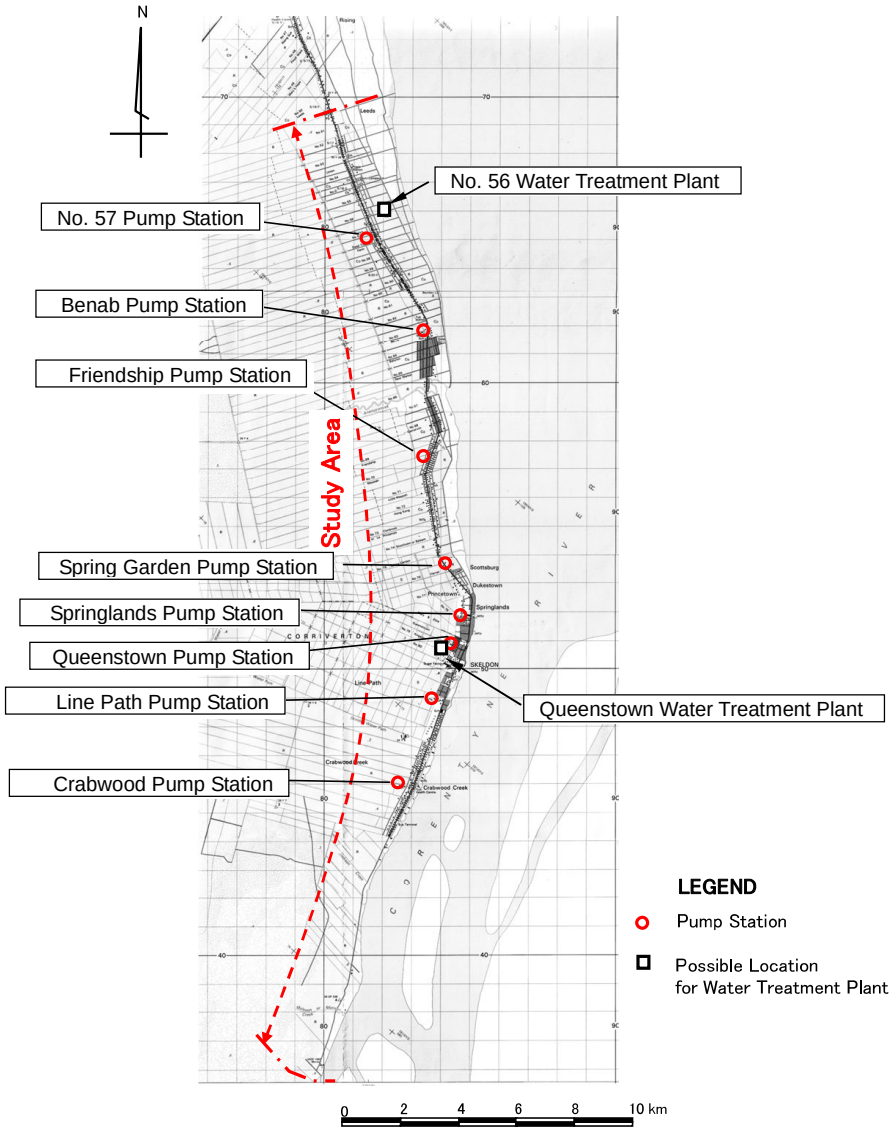
The results of the survey (surveyed coordinates and elevations) are shown in Table 1.

Table 1 Surveyed Coordinates and Elevations

Survey Points		Longitudes	Latitude	Elevations (GL m)
Raw Water Wells/ Pump Station	No. 57 Pump Station	6° 01.03	57° 10.04	18.288*1) 17.528
	Benab Pump Station	5° 59.21	57° 08.99	17.627*1) 17.477
	Freiendship Pump Station	5° 56.90	57° 08.99	17.999*1) 17.769
	Spring Garden Pump Station	5° 54.82	57° 08.64	18.011*1) 17.611
	Springlands Pump Station	5° 53.81	57° 08.29	17.956*1) 17.706
	Queenstown Pump Station	5° 53.31	57° 08.50	17.794*1) **17.794**
	Line Path Pump Station	5° 52.26	57° 08.81	17.518
	Crabwood Creek Pump Station	5°50.64	57° 09.43	17.758*1) **16.958**
Const-Ruction Sites of Water Treatment Plants	Candidate Site of No. 56 village WTP	6° 00.40	57° 09.81 Average GL	17.008 *2) **16.950**
	Connection Point to Distribution Main at National Road, Candidate Site of No. 56 Village WTP		Road Edge (East) Road Center Road Edge (West)	17.517 18.419 17.626
	Candidate site of Queenstown WTP	5° 53.28	57° 08.61 Average GL	17.551*3) **16.950**
	Connection Point to Distribution Main at National Road, Candidate Site of Queenstown WTP		Road Edge (East) Road Center Road Edge (West)	17.669 18.324 17.526

Notes: *1) indicates the elevations measured at tops of the cap concrete at raw water wells. *2) indicates the elevations of temporary BM. *3) indicates the elevations measured at the tops of ridges of sugarcane field.

As a result of the survey, it was found that the Project area is almost flat along the coasts and rivers considering the elevations at the centers of national roads measured to be 18.419m - 18.324m（about 0.10m）, the ground elevations of the pump stations at raw water wells measured in a range from 16.958m to 17.794m (about 0.84m), and the ground elevations of the candidate sites of WTPs measured to be 16.950m.



Survey Points	Longitudes	Latitude	Elevations (m)
Raw Water Wells/Pump Station			
No. 57 Pump Station	6° 01.03	57° 10.04	17.528
Benab Pump Station	5° 59.21	57° 08.99	17.477
Freiendship Pump Station	5° 56.90	57° 08.99	17.769
Spring Garden Pump Station	5° 54.82	57° 08.64	17.611
Springlands Pump Station	5° 53.81	57° 08.29	17.706
Queenstown Pump Station	5° 53.31	57° 08.50	17.794
Line Path Pump Station	5° 52.26	57° 08.81	17.518
Crabwood Creek Pump Station	5°50.64	57° 09.43	16.958
Constrction Sites of Water Treatment Plants			
Candidate Site of No. 56 village Water Treatment Plant	6° 00.40	57° 09.81	16.950
Candidate site of Queenstown Water Treatment Plant	5° 53.28	57° 08.61	16.950

Figure 1 Topographic Survey Results
(Pump Station at Raw Water Wells and, Candidate Sits of Treatment Plants)

Attachment 7: Result of Soil Investigation

The Project area situates on the coastal plain consisting of soft Demerara Clay on Coropia Formations. Entire area is alluvial plain with flat, low and damp and soft ground which may raises long standing destructive depression.

Therefore the soil investigation was carried out at the two proposed water treatment sites, namely No. 56 Village site and Queenstown site to acquire soil data for the construction planning.

Results of the investigation is summarized in Table 1 and discussion is presented below:

The reference elevation of two sites is 16.95m. The elevation converted to mean sea level is +1.39m with high groundwater level. The shallow layer consists of very soft silt clay with N value = 0 from the ground surface to 18 to 22 m below. Deeper layer is a supporting layer consisting of lithosol with N value = 30 to 50. Soft Demerara Clay on consolidated Coropia Formations are identified by the soil investigation..

As depression of the project facilities including consolidated depression is not avoidable due to such soft soil condition, it is required to lighten load conditions, as much as possible. Conclusive construction method to avoid residual destructive depression will be determined using example of locally common construction methods, wood pile foundation.

Table 1 Results of Soil Investigation

Depth (m)	Queenstown site (Reference elevation 17.551m)		No.56 Village site (Reference elevation17.008m)	
	N-Value	Soil Conditions	N-Value	Soil Conditions
0.0-0.6	11	Relatively solid silt clay with organic materials	7	Relatively solid silt clay with blistered organic
2.0-2.6	8	Ditto	38	Blistered silty sand
4.0-4.6	3	Ditto	4	Very soft silt clay with blue-gray colour containing fine silt.
6.0-6.6	0	Vary soft silt clay with blue-gray colour	0	Ditto
8.0-8.6	0	Ditto	0	Ditto
10.0-10.6	0	Ditto	0	Ditto
12.0-12.6	0	Ditto	0	Ditto
14.0-14.6	0	Ditto	9	Relatively solid silt clay with blue-gray colour containing fine silt.
16.0-16.6	2	Ditto	8	Ditto
18.0-18.6	4	Ditto	Sample taken for physical tes	Ditto
20.0-20.6	15	Relatively solid silt clay with blue-gray colour	6	Ditto
22.0-22.6	17	Ditto	4	Ditto
24.0-24.6	Sample taken for physical test	Ditto	Sample taken for physical test	Very solid clay silt with organic materials
26.0-26.6	28	Ditto	37	Consolidated gray clay silt with organic materials
28.0-28.6	32	Ditto	42	Ditto
30.0-30.6	33	Very solid consolidated silt clay with yellow-gray colour	56	Ditto
32.0-32.6	37	Ditto		

Attachment 8: Results of Water Quality Survey

Objectives of the water quality survey are to confirm following problems which had been reported in the Preliminary Study Report, and to investigate water quality of the water resources and distributed water at the service connections.

- In the eight (8) well pump stations in the study area and No. 47 well pump station, concentration of iron exceeding more than 0.3 mg/litter of WHO guideline.
- The all of well pump stations were contaminated by total coliform bacteria.

Sampling location and analysis items are shown in Table 1 and table 2, respectively. The sampling for this survey carried out in 11th and 18th December 2005.

Table 1 Sampling Points and Number of Samples

Sampling Location			No. of sample	Sampling time
Well water	1	No. 47 Well Pump Station	1	1
	2	No. 57 Well Pump Station	1	1
	3	Benab Well Pump Station	1	1
	4	Friendship Well Pump Station	1	1
	5	Spring Garden Well Pump Station	1	1
	6	Springlands Well Pump Station	1	1
	7	Queenstown Well Pump Station	1	1
	8	Line Path Well Pump Station	1	1
	9	Crabwood Creek Well Pump Station	1	1
Tap water	1	No. 47 distribution outlet area	1	1
	2	No. 57distribution outlet area	1	1
	3	Benab distribution outlet area	1	1
	4	Friendship distribution outlet area	1	1
	5	Spring Garden distr. outlet area	1	1
	6	Springlands distr. outlet area	1	1
	7	Queenstown distr. outlet area	1	1
	8	Line Path distribution outlet area	1	1
	9	Crabwood Creek distr. outlet area-1	1	1
	10	Crabwood Creek distr. outlet area-2	1	1
Total			19	1

Table 2 Analysis and Measurement Items

Water quality items	Well Water	Tap Water
1 pH	o	o
2 Water temperature	o	o
3 Turbidity (Tr)	o	o
4 Color	o	
5 Electrical conductivity (EC)	o	o
6 Total alkalinity	o	
7 Calcium (Ca)	o	
8 Magnesium (Mg)	o	
9 Total iron (Fe)	o	o
10 Manganese (Mn)	o	o
11 Nitrate Nitrogen (NO_3-N)	o	
12 Nitrite Nitrogen (NO_2-N)	o *	
13 Ammonia Nitrogen (NH_4-N)	o	o
14 Silicic acid (SiO_2)	o *	
15 Chloride (Cl-)	o	
16 Total Coliform Bacteria	o	o
17 Escherichia Coli	o	o
18 Arsenic (As)	o *	
19 Copper (Cu)	o	
20 Fluoride (F)	o *	
21 Cyanide (CN)	o *	
22 Cadmium (Cd)	o	
23 Mercury (Hg)	o	
24 Selenium (Se)	o *	
25 Lead (Pb)	o	

o: analysis in Guyana o * analysis in Japan

Results of analysis are shown in Table at the end of this attachment. According to the results of analysis, all of analysis items except four items satisfy the guideline of WHO, however, four items of total coliform bacteria, Escherichia coliform, iron and ammonia nitrogen are exceeding the WHO guideline. These four items and silica acid as a parameter for selection of treatment method are described as follows.

1) Total coliform bacteria and Escherichia coliform

Total coliform bacteria and Escherichia coliform were detected in the well pump stations and water taps. Total coliform bacteria was detected on fifteen samples out of nineteen, and high contamination of total coliform bacteria was identified in Line Path well pump station and its service area.

Contamination of Escherichia coliform was identified in Line Path well pump station, and water taps in the service area of Line Path and No. 57.

It is possible that the total coliform bacteria are detected in the water that is no contamination by human activity. However, it is clearly that detection of Escherichia coliform means contamination by feces of human and animals. In the WHO guideline, Escherichia coliform is very important parameter as an indicator for risk of water-born disease.

Therefore, it is necessary to install chlorination or disinfections facilities in the water supply system in the Study area.

2) Iron

The iron ion imparts an undesirable taste to beverages and stains plumbing fixtures and laundry. The guideline value of 0.3 mg/liter is proposed by WHO, which may give rise to complaints from consumers. Almost samples (eighteen out of nineteen) do not satisfy the WHO guideline for drinking water, the higher concentration of 2.16 mg/l and 2.55 mg/l were observed in the No. 57 well pump station and its served area, respectively.

Therefore, it is necessary to install iron removal process in the water supply system using the existing water sources.

3) Ammonium nitrogen

Ammonium nitrogen is not direct importance for health in the concentration to be expected in drinking water. A health-based guideline of WHO has therefore not been derived. Ammonium nitrogen can indicate fecal contamination. However, it may cause increase of chlorination agent and deterioration of taste and smell.

Based on the results of survey, three well pump stations and four water taps exceed 1.5 mg/l as the WHO guideline, the highest value of 8.9 mg/l was detected in the Line Path well pump station.

Generally, it can be said that chlorine agent for disinfections is required approximately 10 times of ammonia nitrogen. It is estimated that operation cost of disinfection is increased without removal ammonia nitrogen process of water treatment system.

4) Silica acid

Silica acid is an important item in selection of the water treatment method for removal iron instead of the problems which are concerning health-based and water usage. Generally, it can be said that formation of colloidal iron in oxidation process is promoted condition of more than 30 mg/l concentration of silica acid, and it has a possibility of causing deterioration of iron removal efficiency in the coagulation and rapid filtration process.

Concentration of silica acid in the water sources in the Study area was in the ranges of 15 to 23 mg/l, and it seems that the deterioration of iron removal efficiency is limited. However, it is

necessary to mind the above-mentioned on the selection of water sources and water treatment method.

5) Additional Water Quality Survey (which is added based on the results of field survey)

Cultivated area of the existing water source wells is an expanse of land from the Study area to Guyana highland, and contamination of human activity is limited extremely most of the area. However, production of corn and rice is performed in the agricultural area extending linearly along the coast, and from results of field survey, agricultural chemicals use is confirmed.

Therefore, additional water quality survey for agricultural chemicals was carried out two well pump stations (No. 57 and Queenstown), and its analysis was conducted in Japan. Since the data about agricultural chemicals was not obtained in the field survey, the following five items were selected from a viewpoint of persistence and common chemicals.

- Aldrin
- Dieldrin
- Carbofuran
- Endrin
- Simazine

Results of analysis are shown in Table 3. According to the results, No. 57 and Queenstown well pump stations are confirmed no contamination by agricultural chemicals.

Table 3 Results of Water Quality Analysis (Agricultural Chemicals)

Items	WHO Guideline (mg/litter)	No. 57 Well Pump Station	Queenstown Well Pump Station	Detection limit
Aldrin	0.00003 *	ND	ND	0.01 µg/litter
Dieldrin		ND	ND	0.01 µg/litter
Carbofuran	0.007	ND	ND	0.0005 mg/litter
Endrin	0.0006	ND	ND	0.01 µg/litter
Simazine	0.002	ND	ND	0.0003 mg/litter

*: For combined aldrin plus dieldrin

Summary

The results of water quality survey are summarized as follow.

- Total coliform bacteria and Escherichia coliform concerning the health significance were detected in the well pump stations and water taps.
- Iron and ammonia nitrogen in the existing water sources do not satisfy the WHO guideline for water using.
- From above points, removal process of iron and ammonia nitrogen, and disinfections facilities are required for water treatment system.
- There is no contamination of agricultural chemicals in the existing water sources.

Table of Results of Water Quality Analysis

Water Quality Items		Standards or Guideline	Well Water									Tap Water									Method of Analysis
			No. 47 Well Pump Station	No. 57 Well Pump Station	Benab Well Pump Station	Friendship Well Pump Station	Spring Garden Well Pump Station	Springlands Well Pump Station	Queenstown Well Pump Station	Line Path Well Pump Station	Crabwood Creek Well Pump Station	No. 47 distribution outlet area	No. 57distribution outlet area	Benab distribution outlet area	Friendship distribution outlet area	Spring Garden distr. outlet area	Springlands distr. outlet area	Queenstown distr. outlet area	Line Path distribution outlet area	Crabwood Creek distr. outlet area-1	Crabwood Creek distr. outlet area-2	
pH	-	5.8 - 8.6 1)	6.3	6.4	6.6	6.4	6.6	6.7	6.6	6.6	6.7	6.4	6.3	6.5	6.4	6.5	6.6	6.6	6.6	6.6	6.8	Electronic pH meter
Water temperature	Cdeg	-	34.8	31.3	34.4	31.7	33.6	33.5	33.0	32.0	38.4	31.9	31.5	32.2	30.0	30.6	31.3	30.6	32.3	35.8	34.2	Thermometer
Turbidity (Tr)	NTU	5 2)	0.6	0.6	0.3	0.5	0.2	0.2	0.3	1.9	0.3	0.2	0.3	1.0	0.2	0.6	0.3	0.4	1.9	0.2	1.0	Nephelometric method (Turbidimeter)
Color	-	-	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	Visual comparison method (Visual examination)
Electrical conductivity (EC)	μs/cm	-	161	142	201	235	678	651	697	1,378	388	161	139	203	230	446	656	706	1,381	425	426	Conductivity meter
Total alkalinity	mg/l	-	103	86.9	103	102	148	150	173	225	155	-	-	-	-	-	-	-	-	-	-	Titration
Calcium (Ca)	mg/l	-	2.2	0.7	0.3	0.1	0.2	0.3	0.2	1.1	0.6	-	-	-	-	-	-	-	-	-	-	EDTA titrimetric method (Detection limit=0.1 mg/l)
Magnesium (Mg)	mg/l	-	0.7	1.1	0.8	1.0	0.5	0.5	0.4	1.1	0.4	-	-	-	-	-	-	-	-	-	-	EDTA titrimetric method (Detection limit=0.1 mg/l)
Hardness	mg/l	500 2)	8.2	6.3	3.9	4.2	2.5	2.8	2.4	7.3	3.3	-	-	-	-	-	-	-	-	-	-	Hardness by calculation
Total iron (Fe)	mg/l	0.3 3)	1.17	2.16	1.05	0.69	0.36	0.55	0.34	0.87	0.95	0.82	2.55	0.73	0.86	0.84	0.21	0.72	1.93	1.00	0.64	Spectrophotometric method (Phenanthroline, Detection limit=0.009 mg/l)
Manganese (Mn)	mg/l	0.1 3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Spectrophotometric method (PAN method, Detection limit=0.01 mg/l)
Nitrate Nitrogen (NO_3-N)	mg/l	11.3 4)	0.59	0.27	0.89	1.36	3.10	1.69	1.39	2.51	0.74	-	-	-	-	-	-	-	-	-	-	Spectrophotometric method (Brucine, Detection limit=0.05 mg/l)
Nitrite Nitrogen (NO_2-N)	mg/l	0.06 4)	ND	ND	ND	ND	ND	ND	ND	ND	0.040	-	-	-	-	-	-	-	-	-	-	Spectrophotometric method (Naphthyl -ethylenediamine, Detection limit=0.002 mg/l)
Ammonia Nitrogen (NH_4-N)	mg/l	1.5 3)	1.28	1.28	0.43	0.43	3.83	1.28	2.13	8.93	1.06	1.91	1.70	1.28	1.28	1.70	1.28	1.28	2.98	0.85	0.43	Spectrophotometric method (Nessler, Detection limit=0.02 mg/l)
Silicic acid (SiO_2)	mg/l	(30) 5)	17	23	16	19	15	15	15	17	16	-	-	-	-	-	-	-	-	-	-	Spectrophotometric method (Molybdenum blue, Detection limit=1 mg/l)
Chloride (Cl^-)	mg/l	250 3)	10	4.7	12	21	125	130	113	291	52	-	-	-	-	-	-	-	-	-	-	Titration (Mercuric thiocyanate, Detection limit=0.1 mg/l)
Total Coliform Bacteria	CFU/100ml	0 3)	42	0	1	9	0	7	6	115	11	3	33	38	7	7	3	10	140	2	85	Plate count
Escherichia Coli	CFU/100ml	0 2)	0	0	0	0	0	0	0	7	0	0	2	0	0	0	0	0	8	0	8	Plate count
Arsenic (As)	mg/l	0.01 2)	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	Inductively coupled plasma atomic emission spectroscopy (detection limit=0.001 mg/l)
Copper (Cu)	mg/l	2 (1) 2)	0.02	ND	ND	ND	ND	ND	0.04	ND	ND	-	-	-	-	-	-	-	-	-	-	Atomic absorption spectrophotometric method (Detection limit=0.005 mg/l)
Fluoride (F)	mg/l	1.5 2)	0.20	0.09	0.19	0.16	0.33	0.43	0.50	0.34	0.55	-	-	-	-	-	-	-	-	-	-	Spectrophotometric Method (Alizarin, Detection limit=0.05mg/l)
Cyanide (CN)	mg/l	0.07 2)	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	Spectrophotometric Method (Pyridine-Pyrazalone, Detection limit=0.01 mg/l)
Cadmium (Cd)	mg/l	0.003 2)	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	Atomic absorption spectrophotometric method (Detection limit=0.001 mg/l)
Mercury (Hg)	mg/l	0.001 2)	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	Cold vapor atomic absorption spectrophotometric method (Detection limit=0.0005 mg/l)
Selenium (Se)	mg/l	0.01 2)	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	Atomic absorption spectrophotometric method (Detection limit=0.001 mg/l)
Lead (Pb)	mg/l	0.01 2)	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	Inductively coupled plasma atomic emission spectroscopy (detection limit=0.001 mg/l)

1) Water Quality Standards (2003, Health, Labor and Welfare Ministry, Decree-law No.101)
2) WHO Guideline : "Guideline for Drinking-water Quality" Third Edition, World Health Organization, Geneva 2004
3) WHO Guideline : "Guideline for Drinking-water Quality" Second Edition, World Health Organization, Geneva 1996
4) Source: 2)

Nitrate nitrogen (as NO_3)	Long-term exposure	50 mg/l	(11.3 mg/l as NO_3-N)
Nitrite nitrogen (as NO_2)	Short-term exposure	3 mg/l	(0.91 mg/l as NO_2-N)
Nitrite nitrogen (as NO_2)	Long-term exposure	0.2 mg/l	(0.06 mg/l as NO_2-N)

5) This is an important item in selection of the water treatment method.

Attachment 9: Results of Social Condition Survey

JICA Study team carried out social conditions survey for households in the Study area from 12th to 15th December 2005. The survey aimed to acquire following information by a questionnaire survey, and total number of household surveyed is 105.

- Social and economic conditions of household
- Water usage and water supply conditions
- Problems and requirement for water supply service
- Willingness to pay for water supply service
- Sanitary conditions

The questionnaire sheets are shown in Table-1, and results of survey are as summarized in Table-2.

1) Characteristics of household

< Structure of family >

Average family size is 4.1 person / household with the range from 1 person to 9 persons per household).

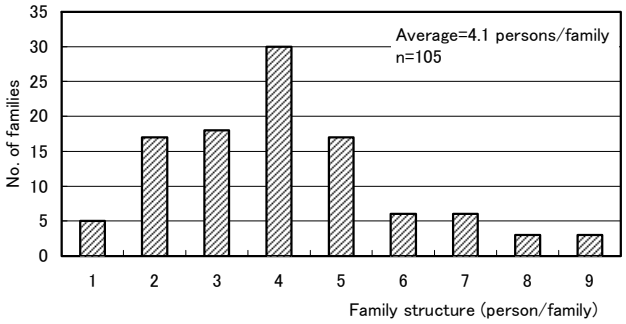


Figure 1 Structure of Family

< Business of head of household >

The ratio of employers and self-employment is 44 % and 56%, respectively. The latter includes 2% of pensioners.

Types of business consist of agriculture, construction & industry, service industry and others with ratios of 24 %, 26 %, 34 % and 16%, respectively. From the ratios of business types, the Study area is characterized as a mixed area with urbanized and agricultural area

Table 3 Structure of Type of Business

Items	Worker of employment		Self-employed worker		Whole	
Agriculture	7	15.2%	18	31.6%	25	24.3%
Industry	20	43.5%	1	1.8%	21	20.4%
Construction	2	4.3%	3	5.3%	5	4.9%
Service industry	14	30.5%	21	36.7%	35	33.9%
Others	3	6.5%	14	24.6%	17	16.5%
Total	46	100.0%	57	100.0%	103	100.0%
	44.7%		55.3%		100%	

< Economic Conditions >

The average monthly income of household is 42,700 GYD (median=39,000 GYD), and maximum and minimum monthly incomes are 140,000 GYD and 8,000 GYD, respectively. Two thirds of the households are distributed in the range of between 10,000 GYD and less than 50,000 GYD.

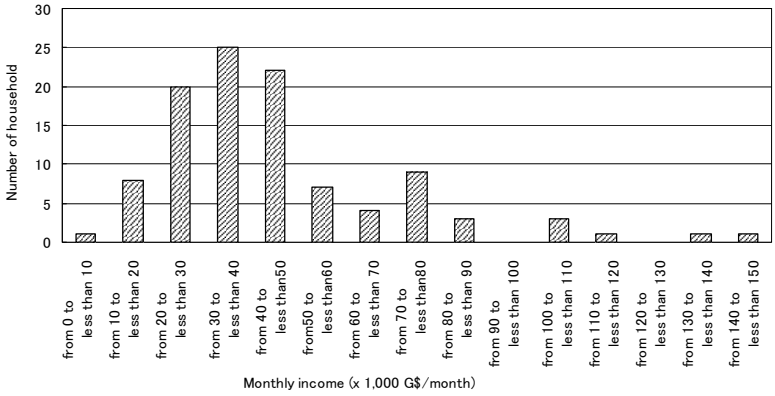


Figure 2 Monthly Income of Household

There is no significant difference in the amount of income between worker of employment and self-employed worker, and among types of business. Similarly, there is no particular difference in the tenant farmer and self-management in agriculture, too.

Table 4 Monthly Household Income

unit : G$/month

Items	Worker of employment			Self-employed worker			Whole		
	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.
Agriculture	42,700	100,000	24,000	44,900	100,000	20,000	44,300	100,000	20,000
Industry	45,700	130,000	20,000	40,000	–	–	45,400	130,000	20,000
Construction	70,000	100,000	40,000	55,300	48,000	68,000	61,200	100,000	40,000
Service industry	43,400	140,000	20,000	40,100	80,000	10,000	41,400	140,000	10,000
Others	80,000	110,000	30,000	26,600	72,000	8,000	35,100	110,000	8,000
Total	47,800	140,000	20,000	38,600	100,000	8,000	42,700	140,000	8,000

The relation between the monthly income and expenditure of households are shown in Figure 3.

From this Figure, a higher end of monthly expenditure of household is 60,000 GYD in general, and it indicates a small inclination of distribution of graph in the more than 60,000 GYD of monthly income.

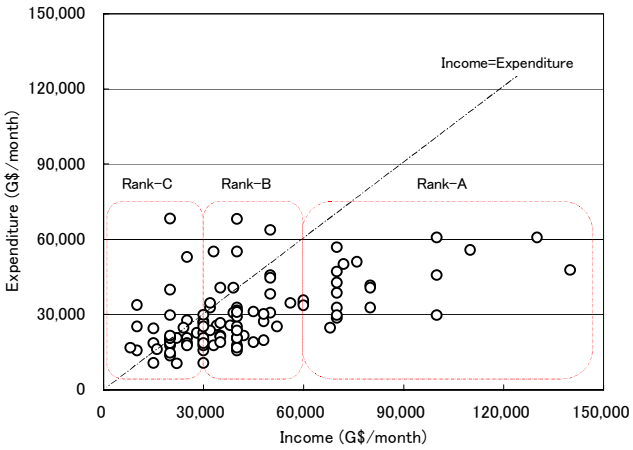


Figure 3 Monthly Income and Expenditure

According to these characteristics, economic conditions of household is classified into the following three categories.

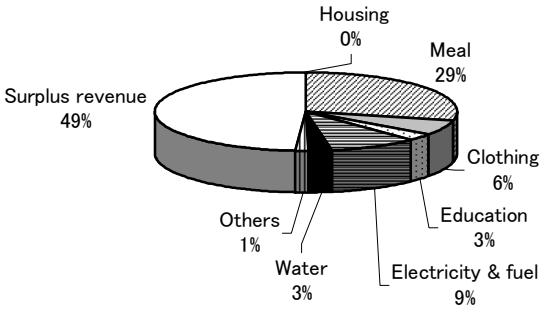
Rank-A（monthly income more than 60,000 GYD）

Rank-B（monthly income from 30,000 GYD to 60,000 GYD）

Rank-C（monthly income less than 30,000 GYD）

Rank-A:

The average expenditure and income ratio is 51%. The income far exceeds the expenditure, having to spare financially. The ratio of a food expenses to a total expenditure is also 30% or less. （22 households、composition ratio=21%）

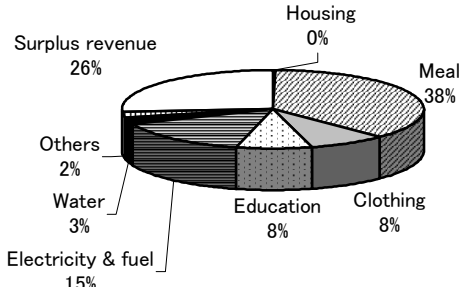


Rank-A (Expenditure/Income=51 %)

Rank-B:

The average expenditure and income ratio is 74%.

While there is a deviation among each household, the expenditure and income are in balance in general. The ratio of a food expenses to a total expenditure is also 40% or less （54 households、composition ratio=52%）

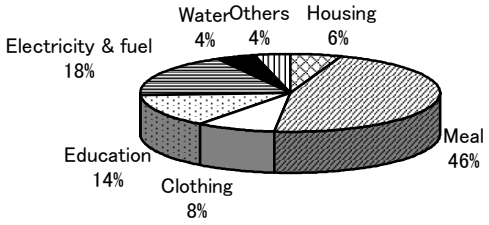


Rank-B (Expenditure/Income=74 %)

Rank-C:

The average expenditure and income ratio is 123%.

The expenditure exceeds income, suggesting financially tight situation. The ratio of food expenses is approximately 60%. It seems that it is lower-income as compared with the two above-mentioned ranks, and the margin to new expenditure is small.（28 households、composition ratio=27%）



Rank-C (Expenditure/Income=123 %)

Figure 4　Monthly Income of Economic Condition (Rank-A, B and C)

2) Situation of Water Usage

All the surveyed households have received supplied water from GWI, and it is used as domestic water, drinking water and commercial use also.　Some households use bottle water for the drinking purpose.

< Water Supply Equipment in House >

Conditions of water supply wquipment in house are as follows.

Water tap

Indoor tap and outdoor tap	69.5%
Outdoor tap only	26.7%
Indoor tap only	2.9%

Public hydrant	0.9%
Ratio of installation of storage tank	90.5%
Ratio of installation of lifting pumps	52.4%

The household with indoor and outdoor water tap is 70% of the total number of the surveyed. The household with outdoor water tap only is 27%, and the household using indoor water tap only and using public hydrant is less than 4% of the whole.

The water supply service period of GWI is for 12 hours/day basically. Therefore, it is necessary to have storage tank for water use throughout 24 hours a day. Approximately 90% of household have storage tank, 52% of household have lifting pump.

Large number of households installed the required equipment in order to supplement the shortage of GWI water supply service, and households share expense for desirable water supply service.

< Water Consumption by Usage >

Average unit water consumption is 91 litter/capita/day (lcd), and it ranges from 14 lcd to 359 lcd. However this value is not measured water consumption but estimated value by supposition.

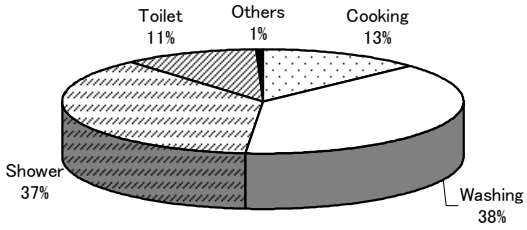


Figure 5 Composition Ratio of Water Consumption by Use

Average composition ratio of water consumption by use is shown as follows.

Drinking & Kitchen use	13%
Washing	38%
Shower	37%
Toilet use	11%
Others	1%

< Situation of Water Supply Service >

The water supply service period of GWI is 12 hours/day basically. Based on the results of the questionnaire survey, the average service period is 10.8 hours, and it ranges from 2 hours as minimum to 16 hours as maximum.

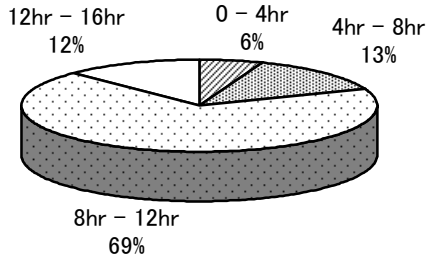


Figure 6 Existing Service Period of GWI

Households, which are service period of less than 4 hours, account for 6 percent in the whole surveyed household, and these households are distributed in No. 62 village, Corriverton, Line Path and Skeldon area. Similarly, service period of less than 8 hours reaches to 19 percent.

< Water Charge >

According to the results, while water charge of each household paying ranges from 2,333 GYD/year/household to 32,000 GYD/year/household, 95% of households pay 8,160 GYD/year/household which is the fixed charge for ordinary household. Bottle water as drinking water is utilized by 28 percent of surveyed household. Average annual expenditure for bottle water is approximately 23,800 GYD/year/household, and it reached about 2.9 times to water rate of GWI (fixed charge for ordinary household).

The situation of bottle water utilization by household economy rank is 55 percent of Rank-A, more than 20 percent of Rank-B and C, and 28 percent in all. More than 20% of utilization rate of bottle water in Ranks B and C shows general in water usage.

< Situation of Water Meter >

Based on the results of survey, installation ratio of water meter in the surveyed households is approximately 30 percent (31 households) with malfunction of three water meters caused by iron in supplied water. However, the water meter is not used now because of that most of the households select fixed charge.

<Users' Opinions of Water Meter >

The household that showed its intention of "refusal of water meter installation" is about 11% (12 households). Some households give a higher meter based water charge as a reason of the refusal. However, 90% of households agree the installation of water meter and to pay water bill that is charged according to actual water consumption measured by water meter.

<People's Awareness of Water Supply Service>

According to the results of questionnaire survey, following complains are significant.

- Three complains were obtained. 1) Supplied water pressure and service period, 2) water quality (color, taste and turbidity), and 3) water tariff
- The major problem is water quality (color, taste and turbidity), it account for 43% of the whole number of replies.
- The next problem is supplied water pressure and service period, it account for 39% of the whole number of replies.

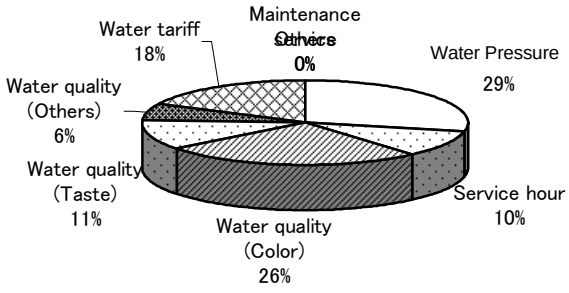


Figure 7 Awareness of People about Water Supply Service

- Six households replied satisfaction with the present water supply service. (Total number of replies is 103)

< Willingness to Pay for the Water Supply Service >

Based on the results of survey, information of willingness to pay for the water supply service obtained as follows.

- Average of willingness to pay for the water supply service under the current service condition is 433 GYD/month/household, it ranges from 0 (refusal) to 1,000 G4/month/household. (refer to Figure 8)
- Average of willingness to pay for the satisfied water supply service is 745 GYD/month/household, it ranges from 0 (refusal) to 3,000 G4/month/household. (refer to Figure 8)
- The price of the difference of the fixed charge of present condition and the charge after a service improvement is 65 GYD/month only.
- Average of willingness to pay for the water supply service in three categories of economic condition are shown in Table 5. From this table, difference of willingness to pay among three economic condition levels is small.
- Even if water supply service (supply period, water quality and others) is improved, it is said that it does not lead to the increase in the amount used.

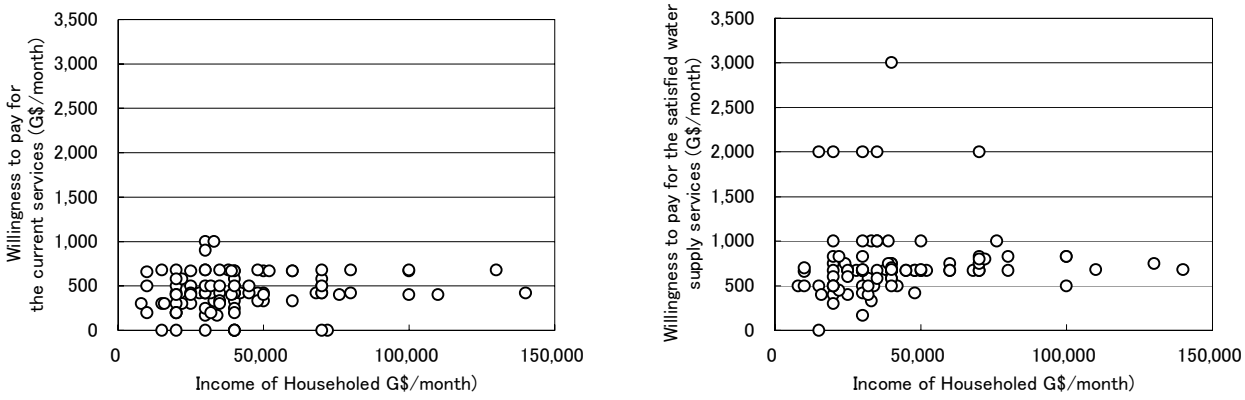


Figure 8 Willingness to Pay for the Water Supply Service
(Left: under the current service condition, Right: the satisfied water supply service)

Table 5 Willingness to Pay for the Water Supply Service in Economic Level of Household

unit: G$/month

	Rank-A	Rank-B	Rank-C	Whole
(1) the water supply service under the current service condition	426	439	459	433
(2) the satisfied water supply service	719	756	817	745
(2) - (1)	293	317	358	312

3) Sanitary Condition

< Conditions of Toilet >

All of households have toilet facilities, and there are two type of toilet, flash toilet with septic tank and pit latrine. The ratio of installation in the Study area is shown as below.

A. Flash toilet with septic tank	27% (28 households)
B. Pit Latrine	54% (57 households)
C. A+B	19% (20 households)

< Morbidity Rate of Waterborne Disease >

Since there was the possibility that people may not understand completely about waterborne infectious diseases, questionnaire survey carried out concerning situation of diarrhea instead of morbidity rate of waterborne infectious diseases.

From results of the survey, situation of diarrhea and medical costs are obtained.

- 25% (26 cases) of all surveyed households had patients of diarrhea in this one year.. Total number of patients is 63 persons.
- The case with medical examination and medicine is 21 replies, and the case without medical examination is 5 replies.
- The case with medical expense is 14 examples. The average expense is 3,900 GYD/case, it ranges from 500 GYD/case to 24,000 GYD/case.
- Although the cause of diarrhea is unknown, it can be said that the rate of diarrhea generating of 25% of household is very high.

4) Summary

Results of Questionnaire survey are summarized as follows.

- Average family member is 4.1 persons/household
- Composition type of business: Agriculture (24%), construction & Industry(26%), service industry(34%) and other(16%)
- The average monthly income of household is 42,700 GYD(median=39,000 GYD), and maximum and minimum monthly income are 140,000 GYD and 8,000 GYD, respectively.
- All the surveyed households have received water supply from GWI, and some households use bottle water for drinking purpose.
- Approximately 90% of households have storage tank and 52% of households have lifting pump in order to supplement the shortage of GWI water supply service.
- The average service period is 10.8 hours, and it ranges from 2 hours to 16. Households, of which service period is less than 4 hours, account for 6 percent in the whole investigated household.
- While water charge of each household paying ranges from 2,333 GYD/year/household to 32,000 GYD/year/household, 95% of households pay 8,160 GYD/year/household which is

the fixed charge for ordinary household.

- Installation ratio of water meter in the surveyed household is approximately 30 percent (31 households), and malfunction of three water meters was caused by iron in supplied water.
- The problems of GWI water supply service are 1) Supplied water pressure and service period, 2) water quality (color, taste and turbidity), and 3) water tariff.
- Average of willingness to pay for the water supply service under the current service condition is 433 GYD/month/household, and average of willingness to pay for the satisfied water supply service is 745 GYD/month/household.
- All of surveyed households have toilet facilities, and there are two type of toilet, flash toilet with septic tank (46%) and pit Latrine (54%).
- 25% (26 cases) of all surveyed households had patients of diarrhea in this one year.. Total number of patients is 63 persons.
- The case with medical expense is 14 examples, and the average expense is 3,900 GYD/case, it ranges from 500 GYD/case to 24,000 GYD/case.

Table 1 Social Condition Survey (1 / 4)

Section-A Information of Respondent

A- 1 Serial Number

A- 2 Day/Month/Year of Interview
Date: Dec. 2005 Time (Start) :

A- 3 Name of Respondent

Name:

Address:

A-4 Gender of Respondent 【Please Tick】
☐01 Male ☐02 Female

A-5 Age of Respondent
☐01 20 - 30 years old
☐02 31 - 40
☐03 41 - 50
☐04 51-

A- 6 Is there water meter in your house?
☐ Yes / ☐ No

A- 7 Type of Housing (1)

☐01 Owned house
☐02 Leased house

A- 8 Type of Housing (2)

☐01 Wooden house of one story (same as flat)
☐02 Wooden house of two stories
☐03 Concrete house of one story (same as flat)
☐04 Concrete house of two story
☐05 Building house with some stories
☐06 Others(Specify)

A- 9 Type of Housing (3)

☐01 with flower garden
☐02 with car park (with car)
☐03 with Kitchen garden sq. ft.

A-10 Total floor area of housing (not land area)

Total floor area: sq. ft.

Section-B Family Structure and Economic Condition

B-1 Family Structure

☐01 adult (with main income)	Male: person	Female: person
☐02 adult (with income)	Male: person	Female: person
☐03 adult (without income)	Male: person	Female: person
☐04 child (less than 18 years old)	Male: person	Female: person
☐05 Total	Male: person	Female: person

B-2 Occupation (Head of Family)
☐01 Salaried employee ☐02 Self-employed worker

B-3 Age (Head of Family)
☐01 20 - 30
☐02 31 - 40
☐03 41 - 50
☐04 51 -

B-4 Category of Occupation (Head of Family)

☐01 Agriculture
☐02 Industry
☐03 Construction
☐04 Service
☐05 Others ( )

B-5 Total Amount of Income

☐01 Total: G$/month /whole family

☐02 Income by head of family G$/month

☐03 Income by others G$/month

B-6 Itemized Expenditure and its Amount

☐01 Housing expenditure G$/month
☐02 Meal expenditure G$/month
☐03 Clothing expense G$/month
☐04 Education expense G$/month
☐05 Electricity and fuel expenses G$/month
☐06 Water expense G$/month
☐07 Others ( ) G$/month
☐08 Others ( ) G$/month
☐09 Others ( ) G$/month

Table 1 Social Condition Survey (2 / 4)

Section-C Condition of Water Usage

C-1 Water Source【Multiple Answer】
What kind of water sources does your household use?

☐01 Supplied water at your house (indoor tap)
☐02 Supplied water at your house (yard tap)
☐03 Bottled water
☐04 Others(Specify_____)

C-2 Water Consumption 【Multiple Answer】
How much does your household use water per month?

☐01 Supplied water (indoor tap)_____gal . /month
☐02 Supplied water (yard tap) _____gal . /month
☐03 Bottled water _____gal . /month
☐04 Others(_____gal. /month

C-2 Purpose of Water Use 【Multiple Answer】

☐01 Cooking /drinking _____gal . /day
☐02 Washing /Cleaning _____gal . /day
☐03 Shower /Bathtub _____gal . /day
☐04 Toilet _____gal . /day
☐05 Others (Specify_____) _____gal . /day

C-3 How much does your household pay for water supply per month or year?
_____G$/month or G$/year

C-4 How much does your household pay for other water source per month or year?
_____G$/month or G$/year

C-5 How many hours per day can you receive water from water supply service?
_____hours/day
from _____ to _____

C-6 What kind of facilities do you have?
【Multiple Answer】

☐01 Storage tank (capacity= gal. , height= m)
☐02 Suction pump
☐03 Indoor tap
☐04 Yard tap
☐05 Others(Specify_____)

Section-D Awareness of People about Water Supply Service

D-1 Are you satisfied with the existing water supply service?

☐01 Yes
☐02 No

D-2 If no, what kind of problems do you have?
【Multiple Answer】

☐01 Supplied water amount _____)
☐02 Service hour _____)
☐03 Water quality (Color) _____)
☐04 Water quality (Taste) _____)
☐05 Water quality (Others) _____)
☐06 Water tariff _____)
☐07 Maintenance service _____)
☐08 Others(_____)

D-3 Which is the major problem among the checked items in D-2?
☐01 First _____
☐02 Second _____
☐03 Third _____

D-4 If check in the question of D-2, what should be improved? Please give your comments.

Table 1 Social Condition Survey (3 / 4)

continue: Section-D Awareness of People about Water Supply Service

D-5 Up to how much are you willing to pay for the water supply service under the current service condition?

_____ G$/month (Please give your comments:_____)

D-6 Up to how much are you willing to pay for the satisfied water supply service (suppose that water is clean and safe and supplied continuously for 24 hours with enough amount)?

_____ G$/month (Please give your comments:_____)

D-7 If you can access the satisfied water supply service, will your water consumption be increase or not?	D-8 If yes, how much ratio of increase do you think?
☐01 Yes ☐02 No	☐01 Less than 20% ☐02 from 20% to 40 % ☐03 from 40% to 60 % ☐04 more than 60 %

Section-E Installation of Water Meter

E-1 If no water meter, do you agree with the installation of water meter?	E-2 If water meter is required for sufficient water supply service, can you accept it?
☐01 Yes ☐02 No (reason:_____)	☐01 Yes ☐02 No
E-3 If yes, how much can you pay for it? _____ G$	E-4 Do you agree to pay water bill which is charged according to actual water consumption measured by water meter? ☐01 Yes ☐02 No (reason:_____)

Section-F Condition of Toilet

F-1 Does your household have a toilet in your home?	F-2 If no, what kind of toilet do you use?
☐01 Yes ☐02 No	☐01 Public toilet ☐02 neighboring toilet ☐03 Others (_____)
F-3 If yes, what kind of treatment facilities do you have? ☐01 Flush toilet with leaching pit (not water proofed pit) ☐02 Flush toilet with septic tank (water proofed pit) ☐03 Poor flush toilet with leaching pit (not water proofed pit) ☐04 Poor flush toilet with septic tank (water proofed pit) ☐05 Pit latrine (or No facilities) ☐06 Others (_____)	F-4 If check 2 or 4 in the question of F-3, where is wastewater from toilet discharged? ☐01 River (name:_____) ☐02 Drainage channel ☐03 Sea ☐04 Others (_____)

Table 1 Social Condition Survey (4 / 4)

Section-G Sanitary Condition	
G-1 Have any members of your family contracted Diarrhea diseases during this year? ☐01 Yes ☐02 No	G-2 If Yes, how many persons contracted the diseases? _____ person
	G-3 If Yes, how much did your household pay for medical examination and medicine? _____ G$

Time (finish) : _____

Section-H Interviewer's Comments	
H-1 How do you estimate the economic condition of the household interviewed by you? ☐01 High – middle class ☐02 Middle – low class ☐03 Low class	Comment (if any)
H-2 How do you think about the environment of the household interviewed by you? ☐01 Clean ☐02 Moderate ☐03 Dirty	Comment (if any)
H-3 How do you feel the health and hygienic conditions around the household interviewed by you? ☐01 Good ☐02 Moderate ☐03 Bad ☐04 unknown	Comment (if any)
Comments (if any) **Name of Interviewer:**	

Table-2 Results of social Condition Survey (1/9)

Serial Number	Location (Village)	Information of Respondent									Family Structure and Economic Condition																		
							Type of Housing (3)				Family Structure					Head of Family			Income (G$/month)			Expenditure (G$/month)							
												Adult																	
		Gender of Respondent	Age of Respondent	water meter	Type of Housing (1)	Type of Housing (2)	Flower garden	Car park	kitchen garden	Total floor area of housing	Total	with main income	with income	without income	Child (less than 18 years old)	Occupation	Age	Category of Occupation	Total Amount	Income by head of family	Income by others	Total	Housing expenditure	Meal expenditure	Clothing expense	Education expense	Electricity and fuel expenses	Water expense	Others
A-01	No. 62	2	3	No	1	2	1	0	1	360	4	1	0	1	2	2	2	1	28,000	28,000	0	22,680	0	10,000	4,000	3,000	5,000	680	0
A-02	No.62	2	1	No	1	2	1	0	1	880	2	1	0	1	0	2	2	1	80,000	80,000	0	32,680	0	15,000	4,000	0	9,000	4,680	0
A-03	No.61	2	3	No	1	2	1	0	1	–	6	2	0	2	2	1	1	1	50,000	25,000	25,000	30,680	0	15,000	6,000	3,000	6,000	680	0
A-04	No.61	1	2	No	1	4	1	0	1	880	4	1	0	1	2	2	2	4	20,000	20,000	0	13,680	0	1,000	2,000	3,000	5,000	2,680	0
A-05	No.61	1	3	No	1	2	1	0	0	770	3	1	0	2	0	2	3	1	100,000	100,000	0	29,680	0	15,000	4,000	0	6,000	4,680	0
A-06	No.61	2	2	No	1	1	0	0	0	780	3	1	0	1	1	1	3	1	40,000	40,000	0	15,680	0	10,000	3,000	0	2,000	680	0
A-07	No.61	1	4	No	1	1	1	0	1	560	5	1	1	1	2	2	4	1	–	–	–	25,680	0	15,000	3,000	3,000	4,000	680	0
A-08	No.61	2	3	Yes	1	1	1	0	1	640	5	1	0	1	3	1	3	4	25,000	25,000	0	20,680	0	10,000	3,000	2,000	3,000	2,680	0
A-09	No.60	2	1	Yes	1	2	1	0	1	608	4	1	0	1	2	2	2	3	48,000	48,000	0	19,680	0	10,000	3,000	3,000	3,000	680	0
A-10	No.60	2	1	Yes	1	2	1	0	1	770	4	1	0	1	2	1	1	1	60,000	40,000	20,000	34,680	0	15,000	3,000	6,000	10,000	680	0
A-11	No.59	2	3	Yes	1	2	1	0	1	770	3	1	0	1	1	1	4	3	40,000	40,000	0	23,680	0	15,000	4,000	0	2,000	2,680	0
A-12	No.59	1	1	Yes	1	4	0	0	0	770	4	1	1	0	2	2	1	2	40,000	30,000	10,000	20,480	0	10,000	3,000	3,000	3,800	680	0
A-13	No.59	1	4	Yes	1	2	0	0	0	600	5	1	0	3	1	1	4	2	40,000	40,000	0	17,680	0	10,000	3,000	1,000	3,000	680	0
A-14	No.59	–	2	Yes	1	2	1	0	0	234	3	1	1	0	1	1	2	2	42,000	28,000	14,000	21,680	0	10,000	3,000	3,000	4,000	1,680	0
A-15	No.59	1	4	No	1	2	1	0	1	–	3	1	1	1	0	2	4	3	68,000	48,000	20,000	24,680	0	15,000	3,000	0	6,000	680	0
A-16	No.59	2	1	No	1	2	0	0	1	640	5	1	1	1	2	2	2	1	70,000	30,000	40,000	32,680	0	15,000	4,000	3,000	6,000	4,680	0
A-17	No.58	–	2	No	2	2	1	0	0	–	4	1	0	1	2	2	1	1	30,000	30,000	0	27,180	?	15,000	3,000	7,000	1,500	680	0
A-18	No.58	1	1	Yes	1	2	0	0	1	608	5	1	0	1	3	2	1	1	30,000	30,000	0	15,680	0	10,000	4,000	1,000	–	680	0
A-19	No.58	2	1	Yes	1	2	1	0	1	660	4	1	0	1	2	2	2	1	40,000	40,000	0	23,680	0	10,000	4,000	6,000	3,000	680	0
A-27	No.51	1	2	No	1	4	1	0	1	880	3	1	0	1	1	1	2	4	33,000	33,000	0	17,680	0	10,000	4,000	0	3,000	680	0
A-28	No.51	2	3	No	1	2	1	0	1	770	7	1	0	6	0	2	3	1	40,000	40,000	0	32,680	0	20,000	4,000	0	8,000	680	0
A-29	No.51	1	4	No	1	4	1	0	0	770	3	1	0	1	1	2	4	4	60,000	60,000	0	35,680	0	15,000	5,000	0	15,000	680	0
A-30	No.51	1	4	No	1	2	1	0	0	700	7	1	2	2	2	1	4	4	56,000	28,000	28,000	34,680	0	20,000	4,000	4,000	6,000	680	0
A-31	No.51	2	2	No	1	2	0	0	0	880	2	1	0	0	1	0	2	0	30,000	30,000	0	17,680	0	10,000	4,000	0	3,000	680	0
A-32	No.51	–	2	No	1	2	0	0	0	770	4	2	1	0	1	1	2	4	30,000	30,000	0	22,680	0	10,000	3,000	4,000	5,000	680	0
A-33	No.52	2	4	Yes	1	2	1	0	0	770	2	1	0	1	0	2	4	4	34,000	30,000	4,000	25,680	0	10,000	4,000	0	11,000	680	0
A-34	No.52	2	3	No	1	2	1	0	1	640	3	1	1	1	0	2	3	1	38,000	20,000	18,000	25,680	0	10,000	4,000	0	4,000	680	7,000
A-35	No.52	1	3	Yes	1	2	1	1	0	770	4	1	0	2	1	1	3	4	50,000	50,000	0	45,680	0	20,000	4,000	15,000	6,000	680	0
A-36	No.53	2	1	No	1	2	1	1	1	748	5	1	3	0	1	1	4	4	140,000	50,000	80,000	47,680	0	18,000	10,000	10,000	8,000	1,680	0
A-37	No.53	2	4	No	1	2	1	0	0	–	6	1	3	1	1	2	4	1	40,000	20,000	20,000	20,680	0	10,000	4,000	0	6,000	680	0
A-38	No.54	1	3	No	1	4	1	0	1	770	2	1	0	1	0	2	3	4	80,000	80,000	0	41,680	0	30,000	4,000	0	6,000	1,680	0
A-39	No.54	2	1	No	2	2	0	1	1	667	5	1	0	1	3	1	2	2	48,000	48,000	0	27,180	0	10,000	3,000	9,000	4,500	680	0
A-40	No.54	2	2	No	2	4	1	0	1	920	5	1	0	1	3	2	3	1	25,000	25,000	0	27,680	3,000	12,000	4,000	2,000	6,000	680	0
B-01	No.67	1	3	Yes	2	2	1	0	144	770	4	1	0	1	2	1	3	1	24,000	24,000	0	24,680	4,000	10,000	3,000	2,500	2,500	680	2,000
B-02	No.67	2	3	No	2	2	1	0	140	770	2	1	0	1	0	1	4	4	20,000	20,000	0	19,680	0	10,000	3,000	0	3,000	680	3,000
B-03	No.67	2	2	No	1	2	0	0	0	920	2	1	1	0	0	1	3	2	40,000	32,000	8,000	31,680	2,000	15,000	6,000	3,000	5,000	680	0
B-04	No.67	–	2	No	1	2	0	0	0	920	6	1	0	1	4	2	3	3	50,000	40,000	10,000	44,667	4,000	15,000	7,000	6,000	10,000	2,667	0
B-05	No.67	2	3	Broken	1	2	0	1	0	880	4	1	0	2	1	2	–	4	32,000	32,000	0	32,680	0	20,000	0	0	12,000	680	0

Table-2 Results of social Condition Survey (2/9)

Serial Number	Location (Village)	Information of Respondent									Family Structure and Economic Condition																	
		Gender of Respondent	Age of Respondent	water meter	Type of Housing (1)	Type of Housing (2)	Type of Housing (3)			Total floor area of housing	Family Structure					Head of Family			Income (G$/month)			Expenditure (G$/month)							
							Flower garden	Car park	kitchen garden		Total	Adult			Child (less than 18 years old)	Occupation	Age	Category of Occupation	Total Amount	Income by head of family	Income by others	Total	Housing expenditure	Meal expenditure	Clothing expense	Education expense	Electricity and fuel expenses	Water expense	Others
												with main income	with income	without income															
B-06	No.67	1	4	Yes	1	2	1	1	1	616	2	1	0	1	0	0	4	0	100,000	0	100,000	60,680	0	40,000	10,000	0	4,000	2,680	4,000
B-07	No.67	2	2	Yes	1	2	1	0	0	660	3	1	0	1	1	1	3	2	20,000	20,000	0	17,680	0	10,000	3,000	0	4,000	680	0
B-08	No.75	1	3	No	1	2	1	0	1	736	6	1	1	1	3	1	3	2	52,000	32,000	20,000	25,180	0	15,000	4,000	2,500	3,000	680	0
B-09	No.75	2	2	No	1	2	0	0	0	920	4	1	0	1	2	1	2	4	35,000	35,000	0	26,680	0	15,000	3,000	3,000	5,000	680	0
B-10	No.73	2	3	No	1	2	1	0	1	550	3	1	1	0	1	1	3	1	40,000	40,000	0	25,280	0	15,000	3,000	3,000	3,600	680	0
B-11	No.73	2	2	No	1	2	1	0	0	580	4	1	1	0	2	2	3	5	45,000	20,000	25,000	18,980	0	10,000	3,000	3,000	2,300	680	0
B-12	No.72	2	2	No	1	2	0	0	0	270	5	1	1	1	2	2	3	4	39,000	24,000	15,000	30,680	0	12,000	4,000	6,000	8,000	680	0
B-13	No.72	2	–	No	1	2	1	0	0	770	2	1	0	1	0	2	2	4	30,000	30,000	0	19,680	0	10,000	4,000	0	5,000	680	0
B-14	No.68	1	3	Yes	1	2	0	0	0	638	9	2	1	0	6	–	3	5	45,000	30,000	15,000	31,180	0	15,000	6,000	5,000	4,500	680	0
B-15	No.68	2	1	No	1	2	0	0	0	704	2	1	0	1	0	2	3	4	50,000	50,000	0	63,680	0	13,000	4,000	0	46,000	680	0
B-16	No.68	1	2	No	1	2	0	0	0	638	4	1	0	2	1	1	2	2	25,000	25,000	0	18,680	0	8,000	3,000	2,000	5,000	680	0
B-17	No.68	1	3	No	1	2	1	0	1	770	8	2	1	2	3	2	3	1	48,000	28,000	20,000	30,180	0	15,000	6,000	5,000	3,500	680	0
B-18	No.68	–	1	No	1	2	0	0	0	748	3	1	0	1	1	2	2	5	40,000	40,000	0	29,180	0	15,000	6,000	4,000	3,500	680	0
B-19	No.68	1	2	Yes	1	2	0	0	0	600	5	1	0	1	3	1	2	2	30,000	30,000	0	20,680	0	10,000	3,000	4,000	3,000	680	0
B-20	No.68	2	3	No	1	1	0	0	1	160	2	1	0	0	1	2	3	4	22,000	14,000	8,000	10,480	0	5,000	2,000	2,000	800	680	0
B-21	Corriverton	2	2	No	1	2	1	0	0	704	2	1	1	0	0	2	4	4	60,000	40,000	20,000	33,680	0	15,000	6,000	0	8,000	4,680	0
B-22	Corriverton	2	2	No	1	4	1	0	1	880	6	1	1	0	4	1	2	2	130,000	80,000	50,000	60,680	0	30,000	10,000	10,000	10,000	680	0
B-23	Corriverton	2	4	No	1	2	0	0	0	800	4	0	2	1	1	2	4	4	70,000	30,000	40,000	28,680	0	15,000	3,000	3,000	5,000	2,680	0
B-24	No.65	1	3	Yes	1	2	1	0	1	600	4	1	1	0	2	1	3	2	40,000	40,000	0	20,680	0	10,000	3,000	3,000	4,000	680	0
B-25	No.64	2	2	Yes	1	4	1	0	1	–	4	2	0	0	2	2	3	4	70,000	70,000	0	38,680	0	20,000	4,000	5,000	9,000	680	0
B-26	No.64	2	3	Yes	1	2	1	0	0	770	7	2	0	3	2	2	1	1	80,000	80,000	0	40,680	0	30,000	6,000	0	4,000	680	0
B-27	No.65	1	2	Yes	1	2	1	0	1	600	5	1	0	1	3	1	2	2	70,000	40,000	30,000	42,680	0	25,000	4,000	7,000	6,000	680	0
B-28	No.65	1	2	Yes	–	2	1	0	1	770	3	1	0	1	1	2	2	4	70,000	70,000	0	29,680	0	15,000	6,000	2,000	6,000	680	0
B-29	No.65	1	2	No	1	2	0	0	0	580	4	1	0	1	2	1	2	1	35,000	35,000	0	21,680	0	10,000	4,000	3,000	4,000	680	0
B-30	No.65	1	3	No	1	2	0	0	0	640	2	1	1	0	0	2	3	1	40,000	40,000	0	16,680	0	10,000	3,500	0	2,500	680	0
B-31	No.65	2	1	No	1	1	0	0	0	340	4	1	0	1	2	2	2	1	30,000	30,000	0	18,680	0	10,000	2,000	4,000	2,000	680	0
B-32	No.65	2	4	No	1	2	1	0	1	580	1	1	0	0	0	2	5	4	30,000	30,000	0	10,680	0	5,000	1,000	0	4,000	680	0
C-01	SpringLand	1	4	Broken	1	5	0	0	0	3,000	4	1	0	3	0	2	4	5	20,000	20,000	0	14,680	5,000	3,000	3,000	0	3,000	680	0
C-02	Crabwood Creek	2	2	No	1	1	0	0	0	800	4	0	2	0	2	1	2	1	50,000	30,000	20,000	38,180	0	23,000	2,000	5,000	5,000	3,180	0
C-03	Crabwood Creek	2	3	No	2	1	0	0	0	300	3	1	2	0	0	1	–	5	110,000	80,000	30,000	55,680	0	30,000	15,000	0	10,000	680	0
C-04	Jackson Creek	2	2	Broken	1	2	0	0	0	1,000	4	1	0	1	2	1	2	4	25,000	25,000	0	17,680	0	5,000	2,000	7,000	3,000	680	0
C-05	Crabwood Creek	1	2	Yes	2	4	0	0	0	720	3	1	0	2	0	2	2	5	30,000	30,000	0	26,680	0	15,000	3,000	0	6,000	2,680	0
C-06	Jackson Creek	1	3	No	1	1	0	0	0	396	4	1	0	1	2	2	3	1	20,000	20,000	0	18,694	0	10,000	2,000	2,000	4,500	194	0
C-07	Jackson Creek	1	2	No	2	1	0	0	0	120	7	1	0	1	5	1	2	4	22,000	22,000	0	20,680	0	9,000	2,000	7,000	2,000	680	0
C-08	Line Path	1	1	No	1	2	0	0	0	400	9	1	3	2	3	2	1	5	72,000	40,000	32,000	50,180	0	28,000	3,000	4,000	6,000	4,180	5,000

Table-2 Results of social Condition Survey (3/9)

Serial Number	Location (Village)	Information of Respondent									Family Structure and Economic Condition																	
							Type of Housing (3)				Family Structure					Head of Family			Income (G$/month)			Expenditure (G$/month)							
												Adult																	
		Gender of Respondent	Age of Respondent	water meter	Type of Housing (1)	Type of Housing (2)	Flower garden	Car park	kitchen garden	Total floor area of housing	Total	with main income	with income	without income	Child (less than 18 years old)	Occupation	Age	Category of Occupation	Total Amount	Income by head of family	Income by others	Total	Housing expenditure	Meal expenditure	Clothing expense	Education expense	Electricity and fuel expenses	Water expense	Others
C-09	Line Path	1	4	No	1	1	0	0	0	880	4	1	0	2	1	1	4	2	70,000	70,000	0	56,780	0	50,000	2,000	2,000	600	680	1,500
C-10		2	–	No	2	2	0	0	0	150	4	1	0	1	2	1	–	2	32,000	32,000	0	23,680	0	15,000	2,000	3,000	3,000	680	0
C-11	SpringLand	1	2	Yes	1	1	0	0	0	1,000	1	1	0	0	0	2	2	4	30,000	30,000	0	25,180	0	15,000	2,000	0	5,000	1,180	2,000
C-12	Line Path	2	2	No	1	2	0	0	0	252	3	1	0	1	1	1	–	2	20,000	20,000	0	20,680	0	6,000	5,000	6,000	3,000	680	0
C-13	SpringLand	1	3	Yes	–	2	0	0	0	600	2	1	0	1	0	1	–	2	70,000	70,000	0	47,180	0	30,000	4,000	0	9,000	2,180	2,000
C-14	No. 77	2	4	No	1	2	0	0	0	500	2	1	0	1	0	2	4	4	10,000	10,000	0	33,817	0	16,000	3,000	0	10,000	1,817	3,000
C-15	Corrierton	1	2	No	1	2	0	0	0	640	5	1	0	1	3	1	2	2	40,000	40,000	0	55,180	0	18,000	3,000	25,000	6,000	1,180	2,000
C-16	No. 78	1	2	No	1	4	0	0	0	500	5	1	0	2	2	2	2	4	35,000	35,000	0	21,180	0	10,000	2,000	3,000	3,000	680	2,500
C-17	No. 78	1	2	Yes	1	1	0	0	0	360	5	1	0	1	3	2	2	4	20,000	20,000	0	68,250	0	20,000	0	20,000	20,000	3,250	5,000
C-18	Queenstown	1	4	No	1	2	0	0	0	700	8	1	0	3	4	2	4	–	10,000	10,000	0	15,680	0	10,000	2,000	0	3,000	680	0
C-19	Queenstown	2	2	No	1	2	0	0	0	450	3	1	0	0	2	2	2	4	20,000	20,000	0	20,680	0	11,000	0	3,000	6,000	680	0
C-20	Kingstown	2	4	No	1	2	0	0	0	500	4	1	0	1	2	2	–	4	20,000	20,000	0	40,000	0	32,000	2,000	0	6,000	0	0
C-21	Queenstown	1	3	Yes	1	2	0	0	0	600	4	1	0	1	2	1	3	2	32,000	32,000	0	34,680	0	25,000	0	0	5,000	680	4,000
C-22	Moleson Creek	1	4	Yes	2	2	0	0	0	720	1	1	0	0	0	1	–	4	35,000	35,000	0	19,000	0	15,000	2,000	0	0	2,000	0
C-23	Jackson Creek	2	4	No	–	2	0	0	0	500	1	1	0	0	0	2	4	5	15,000	15,000	0	10,680	0	8,000	2,000	0	0	680	0
C-24	Line Path	2	1	No	1	2	0	0	0	616	6	1	0	2	3	1	1	2	40,000	40,000	0	68,180	0	25,000	2,000	5,000	35,000	1,180	0
C-25	Line Path	2	3	No	1	2	0	0	0	560	2	1	0	1	0	2	3	5	20,000	20,000	0	29,680	0	10,000	0	10,000	5,000	680	4,000
C-26	Line Path	1	4	No	1	2	0	0	0	576	4	1	0	1	2	2	4	5	15,000	15,000	0	18,680	0	15,000	0	0	3,000	680	0
C-27	Line Path	1	4	No	1	2	0	0	0	792	1	1	0	0	0	2	4	5	16,000	16,000	0	16,180	0	5,000	4,000	0	3,500	680	3,000
C-28	Line Path	1	3	No	1	2	0	0	0	450	5	1	0	1	3	1	3	2	33,000	33,000	0	55,180	0	40,000	0	0	6,000	2,180	7,000
C-29	Line Path	2	4	No	1	2	0	0	0	360	2	1	0	1	0	2	–	5	8,000	8,000	0	16,680	0	10,000	0	0	5,000	1,680	0
C-30	No. 77	2	3	No	1	1	0	0	0	400	4	1	0	0	3	1	3	4	20,000	20,000	0	21,680	0	10,000	2,000	5,000	0	680	4,000
C-31	Line Path	1	2	No	1	2	0	0	0	500	5	1	0	2	2	1	2	2	39,000	39,000	0	40,680	0	20,000	2,000	3,000	2,000	680	13,000
C-32	Area C	1	4	No	1	2	0	0	0	480	8	1	0	3	4	1	–	4	40,000	40,000	0	30,980	0	20,000	2,000	2,000	1,300	2,680	3,000
C-33	skeldon	1	1	No	2	2	0	0	0	600	3	1	0	1	1	2	1	5	15,000	15,000	0	24,500	10,000	10,000	0	0	3,500	0	1,000
C-34	Circle St.	2	3	Yes	2	–	0	0	0	1,100	9	1	0	4	4	2	3	1	25,000	25,000	0	53,000	15,000	20,000	0	12,000	2,500	2,500	1,000
C-35	No. 79	1	4	No	1	1	0	0	0	800	4	1	1	0	2	1	4	4	76,000	36,000	40,000	51,000	0	30,000	2,000	0	14,000	2,000	3,000
C-36	No. 79	1	4	No	1	2	0	0	0	300	2	1	1	0	0	1	4	3	100,000	80,000	20,000	45,680	0	20,000	2,000	2,000	9,000	2,680	10,000
C-37	No. 79	2	3	No	1	2	0	0	0	300	7	1	0	2	4	2	3	5	10,000	10,000	0	25,180	0	20,000	0	4,000	0	680	500
C-38	No. 64	1	2	No	1	2	0	0	0	400	3	1	0	1	1	2	2	5	30,000	30,000	0	29,875	0	15,000	2,000	1,000	10,000	875	1,000
C-39	No. 64	1	4	No	1	2	0	0	0	432	7	1	0	2	4	2	4	5	35,000	35,000	0	40,680	0	20,000	2,000	10,000	1,000	2,680	5,000
C-40	No. 64	1	1	No	1	2	0	0	0	440	5	1	0	1	3	2	1	4	40,000	40,000	0	23,680	0	15,000	2,000	0	5,000	680	1,000

Table-2 Results of social Condition Survey (4/9)

Serial Number	Location (Village)	Condition of Water Usage																				Awareness of People about Water Supp								
		Water Consumption (gal . /month)					Purpose of Water Use (gal . /month)						Water Supply Charge	Expenditure for other water sources	Water Service Time (hr./day)	from	to	Facilities in Household						Satisfaction	Problems							
																		Storage Tank		Suction pump	Indoor tap	Yard tap	Others								
		Total	Supplied water (indoor tap)	Supplied water (yard tap)	Bottled water	Others	Total	Cooking /drinking	Washing /Cleaning	Shower /Bathtub	Toilet	Others						Capacity (gal.)	Height (m)						water amount	Service hour	Water quality (Color)	Water quality (Taste)	Water quality (Others)	Water tariff	Maintenance service	Others
A-01	No. 62	4,010	2,000	2,000	10	0	68	8	30	30	0	0	8,160	0	12	6	18	400	-	1	1	1	0	1	0	0	0	0	0	1	0	0
A-02	No.62	4,040	2,000	2,000	40	0	135	10	40	40	45	0	8,160	48,000	2	6	18	400	-	1	1	1	0	2	1	0	0	0	0	0	0	0
A-03	No.61	4,000	2,000	2,000	0	0	107	12	40	40	15	0	8,160	0	12	6	18	1,200	-	0	1	1	0	2	1	0	1	0	0	1	0	0
A-04	No.61	4,020	2,000	2,000	20	0	81	6	30	30	15	0	8,160	24,000	12	6	18	1,200	-	1	1	1	0	2	1	0	1	0	0	0	0	0
A-05	No.61	5,040	3,000	2,000	40	0	115	15	40	40	20	0	8,160	48,000	12	6	18	400	-	1	1	1	0	2	0	0	1	0	0	0	0	0
A-06	No.61	3,500	2,000	1,500	0	0	68	8	30	30	0	0	8,160	0	12	6	18	0	0	0	1	1	0	2	1	0	1	0	0	0	0	0
A-07	No.61	3,000	0	3,000	0	0	60	10	25	25	0	0	8,160	0	12	6	18	400	-	0	0	1	0	2	1	0	1	0	0	0	0	0
A-08	No.61	4,020	1,000	3,000	20	0	83	8	30	30	15	0	8,160	24,000	12	6	18	400	-	1	1	1	0	2	1	0	1	0	0	0	0	0
A-09	No.60	3,000	1,000	2,000	0	0	100	20	40	40	0	0	8,160	0	12	6	18	400	-	0	1	1	0	1	1	0	1	0	0	1	0	0
A-10	No.60	0	0	-	0	0	96	6	35	40	15	0	8,160	0	12	6	18	400	-	1	0	1	0	2	1	0	1	0	0	0	0	0
A-11	No.59	3,520	1,500	2,000	20	0	66	6	30	30	0	0	8,160	24,000	12	6	18	400	-	0	1	1	0	1	1	0	1	0	0	1	0	0
A-12	No.59	4,000	0	4,000	0	0	73	8	30	35	0	0	8,160	0	12	6	18	45	-	1	0	1	0	2	1	0	0	0	0	1	0	0
A-13	No.59	3,500	1,000	2,500	0	0	83	8	35	40	0	0	8,160	0	12	6	18	400	-	0	1	1	0	2	1	0	1	0	0	1	0	0
A-14	No.59	2,010	0	2,000	10	0	65	10	30	25	0	0	8,160	12,000	12	6	18	800	-	0	0	1	0	2	1	0	1	0	0	1	0	0
A-15	No.59	3,500	1,500	2,000	0	0	78	8	30	40	0	0	8,160	0	12	6	18	400	-	0	1	1	0	2	1	0	1	1	0	1	0	0
A-16	No.59	4,010	2,000	2,000	10	0	80	10	35	35	0	0	8,160	48,000	12	6	18	400	-	1	1	1	0	2	1	0	1	0	0	1	0	0
A-17	No.58	3,500	2,000	1,500	0	0	86	16	30	40	0	0	8,160	0	9	5-9	5-1	45	-	0	1	1	0	2	0	0	1	1	0	1	0	0
A-18	No.58	3,500	1,500	2,000	0	0	80	10	40	30	0	0	8,160	0	9	5-8	5-1	0	0	0	1	1	0	2	1	0	0	0	0	1	0	0
A-19	No.58	3,300	1,200	2,100	0	0	85	6	39	40	0	0	8,160	0	9	-	-	400	-	0	1	1	0	-	0	0	1	0	0	1	0	0
A-27	No.51	3,500	1,500	2,000	0	0	80	10	25	30	15	0	8,160	0	11	4	15	1,600	20 Ft	1	1	1	0	2	1	1	0	0	0	1	0	0
A-28	No.51	2,500	1,500	1,000	0	0	80	10	35	35	0	0	8,160	0	11	4	15	200	Ground	0	1	1	0	2	1	1	1	1	0	1	0	0
A-29	No.51	4,500	2,500	2,000	0	0	65	10	25	30	0	0	8,160	0	11	4	15	400	10 Ft	1	1	1	0	2	1	1	0	0	0	1	0	0
A-30	No.51	3,000	-	3,000	0	0	65	10	25	30	0	0	8,160	0	11	4	15	400	Ground	0	1	1	0	2	1	0	0	0	0	0	0	0
A-31	No.51	3,000	0	3,000	0	0	49	4	20	25	0	0	8,160	0	11	4	15	400	4 Ft	0	0	1	0	2	1	0	1	0	0	0	0	0
A-32	No.51	2,500	1,000	1,500	0	0	75	10	30	35	0	0	8,160	0	11	4	15	45	Ground	0	1	1	0	2	1	1	1	0	0	0	0	0
A-33	No.52	4,000	0	4,000	0	0	70	10	20	20	20	0	8,160	0	11	4	15	400	-	1	0	1	0	2	1	0	1	0	0	1	0	0
A-34	No.52	3,000	1,000	2,000	0	0	73	8	30	35	0	0	8,160	0	6	9	15	400	4 Ft	1	1	1	0	2	1	1	0	0	0	0	0	0
A-35	No.52	3,500	2,000	1,500	0	0	105	10	35	40	20	0	8,160	0	12	6	18	400	-	1	1	1	0	2	1	0	1	0	0	0	0	0
A-36	No.53	3,510	1,500	2,000	10	0	95	10	30	40	15	0	8,160	12,000	12	6	18	800	20 Ft	1	1	1	0	2	1	0	1	1	1	0	0	0
A-37	No.53	3,000	0	3,000	0	0	95	15	40	40	0	0	8,160	0	12	6	18	400	4 Ft	1	0	1	0	2	1	0	1	0	0	0	0	0
A-38	No.54	2,510	1,000	1,500	10	0	70	10	30	20	10	0	8,160	12,000	15	5	20	1,500	20 Ft	1	1	1	0	2	1	0	1	0	0	0	0	0
A-39	No.54	5,000	2,000	3,000	0	0	90	15	45	30	0	0	8,160	0	15	5	20	800	-	1	1	1	0	1	1	0	1	0	0	0	0	0
A-40	No.54	3,600	1,600	2,000	0	0	102	12	40	35	15	0	8,160	0	16	4	20	400	20 Ft	1	1	1	0	1	1	0	1	0	0	1	0	0
B-01	No.67	1,400	0	1,350	0	50	51	4	15	20	6	6	8,160	0	12	-	-	180	20 Ft	1	0	1	0	2	1	1	1	0	0	0	0	0
B-02	No.67	1,350	0	1,350	0	0	45	4	15	10	10	6	8,160	0	12	6	18	400	20 Ft	1	0	1	0	2	1	0	1	0	1	0	0	0
B-03	No.67	3,100	400	2,700	0	0	65	10	25	15	0	15	8,160	0	12	6	18	0	0	0	1	1	0	2	0	0	1	0	0	0	0	0
B-04	No.67	4,050	1,350	2,700	0	0	90	20	20	30	20	0	32,000	0	12	6	18	1,800	20 Ft	1	1	1	0	2	1	0	1	0	0	0	0	0
B-05	No.67	1,350	700	650	0	0	65	10	20	20	15	0	8,160	0	12	6	18	400	-	0	1	1	0	2	0	0	1	0	0	0	0	0

Table-2 Results of social Condition Survey (5/9)

Serial Number	Location (Village)	Condition of Water Usage																				Awareness of People about Water Supp								
		Water Consumption (gal . /month)					Purpose of Water Use (gal . /month)						Water Supply Charge	Expenditure for other water sources	Water Service Time (hr./day)	from	to	Facilities in Household						Satisfaction	Problems							
																		Storage Tank													
		Total	Supplied water (indoor tap)	Supplied water (yard tap)	Bottled water	Others	Total	Cooking /drinking	Washing /Cleaning	Shower /Bathtub	Toilet	Others						Capacity (gal.)	Height (m)	Suction pump	Indoor tap	Yard tap	Others		water amount	Service hour	Water quality (Color)	Water quality (Taste)	Water quality (Others)	Water tariff	Maintenance service	Others
B-06	No.67	1,382	650	700	32	0	65	5	20	20	20	0	8,160	24,000	12	6	18	800	10 Ft	1	1	1	0	1	0	0	1	0	0	0	0	0
B-07	No.67	2,700	700	2,000	0	0	70	30	20	20	0	0	8,160	0	12	6	18	400	5 Ft	1	1	1	0	2	1	0	1	0	0	1	0	0
B-08	No.75	4,000	2,000	2,000	0	0	100	30	35	35	0	0	8,160	0	13	5	18	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0
B-09	No.75	4,000	2,000	2,000	0	0	85	30	20	20	15	0	8,160	0	12	–	–	400	–	0	1	1	0	1	0	0	0	0	0	1	0	0
B-10	No.73	4,000	2,000	2,000	0	0	85	30	20	20	15	0	8,160	0	12	6	18	800	20 Ft	1	1	1	0	1	0	0	1	0	0	0	0	0
B-11	No.73	3,000	0	3,000	0	0	80	30	30	20	0	0	8,160	0	12	6	18	400	–	0	1	1	0	1	0	0	0	0	0	0	0	0
B-12	No.72	3,510	2,000	1,500	10	0	80	20	30	30	0	0	8,160	0	12	6	18	400	–	0	1	1	0	1	0	0	0	0	0	0	0	0
B-13	No.72	5,000	2,500	2,500	0	0	102	32	25	25	20	0	8,160	0	12	6	18	400	–	0	1	1	0	1	0	0	0	0	0	1	0	0
B-14	No.68	4,500	2,500	2,000	0	0	95	30	30	35	0	0	8,160	0	12	6	18	200	–	0	1	1	0	1	0	0	1	0	0	1	0	0
B-15	No.68	4,700	2,000	2,700	0	0	84	4	30	30	20	0	8,160	0	12	6	18	400	–	0	1	1	0	1	0	0	0	0	0	1	0	0
B-16	No.68	4,000	2,000	2,000	0	0	87	7	30	30	20	0	8,160	0	12	6	18	800	–	0	1	1	0	2	0	0	1	0	0	1	0	0
B-17	No.68	4,000	1,000	3,000	0	0	68	8	30	30	0	0	8,160	0	12	6	18	400	–	0	1	1	0	1	0	0	1	0	0	1	0	0
B-18	No.68	3,500	0	3,500	0	0	81	6	30	30	15	0	8,160	0	12	6	18	400	–	0	0	1	0	2	1	0	1	0	0	1	0	0
B-19	No.68	3,500	2,000	1,500	0	0	88	8	30	30	20	0	8,160	0	12	6	18	400	–	1	1	1	0	2	1	0	1	0	0	1	0	0
B-20	No.68	1,500	0	1,500	0	0	36	6	15	15	0	0	8,160	0	12	6	18	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0
B-21	Corriverton	1,440	700	700	40	0	86	6	30	30	20	0	8,160	48,000	12	6	18	800	–	1	1	1	0	2	1	0	0	1	0	0	0	0
B-22	Corriverton	4,000	2,000	2,000	0	0	101	16	35	35	15	0	8,160	0	12	6	18	800	–	1	1	1	0	2	1	0	1	0	0	0	0	0
B-23	Corriverton	4,020	2,000	2,000	20	0	81	6	30	30	15	0	8,160	24,000	12	6	18	800	–	1	1	1	0	2	1	0	1	1	0	1	0	0
B-24	No.65	3,500	1,500	2,000	0	0	82	7	30	30	15	0	8,160	0	12	6	18	400	–	1	1	1	0	2	1	0	0	0	0	1	0	0
B-25	No.64	4,500	3,000	1,500	0	0	104	9	35	40	20	0	8,160	0	12	6	18	200	20 Ft	1	1	1	0	2	1	0	0	0	0	1	0	0
B-26	No.64	5,000	3,000	2,000	0	0	85	15	40	30	0	0	8,160	0	12	6	18	400	–	1	1	1	0	2	1	0	0	0	0	1	0	0
B-27	No.65	5,000	2,000	3,000	0	0	94	9	35	30	20	0	8,160	0	12	6	18	800	–	1	1	1	0	2	1	0	0	0	0	1	0	0
B-28	No.65	4,020	2,000	2,000	20	0	76	6	25	30	15	0	8,160	0	12	6	18	400	–	1	1	1	0	2	1	0	0	0	0	1	0	0
B-29	No.65	3,500	2,000	1,500	0	0	68	8	30	30	0	0	8,160	0	12	6	18	300	–	1	1	1	0	2	1	0	0	0	0	1	0	0
B-30	No.65	4,000	2,000	2,000	0	0	83	8	20	35	20	0	8,160	0	12	6	18	400	–	1	1	1	0	2	1	0	0	0	0	1	0	0
B-31	No.65	3,000	1,000	2,000	0	0	69	9	30	30	0	0	8,160	0	12	6	18	400	–	1	1	1	0	2	1	0	0	0	0	1	0	0
B-32	No.65	2,000	1,000	1,000	0	0	79	4	30	30	15	0	8,160	0	12	6	18	0	0	0	1	1	0	1	0	0	0	0	0	1	0	0
C-01	SpringLand	1,350	0	1,350	0	0	45	5	15	15	0	10	8,160	0	12	6	18	4,500	4 m	1	0	1	0	2	1	0	1	1	0	0	0	0
C-02	Crabwood Creek	5,025	0	5,000	25	0	55	20	20	10	5	0	8,160	30,000	6	12	18	400	10 m	1	0	1	0	2	1	1	1	1	0	0	0	0
C-03	Crabwood Creek	1,600	1,600	0	0	0	53	8	20	15	10	0	8,160	0	6	6	12	400	10 m	1	1	0	0	2	1	1	1	1	0	0	0	0
C-04	Jackson Creek	1,350	450	900	0	0	90	10	40	15	25	0	8,160	0	12	6	18	450	20 m	0	1	1	0	2	1	1	1	1	0	1	0	0
C-05	Crabwood Creek	2,420	1,500	900	20	0	24	3	9	9	3	0	8,160	24,000	6	6	12	400	5 m	0	1	1	0	2	1	1	1	1	1	1	0	0
C-06	Jackson Creek	400	0	0	0	400	49	3	40	6	0	0	2,333	0	6	12	18	400	3 m	0	0	0	and p	2	1	1	1	1	0	1	0	0
C-07	Jackson Creek	450	0	450	0	0	21	5	1	15	0	0	8,160	0	5	6	11	0	0	0	0	1	0	2	1	1	1	1	0	1	0	0
C-08	Line Path	1,235	1,200	0	35	0	83	3	25	45	10	0	8,160	42,000	3	6	9	400	2 m	1	1	0	0	2	1	1	1	1	0	0	0	0

Table-2 Results of social Condition Survey (6/9)

Serial Number	Location (Village)	Condition of Water Usage																					Awareness of People about Water Supp								
		Water Consumption (gal . /month)					Purpose of Water Use (gal . /month)						Water Supply Charge	Expenditure for other water sources	Water Service Time (hr./day)	from	to	Facilities in Household					Satisfaction	Problems							
																		Storage Tank													
		Total	Supplied water (indoor tap)	Supplied water (yard tap)	Bottled water	Others	Total	Cooking /drinking	Washing /Cleaning	Shower /Bathtub	Toilet	Others						Capacity (gal.)	Height (m)	Suction pump	Indoor tap	Yard tap	Others		water amount	Service hour	Water quality (Color)	Water quality (Taste)	Water quality (Others)	Water tariff	Maintenance service	Others
C-09	Line Path	1,600	0	1,600	0	0	78	3	45	10	20	0	8,160	0	5	6	11	400	7 m	1	0	1	0	2	1	1	1	1	0	0	0	0
C-10		675	0	675	0	0	19	2	9	8	0	0	8,160	0	3	6	9	400	3 m	1	0	1	0	2	1	1	1	1	0	1	0	0
C-11	SpringLand	755	150	600	5	0	41	1	30	6	4	0	8,160	6,000	12	6	18	200	3 m	0	1	1	0	2	1	0	1	0	0	0	0	0
C-12	Line Path	400	0	400	0	0	19	3	4	12	0	0	8,160	0	6	6	12	0	0	0	0	1	0	2	0	0	1	0	0	1	0	0
C-13	SpringLand	435	120	300	15	0	28	3	8	7	10	0	8,160	18,000	12	6	18	400	10 m	0	1	1	0	2	1	1	1	1	0	0	0	0
C-14	No. 77	305	150	150	5	0	18	2	9	7	0	0	15,800	6,000	12	6	18	400	1 m	0	1	1	0	1	0	0	0	0	0	0	0	0
C-15	Corrierton	5	-	-	5	0	45	2	20	20	3	0	8,160	6,000	2	6	8	450	12 m	1	1	1	0	2	1	1	1	1	0	0	0	0
C-16	No. 78	400	0	400	0	0	35	5	15	15	0	0	8,160	0	5	6	11	400	1 m	0	0	1	0	2	1	1	1	1	0	1	0	0
C-17	No. 78	20	-	0	20	0	56	2	24	10	20	0	15,000	24,000	12	6	18	400	10 m	1	1	1	0	2	1	0	1	0	0	0	0	0
C-18	Queenstown	1,660	1,200	460	0	0	112	2	45	45	20	0	8,160	0	15	4	19	450	0.5 m	0	1	1	0	1	0	0	0	0	0	0	0	0
C-19	Queenstown	700	600	100	0	0	23	2	16	5	0	0	8,160	0	15	4	19	400	3 m	0	1	1	0	1	0	0	0	0	0	0	0	0
C-20	Kingstown	400	300	100	0	0	22	3	9	10	0	0	0	0	15	4	19	400	3 m	0	1	1	0	2	1	0	1	1	0	0	0	0
C-21	Queenstown	730	280	450	0	0	25	2	4	16	3	0	8,160	0	15	4	19	400	0 m	0	1	1	0	1	0	0	0	0	0	1	0	0
C-22	Moleson Creek	220	200	0	20	0	16	2	3	8	3	0	0	24,000	6	12	18	450	10 m	0	1	0	0	2	1	0	0	0	0	0	0	0
C-23	Jackson Creek	140	80	60	0	0	16	5	6	5	0	0	8,160	0	6	12	18	0	0	0	1	1	0	1	1	0	1	0	1	1	0	0
C-24	Line Path	800	0	800	0	0	160	10	90	45	15	0	8,160	6,000	6	12	18	430	10 m	1	1	1	0	2	1	1	1	0	1	1	0	0
C-25	Line Path	500	0	100	0	400	25	4	5	10	6	0	8,160	0	2	-	-	450	3 m	1	0	1	0	2	1	1	1	1	1	0	0	0
C-26	Line Path	3,000	0	3,000	0	0	52	2	20	20	10	0	8,160	0	5	6	10	360	0 m	1	0	1	0	2	1	1	1	1	1	0	0	0
C-27	Line Path	840	0	840	0	0	14	1	8	5	0	0	8,160	0	12	6	18	400	3 m	1	0	1	0	2	1	1	1	1	1	0	0	0
C-28	Line Path	415	0	400	15	0	49	4	20	25	0	0	8,160	18,000	15	4	19	400	3.5 m	1	0	1	0	2	1	0	1	1	1	0	0	0
C-29	Line Path	410	0	400	10	0	35	5	20	10	0	0	8,160	12,000	6	6	12	400	0 m	1	0	1	0	2	1	1	1	1	1	1	0	0
C-30	No. 77	400	0	400	0	0	80	10	20	50	0	0	8,160	0	12	6	18	0	0	0	0	1	0	2	1	1	1	0	0	1	0	0
C-31	Line Path	550	150	400	0	0	52	2	14	30	6	0	8,160	0	15	4	19	400	0.25 m	1	0	1	0	2	1	1	0	0	1	0	0	0
C-32	Area C	420	0	400	20	0	70	10	20	30	10	0	8,160	24,000	12	6	18	400	0 m	1	0	1	0	2	1	0	1	1	1	0	0	0
C-33	skeldon	142	0	142	0	0	38	3	15	20	0	0	0	0	4	0	0	165	0 m	0	0	1	0	2	1	1	1	0	1	0	0	0
C-34	Circle St.	825	0	800	25	0	70	10	25	30	5	0	0	30,000	12	6	18	400	10 m	1	0	1	0	2	1	0	1	1	1	0	0	0
C-35	No. 79	470	0	450	20	0	57	3	30	16	8	0	0	24,000	15	4	19	450	4 m	1	0	1	0	2	1	1	1	1	1	0	0	0
C-36	No. 79	1,370	0	1,350	20	0	61	10	25	20	6	0	8,160	24,000	15	4	19	430	3 m	1	0	1	0	2	1	1	1	1	1	0	0	0
C-37	No. 79	360	0	360	0	0	70	5	35	30	0	0	8,160	0	15	4	19	45	0 m	0	0	1	0	2	1	0	1	1	1	1	0	0
C-38	No. 64	300	100	200	0	0	143	8	90	35	10	0	10,500	0	12	6	18	400	0.25 m	0	1	1	0	2	1	0	1	1	0	0	0	0
C-39	No. 64	210	90	100	20	0	90	10	30	30	20	0	8,160	24,000	12	6	18	400	1 m	0	1	1	0	2	1	1	1	1	1	1	0	0
C-40	No. 64	645	45	600	0	0	75	5	25	45	0	0	8,160	0	12	6	18	25	-	0	1	1	0	2	1	1	1	1	0	0	0	0

Table-2 Results of social Condition Survey (7/9)

Serial Number	Location (Village)			Installation of water meter				Condition of Toilet				Sanitary Condition			Interviewer		
		Increase of Water Consumption	Ratio of Increase of Water Consumption	Acceptance of Installation of Water Meter (1)	Acceptance of Installation of Water Meter (2)	Contribution for Water Meter	Water Supply Charge according to Water Meter	with or without Toilet in your home	If no, what kind of toilet do you use?	If yes, what kind of treatment facilities do you have?	Where is wastewater from toilet discharged?	Contract of Diarrhea Diseases during this year	How many persons contracted the diseases?	How much did you pay for medical examination and medicine?	Economic condition	Environmental condition	Hygienic condition
A-01	No. 62	1	1	1	1	1,000	1	1	0	5	0	2	0	0	2	2	2
A-02	No.62	1	1	1	1	3,000	1	1	0	2	2	2	0	0	–	–	–
A-03	No.61	1	1	1	1	2,000	1	1	0	2	2	2	0	0	2	2	2
A-04	No.61	1	1	1	1	2,000	1	1	0	2 & 5	2	2	0	0	2	1	1
A-05	No.61	1	1	1	1	2,000	1	1	0	5	0	2	0	0	1	2	2
A-06	No.61	1	1	1	1	2,000	1	1	0	5	0	2	0	0	2	2	2
A-07	No.61	1	1	1	1	2,000	1	1	0	5	0	1	6	10,000	2	2	2
A-08	No.61	1	1	1	1	2,000	1	1	0	2	2	1	2	5,000	2	1	1
A-09	No.60	1	1	1	1	2,000	1	1	0	5	0	2	0	0	2	2	2
A-10	No.60	1	1	0	0	0	1	1	0	2	2	2	0	0	2	2	2
A-11	No.59	1	1	0	0	0	1	1	0	5	0	2	0	0	2	2	2
A-12	No.59	1	1	0	0	0	1	1	0	5	0	2	0	0	2	2	2
A-13	No.59	1	1	0	0	0	1	1	0	5	0	2	0	0	2	3	3
A-14	No.59	1	1	0	0	0	1	1	0	5	0	2	0	0	2	2	1
A-15	No.59	1	1	1	1	2,000	1	1	0	5	0	2	0	0	2	1	1
A-16	No.59	1	1	1	1	2,000	1	1	0	5	0	2	0	0	–	–	–
A-17	No.58	1	1	1	1	2,000	1	1	0	5	0	2	0	0	2	2	2
A-18	No.58	1	1	0	0	0	1	1	0	5	0	2	0	0	2	2	2
A-19	No.58	1	1	0	0	0	1	1	0	5	0	2	0	0	2	1	1
A-27	No.51	1	1	1	1	0	1	1	0	2 & 5	2	2	0	0	1	1	1
A-28	No.51	1	1	1	1	0	1	1	0	5	0	1	2	0	2	3	3
A-29	No.51	–	–	1	1	–	1	1	0	5	0	2	0	0	2	2	2
A-30	No.51	1	1	1	1	1,000	1	1	0	5	0	2	0	0	2	3	3
A-31	No.51	1	1	1	1	5,000	1	1	0	5	0	2	0	0	2	1	2
A-32	No.51	1	2	1	1	0	1	1	0	5	0	2	0	0	2	3	3
A-33	No.52	1	2	0	0	0	2	1	0	2 & 5	2	2	0	0	–	–	–
A-34	No.52	1	1	1	1	–	1	1	0	5	0	1	2	5,000	2	1	1
A-35	No.52	2	0	0	0	0	1	1	0	2	2	2	0	0	2	2	2
A-36	No.53	2	0	1	1	–	1	1	0	5	2	1	5	–	2	1	1
A-37	No.53	1	1	1	1	2,000	1	1	0	5	0	2	0	0	2	2	2
A-38	No.54	2	0	1	1	don't know	1	1	0	2 & 5	2	2	0	0	1	1	1
A-39	No.54	1	1	1	1	don't know	1	1	0	5	0	2	0	0	3	3	3
A-40	No.54	2	0	2	2	0	2	1	0	2 & 5	2	2	0	0	2	2	3
B-01	No.67	1	1	0	1	0	1	1	0	2 & 5	2	1	4	500	2	2	2
B-02	No.67	1	1	1	1	Don't know	1	1	0	2	2	2	0	0	2	1	1
B-03	No.67	1	1	1	1	1,000	1	1	0	5	0	2	0	0	2	2	2
B-04	No.67	1	1	1	1	5,000	1	1	0	5	0	1	2	1,000	2	2	2
B-05	No.67	1	2	2	2	0	2	1	0	2 & 5	2	1	2	7,000	2	2	2

Table-2 Results of social Condition Survey (8/9)

Serial Number	Location (Village)			Installation of water meter				Condition of Toilet				Sanitary Condition			Interviewer		
		Increase of Water Consumption	Ratio of Increase of Water Consumption	Acceptance of Installation of Water Meter (1)	Acceptance of Installation of Water Meter (2)	Contribution for Water Meter	Water Supply Charge according to Water Meter	with or without Toilet in your home	If no, what kind of toilet do you use?	If yes, what kind of treatment facilities do you have?	Where is wastewater from toilet discharged?	Contract of Diarrhea Diseases during this year	How many persons contracted the diseases?	How much did you pay for medical examination and medicine?	Economic condition	Environmental condition	Hygienic condition
B-06	No.67	2	0	0	0	0	1	1	0	2	2	2	0	0	2	1	1
B-07	No.67	1	1	1	1	Don't know	1	1	0	5	0	2	0	0	2	2	2
B-08	No.75	1	1	1	1	5,000	1	1	0	5	0	2	0	0	2	3	3
B-09	No.75	1	1	1	1	Don't know	1	1	0	2	2	2	0	0	–	–	–
B-10	No.73	1	1	1	1	5,000	1	1	0	2	2	2	0	0	2	1	1
B-11	No.73	1	1	1	1	5,000	1	1	0	5	0	2	0	0	2	2	2
B-12	No.72	1	1	1	1	1,000	1	1	0	5	0	2	0	0	2	2	2
B-13	No.72	1	1	1	1	2,000	1	1	0	5	0	2	0	0	2	2	2
B-14	No.68	1	1	0	0	0	1	1	0	5	0	2	0	0	3	3	3
B-15	No.68	1	1	1	1	1,000	1	1	0	2 & 5	2	2	0	0	2	2	2
B-16	No.68	1	1	1	1	–	1	1	0	2 & 5	2	2	0	0	3	2	2
B-17	No.68	1	1	1	1	2,000	1	1	0	5	0	1	1	1,000	2	2	2
B-18	No.68	1	1	1	1	2,000	1	1	0	5	0	2	0	0	2	2	2
B-19	No.68	1	1	1	1	–	1	1	0	2 & 5	2	2	0	0	2	2	2
B-20	No.68	1	1	1	1	1,000	1	1	0	5	0	2	0	0	3	2	2
B-21	Corriverton	2	0	1	1	2,000	1	1	0	2	2	2	0	0	2	1	1
B-22	Corriverton	1	1	2	1	0	2	1	0	2	2	2	0	0	1	1	1
B-23	Corriverton	–	–	1	1	2,000	1	1	0	2	2	2	0	0	2	2	2
B-24	No.65	1	1	0	0	0	1	1	0	2 & 5	2	2	0	0	2	2	2
B-25	No.64	1	1	0	0	0	1	1	0	2 & 5	2	2	0	0	2	1	1
B-26	No.64	1	1	0	0	0	1	1	0	5	0	2	0	0	2	2	2
B-27	No.65	1	1	0	0	0	1	1	0	2 & 5	2	2	0	0	2	2	2
B-28	No.65	1	1	0	0	0	1	1	0	2	2	2	0	0	2	2	2
B-29	No.65	1	1	1	1	2,000	1	1	0	5	0	1	1	2,000	2	3	3
B-30	No.65	1	1	1	1	1,000	1	1	0	2 & 5	2	1	2	5,000	2	2	2
B-31	No.65	1	2	1	1	1,000	1	1	0	5	0	2	0	0	3	2	2
B-32	No.65	1	1	1	1	1,000	1	1	0	2 & 5	2	2	0	0	2	1	1
C-01	SpringLand	2	0	2	2	0	2	1	0	5	0	2	0	0	2	2	1
C-02	Crabwood Creek	2	0	1	1	1,000	1	1	0	2	2	2	0	0	2	1	1
C-03	Crabwood Creek	2	0	2	1	1,000	1	1	0	2	2	2	0	0	2	1	1
C-04	Jackson Creek	2	0	2	2	0	1	1	0	2	2	2	0	0	2	1	1
C-05	Crabwood Creek	2	0	2	2	1,500	1	1	0	2	2	2	0	0	2	1	1
C-06	Jackson Creek	2	0	1	1	1,000	1	1	0	5	0	2	0	0	2	2	2
C-07	Jackson Creek	2	0	2	1	800	1	1	0	5	0	2	0	0	2	1	1
C-08	Line Path	2	0	1	1	1,000	1	1	0	2	2	1	1	public	2	1	1

Table-2 Results of social Condition Survey (9/9)

Serial Number	Location (Village)			Installation of water meter				Condition of Toilet				Sanitary Condition			Interviewer		
		Increase of Water Consumption	Ratio of Increase of Water Consumption	Acceptance of Installation of Water Meter (1)	Acceptance of Installation of Water Meter (2)	Contribution for Water Meter	Water Supply Charge according to Water Meter	with or without Toilet in your home	If no, what kind of toilet do you use?	If yes, what kind of treatment facilities do you have?	Where is wastewater from toilet discharged?	Contract of Diarrhea Diseases during this year	How many persons contracted the diseases?	How much did you pay for medical examination and medicine?	Economic condition	Environmental condition	Hygienic condition
C-09	Line Path	2	0	2	1	1,500	1	1	0	2	2	2	0	0	2	1	1
C-10		2	0	2	1	1,500	1	1	0	5	0	1	2	4,500	2	1	1
C-11	SpringLand	2	0	1	1	0	1	1	0	2	2	1	2	6,000	2	2	2
C-12	Line Path	2	0	2	1	800	1	1	0	5	0	2	0	0	2	2	3
C-13	SpringLand	2	0	1	1	0	1	1	0	2	2	2	0	0	2	1	2
C-14	No. 77	2	0	2	1	0	1	1	0	5	0	2	0	0	2	2	2
C-15	Corrierton	2	0	2	1	800	1	1	0	2 & 5	2	2	0	0	2	1	1
C-16	No. 78	1	2	2	1	1,000	1	1	0	5	0	1	3	Public	2	2	2
C-17	No. 78	2	0	2	1	1,000	2	1	0	2	2	2	0	0	2	2	2
C-18	Queenstown	2	0	2	1	0	2	1	0	5	0	2	0	0	2	2	2
C-19	Queenstown	2	0	2	2	0	2	1	0	5	0	2	0	0	2	2	2
C-20	Kingstown	2	0	2	1	800	1	1	0	2 & 5	2	2	0	0	2	2	2
C-21	Queenstown	2	0	2	1	1,500	1	1	0	2	2	2	0	0	2	2	2
C-22	Moleson Creek	2	0	1	1	1,000	1	1	0	2	2	2	0	0	2	1	1
C-23	Jackson Creek	2	0	2	1	1,000	1	1	0	5	0	2	0	0	2	2	2
C-24	Line Path	2	0	2	2	0	2	1	0	2 & 5	2	1	2	public	2	2	2
C-25	Line Path	1	2	1	1	1,500	1	1	0	2	2	2	0	0	2	2	2
C-26	Line Path	2	0	2	1	300	1	1	0	2	2	1	1	public	2	2	2
C-27	Line Path	2	0	1	1	1,000	1	1	0	5	0	2	0	0	2	2	2
C-28	Line Path	2	0	2	1	1,000	1	1	0	5	0	2	0	0	2	2	2
C-29	Line Path	2	0	2	2	0	2	1	0	5	0	2	0	0	2	2	2
C-30	No. 77	2	0	2	2	0	2	1	0	5	0	1	2	6,000	2	2	2
C-31	Line Path	2	0	2	2	0	2	1	0	5	0	1	2	public	2	2	2
C-32	Area C	2	0	2	1	500	1	1	0	5	0	1	6	24,000	2	2	2
C-33	skeldon	2	0	2	1	0	1	1	0	5	0	2	0	0	2	2	2
C-34	Circle St.	2	0	2	2	0	2	1	0	2	2	1	1	public	2	2	3
C-35	No. 79	1	-	1	1	1,000	1	1	0	2	2	1	4	0	2	2	2
C-36	No. 79	2	0	2	1	1,000	1	1	0	5	0	1	3	9,000	2	2	2
C-37	No. 79	2	0	2	1	0	1	1	0	5	0	1	2	public	2	2	2
C-38	No. 64	1	2	1	1	1,000	1	1	0	2 & 5	2	2	0	0	2	2	2
C-39	No. 64	2	0	2	1	1,000	1	1	0	2 & 5	2	1	2	0	2	2	2
C-40	No. 64	2	0	2	2	0	2	1	0	5	0	1	1	0	2	2	2

Attachment 10: Result of Iron Bacteria Teat

It was confirmed that water from the water source wells contains high concentration of iron, exceeding WHO criteria (0.3 mg/l). The Project will include iron removal treatment to make the water acceptable by reducing the iron concentration below WHP criteria.

There are two iron removal methods as below:

i) Removal by sedimentation and/or filtration of insoluble iron after oxidizing soluble ferrous compounds by aeration or oxidants to insoluble ferric compounds.

ii) Biological removal by iron bacteria developed on the slow sand filtration media.

Method i) has been adopted in the existing GWI's WTPs. The study intended to adopt method ii) while it has not been applied in Guyana, because of its expected advantage to reduce the operation cost and to ease the maintenance works. However, it was necessary to adopt this method that there exist iron bacteria in water. This test was conducted to confirm the existence of iron bacteria.

The test was carried out by setting up a simplified slow sand filter (also refer to photo 4) shown below in the Benab well. After setting up, well water is introduced continuously and change of surface conditions of the sand media was observed visually. Colour change of the surface to yellow or brown was observed after 3, 4 days. After 1 week, sand surface was scraped as a sample and brought to Japan for the microscopic observation.

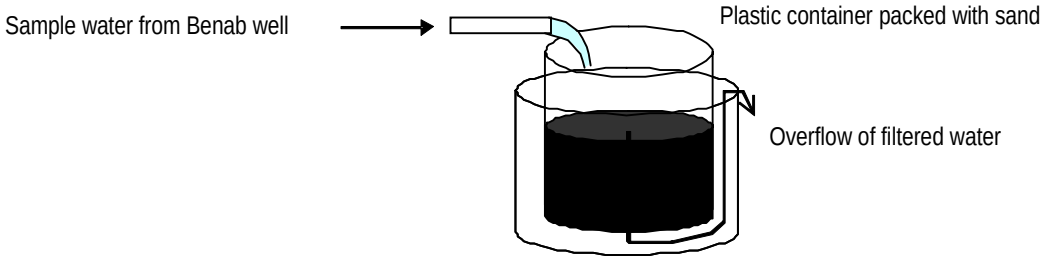


Figure 1 Simplified Slow Sand Filter for Iron Bacteria Test

As results of the microscopic observation, following three kinds of iron bacteria were identified:

Siderocapsa: dominant species

cf. Leptothrix sp.:

cf. GAllionella ferruginea:

Photo 1: Siderocapsa

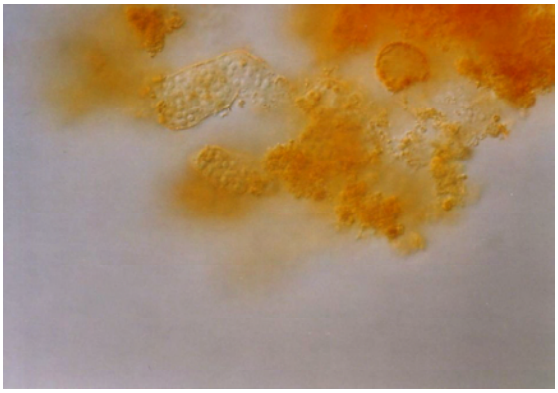


Photo 2: Leptothrix sp.

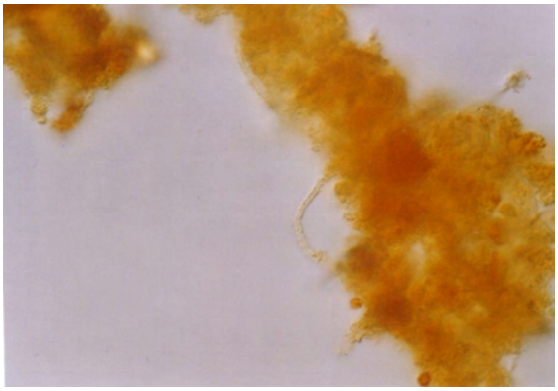


Photo 3: GAllionella ferruginea

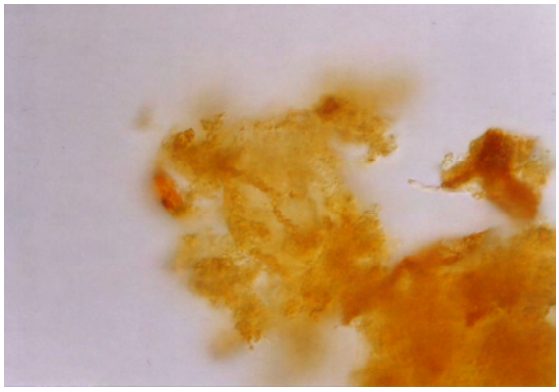


Photo 4: Simplified slow sand filter

Attachment 11: References

No.	Title of Reference	Publisher
1	GWI Metered Customer Consumption Analysis (Draft)	GWI / Horn
2	Updated Station Consumption Report 2005	GWI
3	Survey Results of Hydraulic Pressure Level at the Service Point (November, 2005)	GWI, Division 5
4	GWI Leakage Control Strategy	GWI, Mr. Altaf
5	Employee Training Programmes	Mr. Gafoor, GWI
6	Planned prgogrammes-2006	Mr. Gafoor, GWI
7	Meteorological Data	Ministry of Agriculture
8	Report of Geo-Technical Survey	Ground Structures Engineering Consultant Inc.
9	No. 75 & Spring Garden	DIMTECS
10	Site Selection Study New Sugar Factory, Skeldon North, June 1999	GUYSUCO Ground Structures Engineering Consultants LTD
11	Geotecnical Investigation Recontruction of New Amusterdam Hospital	Ground Structures Engineering Consultant Inc.
12	Scoping Study of Presence of Pesticides in Drainage Canal Sediments and Drain water in Guyana's Regions 3 and 6 Sep. 10, 2004	Guyana Ministry of Agriculture
13	List of Agricultural Chemicals for Guyana Suger Corporation Inc.	Guyana Sugar Corporation Inc.
14	Results of Bacterial Test	GWI
15	The Law of Guyana, National insurance and social security	Gvernment of Guyana
16	Topographical map	Government of Guyana 1987
17	City planning map (Region 6, 1 :250,000, 13 sheets)	GLSC
18	Geological map	L Heesterman Jone, 2005
19	Contract for Rosehall Water Supply Rehabilitation Project (Work Lot I)	GWI, Division 5
20	Georgetown Water and Sewerage Master Plan	HALCROW Ltd.
21	2004 Capital Investiment Programs	GWI
22	GWI Water Quality Statistics KH queries 3	GWI, Mr. Altaf
23	Interim Guidelines for Industrial effluent discharge into the environment	Guyana National Bureau of Standards