ANNEX 12

FORMS AND RESULS OF QUESTIONNAIRE SUREVEY

Questionnaire (**Connected**) / Socio-Economic Survey
The Study on Vientiane Water Supply Development Project

1. Questionnaire Form

For

Households, which already connected to water supply services

Interviewers Name: _____ Date of Interview: _____

Survey Area: ☐around Chinamimo T.P. ☐around Kaolieo T.P. ☐central part of the City ☐Dondok area

Living Address: _____

Responded Family Name: _____

Sex of Respondent: _____ Age of Respondent: _____

Sex of Household Head: _____ Age of Household Head: _____

Duration of living in this area: Year/Month Duration of living in current house/apartment: Year/Month

Marital Status of Household Head: ☐Married ☐Single/never married ☐Widow Divorced ☐Separated

Relationship of Respondent to Household Head: _____

Housing Ownership: ☐Owns a house ☐Rent a house ☐Owns an apartment ☐Rent an apartment

① Water Supply and Use

a. Is water always available, every day, 24 hours?

☐ Yes ☐ No, only _____ : _____ ～ _____ : _____ available

b. Is quantity and pressure enough?

☐ Yes No ☐Quantity is not enough ☐Pressure is not enough

c. Do you have any problem concerning water quality? Any smell, turbidity, colour?

☐No Yes ☐Smell ☐Turbidity ☐Colour

d. Do you reserve water in your house?

☐Yes (go to d-y) ☐No (go to e)

d-y. How do you reserve the water? May I see it? (Multiple Answer)

Way of reserve:

☐ Plastic container Capacity:_____m^3 ×_____ (Number)

☐ Bucket Capacity:_____m^3 ×_____ (Number)

☐ Plastic Tank Capacity:_____m^3 ×_____ (Number)

☐ Drum Capacity:_____m^3 ×_____ (Number)

☐ Bath tub Capacity:_____m^3 ×_____ (Number)

☐ Others (Specify) _____ Capacity:_____m^3 ×_____ (Number)

e. For which purposes followed do you use the water from public water supply service? (Multiple Answer)

【Interviewer shall ask the following one by one, and tick off.】

☐Drinking ☐Cooking ☐Washing Dishes ☐Washing Clothes ☐Washing Bicycle/Motor Bike/Car

☐Bathing ☐Flushing Toilet ☐Irrigating Garden ☐Irrigating Farmland (crops)

☐Business (specify:_____) ☐Others (specify:_____)

f. For which purpose do you use water from other sources? (Multiple Answer)

【Interviewer shall ask the following one by one, and tick off & put code below for source】

Purpose	Source	Purpose	Source
☐ Drinking		☐ Flushing toilet	
☐ Cooking		☐ Irrigating garden	
☐ Washing Dishes		☐ Irrigating farmland	
☐ Washing Clothes		☐ Business (specify:)	
☐ Washing Bicycle/Motor Bike /Car		☐ Others (specify:)	
☐ Bathing		☐	

Source:

a=tube well / borehole with pump, b=protected dug well, protected spring, c=bottled water,, d=rain water collection, e=unprotected dug well or spring, f=pound, river, stream, g=tanker, truck, vender, h=Public service through neighbour, I=others (specify)

g. Do you buy any bottled water?

☐Yes (go to g-y1) ☐No (go to h)

g-y1. How much do you pay for bottled water per day/month?

_____Kip. per day

_____Kip. per month

g-y2. How much bottled water do you use per day/month

_____Litre / m^3 per day

_____Litre / m^3 per month

g-y3. Why do you buy the bottled water though you can get public water supply service? (Multiple Answer)

【Question shall be opened, tick off the following answered】

☐ Since it is safe	☐ Since the public water supply is not enough
☐ Since it is tasty	☐ Since I feel well-off / it is fashionable
☐ Since it is cheap	☐ Others (specify)

h. Do you have any wells?

☐Yes (go to h-y1,2.3,4) ☐No (go to I)

h-y1. If "Yes", check size of the well.

Diameter_____mm Depth_____m

h-y2. How much did it cost for installation of well?

_____Kip ☐ I do not know

h-y3. How much do you pay in average for operation and maintenance per month?

_____Kip

_____Kip (for electricity, if interviewee know)

h-y4. How much water do you use from well per day/month?

_____m^3 per day _____m^3 per month

i. How much water from public water supply services does your family use per day / month?

_____m^3 per day _____m^3 per month

i-1. How much do you pay for public water supply per month?

_____Kip per month

i-2. Do you think it is expensive?

☐Very expensive ☐Expensive ☐Fair ☐Cheap ☐Very cheap

i-3. In case of expensive or cheap in the question above, how much water charge is desirable for your water consumption?

_____Kip per month (in case of expensive)

_____Kip per month (in case of cheap)

j. How much water from other source (including bottled water and well) does your family use per day / month?

_____m^3 per day _____m^3 per month

k-1. Do you pay for water from other sources (including bottled water and well)? If "Yes", how much do you pay?

☐ Yes ☐ No

_____Kip per month

k-2. Do you think it is expensive?

☐Very expensive ☐Expensive ☐Fair ☐Cheap ☐Very cheap

l. Are there any positive change on your life style after connecting water supply services?

☐Yes (go to l-y) ☐No (go to m)

l-y: How it changed? 【Question shall be opened, tick off the following answered】

☐	Sanitation and Hygiene condition is improved	☐	Water is available regardless of time
☐	Time and burden to obtain water is consumed	☐	Cost to buy water is reduced
☐	Medical expense is decreased	☐	Opportunity to learn/work is increased
☐	Others (specify)		

m. Are you save water from public water supply service?

☐Yes (go to m-y) ☐No (go to m-n)

m-y. Why do you save water from public water supply service? (Multiple Answer)

【Question shall be opened, tick off the following answered.】

☐	Since water is common and limited resource	☐	Due to publicity for water conservation
☐	Since water rate is expensive/ to save expenditure for water	☐	Without any reason
☐	Others, Specify:		

m-n. Why you do not save water from public water supply service? (Multiple Answer)

【Question shall be opened, tick off the following answered.】

☐	Since water is plenty	☐	Since water supply is irregular, water tap shall be kept always open
☐	Since water rate is cheap	☐	Since it is safe
☐	Since only limited amount is used	☐	Without any reason
☐	Others, Specify:		

n. What do you think the most important in water supply among the following?

【Two (2) answers form the following shall be selected by interviewee】

☐	That water quality/taste is good	☐	That amount of water and pressure is enough
☐	That water rate is cheap	☐	That water is always supplied enough without cut-off and low pressure
☐	Others, Specify:		

o. Do you have any complain with current public water supply services?

☐Yes (go to o-y) ☐No (go to p)

o-y. If “Yes”, what kind of complain? (Multiple Answer)

【Question shall be opened, tick off the followings answered】

☐ Current operation hours of the water supply	☐ Manner of billing
☐ Quantity and pressure	☐ Manner of notice
☐ Quality of water supplied	☐ Manner of public relations
☐ Manner in which claims are treated	☐ Services at the pay office
☐ Manner in which defects are repaired	☐ Amount paid
☐ Others (specify)	

p. Do you have any request for improvement of water supply services?

☐Yes (go to p-y) ☐No (go to q)

p-y. If “Yes”, what kind of services/issues to be improved?

【Question shall be opened, tick off the followings answered】

☐ Current operation hours of the water supply	☐ Manner of billing
☐ Quantity and pressure	☐ Manner of notice
☐ Quality of water supplied	☐ Manner of public relations
☐ Manner in which claims are treated	☐ Services at the pay office
☐ Manner in which defects are repaired	☐ Amount paid
☐ Others (specify)	

q. Do you want much improved public water supply service, even if current water rate is increased?

☐ I am satisfying current service and rate	☐ No, even if it is reasonable raise
☐ Yes, if it is reasonable raise	☐ No, if it is steep raise
☐ Yes, even if it is steep raise	☐ I do not know

r. On a scale of 1-5, how do you rate the following issues of public water supply services?

1=Very Good, 2=Good, 3=Fair, 4=Bad, 5=Very Bad, 6=I do not know

Issues	Rate	Issues	Rate
Current operation hours of the water supply		Manner of billing	
Quantity and pressure		Manner of notice	
Quality of water supplied		Manner of public relations	
Manner in which claims are treated		Services at the pay office	
Manner in which defects are repaired		Amount paid	

s. What do you want to know about water supply management?

【Three (3) answers shall be selected from the following by interviewee】

☐ How water rate is decided (rate setting)	☐ How the water rate collected is utilized
☐ Water quality control	☐ Extension, rehabilitation plan
☐ Financial status of water providing organization/company (Financial Management)	
☐ What is water source, how the water treated, transmitted, and distributed	
☐ How the water business is run (business management)	☐ When and where the water supply is cut-off
☐ Others, Specify	

② Sanitary Condition

a. Is frequency of diarrhoea decreased after having water supply services?

☐Yes ☐No ☐No Change/I do not know

b. What kind of toilet do you use? Do you have problem on your toilet? May I see it?

The type of toilet:

☐ Flush toilet to sewage or septic tank ☐ Por flush toilet

☐ Dry/Traditional pit latrine ☐ None

☐ Others (specify)_____

☐No problem

☐Yes, I have problem in:

☐Drainage ☐Septic Tank ☐Water for flushing ☐Vermin ☐Smell

☐Others (specify) _____

☐Possible to see ☐Impossible to see

c. How often do you withdraw sludge from the toilet? Who usually do this work? How much do you pay for the withdrawing?

_____times per_____

The person/the organization/the company doing that work is_____

I pay Kip_____per time

d. When you get sick, how much does your family spend for doctor inspection and medicine per year in average? How much does your family spend for doctor inspection and medicines per month in average for disease relating water?

Total_____Kip. per year per family in average

Water relating_____ Kip. per month per family in average

e. Do your children have hygienic education at their school?

☐Yes ☐No ☐I don not know

③ Community

a. Do you know which government has jurisdiction of public water supply service?

☐Yes ☐No

If "Yes", organization _____

b. Do you know the process where does it get water for public water supply service from, how to treat it and how to distribute it?

☐Yes ☐No

c. Do you know the basic principle that almost of all the cost for running public water supply services shall be covered by the user fee collected?

【Answer shall be selected from the followings by interviewee】

☐Yes ☐No

☐I thought the half to be covered by tax/government

☐I thought the most to be covered by tax/government

d. Are there any in-house/yard leakage, or pipe/tap always opened or broken, at present?

☐ Yes (go to d-y) ☐ No (go to e)

d-y. Why do not you fix it?

Since water rate is cheap	Since it shall be responsible of NPV
Since it leaks only a little	Since water supply is irregular / limited (in night)

e What do you think the role and responsibility of users for use of public water supply services.

【Multiple Answer: Answer shall be selected from the followings by interviewee】

☐ Paying connection fee	☐ Paying water bill
☐ Repairing in-house/yard leakage from pipeline	☐ Cleaning of drainage near house
☐ Others (specify)	

f. Are there any residents' organizations concerning water (including water supply services)? If there are, what kind of activities are they doing?

☐Yes ☐No

If "Yes",

Organization:_____

Activities: _____

_____

g. Are there any private water vender? Have you ever bought water from them?

☐Yes ☐No

If "Yes", ☐I have frequently bought ☐ I have sometime bought ☐I have not bought

④ Family Status

a. How many persons usually live in your household?

Adult men_____ Adult women_____

Own children_____ Other children_____ Total_____

b. What are the occupations of the members earning money?

☐ Company employee ☐ Public employee ☐ Waged labour/worker

☐ Self-employed ☐ Farmer/Fisher ☐ Employer

☐ Others (specify) _____

c. How much is your family income per month in average?

_____Kip per month

d. Do you pay for house rent? How much do you pay?

☐Yes ☐No

If "Yes", _____Kip per month

e. How much do you pay for public electronic supply per month? Do you think it is expensive?

_____ Kip per month

☐Very expensive ☐Expensive ☐Fair ☐Cheap ☐Very cheap

f. What do you have among the following items? (Multiple Answer)

☐Television ☐Radio/Cassette player ☐ Refrigerator ☐Electric cooker ☐Motorbike ☐Car

Questionnaire (**not connected**)/ Socio-Economic Survey
The Study on Vientiane Water Supply Development Project

2. Questionnaire Form

For

Households, which are not connected to water supply services

Interviewers Name: _____ Date of Interview: _____

Survey Area: ☐around Chinamimo T.P. ☐around Kaolieo T.P. ☐central part of the City ☐Dondok area ☐future service area

Living Address: _____

Responded Family Name: _____

Sex of Respondent: _____ Age of Respondent: _____

Sex of Household Head: _____ Age of Household Head: _____

Duration of living in this area: Year/Month Duration of living in current house/apartment: Year/Month

Marital Status of Household Head: ☐Married ☐Single/never married ☐Widow Divorced ☐Separated

Relationship of Respondent to Household Head: _____

Housing Ownership: ☐Owns a house ☐Rent a house ☐Owns an apartment ☐Rent an apartment

② Water Supply and Use

a. What is major source of water to use in your house?

☐water vender ☐bottled water ☐protected dug well/spring ☐unprotected dug well/spring ☐tube well/borehole with pump ☐river, pound, stream ☐rain water ☐public service through neighbour ☐others (specify) _____

b. Is quantity enough?

☐ Yes ☐No

c. Do you have any problem concerning water quality? Any smell, turbidity, colour?

☐No Yes ☐Smell ☐Turbidity ☐Colour

d. Do you reserve water in your house?

☐Yes (go to d-y) ☐No (go to e)

d-y. How do you reserve the water? May I see it?

Way of reserve:

☐ Plastic container Capacity:_____m^3 ×_____ (Number)

☐ Bucket Capacity:_____m^3 ×_____ (Number)

☐ Plastic Tank Capacity:_____m^3 ×_____ (Number)

☐ Drum Capacity:_____m^3 ×_____ (Number)

☐ Bath tub Capacity:_____m^3 ×_____ (Number)

☐ Others (Specify) _____ Capacity:_____m^3 ×_____ (Number)

e. How long does it take to carry water for major use to your house? Who is carrying mainly and how many times a day he/she carrying?

It takes_____hours_____minutes per time

_____Is carrying mainly_____times a day

f. For which purpose do you use water from sources? (Multiple Answer)

【Interviewer shall ask the following one by one, and tick off & put code below for source】

Purpose	Source	Purpose	Source
☐ Drinking		☐ Flushing toilet	
☐ Cooking		☐ Irrigating garden	
☐ Washing Dishes		☐ Irrigating farmland	
☐ Washing Clothes		☐ Business (specify:)	
☐ Washing Bicycle/Motor Bike/Car		☐ Others (specify:)	
☐ Bathing			

Source:

a=water vender b=bottled water c=protected dug well/spring d=unprotected dug well/spring e=tube well/borehole with pump f=river, pound, stream g=rain water h=public service through neighbour I=others (specify)

g. Do you buy any bottled water?

☐Yes (go to g-y1) ☐No (go to h)

g-y1. How much do you pay for bottled water per month?

_____Kip. per month

g-y2. How much bottled water do you use per day/month

_____Litre / m^3 per day

_____Litre / m^3 per month

h. Do you have any wells?

☐Yes (go to h-y1,2.3,4) ☐No (go to I)

h-y1. If "Yes", check size of the well.

Diameter_____mm Depth_____m

h-y2. How much did it cost for installation of well?

_____Kip ☐ I do not know

h-y3. How much do you pay in average for operation and maintenance per month?

_____Kip

_____Kip (for electricity, if interviewee knows)

h-y4. How much water do you use from well per day/month?

_____m^3 per day _____m^3 per month

i. How much water (including bottled water) does your family use per day / month?

_____m^3 per day _____m^3 per month

j-1. Do you pay for water (including bottled water)? How much do you pay for water per month?

☐Yes ☐No

_____Kip per month

j-2. Do you think it is expensive?

☐Very expensive ☐Expensive ☐Fair ☐Cheap ☐Very cheap

k. If a water pipe runs near your house, do you want to have water supply service?

☐Yes (go to k-y) ☐No (go to k-n)

k-y. How much can you pay for the new connection?

I can pay Kip_____ for new connection.

k-n. If "No", why is it? (Multiple Answer)

【Question shall be opened, tick off the following answered】

- ☐ Since cost for connection shall be borne by the water agency/government
- ☐ Since water shall be free
- ☐ Since there is alternative water source
- ☐ Since the services might not be reliable
- ☐ Since it is expensive
- ☐ Without any reasons
- ☐ Others (specify) _____

l. If you have water supply service, how much can you pay for it per month?

_____Kip per month

m. Do you know the connection fee of water supply service? Is it possible that you can pay it at once?

☐Yes ☐No

☐If "Yes", I can pay it at once ☐I can not pay it at once

② Sanitary Condition

a. What kind of toilet do you use? Do you have problem on your toilet? May I see it?

The type of toilet:

☐ Flush toilet to sewage or septic tank ☐ Por flush toilet

☐ Dry/Traditional pit latrine ☐ None

☐ Others (specify)_____

☐No problem

☐Yes, I have problem in:

☐Drainage ☐Septic Tank ☐Water for flushing ☐Vermin ☐Smell

☐Others (Specify) _____

☐Possible to see ☐Impossible to see

b. How often do you withdraw sludge from the toilet? Who usually do this work? How much do you pay for the withdrawing?

_____times per_____

The person/the organization/the company doing that work is_____

I pay Kip_____per time

c. Have you ever tried to reuse the sludge as fertilizer?

☐Yes ☐No

d. When you get sick, how much does your family spend for doctor inspection and medicine per year in average? How much does your family spend for doctor inspection and medicines per year in average for disease relating water?

Total_____Kip. per year per family in average

Water relating_____ Kip. per year per family in average

e. Do your children have hygienic education at their school?

☐Yes ☐No ☐I don not know

③ Community

a. Do you know which government has jurisdiction of public water supply service?

☐Yes ☐No

If “Yes”, ask “Which organization?” Then, if it is NPV, tick off correct, if not, incorrect.

☐Correct ☐incorrect

b. Do you know the process where does it get water for public water supply service from, how to treat it and how to distribute it?

☐Yes ☐No

c. Do you know the basic principle that almost of all the cost for running public water supply services shall be covered by the user fee collected? (Multiple Answer)

【Answer shall be selected from the followings by interviewee】

☐Yes ☐No

☐I thought the half to be covered by tax/government

☐I thought the most to be covered by tax/government

d What do you think the role and responsibility of users for use of public water supply services.

【Multiple Answer: Answer shall be selected from the followings by interviewee】

□ Paying connection fee	□ Paying water bill
□ Repairing in-house/yard leakage from pipeline	□ Cleaning of drainage near house
□ Others (specify)	

e. Are there any residents’ organizations concerning water (including water supply services)? If there are, what kind of activities are they doing?

☐Yes ☐No

If “Yes”,

Organization:_____

Activities: _____

_____

e. Are there any private water vender? Have you ever bought water from them?

☐Yes ☐No

If “Yes”, ☐I have frequently bought ☐I have sometime bought ☐I have not bought

④ Family Status

a. How many persons usually live in your household?

Adult men_____ Adult women_____

Own children_____ Other children_____ Total_____

b. What are the occupations of the members earning money?

☐ Company employee ☐ Public employee ☐ Waged labour/worker

☐ Self-employed ☐ Farmer/Fisher ☐ Employer

☐ Others (specify) _____

c. How much is your family income per month in average?

_____Kip per month

d. Do you pay for house rent? How much do you pay?

☐Yes ☐No

If "Yes", _____Kip per month

e. How much do you pay for public electronic supply per month? Do you think it is expensive?

_____ Kip per month

☐Very expensive ☐Expensive ☐Fair ☐Cheap ☐Very cheap

f. What do you have among the following items?

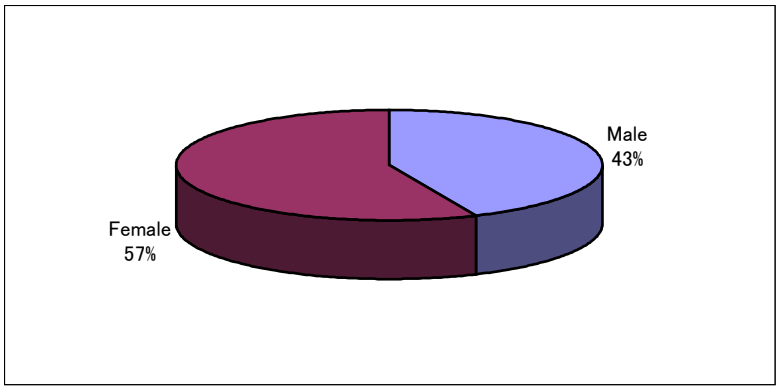
☐Television ☐Radio/Cassette player ☐ Refrigerator ☐Electric cooker ☐Motorbike ☐Car

3. Results and Findings of the Household Survey

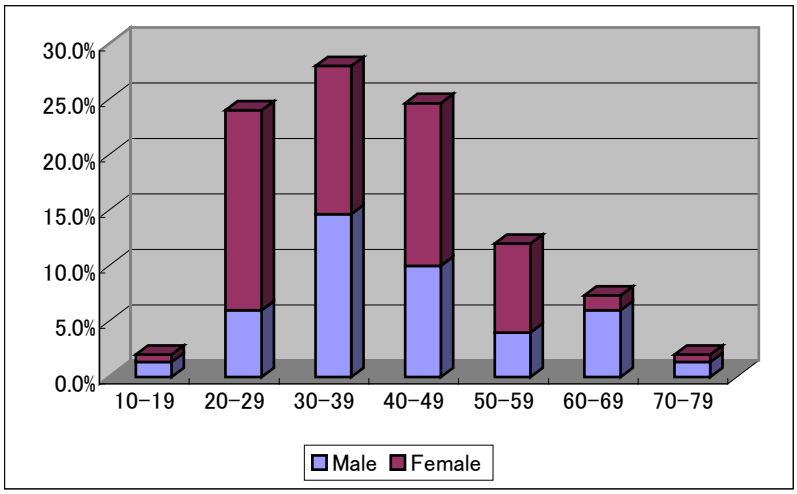
(1) Characteristics of Respondents

Characteristics of 150 respondents (75 for Connected, another 75 for Not-Connected), by age, gender, living duration, and housing ownership, are shown in the figures below:

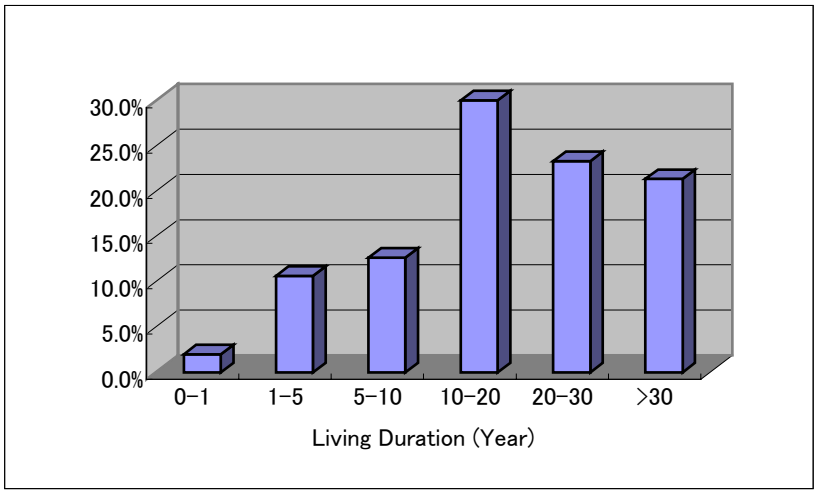
(1) By sex **Figure 3-1 Characteristics of Respondents by Sex**



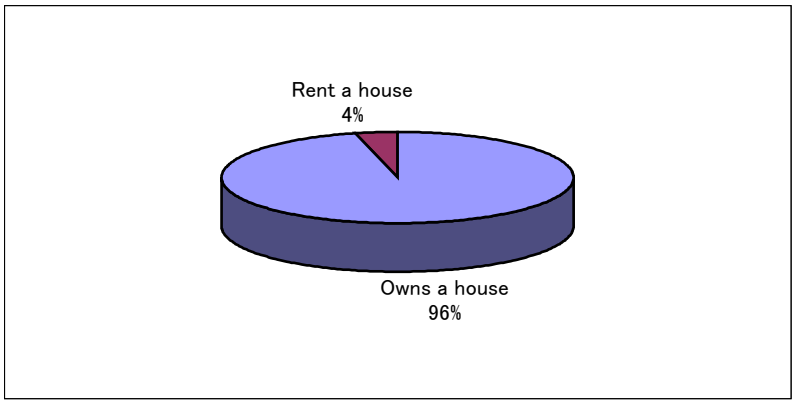
(2) By Age **Figure 3-2 Attributes of Respondents by Age**



(3) By Living Duration **Figure 3-3 Attributes of Respondents by Living Duration**



(4) By Housing Ownership **Figure 3-4 Attributes of Residents by Housing Ownership**

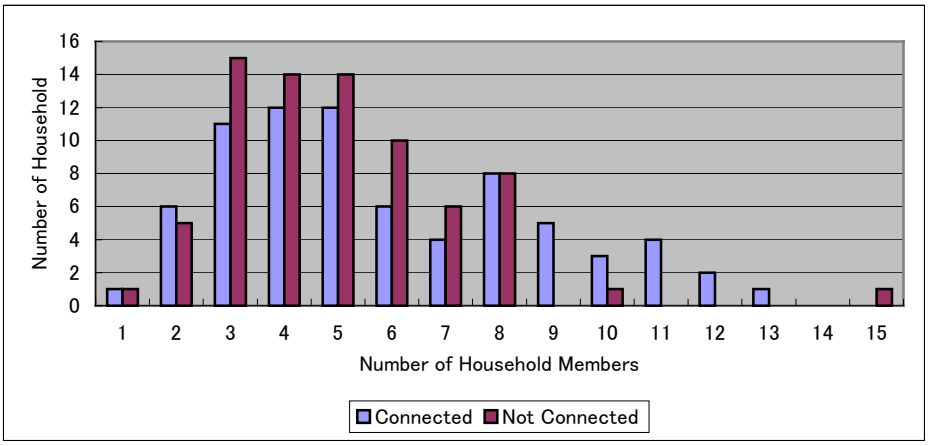


(2) Family Status

1) Household size and Composition

The table below shows the household size of the surveyed area, for both households that are served with a public water supply service (connected), and those that are not served (not connected).

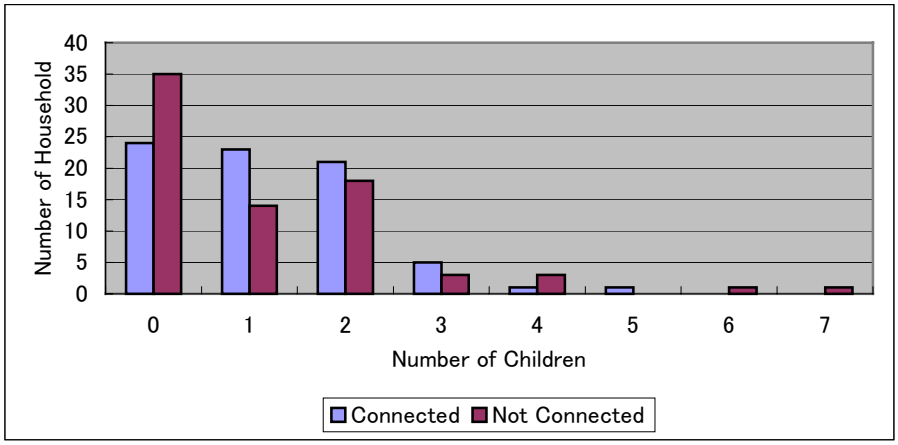
Figure 3-5 Household Size



The average size of household members amounts to 6.41 persons per household throughout the survey area as a whole. In the survey, however, it has been observed that the households that are connected have a slightly larger average size of household members, amounting to 6.84 people, compared to households not connected which averaged 5.97 people. Those average sizes shall be noted when analyzing consumption of water by users, their satisfaction on amount available, and so forth.

The figure below shows the number of children, a child being defined as a person who is under 12 years old. The average number of children in the total surveyed area is 1.15 people per household (1.19 persons in households connected, and 1.12 persons in households not connected).

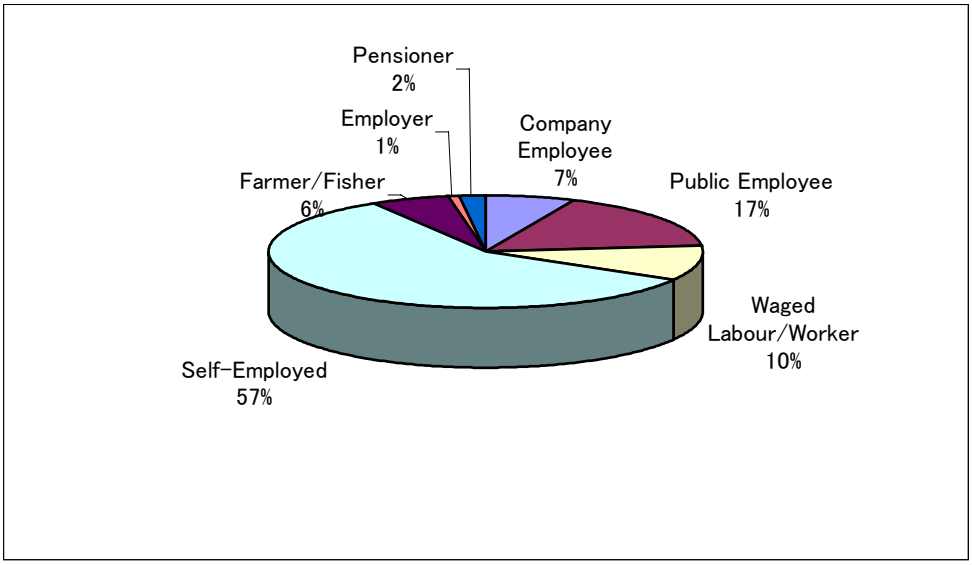
Figure 3-6 Number of Children (under 12 years old)



2) Occupation

"Self employed" is the most predominant (57%) occupation in the surveyed area, followed by public/government employee (17%), waged labourer/worker (10%), and company employee (7%). The following figure shows the occupation of the household head.

Figure 3-7 Occupation of Household Head



3) Income level

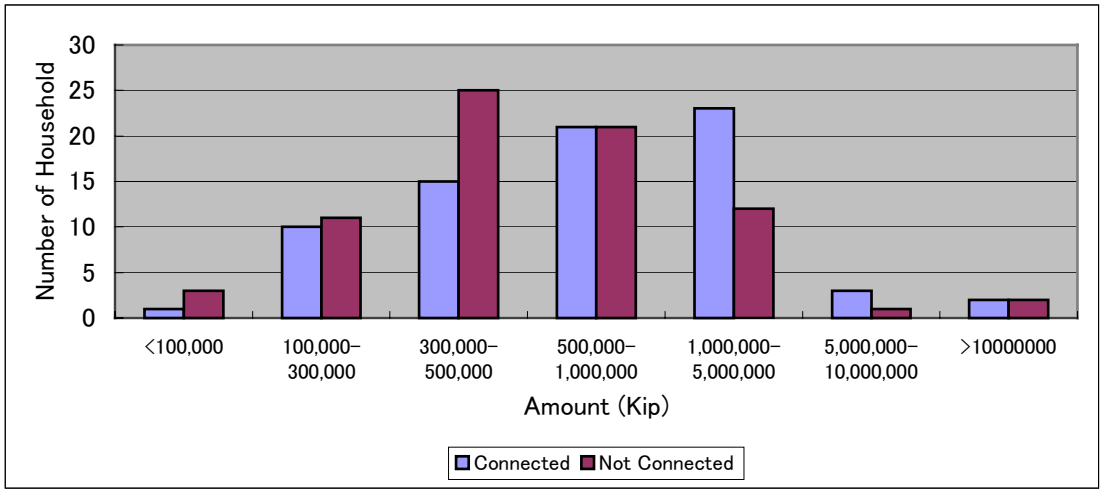
In the survey area as a whole, the comparatively dominant range of average income per month is between 500,000 to 1,000,000 Kip (28.0%), followed by ranges of 300,000-500,000 Kip (26.7%) and 1,000,000-5,000,000 Kip (23.3%). It is observed, however, that the second dominant range of income /month (300,000-500,000 Kip and 1,000,000-5,000,000) has been varied in dominance between households connected to public water supply service and ones not On the one hand, only 20.0 percent of household connected has a salary range of 300,000-500,000 Kip, while 33.3% of households not connected is categorized into the same range. On the other hand, 30.7% of households connected are categorized into the range of 1,000,000-5,000,000 Kip, while only 16.0 % of households not connected remains within the same range.

The following table and figure shows the range variation of income per month.

Table 3-1 Average Income / Household / Month

Average Income / Month (Kip)	Household Connected		Household Not Connected		Total	
	Frequency	%	Frequency	%	Frequency	%
<100,000	1	1.3%	3	4.0%	4	2.7%
100,000-300,000	10	13.3%	11	14.7%	21	14.0%
300,000-500,000	15	20.0%	25	33.3%	40	26.7%
500,000-1,000,000	21	28.0%	21	28.0%	42	28.0%
1,000,000-5,000,000	23	30.7%	12	16.0%	35	23.3%
5,000,000-10,000,000	3	4.0%	1	1.3%	4	2.7%
>10000000	2	2.7%	2	2.7%	4	2.7%
Total	75	100.0%	75	100.0%	150	100.0%

Figure 3-8 Average Income / Household / Month



4) Housing and asset ownership

Most households surveyed (96%) own their own house, while 4 % of households rent their houses. The following table indicates the status of possession of various household assets.

Table 3-2 Housing and Asset Ownership

	Household Connected		Household Not Connected		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Television	73	97.3%	69	92.0%	142	94.7%
Radio/Cassette Player	70	93.3%	65	86.7%	135	90.0%
Refrigerator	73	97.3%	59	78.7%	132	88.0%
Electric Cooker	30	40.0%	24	32.0%	54	36.0%
Motorbike	71	94.7%	53	70.7%	124	82.7%
Vehicle	41	54.7%	12	16.0%	53	35.3%

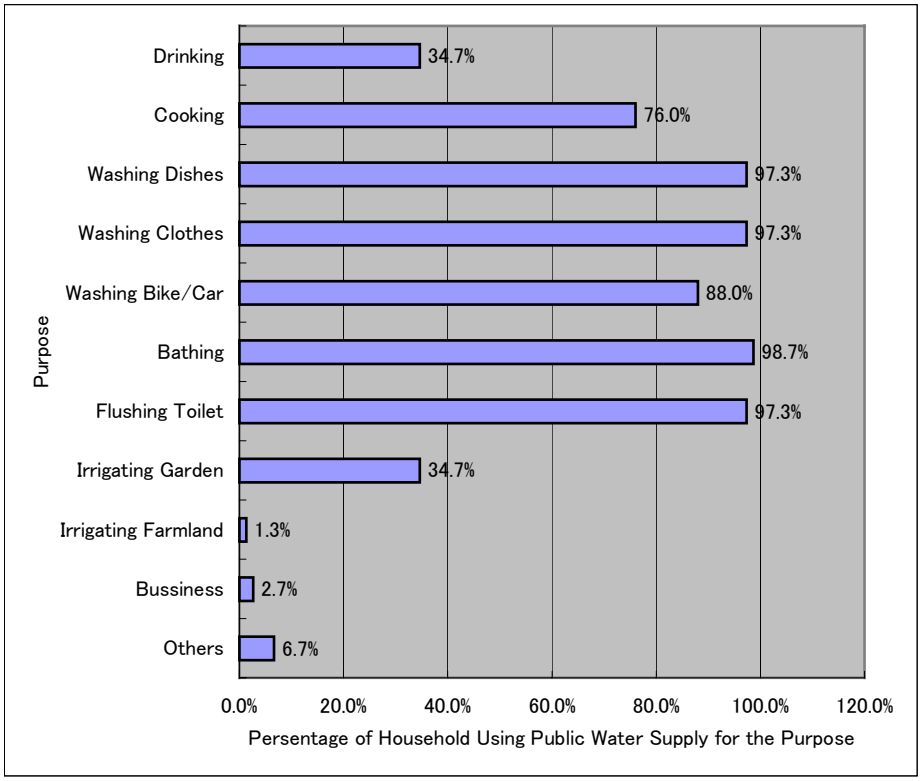
(3) Current Use/Consumption of Water

1) Purpose of Water Use

a) Current purpose for use of public water supply / households connected to public water supply service

Survey results indicates that most households (88% - 98 %) served with public water supply service use the water from the public water service for the purposes of washing dishes, clothes, bike/car, bathing, and flushing the toilet. However, only 34.7 % of connected households utilize the water from the public service for the purpose of drinking, while 76,0 % of connected households uses the water for cooking. The figure below indicates the purposes of using public water supply in connected households. A low degree in percentage of people using the water for drinking could be attributed to the user's dissatisfaction of the water quality, in particular, the smell (chlorine), which is discussed later.

Figure 3-9 Purposes for Using Public Water Supply



b) Use of Other Water Sources in households connected to public water supply service

Use of other water sources for different purposes, in connected households connected is described the table below. The majority of households connected (66.7%) make use of bottled water as the major source of drinking water, while a relatively higher proportion of people (22.7%) utilize bottled water for cooking purposes. There are several cases where connected households also use

protected and/or unprotected wells for a multitude of purposes.

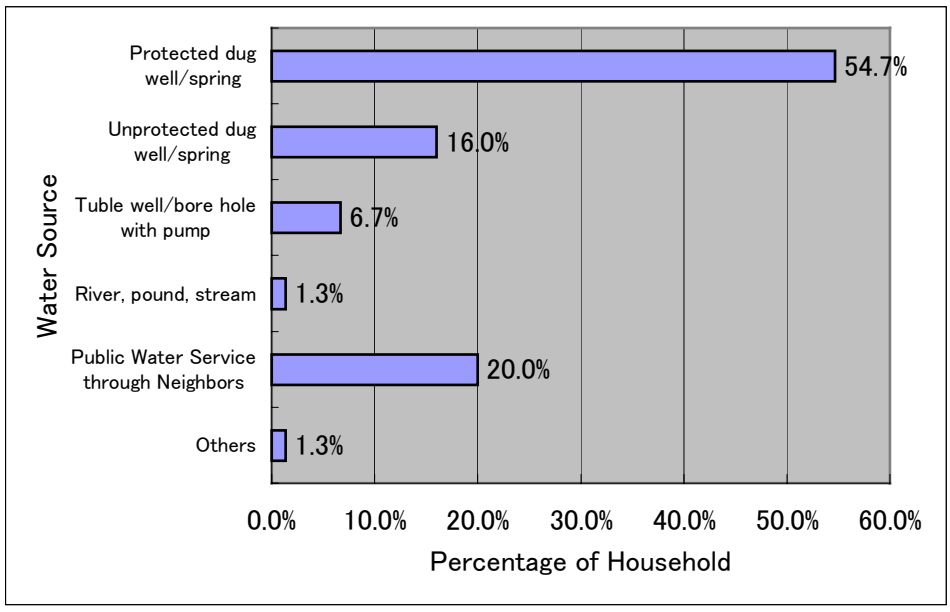
Table 3-3 Use of Other Water Source in Household Not Connected to Public Water Supply

Purpose and Source of Water	Drinking	Cooking	Washing Dish	Washing Cloth	Washing Bike, Car	Bathing	Flushing Toilet	Irrigating Garden	Others
Bottled water	66.7%	22.7%	-	-	-	-	-	-	-
Protected dug well/spring	1.3%	2.7%	1.3%	1.3%	4.0%	2.7%	1.3%	6.7%	1.3%
Unprotected dug well/spring	1.3%	4.0%	2.7%	4.0%	4.0%	2.7%	2.7%	2.7%	-
Tube well/Borehole	-	-	-	-	1.3%	-	-	1.3%	-
River, pond, stream	-	4.0%	-	-	1.3%	-	-	2.7%	-
Public Service through Neighbour	-	-	-	-	-	-	-	-	-
Others	-	4.0%	-	-	-	-	-	-	-

c) Major Source of Water for Domestic Use in Households NOT served/connected

For the households which are not connected to the public water supply service, the majority of households (54.7%) use protected dug wells or springs as a major source of water for domestic use, followed by public water service available through connected neighbours water supply (20.0%). However, the survey also revealed that in the area where the public water supply service is available (i.e. around the Chinamimo Treatment Plant, the Kaolieo Treatment Plant, and the central part of the city), households not connected to, but using public water service through neighbours increases to 40% - 60%, as indicated in the table below.

Figure 3-10 Major Source of Water for Domestic Use / Household Not Connected



Cross tabulation

Major Source of Water for Domestic Use by AREA / Not Connected

			Major Source of Water Using in House						
			protected dug well/spring	unprotected dug well/spring	tuble well/bore hole with pump	river, pound, stream	pipe through neigbour	others	Total
Survey Area	Around Chinaimo T.	Count	3				2		5
		% within Survey Are	60.0%				40.0%		100.0%
	Around Kaolieo T.P	Count		1			3	1	5
		% within Survey Are		20.0%			60.0%	20.0%	100.0%
	Central City	Count	4	1	1		9		15
		% within Survey Are	26.7%	6.7%	6.7%		60.0%		100.0%
	Dondok Areas	Count	7	3					10
		% within Survey Are	70.0%	30.0%					100.0%
	Future Service Are	Count	27	7	4	1	1		40
		% within Survey Are	67.5%	17.5%	10.0%	2.5%	2.5%		100.0%
Total		Count	41	12	5	1	15	1	75
		% within Survey Are	54.7%	16.0%	6.7%	1.3%	20.0%	1.3%	100.0%

d) Sources of water and purposes of use in households not connected to the public supply service

The table below shows the source of water for each purpose in households not connected to the public water supply service. For drinking purposes, as is observed in connected households, the majority of the population utilizes bottled water as a major source, followed by using public service water through connected neighbours (9.3%). It is obvious from the table that the use of protected dug wells and springs is popular for all kinds of purposes. It shall be again noted that the consumption of water from the public service seems to be a preferable alternative for connected households to obtain water for all purposes, where that service is available.

Table 3-4 Source of Water for Purposes / Household not connected to public supply service

Purpose and Source of Water	Drinking	Cooking	Washing Dish	Washing Cloth	Washing Bike, Car	Bathing	Flushing Toilet	Irrigating Garden	Irrigating Farmland	Business
Bottled water	68.0%	28.0%	1.3%							
Protected dug well/spring	13.3%	40.0%	53.3%	56.0%	56.0%	56.0%	56.0%	30.7%	2.7%	9.3%
Unprotected dug well/spring	4.0%	8.0%	13.3%	14.7%	14.7%	14.7%	14.7%	9.3%		0.0%
Tube well/Borehole	2.7%	5.3%	6.7%	5.3%	5.3%	5.3%	5.3%	2.7%		2.7%
River, pond, stream	1.3%	1.3%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	
Public Service through Neighbour	9.3%	16.0%	21.3%	20.0%	17.3%	20.0%	20.0%	6.7%		
Others	1.3%	1.3%	1.3%	1.3%			1.3%			

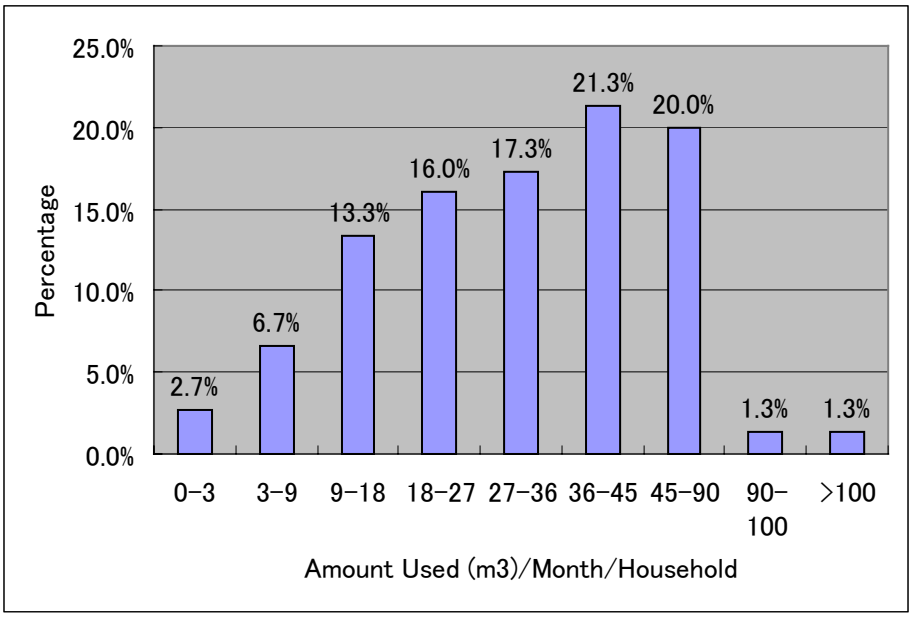
2) Amount Consumed and paid

a) Public Water Supply

The figure below indicates the amount of water consumed from the public water supply by connected households per month. The comparatively dominant group is households that consume a range of 36-45m^3 per month (21.3%), followed by one of 45-90m^3 (20.0%), 27-36m^3 (17.3%), and

18-27m^3 (16.0%).

Figure 3-11 Amount Consumed (m3) from Public Water Supply / Month / Household



The table below shows the average consumption rate per household and person from the results of the survey. The average consumption per person per day amounts to 167.5 liter.

Table 3-5 Average Consumption of Public Water Supply

Average Consumption / Household / Month	34.37m^3
Average Consumption / Household / Day	1.16m^3
Average Consumption / Person / Day	167.5 liter

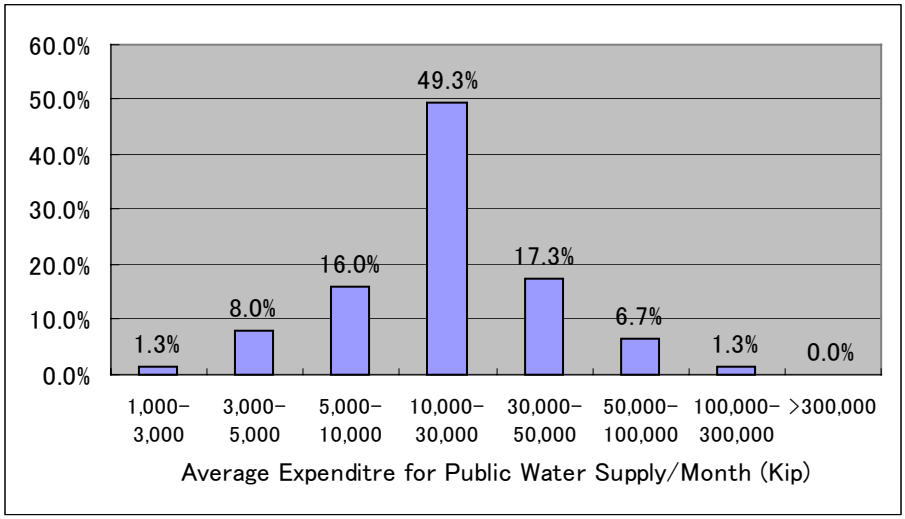
However, it should be noted and emphasized that, as analyzed further, the amount consumed is varies considerably among households, as the cross-table below indicates. The table shows the consumed amount in comparison to household size (i.e. number of family members). For instance, there is a considerable variation of the amount consumed in family sizes of 5 and 6 members. The variation ranges from 3-9m^3 of water consumed and up to 45-90m^3, and more than 100m^3 in case of 5 family members. It might be due to a variation in life style, availability of public water, or the availability of alternative water sources, as described before. Pipe and tap defects (in-house leakage) could also be one of the contributing factors in the variation, with a result that 22.7% of connected households replied that they have pipe and tap defects in the house.

Table 3-6: Amount Consumed for Public Water Supply / Household / Month by Household Size

			Amont Consumed for Public Water Supply (m3) / Household / Month									
			0-3	3-9	9-18	18-27	27-36	36-45	45-90	90-100	>100	Total
Family Size (Number of Family Member)	2	Count		1								1
		%		100.0%								100.0%
	3	Count		1	1	1	1	1	1			6
		%		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%			100.0%
	4	Count			1	2	3	2	3			11
		%			9.1%	18.2%	27.3%	18.2%	27.3%			100.0%
	5	Count		1	3	2	1	3	1		1	12
		%		8.3%	25.0%	16.7%	8.3%	25.0%	8.3%		8.3%	100.0%
	6	Count		1	2	4	2		3			12
		%		8.3%	16.7%	33.3%	16.7%		25.0%			100.0%
	7	Count		1	1			4				6
		%		16.7%	16.7%			66.7%				100.0%
	8	Count				1	1	1	1			4
		%				25.0%	25.0%	25.0%	25.0%			100.0%
	9	Count	1			1	2	2	2			8
		%	12.5%			12.5%	25.0%	25.0%	25.0%			100.0%
	10	Count	1		1	1	1		1			5
		%	20.0%		20.0%	20.0%	20.0%		20.0%			100.0%
	11	Count						1	1	1		3
		%						33.3%	33.3%	33.3%		100.0%
	12	Count					1	1	2			4
		%					25.0%	25.0%	50.0%			100.0%
	13	Count					1	1				2
		%					50.0%	50.0%				100.0%
	14	Count			1							1
		%			100.0%							100.0%
Total		Count	2	5	10	12	13	16	15	1	1	75
		%	2.7%	6.7%	13.3%	16.0%	17.3%	21.3%	20.0%	1.3%	1.3%	100.0%

The figure below shows the average amount paid for public water supply service per month per household. As indicated, almost half of households (49.3%) paid for monthly water bill in a range of 10,000-30,000 Kip, followed by a range of 30,000-50,000 Kip (17.3%) and one of 5,000-10,000 Kip.

Figure 3-12 Average Expenditure for Public Water Supply / Month



b) Bottled Water

As mentioned previously, bottled water is one of the major sources of drinking water, and cooking in some cases. In the survey, 70.7% of households connected to the public water supply replied that they purchased bottled water, while 69.3% of households not connected purchase bottled water. The figure below indicates the amount of bottled water consumed and the amount paid for by households connected to the public water supply service, and households not connected. Patterns in the consumed amount and expenditure are somehow identical both in households connected and not connected to the public water supply service. More than half of the respondents (56.0% of household connected, and 54.7% of household not connected) consumed bottled water at the rate of more than 150 litres per month, while almost more than half of the respondents (48.0% of household connected and 58.6%) spent in the range of 15,000-30,000 Kip or 30,000-60,000 Kip.

Figure 3-13 Consumption of, and Amount Paid for Bottled Water [Household Connected]

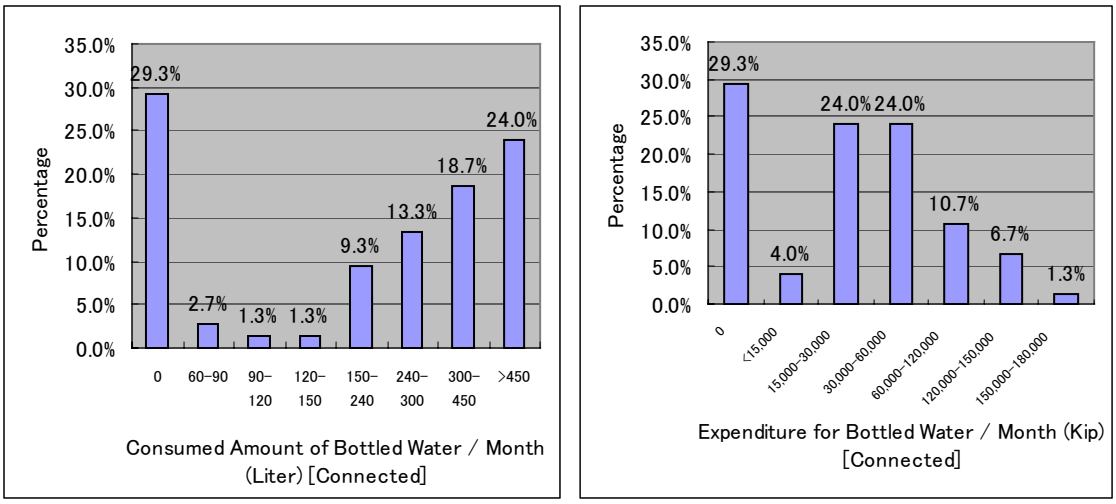
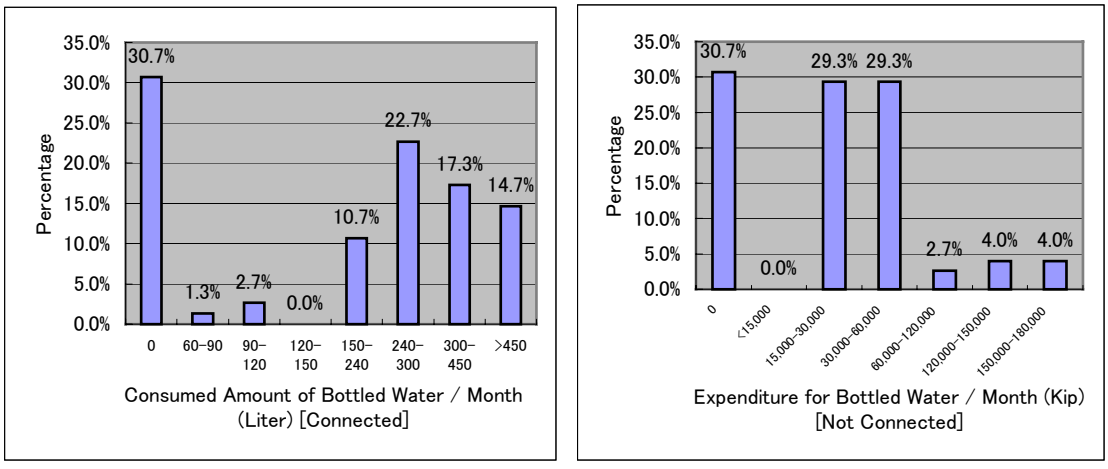
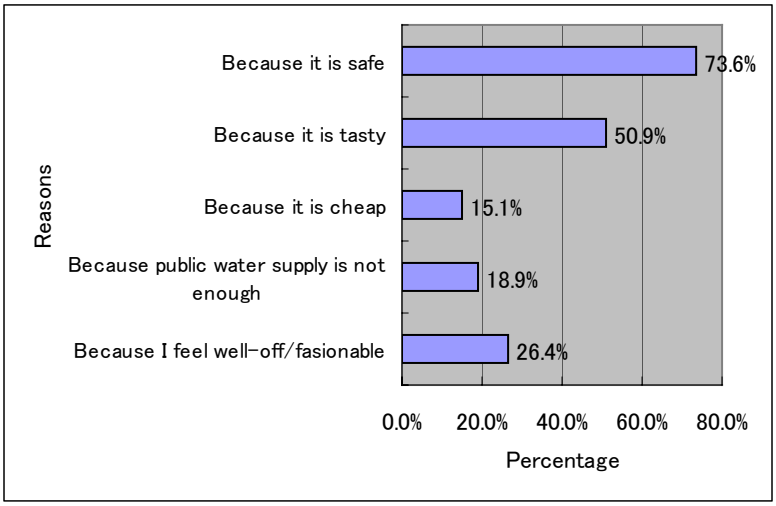


Figure 3-14 Consumption of, and Amount Paid for Bottled Water [Household Not Connected]



The survey also attempted to find why households connected to public water supply service prefer bottled water, although the public service is available. Among 53 households (out of 75 connected to the public service) connected to the public service but who purchased bottled water, further questioning revealed reasons for the preference for bottled water. The reasons given for purchasing bottled water were; its safety (73.6%) and its taste (50.9%), followed by a superior feeling (26.4%) and a scarcity of public water supply (18.9%)

Figure 3-15 Reasons to Consume Bottled Water

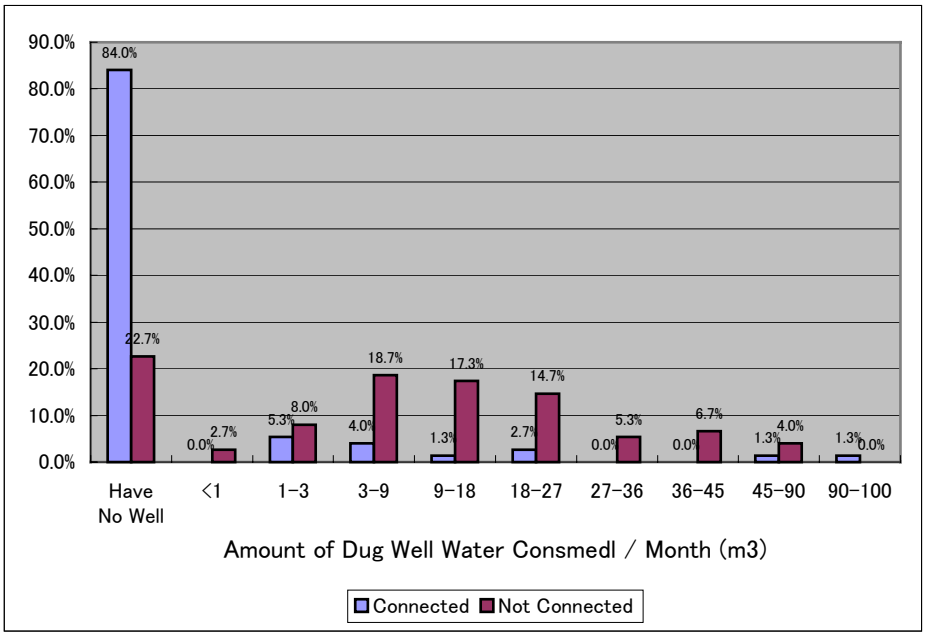


c) Use of Wells

Protected and unprotected dug wells is a major alternative water source for households connected to the public water supply service, and a major source for households not connected to the service as described previously. 16.0% of connected households has a protected or unprotected well, while 77.3% of households not connected own dug wells. Most dug wells in the survey area have identical features with a diameter of 1.0-1.5m and a depth of 5.0-10.0m. More than 90% of dug wells are protected. More than half of thedug wells are installed with a motorised pump however, respondents had difficulty in answering questions about the installation costs due to changes in the value of money since the time of installation, as well as in answering questions about the cost of electricity since there is no means isolate the cost of an electric pump from other electrical household appliances.

The figure below shows the amount of water used from wells in connected and non-connected households.

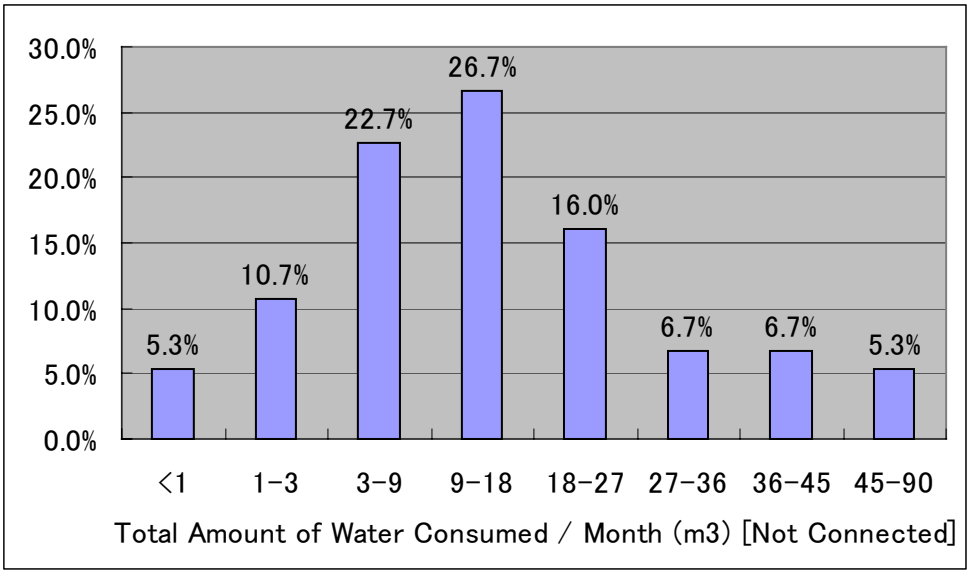
Figure 3-16 Consumption of Water from Well



d) Total Amount of water consumed per households not connected to public water supply service.

The total amount of water obtained and consumed from various source together (bottled water, well, others) in households not connected to public service is given in the figure below. The most dominant group is the one consuming a range of 9-18m^3 per month, followed by 3-9m^3 (22.7%) and 18-27m^3 (16.0%). It is obvious that amount of water consumption from these sources is considerably limited in comparison to the households connected to the public water supply service.

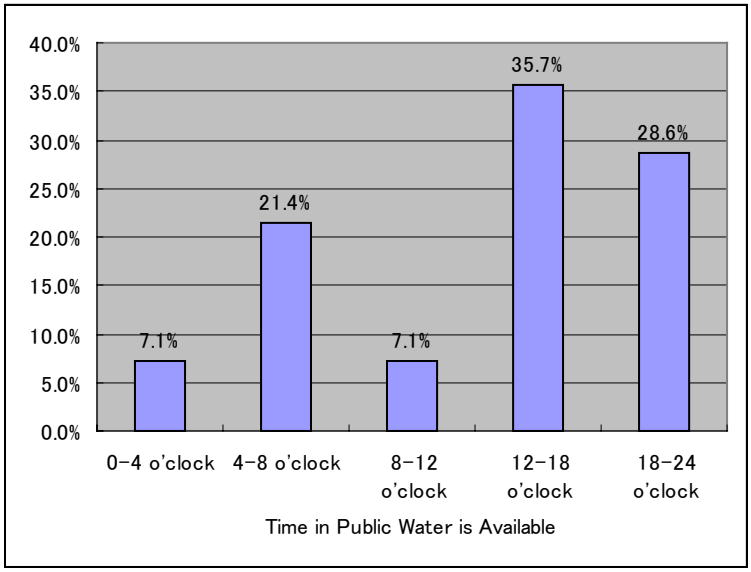
Figure 3-17 Total Amount of Water Consumed [Households Not Connected]



3) Availability Times of Public Water Supply Service

Among household connected to the public water service, 74.7% answered that water is ALWAYS available. The remaining 25.3% of households replied that the public water is only always available in the time shown in the following figure. The time range that the public water supply is available is concentrated from 12-18 o'clock (35.7%), and 18-24 o'clock (28.6%).

Figure 3-18 Time in Public Water Service is Available



4) Perceived problems in quantity and quality of water in Public Water Supply Service

38.7% of households connected to the public water supply service perceived that the quantity and pressure of water provided is not enough, while considerably more respondents, 69.3%, of the connected households perceived problems in water quality.

Figure 3-19 Problem in Quantity of Water

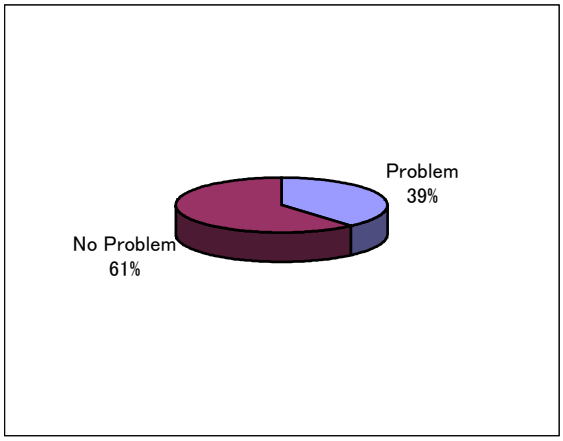
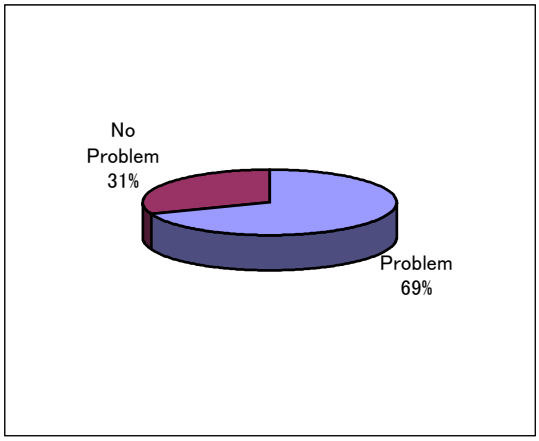


Figure 3-20 Problem is Water Quality



An area-wise analysis was made for households perceiving problems in water quantity of the public service. Cases of complaint are concentrated in the central part of the city (51.4%), and the area around the Chinamimo Treatment Plant (40.0%).

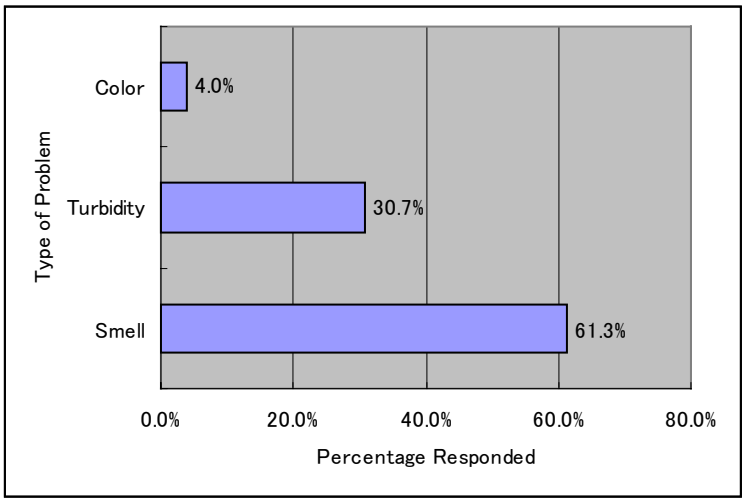
Table 3-7 Problem in Quantity of Water by Area

Survey Area		Problem in Quantity		Total
		No	Yes	
Central Part of City	Count	17	18	35
	%	48.6%	51.4%	100.0%
Around Chinamimo T.P.	Count	6	4	10
	%	60.0%	40.0%	100.0%
Around Kaolieo T.P.	Count	8	2	10
	%	80.0%	20.0%	100.0%
Dondok Area	Count	15	5	20
	%	75.0%	25.0%	100.0%
Total	Count	46	29	75
	%	61.3%	38.7%	100.0%

T.P.: Treatment Plant

Problems with water quality are further categorized as follows, with respondents identifying the types of problems in water quality. Most of the households (61.3%) complained of a smell in the water from public in particular, a smell of chlorine. Some households (30.7%), complained of turbidity in the water, mentioning that they often find sawdust-like sand in the water supplied.

Figure 3-21 Type of Problem in Water Quality



(4) Current Conditions of Household Hygiene and Sanitation

1) Sanitary facility (Toilet)

a) Type of toilet

The table below shows the types of toilet that the households own. Most of the households, (73.3% connected to the public water supply service, and 84.0% in household not connected) own pour flush toilet. Possession of automatic flush toilets in non-connected households is 4.0%, while 24.0% of households connected to the public service have automatic flushing toilets.

Table 3-8 Type of Toilet

	Flush Toilet to Sewage System or Septic Tank	Pour Flush Toilet	Traditional/Dry Toilet	No Facility
Household Connected	24.0%	73.3%	2.7%	0.0%
Household Not Connected	4.0%	84.0%	8.0%	4.0%

b) Problems in the toilet

17.3% of connected households responded to having problems in the toilet, while 28.0% of non-connected households reported problems. These problems could be attributed to the different types of toilet in households connected and not connected to the public water supply, since automatic flush toilets and pour flush toilets are more sanitary and hygienic than traditional toilets (see the traditional toilet has problems such as drainage, flushing, vermin, and smell.)

2) Medical expenditure

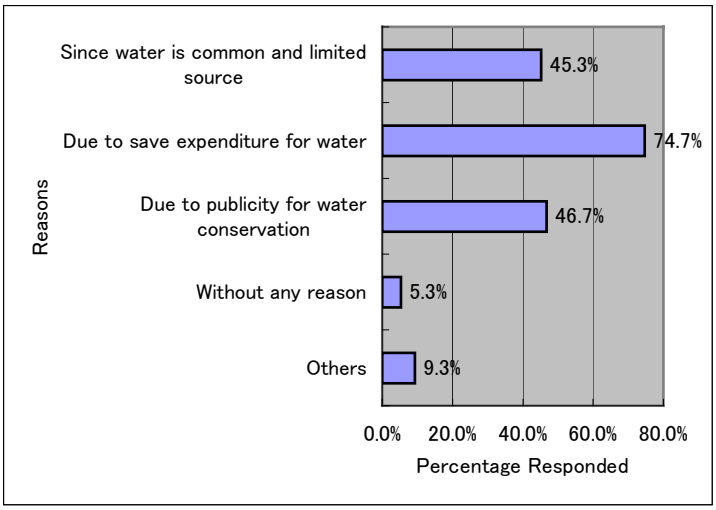
Medical expenditure on average was estimated at approximately 280,000 Kip per year per household. However, for the medical expenditure of water related diseases between in households connected and those not connected to public water supply service are very similar. More than 80% of these households spend less that 10,000kip per year on treatment for water related diseases. This might be because sanitation and hygiene awareness is high and other preventive means are practiced in these households.

(5) User's Awareness on Water Supply

1) Awareness in water conservation

Most households (90.7%) said they are conserving water from the public water supply. The reasons that respondents gave for conserving water are given in following figure. Most households (74.7%) replied that they save water from the public service to save on expenditure for the water bill, while there is an increased awareness in water conservation as a common and limited resource (45.3%), and an awareness of water conservation, enhanced by publicity (46.7%), is also significantly observed.

Figure 3-22 Reasons to Save Public Water Supply



2) Awareness in water intake, treatment, distribution, etc.

Only 22.7% of households connected to the public water supply service replied that they know the process of water supply (intake, transmission, treatment, and distribution), while 17.3% of households not connected replied that they know the process. It can be said that the awareness in the production and distribution process of water supply is considerably lacking among users in society.

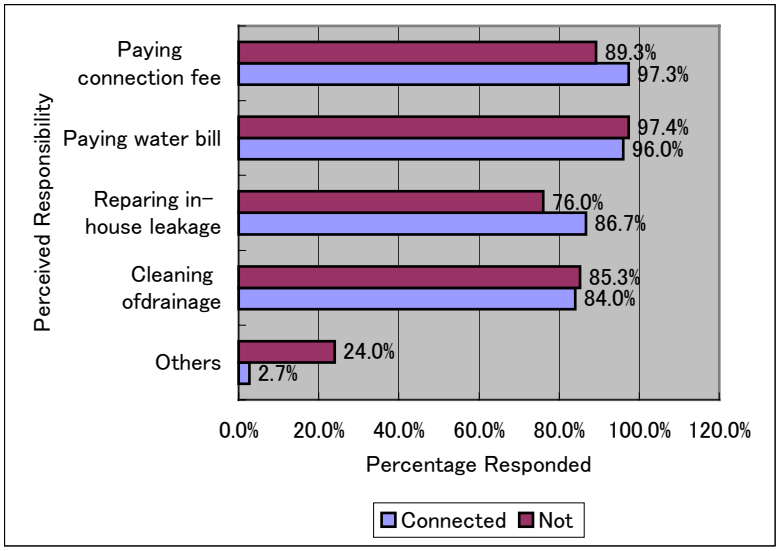
3) Awareness of who provides the water

It should be also noted that user's awareness about who provides the water is significantly low. Only 8% of households connected to the public water supply responded that the NPVC is the jurisdiction institute for water supply, although a slightly higher response of 17.3 % of households not connected to the water supply answered correctly.

4) Awareness in user responsibility, user-payment principle

Respondents were asked about the responsibility of users in the public water supply service. The questions were given to both connected households, and non-connected households. The questions were presented in a multi-choice format and asked about,; 1) paying the connection fee, 2) paying of the water bill, 3) repairing in-house leakages, and, 4) cleaning drainage. A relatively higher awareness among connected households was observed in the perceived responsibility of users in paying a connection fee (97.3% in connected households, and 89.3% in households not connected), and paying the water bill (96.0% in connected, 97.4% in not connected). However, lower a awareness is recorded for people to repair in-house leakages (86.7% in connected, 76.0% in not connected), and cleaning drainage (84.0% in connected, and 85.3% in not connected). In particular, the users' awareness in their responsibility to repair in-house leakage should be increased, as it is an important aim within the NPVC's strategy, for the prevention of UFW (unaccounted for water).

Figure 3-23 Perceived Responsibility in Public Water Supply Service

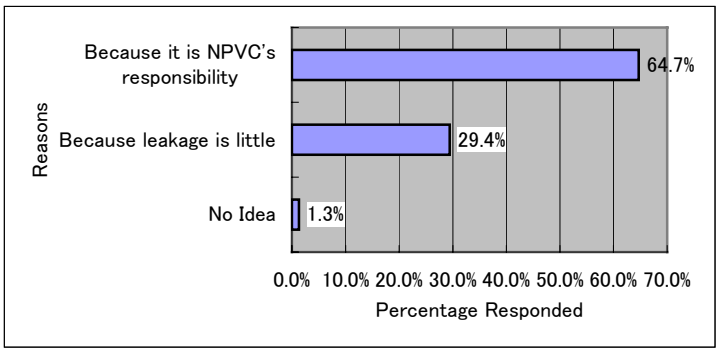


The survey on users' awareness of their responsibilities is further extended to the "User-Pay Principle" in public water supply service. Only 38.7% of households connected to the public water service are aware of their responsibilities while 45.3% of household not connected are aware.

5) Pipe/Tap defects in house/yard

The survey found that a considerable number of households connected to the public water service who were interviewed have current in-house leakages from defect pipes and/or taps. 22.7% of these households have in-house leakage. The reasons that they don't repair in-house leakage are given in the following figure. The results revealed that most respondents (64.7%), misunderstand their responsibilities to repair in-house leakage, and consider it to be the responsibility of the NPVC.

Figure 3-24 Reasons Not to Repair In-House Leakage

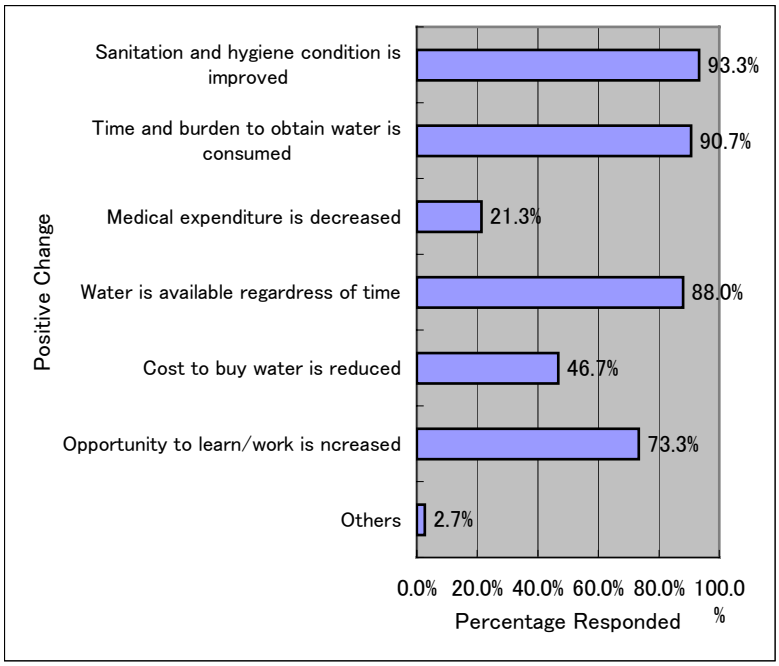


(6) User's Valuation on Current Public Water Supply Service

1) Users' perception on positive change after connecting public water supply

All (100%) households interviewed (household connected to the public water service) perceive a positive change after connecting to the public water supply service. The figure below indicates in which way the positive changes were brought. Multiple answering was applied for this question, and more than 90% of households felt benefits in sanitation/hygiene conditions, as well as time and labour saved in obtaining water. Other outstanding answers are "water is available regardless of time" (88.0%) and "Opportunity to learn/work is increased"(73.3%). Another perceived benefit is observed in the reduction in expenditure for water (46.7%), while a less perceived benefit is observed in a decreased medical expenditure (21.3%).

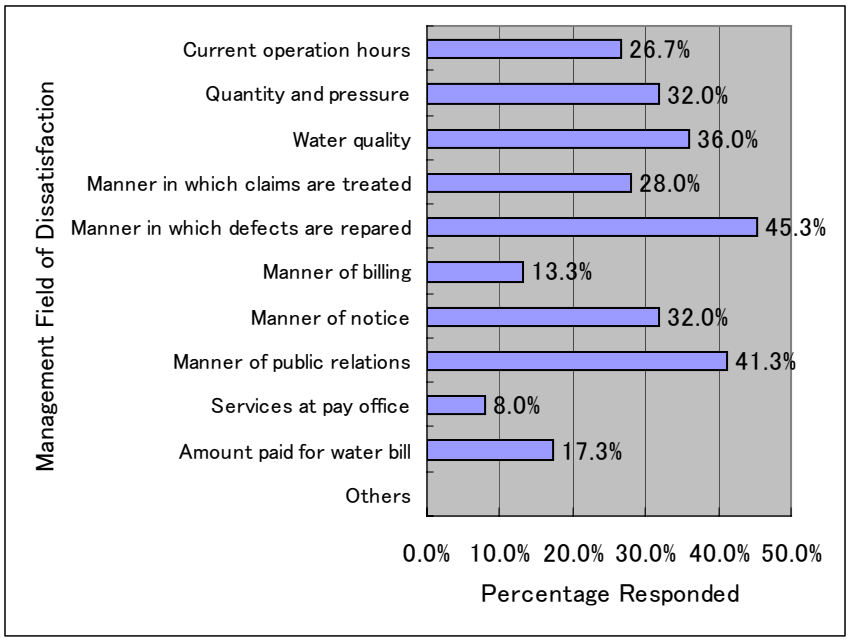
Figure 3-25 Perceived Positive Change after Connecting Public Water Supply Service



2) Users' satisfaction on management in public water supply service

Households connected to public water supply service were asked whether or not they are dissatisfied with the management of the public water supply service. The figure below shows the areas of dissatisfaction identified by the respondents. Most considerably, 45.3% of households are frustrated in manner in which defects are repaired. The second are of dissatisfaction is the manner of public relations of the public water supply (41.3%). More than 30% of households are not satisfied with, 1) quantity and pressure, 2) water quality, 3) manner of notice. These management areas need to be improved to increase the confidence that the public has with the NPVC as the public water supply authority.

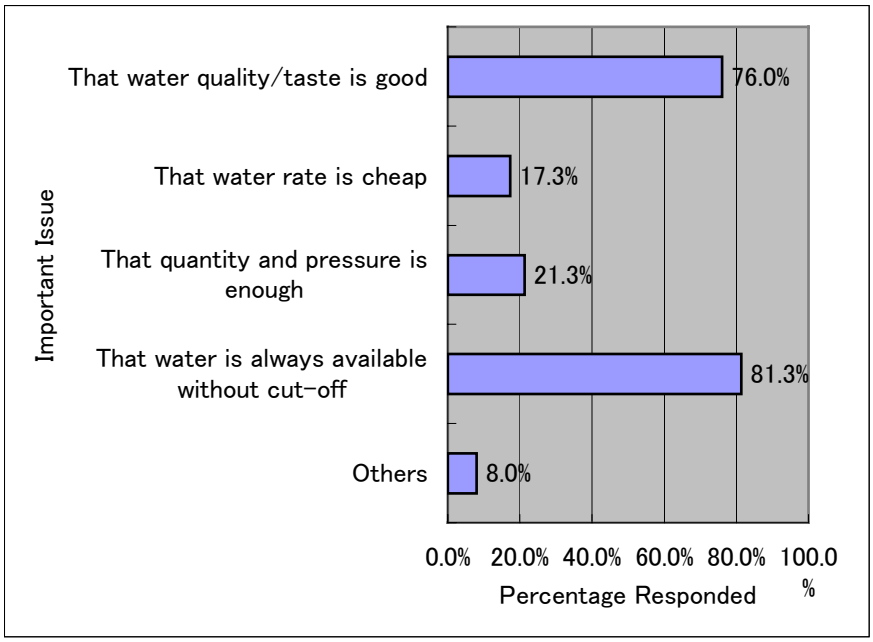
Figure 3-26 Degree of Users' Dissatisfaction on Management in Public Water Supply



3) Valued issues in water supply service

The survey attempted to find which issues in public water supply user consumers rate as being important. The graph below indicates the issues that households think are most important for public water supply service. Multiple choice questions were used as the format to find out these values. Most households rated the water quality and taste as being good (76.0%) and that water supply is always available (81.3%). It shall be noted that less value are perceived by users' society on that water rate is cheap (17.3%) comparing other outstanding valued issues.

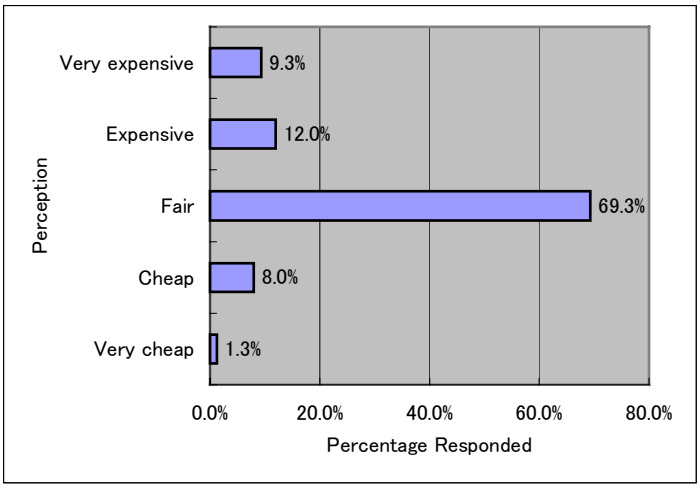
Figure 3-27 Users-Valuated Issues on Management of Public Water Supply Service



4) Users' perception on the current amount paid for public water supply service (the water bill)

Significant numbers of households connected to the public water supply service (69.3%), responded that the current amount paid for the water bill is fair. 9.3% of households considered their water bills "cheap" and "very cheap", 21.3% of households said that their bills were "expensive" and "very expensive".

Figure 3-28 Users' perception on the current amount paid for public water supply service



For a comparison of other public utility charges, respondents were asked the current amount paid for their electricity consumption. The figures below indicate the amount paid for electricity per month, and the users' perception of that service. The majority of households (56.0%), pay for electricity in the range of 100,000-500,000 Kip per month, which is considerably higher than the cost for the public water supply. Also of note is that 60.0% of households rated the cost of electricity is "very expensive", while 21.3% answered that it is "expensive".

Figure 3-29 Amount Paid for Electricity

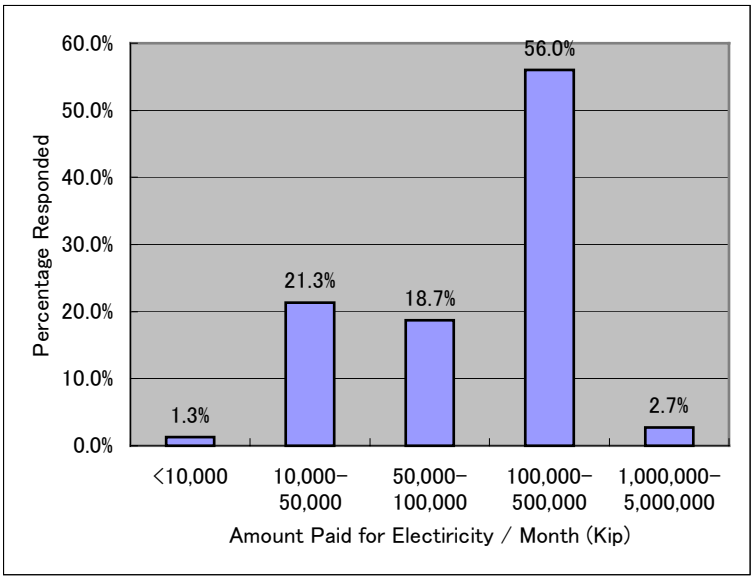
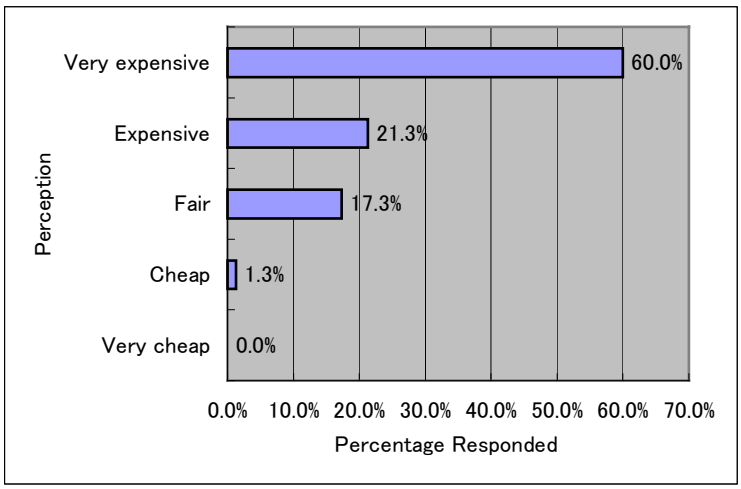


Figure 3-30 Users' perception on current amount paid for electricity

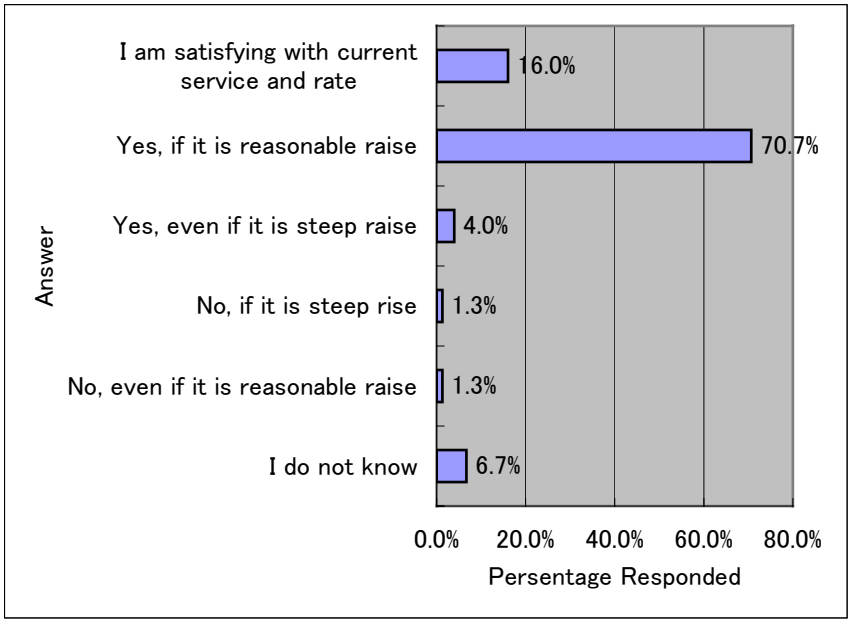


5) User's willingness to pay for improved water supply service

Households connected to the public water supply service were asked whether or not they want to have an improved water supply service, even if the cost of the water is increased. To understand consumers perception of the degree of their needs, the answer choices in the questionnaire were given by the degree of needs, as follows: 1) I am with the current service and water rate (no needs perceived), 2) Yes, if it is a reasonable raise (moderate needs perceived), 3) Yes, even if it is steep raise (considerable needs perceived), 4) No, if it is steep raise (moderate denial), 5) No, even if it is reasonable raise (considerable denial).

The survey found that the majority of households (70.7%) felt a moderate need to improve the water supply, with a reasonable increase price rise. This finding and degree of satisfaction in the current amount paid for the service should be considered for tariff setting for an improved water supply.

Figure 3-31 User's willingness to pay for improved water supply service



(7) User's Valuation on future provision of the water supply service

1) User's expectation on future provision of the water supply services

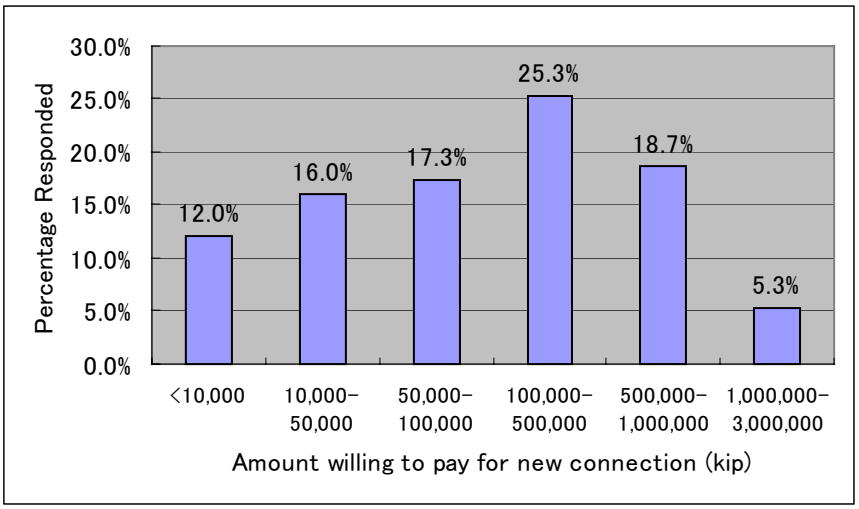
Almost all (94.7%) of non-connected households are willing to connect to the service if a pipeline is installed near their house. 5.3% of households were not willing to connect, giving the reasons that they have alternative water sources and that the water and connection fee is expensive.

2) User's willingness to pay for future provision of water supply service

a) Willingness to pay for new connection

Among households not connected, but willing to be connected, it was asked how much they would be prepared to pay for a connection to the public water supply. 25.3% of households, the dominant group, answered that they are willing to pay for a connection in the range of 100,000-500,000 Kip, followed by 18.7% of households who said they are prepared to pay in the range of 500,000-1,000,000 Kip, and 17.3% of households who will pay in the range of 50,000-100,000 Kip. More than half (53.3%) of these households replied that they could pay the entire amount at once, but a considerable number of households (37.3) said that they could not at once. It was revealed that users would prefer to pay by instalments, taking into consideration that the average connection fee is 600,000 Kip.

Figure 3-32 Willingness to Pay for New Connection



b) Willingness to pay for water bill

As can be seen from the figure below, 40.0% of households are willing to pay in the range of 5,000-10,000 Kip for their water bill per month. This was, followed by 28.0% of respondents who are prepared to pay in the range of 10,000-30,000 Kip per month. This pattern is identical for the actual expenditure for public water supply in households already connected, although the range is

slightly lower in the amounts of households not connected.

Figure 3-33 Willingness to Pay for Water Bill