Hai Phong Water Supply and Sanitation Programme

the awareness and evaluation of customer and supplier on the present water supply service in haiphong city

(Report on Results of Customer and Staff Surveys)

Hai phong
February 1998

Table of Contents

Introduction

As required by Hai Phong Water Supply and Sanitation Program (HPWSSP), in 12/1997 and 1/1998, a survey on the water supply service of Hai Phong city has been carried out by the Research Team from National Center for Social Sciences and Humanities (NCSSH), Hanoi. The main content of the survey is concentrated on awareness and evaluation of customers and service suppliers about the existing situation and quality of this service. The purpose of the survey is to collect information about awareness and evaluation, to find out new direction to support upgrading the quality of water supply service of the city. The survey has been carried out according to scientific regulations and included two components:

1. Carrying out a survey with a sample of 300 household-customers. The questionnaire that have been used consist of 31 questions (see the questionnaire in the appendixes). The sampling is a random walking route one: the surveyors walk along chosen areas and visit randomly households to have interviews. There are total 12 areas that have been selected in the whole city under consult of HPWSCo. 15 students of Hai Phong Marine College have been selected and trained carefully to be surveyors and they have completed the direct interviewing 300 household-customers within 7 days. The information received from questionnaire has been processed by SPSS software (see Result of Data Processing in Appendix).

2. Interviewing 40 staff members of Hai Phong Water Supply Company (HPWSCo), consisting of 4 groups: staff of the Utilisation Section (at HPWSCo headquarters); Heads of the Water Management Groups in wards; repair workers; and bill collectors and water meter readers. The list of these 40 staff was selected and provided by HPWSCo (see Part Two of this report and attached appendix). A group of 4 experienced researchers (sociologist and psychologist) has prepared and completed these interviews.

This report is written on the bases of information received from the above two researches. Correlatively, the report consist of three parts. The first and the second present the results of two surveys, which include some combination between them in certain related parts. The third part is a summary of main findings and recommendations from the research.

Attached Appendixes consist of 2 Questionnaires of two surveys; the result of data processing by SPSS software for customer's survey. Research Team headed by Urban sociologist, Dr. Trinh Duy Luan hold responsibility for the quality of this report.

Hanoi/ Hai Phong,
February/1998

Part One **Customer survey**

I. Social - Demographic characters of surveyed households

1.1 Gender and age of household heads (interviewees)

Male: 127 cases = 42.3%

Female: 173 cases = 57.7%

Table 1

Age	Number of households	Percentage
19 - 25 year old	16	5.3
26 - 30	17	5.7
31 - 35	21	7.6
36 - 40	43	14.3
41 - 45	35	11.7
46 - 50	38	12.7
51 - 55	35	11.7
56 - 60	41	13.7
61 - 85	54	18.0
Total	300	100 %

1.2 Education of head of household (interviewee)

Table 2

Education level	Number of households	Percentage %
+ Illiterate	1	0.3
+ Primary school	38	12.7
+ Secondary school	87	29.0
+ Higher secondary school + College, university	130	43.3
	3	1.0
Total	300	100 %

1.3 Family size (number of person in family)

Table 3: **Number of households by family size**

Number of person in family	1	2	3	4	5	6	7	8	9	> 10	Total
Number of	3	27	45	109	76	28	6	4	1	1	300

household s											
Percentage	1.0	9.0	15.0	36.3	25.3	9.3	2.0	1.3	0.3	0.3	100%

Average: 4.23 person / Household

1.4 Household occupation

Table 4

Occupation group	Number of HH	Percentage
State employees	140	46.7
Mixed	115	38.3
Trade, service-makers	23	7.7
Retired	10	3.3
Others	12	4.0
Total	300	100 %

1.5 Housing

Among 300 interviewed households:

- 80% household living in ground floor or in private multifloor house
- 8% household living in second floor.
- 12 % household living in 3rd -5th floor in apartments.

The house location also varies

- 24.7% houses /apartments located along main streets
- 75.3% houses/ apartments located in lanes, hamlets or popular living quarter.

Therefore, the houses of interviewed households included different types, fairly matching with housing conditions in Hai Phong at present.

Table 5: **Main living (floor) area of hosehold**

Floor Area (m²)	Number of HH	Percentage
10 - 18	42	14.0
20 - 25	50	16.7
26 - 30	35	11.7
31 - 35	33	11.0
36 - 40	59	19.7
42 - 50	38	12.7
55 - 60	10	3.3
62 - 70	8	2.7

80 - 100 Above 100	19 6	6.3 2.0
Total	300	100%

Most surveyed households (85.8%) have a main living area of 10 - 50m^2 with an additional area for kitchen, bath and toilet from 5-20m^2, of which 88.3% are used separately.

1.6 Sanitation

Being used latrine

- Pour-flush toilet 29.3%
- Flush toilet 63.3
- Bucket latrine 7.0
- Others 0.3

Sewage from latrine

- Disposed directly to septic tank 70.6%
- Disposed to underground sewerage 27.6
- Disposed to open sewerage 1.4
- Disposed to trenches, lakes, ponds 0.4

1.7 Living conditions - income and expenditure of households

The living condition of household is reflected through monthly income and expenditure of household.

Income

Average income of household: 1,289,803 VNdong/household/ month Average income per capita: 335,485 VNdong / capita/ month

Expenditure:

- Average expenditure of household 1,029,803VNdong/ household/ month
- Average expenditure per capita 257,565 VNdong/ capita/ month

4 expenditure items for water, electricity, housing and sanitation in every months

- Average water charge 19,867 VNdong / household/ month
- Average electricity charge 58,237 VNdong
- House or land rent charge 23,649 VNdong
- Sanitation charge 4,253 VNdong

The data shows that, in the expenditure structure of households, water charges take a small portion in comparison to the average income of more than 1.2 million dong. However, due to the influence of the subsidised system in the past, there are still some consumers who avoid or delay paying water charges.

1.8 Living standard

Living standard of interviewed households have been categorised based on self-evaluation by head of HH and surveyors' evaluation as follow:

Table 6 **Living standard, Income and Expenditure**

Living standard group	Self evaluation by Head of HH	Surveyors evaluation (%)	Average income per *(thousand dong)*		Average expenditure *(thousand dong)*	
			Household	Capita	Household	Capita
Wealthy	1.3	9.7	2,508	646	1,706	379
Fairly	12.0	34.0	1,390	344	1,073	266
[illegible]	67.7	44.3	1,103	296	938	243
[illegible]	17.7	10.3	741	213	719	200
[illegible]	1.3	1.7	534	156	580	115
Total	**100**	**100**	**1,290**	**335**	**1,030**	**257**

About representativeness of the sample

Being a random sample covering up 12 selected areas in the whole city, the sample of 300 HH-customers with above-mentioned demographic and social-economic characteristics fairly matches with the population structure of the whole city and offers good representation for the city in the research subject.

II. the Existing situation of water supply service in the city

The sampling of the survey has considered the actual situation of water supply system in Hai Phong. Therefore, when divided households to be surveyed into 2 areas: area of which the water supply system has been improved and an area which is not, the ratio between two areas are as following:

- Has been improved 73.7%

- Has not been improved 26.3%

This proportion nearly matches with the status quo of water supply system in Hai Phong. In addition, the households in the area of improved water supply are further divided into groups by the year improvement as follows:

1992: 1.4% total surveyed households
1993: 1.6
1994: 7.7
1995: 24.9
1996: 40.0
1997: 21.7

2.2 **Accessibility to water supply service**

Levels of accessibility of surveyed households to water supply service are as follow:

Table 7: **Accessibility to water supply service**

Code	Water sources	Percentage
1	There is water tap in the house	59.7
2	Collecting water (to carry, pump,...) from public water tap in the Living quarter	0.7
3	Collecting water (to carry, pump,...) from public water tank in the Living quarter	10.0
4	Using water from neighbour house	1.0
5	Buying water (from private water vendors, water lorry of HPWSCo,...)	1.7
6	Other sources (other than municipal water tap)	2.7
	1 + 3	3.3
	1 + 6	15.7
	2 + 6	0.3
	3 + 4	1.7
	3 + 6	2.0
	5 + 6	1.3
	Total	100 %

According to this result, nearly 60% of households have water supplies which reached to the house, 10% use water from public tank and 15.7% use from both sources; 1.7% have to buy water from private or HPWSC water selling service, 2.7% have to used other sources.

In general, most households are able to access to piped water supply, other sources take a small portion. However, there are 66 households (=22%) using other sources than piped water supply for domestic use, in detail as follow:

Table 8: **Other water sources being used**

Code	Water sources	Rate for the whole sample	Rate % for valid users	upgraded area	not upg-raded area	drinking water	cleaning water
1	Drilling	2,7	12,	10,9	15,0	4,5	22,7
2	well	4.0	1	19,6	15,0		33,3
3	Digging	9,7	18,	52,0	25,0	65,2	25,8
4	well	2,3	2	8,7	15,0		
5	Rain water	3,0	43,	6,5	30,0		
6	1 + 3	0,3	9	2,2			
7	2 + 3	78,0	10,				
	1 + 2 + 3		6				
	Do not use		13,				
			6				
			1,5				
	Total	100	100	100			

According to the utilisation level from much to less, other than piped water supply from the main source, these households have used rain water (70% of 66 valid users of other sources and this percent is the same in both upgraded and not upgraded areas), digged wells and drilled wells for: drinking, bathing, and trade (there are 3 household used two type of well for this purpose).

The reasons gived by households that already have piped water supply but still utilised these water sources are:

Table 9: **Reasons of using other water sources**

Code	Reasons	Rate for the whole sample	for upgraded area	for not upgraded area
	To save water charges	69,7	86,9	30,0
		6,2	6,6	5,0
	To save expenditure in trade-service activities	15,1	15,1	15,0
	Due to the habit of using this type of water source	22,7	26,0	15,0

5	Already have this type of water source Have not enough to use	15,1	-	50,0

(Total of this percentage may be > 100% due to one household may cited more than one reason).

It is clear that the main reason for households in the upgraded area is to save water charge while in the not yet upgraded area the main reason is of having not enough piped water for domestic use.

While using these water sources, how do households evaluate their quality in compare to piped water? The general answers are as follow

Table 10 ***Evaluation of other water sources***

Code	Evaluations	For the whole sample	for upgraded area	for not upgraded area
1 2 3	Hygiene as much as piped water Hygiene less than piped water No idea	54,6% 33,3% 12,1%	60,9 28,3 10,9	40,0 45,0 15,0

Again, in this matter, there is a difference between 2 areas: in upgraded area, customers seem do not care much more than those in not upgraded area about quality of other water sources. 60.9% customers in the first area versus 40% those in the second area think that other water sources they are using is hygiene as much as piped water.

This evaluation however is only a portion (66 household=22%). Yet it clearly indicates a matter of awareness regarding hygiene level of water sources. Here, it is important not only to make people accessible to piped water supply, but also to make them understand completely the meaning and necessity of using a clean water source. (hygiene (as piped water), should not use other). Unsafe sources should not be used just to save money, and to be insecure. This is an important subject in the content of campaigns of so-called education-information-communication (EIC) about clean water, at present.

2.2 Water charge paying modes

Water charge paying modes (based on actual consumption or flat rate) reflect the quality of water supply service and the awareness of customers in saving water as well as to insure equity in using domestic used water. The way households's pay water charges are indicated by the survey results as follows:

- Paying by Water Meter (WM) 203 cases (67.7%)
- Paying by flat rate 65 cases (21.7%)
- Do not pay water charge 32 cases (10.7%)

The ratio of households who pay based on WM or flat rate almost match with ratio of households in two surveyed area with improved water supply (73.7%) and not improved water supply (26.3%). The different may be due to some families not paying for water charges (10,7%), among which a portion are invalid family. 40% of households who do not pay for water charge cited the reason of water not available, polluted water, or using other water sources. A further 27% (9 among 33 households) refuse payment with the reason "using water in public tank". Details are as follow:

Table 11: **Reasons for not paying water charge**

Code	Reasons	Number of households	Percentage
	Water is polluted	1	3.0
	Using public tank	9	27.3
	Water not available	10	30.3
	Using well, rain water	2	6.1
	Invalid families	8	24.2
	Other	3	9.1
	Total	33	100 %

Due to many stages of improvement, the water meters used in the city are of various types, those in the survey are as follows:

Table 12; **Type of water meter**

Code	Type of WM	Number of households used	Percentage

1	Thailand	63	31.0
2	China	23	11.3
3	Malaysia	52	25.6
4	Other	5	2.5
5	Do not know	60	29.6
	Total	203	100 %

According to this data, the most popular types are made in Thailand, then China and Malaysia. Nearly 1/3 number of people do not know/care.

According to many staff of HPWSCo., the sensitiveness of Thailand and Chinese meter is poor. Thus when water pressure is low (water dripping) the meter doesn't work. This creates a gap for cheating in paying water charges, by keeping water dripping, the meter does not run and therefore, water is used free of charge. This action is called "vodka making" and well-known by many customers, including HPWSCo. However, since there is not any legal document or administrative regulation for this nothing could be done.

The solution might be to replace all low sensitive meter. At the same time, It may be a necessary assistant and worth to expect to conduct EIC activities, to increase responsibility and duty of the customer on the motto "user-pay", to implement self-control in community.

2.3 Collecting water charge

The survey shows following form of bill collecting

Table 13: **Collecting water charge**

Code	Collecting forms	Number of households	Percentage
	Collector come to customer at home	234	78.0
	Household pay to Water management Group in the ward	9	3.0
	Pay to head of HH's group or	29	9.7
	person who has been entrusted	4	1.3
	Other	24	8.0
	Do not pay		

The time interval of bill collecting

- Monthly 254 cases (92%)
- Quarterly 18 (6.5)
- Biannually/ annually 3 (1.3)

So, most households pay the water charge at home to a bill collector. This is common manner and most convenient for urban households at present. However, there are some difficulties: if the bill-collector does not meet any one, he has to return an other day or leave a bill for the customer to pay to the Water Management Group (WMG) in the ward. The first case creates hard work for the bill-collector, the second is not convenient for household-customer, thus leading to late payment, effecting the turn-over of the Company.

Monthly collection is most rational, and to collect at the end of month (when employees just receive salary) is most effective. Some cases of payment every 6 months or one a year almost all belong to unimproved area, lack of water seriously, high apartments that using public water tank.

2.4 Storing water

At the present, since the improvement of water supply system in the city is ongoing, most households in the city still have water storage means. The survey shows that ratio of households using water storage means are as follows:

Table 14: **Types of water container**

Code	Type of water storage means	Number of household	Percentage
1	Under ground cement tank	59 + 53*	19.7
2	Above ground (semi above ground)	85 + 28	(37.2)**
3		18 + 42	28.3
4	Cement tank built on top of flat roof	4 + 19	(38.0)
5		7 + 16	6.0
6	Hanging tank (made of steel, iron...)	13 + 11	(20.0)
7		23	1.3
8	Ceramic jar (various volume)	4	(7.6)
	Barrel		5.3
	Other type		(11.0)
	Do not storage		4.3
			(8.0)

			7.7 1.3

Note: *) *Number of households to be plused are those that using more than one means of storage*

**) *The percentage in the bracket are included of all type of households that use one and more means of water storage*

So almost every household (98.7) have water storage means. The method of water storage is mostly by a cement tank of 1 - 3m^3 volume.

Although in the area where water supply systems have been improved, the water pressure is fairly good and there are water hour in a day, the people are still careful, using water storage means. There remains a belief that: stored water for some time will reduce chlorine smell and cleaner.

Table 15: **Reasons to store water for domestic use**

Code	Reason to store water	Number of household	Percentage
1	Store for time of water or power cut-off	116 + 70*	38.7 (61.8)**
2	Stored water is more tasty and cleaner	9 + 56	3.0
3	More convenient because pip water pressure is low	1 + 13	(21.6)
4	Water supplied not through		0.3
5	24/24 h.	5 + 53	(4.6)
6	Other reason	4 + 6	
7	There is no piped water supply	48	
	Do not store/ do not answer	23	1.7 (19.3) 1.3 (3.3) 16.0 7.7

Note: *) *Number of households plused are those who cited more than one reason*

**) *The percentage in the bracket are included of all households cited one or more reasons to store water*

However, the main reason is that water for domestic use is not supplied continuouly and water pressure is not strong enough (to run to higher floor)

2.5 Monthly consumed water volume and water charge

To calculate consumed water volume for household having WM is easy. For those without WM, it is based on

estimated flat level in each area to calculate consumed water volume, and therefore this number is not accurate. Among 300 surveyed households, 209 households pay by WM, 59 pay by flat rate (nearly match with households in improved area and unimproved area), 24 households "do not have to" pay for water.

Average consumed water volume is 14m^3/ household/ month, per capita is 3.4m^3/capita/month. Data processed show that about 70% households consume less than 15m^3 monthly; and nearly 20% using 16 - 30m^3.

Table 16: **Monthly consumed water volume**

Consumed volume	Number of household	Percentage
2 - 3 m^3	10	3.3
4 - 6	38	12.7
7 - 10	59	19.7
11 - 15	97	32.3
16 - 20	59	19.7
22 - 25	14	4.7
27 - 30	13	4.3
More than 32m^3	8	2.7

Water charges that households pay monthly fluctuated, from 2,000 VNdong to 200,000 VNdong. Average is 21,000 d/ household/ month. The common case (55%) are households that pay from 11,000d to 25,000d.

In area where water pressure is low, especially in high-rise apartments (such as Van My living quarter), apart from the charge paid by flat rate, households have to pay an extra amount for pumping water from a public tank to the house or to buy water. This amount is paid to some households who offer pumping service for whole area. This not only increases the water charge (sometimes the pumping cost is more than the flat rate charge) but also creates inconvenience for the user.

Table 17: **Monthly water charges**

Monthly charged water volume (VND)	Number of household paying	Percentage
2,000 - 5,000	16	5.3
6,000 - 10,000	37	12.3

11,000 - 15,000	38	12.7
16,000 - 20,000	71	23.7
20,800 - 25,000	44	14.7
25,600 - 30,000	25	8.3
30,400 - 35,000	16	5.3
36,000 - 40,000	9	3.0
42,000 - 50,000	12	4.0
60,000 - 100,000	7	2.3
200,000	1	0.3

Table 18: **Monthly consumed water and charges by living standard**

Code	Living standard	Monthly consumed water (m^3)	Monthly water charge (dong)
1	Wealthy	20.8	31,600
2	Fairly good	14.8	25,280
3	Average	13.3	19,559
4	Under average	12.0	15,016
5	Poor	6.2	7,250
	In general	**14.3**	**21,000**

There are differences among HHs of various living standards in above-mentioned indicators. It is noteworthy that the poor families use too limited volume of water (due to having no water-consuming means, but mainly to reduce expenditure). The fact that a family uses 6.3 m3 water a month (against 20.8 m3 in wealthy family) may have two meanings: a manner of saving water and at the same time, a life style less hygiene, not good for health (see the above Table 16).

III. customer's awareness about water supply service

3.1 Awareness about capital source for improving water supply system of the city at present

This is a subject which perhaps is appeared the least in EIC activities for household-customers. When asked about this issue, 39.7% households answered "Don't know". This

percentage in poor group is 54.8% (very poor household is 80%). 26.7% hold the opinion that the main financial source is from National and the city budget. 40.7% claimed that the main source is from ODA of The Finland Government.

Only 9 households (=3%) knew that the capital source for upgrading the water supply of the city is a loan from the World Bank or other international financial agencies. Among these 9 interviewees, one holds a post-graduated diploma, 2 persons are university graduates and the remaining 6 persons are higher secondary school educated. This shows that only small portion of highly educated persons knew about current changes in capital sources for investment in water supply system of the city. The Vietnamese saying "first guilty, second debt" expreses their concern with debt. Therefore, if we make customers aware of the burden that they will have to share through paying water charge fully and on time, it is affect very likely to positively change their awareness and behaviour in paying water charges.

It also might be useful to add this subject in the content of EIC campaigns on using and protection of clean water sources.

3.2. About propaganda subjects on clean water in the city

To understand in more detail about usefulness of Information-Education-Communication (IEC) about water, we have questioned about propaganda subjects that household-customer have known (heard/ read). The result is as follows:

3 first subjects that is known to 61.6% customers are:

- To water use economically (84.9)
- To keep water sources hygiene (73.6)
- To pay full and in time water charges (76.6)

(the number under bracket are percentage for each subject)

Then other subject such as

- 26.9% knew about issues concerning water using regulations and rules for penalty and reward.
- 7.6 % knew about issue cost of clean water producing

and 8.3% household-customer never knew / heard of any of the above subject.

Those numbers could suggest to have a better direction in IEC content concerning to clean water in the city.

3.3 Customer understanding about character of water supply service at present

The water supply service of Hai Phong city is approaching the mechanism of market-based water production and business. How are household-customers understanding about its nature ? The answer for this question may provide some clue to those who manage this important urban service.

The survey result shows that there isn't a uniform understanding about this issue. The percentages of households in relation to various opinions are as follow:

***Table 19*: Character of present water supply service**

Code	Answer alternatives	Percentage
1	Totally based on market mechanism, there's seller (HPWSCo), there's buyer (households), rational price	46.3
2	A business activity with partial governmental subsidy.	21.2
3	Water trading is only formal, and government still have to subsidy .	10.0
4	It is not totally free trade due to monopoly and there is no competition	27.2
5	Other evaluation	7.3

So nearly a half of the customers said that water supply service at present is a business activity based on market mechanism. A smaller portion (10-20%) of customers see the dual nature of this service, perhaps by guessing but not having evidence. Especially, 27.2% customers express opinion that this service is not yet free trade since "there is monopoly and there isn't competition". The variety of opinions is understandable because there is not yet a clear identification of the business nature of many state-run enterprises, especially, so-called public-service companies like HPWSCo.

Let us make a comparison between understanding of household and that of HPWSCo staff on this issue.

When being asked about this, 73.0% employees of HPWSCo answered that, the water supply service at present is "*a business activity with partial governmental subsidy*". There is only 10% who consider this service as pure-

business and an other 10% that it is subsided in "principal".

So that, there is a gap between customers' awareness and suppliers' in this issue. Customers, with some favour to the former subsidy system, when paying water charges directly and somewhat higher than before, think that there are no longer subsidies and only the market mechanism. Suppliers, with the psychology of a trader wish to get more benefit by increasing water price. Perhaps it is a reason why suppliers do not yet identify the water supply service as a pure-business activity.

However, suppliers highly evaluate customer's awareness on the business nature of the water supply service. Most interviewed staff said that majority customers had a good awareness and fairly accepted the principle of "user-pay" for this service. Reality also supports this fact.

In general, the business nature based on the market mechanism of the water supply service has been clearly recognised by the majority. (67.5%) of both customers and suppliers. This advantage on awareness aspect will encourage a continuing improvement of service quality, even with an additional principle "better service requires higher cost and price".

Among different customer groups, there is various understanding about this matter. The poor group has 60%, while the wealthy has only 27.6% interviewees confirming the business nature of the water supply service, and in general, poorer households had a higher percentage favouring this answer. This may be affected by paying water charges: for the poor, water charges are a notable item within their low income and thus to them, water prices seem too expensive. This also can lead to overeconomical use of water, which is not good for health. To the wealthy family, water charges are small and thus water charges seem too cheap (due to subsidised ?). This, in contract, can lead to wasting water (see the table below).

Table 20: **Monthly average income, expenditure and water charge by living standard**

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Wealthy	2.508	32	1.706
[illegible]	Fairly good	1.390	25	1.073

3	Average	1.103	19	938
4	Under average	741	15	719
5	Poor	534	7	580

According to this data, the wealthy household pay only 1.83% total expenditure and 1.25% income per month for water charge. The percentage for the poor household is 1.25% expenditure and 1.35% income.

3.4 Understanding about the rights and duties of customer

Upon signing the water using (buying-selling water) contract, customer have rights and duties that need to be known and followed up. When being asked about this, only 45.7% customers said that they know about these; 32.3% said "has read /heard somehow" and 22% have no idea. This means there something should to be done in IEC activities to continue improving customer understanding, and by doing that, improving service quality itself.

There are 3 main channels giving customers information on their rights and duties. They are: Water selling-buying Contract signed by customer and HPWSCo (34% customers cited this channel); mass media - newspaper, radio, TV (64.3%) and disseminated by HPWSCo staff (12.3%).

When asked about feasibility for realising these duties and rights, 63.7% customers said that "it's easy to realise". Perhaps this percentage will match with the percentage of households paying full water charges in time (will be dealt with in following part of this report); 14% customers think that "it isn't easy to realise"; 22% customers do not know or did not answer.

In conclusion, on some important issues such as "investment source for improvement of water supply system"; "business nature of water supply service"; "rights and duties of customer", it can be seen that customer's attitudes are fairly positive. However, there are still some "vacuum corners" which need to be filled up by IEC activities through mass media or other communication channels.

IV. Customer's evaluation on quality of water supply service

4.1 Evaluation on factors of water supply service

The customer's evaluation is a kind of feedback for improving service quality. To quantify the evaluation of

customer on water supply service, we have proposed 8 factors of this service for customer's evaluation on a 5-points scale (lowest level 1 point, highest 5 points) Below are the results of evaluation from 300 household-customers on 8 factors with average points for each.

Table 21: **Average evaluation points for factors of water supply service**

Code	Factors of water supply service	Average point	Of which	
			for upgraded area	for not upgraded area
1	Supply duration	3.6	3.7	3.2
2	Water quality	3.5	3.6	3.1
3	Water pressure	3.4	3.6	2.8
4	Supplied water volume	3.0	3.1	2.7
5	Domestic water charge	3.4	3.5	3.3
6	Flat rate norm	3.3	3.3	3.4
7	Flat rate norm for water from public tank	3.4	3.4	3.5
8	Norm for water consumption with accumulative price	3.1	3.1	3.1

In general, for all 8 factors, customers evaluate from 3 - 3.6/ 5 points. That means a positive evaluation, approaching a good level (4 points).

4.2 Satisfaction degree with water supply service

To test the above-mentioned evaluation, we have asked customers to state their satisfactory degree with water supply service in general, also on a 5-points scale. The results are as follow:

Table 22: **Satisfaction degree with water supply service**

[illegible]	for the whole samples	for upgraded area	for not upgraded area
Very satisfied	9,0	10,4	5,1
Satisfied	40,3	47,5	20,3
Acceptable	34,7	33,9	36,7
	15,0	7,7	35,4
Not satisfied	1,0	0,5	2,5
Fully not satisfied	-------	-------	-------
	-----	-----	-----
----------	**3,4**	**3,6**	**2,9**
Average evaluation point			

In average, there is about 50% customers express their satisfaction with the WS service; one-third consider as "acceptable"; and the rest 16% are not or very not satisfied with the service. It is noteworthy that in upgraded area there is only 8.2% customers who is not or very not satisfied with the service while in not upgraded area this rate is 37.9%. It is surely is understandable reality.

The average degree of evaluation is 3,4 - means between "Acceptable" and "Satisfied". This nearly corresponds to evaluations with the above mentioned factors. There is a difference of this evaluation in two areas: 3,6 point for improved area and 2,9 for unimproved area. Among various living standard, the better living conditions households have, the higher satisfaction with water supply service they express.

In a word, it can be said: customers have accepted existing water supply service at the "above average level" and are sympathetic to it.
However, there is still about 16% (48 households) who are not satisfied with this service. In more detail, 13 households are in situations with a lack of water or less-water, or must be in use of another source of water. The remaining households cited 3 following reasons:

1. Lack of quantity of supplied water and weak pressure (25%)
3. Poor quality (23%)
3. High tariff (31%)

4.3 Situations of water-bill paying

In contact with customers daily, many situations might have happened, especially between customers and bill-collector. Being interviewed on this matter (with a list of main situations), households acknowledged the situations familiar to theirs. The results are as follow:

Table 23: **Situations during water-bill paying**

Code	Situations	Rate for the whole sample	for upgraded area	for not upgraded area
[illegible]	Full monthly payment in time to collector	75,5	82,0	58,2

2	Full payment in certain	11,0	12,3	7,6
3	days	7,0	7,8	5,0
4	Sometimes the payment is delayed in some days, due to lack of money	0,7	1,0	-
5	Due to late payment, sometime the water is cut off.	0,7	0,9	-
6	Refuse payment because do not agree with WM'	0,3	-	1,3
7	indicator and bills.			
	Do not want to pay for	0,3	0,5	-
8	water due to not satisfaction with water supply service.	10,7	3,6	30,4
	Quarrelling / altercation with collector			
	Others (no payment for water bill)			

These opinions from households - customers show that about three quarters of customers pay water charge fully and in the required time (of which 82% in upgraded area and 58,25 in not upgraded one). - In the area of *not upgraded water supply system the rate of this kind of customers is higher (30,4%), mean while it is 3,6% in upgraded area.* Other 11% pay fully in certain days and 7% postpone the payment and delay some more days. In total, about 90% of customers pay water charge.

The tense situations such as "Quarrelling -altercation between customers and collector" "Not satisfied with the service and not pay water charge" take a very small rate (1%).
However, there still remains 11% of households-customers who refuse payment for different reasons (as mentioned above). The more detail research shows:

- High rate belongs to under average households (23%) or the poor (25%)
- Especially, 64% of these customers is households of invalids. In the group of non-invalid households, this rate takes only 8,6%. This situation has been well known by HPWSCo and now re-acknowledged by opinions from interviewed households-customers. This is a sensitive and subtle matter: These households themselves openly say about their special right. That is using water without payment. For this matter, there are two possible solutions:

+ Perhaps the city authority co-ordinates with HPWSCo in confirming their right, and then using city's

budget (or welfare funds) to pay this amount of water charge for HPWSCo.

+ Or disclaim these special rights with appropriate explanation, persuasion in order to make these households be understood and followed existing regulations.

4.4 Convenient time and place for water charge payment:

We have consulted with households-customers about convenient time and place for water charge payment. The results are as follow

Table 24: **Convenient days of month for payment**

Code	Convenient days	Rate % of opinion
1	From 1st - 10th monthly	4,7
2	From 11th - 20th monthly	10,5
3	From 21st - 30th monthly	57,6
4	Sundays	4,3
5	Any day	22,1

Table 25: **Convenient time of day for payment**

Code	Convenient time	Rate
1	Morning	9,8
2	Noon	1,8
3	Afternoon	8,7
4	Evening	50,4
5	Anytime	28,6

Table 26: **Convenient place for payment**

Code	Convenient place	Rate
1	At home	93,1
2	At office of Ward's WM	5,1
3	Group	2,8
4	Other place	

Regarding the days of month, those considered to be convenient by households for payment: (57,6% of households) are the 10 last days of month. This rate is highest in the group of state employees (62,3%). This corresponds to the job structure of city households as show in the survey sample (50% of households is governmental employees, 38,3% is mixed households).

The trade / service-maker households or pensioners households have the highest rate on payment of water charge at anytime of month.
There is the difficulty that different kinds of households reside together in one area, making it very hard for the collector to have an appropriate route to divide equally his work for all days of the month.
The same problem occurs with question of time in a day. High rate (50%) is taken by households, who are ready to pay in the evenings. About one-quarter of households can pay at anytime of day.
For place of payment: 93% of households want to do payment at home. Only a few households (mainly users of public tapes/ tanks) want to pay at office of Ward's Water Management Group.

4.5 Customer's evaluation about HPWSCo's staff

In addition to household-customers' evaluation about water supply service, we also asked them to evaluate working of HPWSCo's staff, those they contact. Evaluation bases on a 5-points scale. The results are as follow:

Table 27: **Average evaluation points for about HPWSCo staff**

Code	Character and capacity of the staff member	Evaluation on average point	Divided in areas with water supply system	
			Improved	Unimproved
	Responsibility for work	3,7	3,8	3,5
	Attitude, behaviour in contact with customers	3,8	3,8	3,7
	Technical skill (for repair workers)	3,5	3,5	3,4
	Be master of working regulations, rules	3,6	3,6	3,4
	Capacity to monitor ward's water supply works, understanding customers	3,6	3,6	3,4

(In average, about 70-80% of customers gave their evaluation).

It is clear that the customers' evaluation about HPWSCo staff is quite good: most average evaluation points are from 3,5 to 3,8/ 5 points (even higher than evaluation about service itself). The highest point (3,8) belongs to "Attitude, behaviour in contact with customers" (on the principal of respect). In fact, customers accept and have

good intentions and sympathy with their suppliers. A portion of customers gave evaluation fair or good mark.

Other contacts

Except usual contacts (e. g. with collector), the customers may have contact with HPWSCo staff for other purposes. Being interviewed on this matter, 27 households answered that they have had working contacts on the following subjects:

+ Signing contract on installation of water connections 70,4%
+ Complaints
14,8%
+ Offering a word of criticism, commends
11,1%
+ Informing of water troubles
11,1%

Among these 27 cases, 22 cases are working contact for a household, 5 cases are on behalf of a household group or a living cluster

In these cases, the bodies whom consumers have contacted with are:

•Heads/ staff of Ward's Water Management Group 30,4%
•Representative of WSCo in District 18,5%
•Staff of specialised sections of HPWSCo 33,3%

The household-customers also noted their opinion on the results of contacts, the manner of making solution and effects of the above mentioned working contacts. All evaluations reflected in a degree of satisfaction with the contacts, as below:

Table 28: **Satisfaction on other contacts**

Code	Satisfaction degree	Number opinions	Rate %
1	Very satisfied	3	11,1
2	Satisfied	25	55,6
3	Accepted	2	7,4

4	Not satisfied	7	25,9
	Total	27	100%

The average point for this evaluation is 3,5/ 5 points.

4.6 Customer's acknowledge about violation of regulations in using water

At the present, in some areas of the city, piped water is leaked and lost, by which water revenue also is significally lost. Besides technical and managerial reasons, there are reasons belonging to the customers themselves. Being asked about "negative phenomena" (i.e. violation regulations in using piped water) in the whole city, and especially in residential areas where the customers live, they confirmed their acknowledgement of these phenomena as follows (see here under table).

In accordance with these results, in the whole city, the most notable is waste use of water: about one- third of interviewed households recognised this phenomena. Especially, more than a half of customers in not-upgraded area know / hear this thing. Other phenomena: delaying payment of water charge (22,7 % opinions without difference between 2 areas); neutralising water meters (19 % opinions); dripping water tap (15,9%), etc. It is noteworthy that, customers in not-upgraded are very critical to water use violations: in many kind of this phenomena, the rate of this customers group is often double higher than other group who even now enjoin much better WS service. For example, only 5.3% customers in upgraded area know about attitude "*Delaying paying water charge*", mean while 22.8% those in not-upgraded area know it.

Table 29: **Acknowledge about violation of regulations in using water in the whole city**

Code	Negative phenomena	occurring somewhere in the city		
		Rate for whole sample	for upgrade d area	for not upgraded area
	Waste water	**32,6**	22,1	*57,0*
	Illegal connection	15,9	13,5	26,6
	Connecting ahead of WM	13,5	9,8	*26,6*
	Neutralising WM	19,0	17,2	26,6
	Dripping water tap to stp	15,9	12,8	*25,3*
	make meter	11,2	7,0	*24,0*
	Paying for water for			

7	production with price of	22,7	22,6	22,8
8	water for domestic use	9,4	5,3	*22,8*
9	***Delaying payment of water***	1,4	1,0	3,8
10	***charge***	***46,3***	***48,0***	***41,8***
	Refusing to pay			
	Others			
	Do not know / no comment			

In living quarters, people pretend reserved but also acknowledged the most popular phenomena that is "delaying payment of water charge" (21,8%, this rate is the same in both 2 areas) and 3-5% for other phenomena. Particulaly, phenomena *"Refusing to pay"* is found by 18.9% customers in not-upgraded area versus only 1% in upgraded area. So that it is clear that violation of regulations in water using still being significant at the present.

Table30: **Acknowledge about violation of regulations in using water in this living quarter**

Negative Phenomena	Occurring in this living quarter		
	Rate for the whole sample	for upgrsded area	for not upgraded area
Waste water	3,1	4,2	1,3
Illegal connection	0,3	0,5	-
Connecting ahead of WM	1,0	1,4	-
Neutralising WM	4,1	5,8	1,3
Dripping water tap to make meter stopped	3,3	3,8	2,5
Paying for water for production with price of water for domestic use	5,9	6,6	5,0
Delaying payment of water charge	**21,8**	**22,2**	**23,3**
Refusing to pay	5,7	1,0	18,9
Others	1,3	0,9	2,5
Do not know / no comment	***69,3***	***67,9***	***73,4***

How do the above-mentioned wrong actions affect the quality water supply service in general, and to water charge to be paid by good customers ? We asked household-customers this question. The results are as follows:

Table 31: **Acknowledge about negative impact of violation of regulations in using water**

Code	Do those violation actions affect to.....	Rate for the whole sample	for upgrsded area	for not upgraded area
1	Yes, strongly affect....	60,7	51,4	87,7
2	Yes, affect but not so	26,7	32,4	10,2
3	strongly	7,3	9,2	2,0
4	Do not affect in comparison to other reasons	5,3	7,0	-
- -	Do not know, not care			
	Céng	100 %	100	100

This means customers clearly acknowledge harmless (general and particular) wrong actions in using of water. At least 80% customers affirmatively answered "Yes" to the above question.

87,8% households in area with improved water system against 51,4% in improved areas affirmed that such kind of violations strongly affect the quality of water supply service in their living quarter. In other words, customers in upgraded area are the most "sensitive" with negative actions / rules violation in water use.
Confirming this awareness is the way to encourage to find out new directions supporting campaign by HPWSCo in preventing water loss.

One of those directions might be encouraging self-control activities in communities. To test this idea, the following question was asked to respondent-customers: "Besides measures of control, supervision and sanction from HPWSCo for violations, do you consider the role of households in wards, residential groups be significant in self-control, supervision of water use in your living quarter?". Their answers are:

Table 32: **Possibility of community participation in self-supervision on water using**

Code	Answers	Rate for the whole sample	for upgrsded area	for not upgraded area

1	Yes, if there are good and appropriate	50,3	45,7	63,3
2	organisational forms	21,7	24,4	13,9
3	Yes, but still being limited effect	26,3	28,5	20,3
4	Not sure, cause may be not much people take care and participate	1,7	1,4	2,5
	Others			
	Céng	100%	100 %	100%

As in many other evaluations we have mentioned above, group of customers in not- upgraded area often express more positive and more critical evaluations in comparison with those in upgraded area. For example, 63% customer in not-upgraded area (versus 45.7% in upgraded area) believe in effectiveness of measure so-called "self-controlled" at community level. The reason of this different attitudes may be lie in the quality of WS service in each area. The lack (or thirsty) of piped water in not-upgraded area possibly makes local customers be more active and interested in (or more sensitive to) WS service in the city and in their living area in particular.

So that it is quite clear to think of new content for ICE activities in community. The main point is that, as mentioned by customers, "if there are good and appropriate organisational forms", at least we can expect that 50% of household-customers are ready to respond and support the campaign on reduction of water losses in the city (see more in the Part III of report)

part two **staff survey**

I. general information about interviewed staff

1.1 Socio - Demographic characteristics

The sample of staff survey is 37 staff (plus 3 managers) of Hai Phong Water Supply Company (HPWSCo). It is structured by 4 staff groups: staff of the Utilisation Section (at HPWSCo headquarters); Heads of the Water Management Groups in wards; repair workers; and Water meter readers and bill collectors. The list of these 40 staff has been representatively selected by Hai Phong Water Supply Company. The first group belongs to a specialised unit under HPWSCo. The remaining 3 groups are head and staff (repair workers, WM readers and bill collectors) of Water Management Groups (WMG) in wards. Afterwards, we will use their short names as follow:

- The entire sample: HPWSCo staff / Company staff
- The first group: Section staff
- The second group: Heads of group
- The third group: Workers
- The fourth group: Collectors

Table 33: **Some general information on groups of selected HPWSCo staff**

	Groups				
	Section staff	Repair workers	Head of Group	Reader/ Collector	Total
Se					
M	4	5	7	5	21
	3	-	-	13	16
Ec					
L	1	3	1	6	11
Upp	-	2	5	10	17
Co	6	-	1	2	9
	37.8	42.2	46.4	39.9	
	9.7	16.8	17.3	17.8	
	7	**5**	**7**	**18**	**37**
To					

The majority of WM readers and collectors are female, while the entire Heads of Group and repair workers are male.
With a quite high average age (approximately 40), the Section staff are professional and experienced.
Heads of Group and Section staff achieve higher education level than those in Ward's WMGs.
Most of the HPWSCo staff who enjoyed official training fall on the Section staff and Heads of Group. The minority remaining staff are, however, young and university graduated, but working as WM Readers or Collectors - the jobs alien to their profession.

1.2 Income

The 1997 monthly average salary and other incentives of most (81.6%) of those interviewed totalled around VND 500 to 700. This amount is considered normal and rated at 3.15 against the five-point scale. Many of the interviewees seem to accept the rate provided because, they said, if they could have any other job, the income would not be higher and more stabilised then that they get from the Company now.

Over half of those interviewed express their hardship with the average income of VND 300 / per/ month. Only one third of those questioned gave their average income between VND 300 - 500.

1.3 Living standard

Table 34: **Living standard self- evaluation by households**

[illegible]	Groups				Total	
	[illegible]	[illegible]	Head of group	Collector	Number of staff	Percentage (%)
[illegible]	-	-	-	-	-	-
[illegible]	1	-	-	-	1	2.7
[illegible]	6	3	6	11	26	70.3
[illegible]	-	2	1	6	9	24.3
[illegible]	-	-	-	1	1	2.7
Total	7	5	7	18	37	100

70.3% of the interviewees classified themselves as average compared to other urban families. 24.3% confessed the under average level. None of the questioned ranked him/ herself into the wealthy group. Only one case was

self-considered as poor and one was self-classified as fairly good.

1.4 Housing

75.7% of the interviewed have private residences including liquidated dwellings. The rest are living in public apartments. Section staff enjoy a higher living area against the others. The general living areas remain oscillated between 48 m^2 and 25 m^2. Qualitatively, one third of interviewed said their housing remain either half- fortified or make-shift, nearly half of which are of Readers/Collectors and Heads of Group.

II. understanding on the business nature of the water-supply service and attitude toward the current jobs

2.1 Understanding on the business nature of the water-supply service

The understanding of the interviewed staff on the issue does reflect the transformation of the HPWSCo in the market-oriented context, which implies a great impact on their working attitude, the service quality, their relationships with clients, and finally on the Company's productivity.

70.3% of the interviewed held that the Company operates *"mainly on business basis"*, yet *with the partial subsidy-based nature*, it is also considered as the *public-interest service* that currently exists in Vietnamese urban areas.

Following are two evidences commonly expressed by interviewees: (i) water charge remains subsidised or is of support-oriented (*some interviewees noted that, current water tariff - VND 1,600 per m3 is lower than its productive cost*); and (ii) the Company has not yet been autonomic in its business including the determination of water tariff.

The divergence in the nature of the Company's current operation against that in the centrally planning past was reflected in the fact that 95% of the interviewees noted that their current salary (income) depends much on the Company's business and productivity.

2.2 Attitude toward the current jobs

Understanding of the nature of the Company's operation constitutes an element that decides the evaluation by its staff on the suitability of their jobs.

86.1% of those interviewed hold that the jobs assigned to them are *absolutely suitable*, in which 41.9% of the responses acknowledge that their jobs are "appropriate with their competence " and 22.6% of the responses give the reason to their "*long seniority and experience*".
Only 16.1% of them emphasise on the "relevance between occupation and training" and 6.5% "find themselves suitable because they love their jobs".
Only 18.7% among the female staff acknowledge the suitability of their jobs (They are mainly collectors.

Four interviewees (11.1%) do not find themselves suitable to their jobs and wish or plan to shift to a new job.

There remain of course, both subjective/ personal/ internal factors and objective/ external elements that affect the interviewees feeling on the "suitability".

Patience, persuasiveness, the capacity of group/ team organisation and work in co-operation ... are the values/ capacities that are the necessary and expected characters and should be strengthened among the collectors, WM readers and Heads of Groups.

The majority of the interviewees acknowledge the significance of these values. However, in choosing three internal factors that affect the most on the productivity, 91.9% give the "*sense of responsibility and enthusiasm*" to the primary factor, 64.9% rank *health* second, while one third of the responses rank *interaction skill with clients* (but neither experience nor seniority) third. Only 10% rank *profession and skills* first.

External factors that determine the dedication of the HPWSCo staff are reflected in their satisfaction with the present employment. The average points in the following five-point scale table illustrates the grade of their satisfaction with the respectively assigned jobs.

The Table reflects a positive (or seemingly satisfactory) attitude of the staff toward their present jobs. Most of the job-related factors are scaled between 3 or 4. Following are some prominent points:

The lowest point (2.8) is given to the factor of "*relationship with clients*". In the later part of the Report there exists a situation where 55.6% of the WM readers/ collectors complain about the clients' misbehaviour. This easily understood factor can also be the reason for the group's under-satisfaction with their job. What is a solution to the situation? The not smooth in relationship between the suppliers and customers

apparently stem from this psychological factor. This factor should not be neglected while strengthening and perfecting the service quality as it is a sort of "invisible diminution" that can be compared to their physical exposition (times of collection, overtime ....).

Table 35: **Job satisfaction evaluation** *(average points)*

Code	Job natures	Satisfaction Level of respective groups				
		Average	Office staff	Repair worker	Head of Group	Reader/ Collector
1	Labour intensity	**3.42**	3.83	3.60	3.29	3.22
2	Working duration	**3.29**	3.83	3.40	3.43	3.00
3	Relationship with customers	***2.80***	3.60	3.00	2.71	2.56
4	Colleague relationship	***4.05***	4.00	4.40	4.14	4.06
5	Management style in group	**3.56**	3.33	3.60	3.14	3.78
6	Management style in Company	**3.76**	3.67	3.80	3.86	3.78
7	Salary and scaling	**3.15**	3.57	3.20	3.43	3.22
8	Company training plan	**3.14**	3.33	3.40	3.57	3.00
9	Promotion conditions	**3.34**	3.17	3.60	3.29	3.39

In contrary, the most positive factor is given to the *colleague relationship* (4.05 point) This, apparently, seems a natural balance between the two extremes in their working relationship (with clients and with colleagues).

All factors relating to Job natures *(Labour intensity, Working duration)* and others of material stimulation *(Salary, Training plan, Promotion conditions)* are equally given with positive points.

Meanwhile, the element which is considered foremost (92% respondents) in the occupations of the staff is given to

the "*sense of responsibility and enthusiasm*" . Hence, the emphasis on or appraisal the *human relations* (with customers, between colleagues) at work, although being good (in colleague relationships) or not smooth (in relationship with customers) can be seen as a prominent or a traditional strength of the Company staff.

In comparing the level of satisfaction between the interviewed groups, attention should be paid to the first 3 factors (i.e. *Labour intensity, Working duration and Relationship with Customers*). Looking at the table one can realise the declining from the Section Staff to the Head of Group and finally the Readers/Collectors. At the same time, there is no big divergence in the other factors. Due consideration must be taken into this actuality so that rational improvement can be made to the working condition of the field staff (e.g. collectors).

Value of the work is also indicated in the desire of the Company staff to have their children (upon entering the labour force) taking their footstep or working at the Company. Among 64.9% of the staff interviewed, three fourth wish their children to have working opportunities in the Company, and 12% of them want their children to work in their positions.

Following are the three main motives leading to such a desire :

- Professionally, the parents want their children to be their successors of the jobs they are handling are "suitable to their kids". Between 15 to 20% among the interviewees who express such a desire from this motive;
- Traditionally, as a desire of "son better than father", the Company staff, despite of the feeling that their jobs are uninteresting and of no high social position, still take advantage of possible opportunities (*close relationship with their superiors*) against their difficulties in taking other alternatives.
- Another reason that expresses the outstanding value of the service where 16.7% of those interviewed give to the fact that " *As the job is needed for all societies, there is no fear of jobless*".

In general, all the Company staff , regardless their motives, hope their children, upon entering the labour age, have opportunities to work at the Company. This is seen as an important element that decides the positive attitude of the Company staff toward their current service.

III. evaluation on HPWSC' services and operations

3.1 Evaluation on the Company services

The purpose of the evaluation work is aimed to measure the Company's operational effectiveness and productivity as well as to find out outstanding problems with a view to strengthen the water supply service quality for the City. The survey takes a number of services and major operations of the Company for evaluation by a set of criteria. The evaluation is based on the five-point scale with the corresponding points from 1 to 5. The higher point reflects a higher service quality. The average point given in the Table 4 below shall be used for analysis purpose.

There are all 10 operations and services with 18 evaluation criteria. Results indicated in Table 4 are quite good with the lowest point of 3.44 and the highest point of 4.56. Among the 18 criteria:

9 of which rank between 3,44 - 3,97 and

9 of which rank between 4,08 - 4,56

Generally, this reflect the fact that the HPWSCo staff, with their above-indicated sense of responsibility and enthusiasm, seem to be fairly self-confident (with their firm ground) in their operational results and service quality.

The evaluation scope in this part is quite large with connection to the management at the city level. We, therefore, do not set similar questions as to customer groups. In the later part, two-side comparative information shall be made upon evaluating specific factors on water supply service.

Table 36: **Evaluation on the HPWSC' services and operations**

Code	Types of service operations and evaluation criteria	Average point
	Ward pipe-line network improvement programme	
	* *Mode of construction organisation*	3.91
	* *Construction supervision*	3.70
	Installation of new/individual home connection	3.69
	* *Rational cost*	3.82
	* *Streamlined procedure*	
	Pipeline maintenance and improvement	***3.44***

	** Punctuality*	
4	Repair ** On time, quality*	4.25
5	Control, supervision, reward /fine ** Strictness* ** Equity*	4.11 3.97
6	Information/ propaganda ** Diversification, usefulness*	4.35
7	Consultation, complaint settlement ** Accuracy, speediness*	3.71
8	Customer complaint settlement ** Rationality, speediness*	4.19
9	WM Reading ** Accuracy, on regular basis* ** In correspondence with unit cost* ** Notice of illegal and damaged WM* ** Rational solution to complaint*	4.08 4.08 4.14 3.84
10	Bill Collection ** Convenience, rationality* ** Checking the accuracy of bill* ** Complaint settlement*	4.16 ***4.56*** 3.95

Following are a number of additional comments and explanation to specific cases

- The activities on the Ward Pipe-line Network Improvement Programme are based on the 2 evaluation criteria : *Mode of construction organisation and Construction supervision*, which are assumed to be the elements that cause the water losses in the improved areas. These criteria with respective 3.91 point and 3.70 point, are lower than those among the 18 criteria. Following is the common comment by many of the interviewees :

> *"In the first years of the programme implementation, there were negative signs and execution in the construction supervision, material quality guarantee, construction against design, all of which lead to poor quality, water leakage and losses. From the later part of 1995 up to now, however, with great importance attached to both construction and supervision, and experience learnt, the pipeline quality has been improved and that contributes to the reduction of water losses".*

This is also be indicated in the Table on " The water loss rate in the improved wards in October 1997" (an

excerpt from the Utilisation Section's " November 1997 Report on Consumption Revenue"). From the indicated data, the observation is that : there are 5 wards with the highest losses rate (between 24.78% to 37.61%) where the improvement of pipeline network conducted from 1995 upward (see Table below). Meanwhile, the rate, merely over 10% is given to those improved from 1996 onward. If the monthly and annual statistics are in lines with the tendency, then this helps enrich the persuasiveness of such a justification.

***Table 37*: 5 Wards with highest water losses rate in October 1997**

Code	Ward	Year of improvement	Water loss rate (%)
1	*An D--¬ng*	*1994*	*34.01*
2	*TrÇn Nguy^{a}n H·n*	*1994*	*27.21*
3	*NiOm NghUa*	*1994*	*27.17*
4	*Hµng K^{a}nh*	*1995*	*24.78*
5	*D- Hµng*	*1995*	*37.61*

- *Expansion to new customers* has become a regular activity of the Company. The evaluation criteria given to this are: *Rational cost* and *Streamlined procedure*. with respective point of 3.69 and 3.82. Many of the staff noted that such a service has not been provided under a "one stop and one stamp" mechanism. Customers have to contact various such agencies concerned as the Post office, the Energy Department, the Transport and Public Work Department with uncountable troubles and very time-consuming. The designing work by the Company sometimes proves delay, partially because of the fact that the insufficient number of designers are unable to meet customers' requirements. The main reason, however, lies in the concentrated demand form new customers (especially in Summer and at the turn of the year).

- *Maintenance and improvement services* are evaluated by the *punctuality criterion* with the lowest point of 3.44. Those interviewed held that on-scheduled repair maintenance work is only done with valves. Other maintenance work only takes place on case basis but not on regular basis.

- *Repair* service holds an important position against the City's make-shift pipeline system. The service is given with 4.25 point to the punctuality and quality criteria. Many of the staff consider this a superiority of the management mode applied to the ward

level with its mobility and the understanding of the actual situation by the WMGs in wards.

- *Information and propaganda* implies an important element to such a business with big number of customers as HPWSCo in its market-oriented process. This activity has been paid with due and effective investment attention by the Company as well as the Programme alike. Evaluation given to the activity is scaled at 4.35 point.

- *Consultation and complaint explanation* service is only given with 3.71 point to the accuracy and promptness criteria. Meanwhile, the *complaint settlement* is given with higher evaluation, at 4.19 point as referred to *rationalisation* and *promptness*. These two types of services have their own difficulties, especially with the currently inadequate competence and knowledge of the Company staff in dealing with customers. Nonetheless, with the improved quality in the service, the confidence of the Company among customers shall be strengthened.

- *WM Readers and bill Collectors* - with their most frequent contact with customers - are evaluated under various criteria. Despite of that, the scales given to these work are quite high (between 4 to 4.5 point). Only one criterion (*complaint explanation*) is given with a relatively lower scale (3.84 and 3.95).

In short, despite being possible influent by subjectiveness, the entire staff of the HPWSCo give fairly good evaluation to its operation and service availability. In term of quality, the evaluation is often given at "fairly good" level (with 4 point out of the 5-point scale). Comparing with other evaluated areas, a conclusion can be drawn at this stage is that: There emerges "no big problem". If any, there are vacancies that should be and are able to be filled in order to enhance the water supply service to customers in future.

3.2 Evaluation on the factors of the water supply service

The Company staff and customers were required to give evaluation to the 9 factors on the water supply service (see results in Part One of the Report). Table 34 below gives indications to the results of their evaluation.

On the whole, the service factors are given with a fairly high evaluation by the staff group (lowest with 3.69 point and highest with 4.48 point). The lowest level is given to the rationality of water consumption norm for public tank in unimproved areas. Some of those interviewed hold that the norm of $5m^3$/ person/ month for

flat rate remains high. On the contrary, with the norm of water consumption applied to the uncountable public tank, the collection rate merely reaches between 10 to 20% the actual consumption level.

The factors on water quality, pressure and supplying duration are equally given with considerably high evaluation (over 4 point).

The factor of highest evaluation (4.48 point) is given to the *sense of responsibility* with *duty fulfilment*. This coincides with the view by the majority of the staff who hold that the most important factors of their work are the sense of responsibility and enthusiasm.

Table 38: **Evaluation on factors of the water supply service**

Code	Service factors and evaluation criteria	Average point	
		Staff group	Customer group
1	Water price (tariff) * *Rationality*	3.78	3.42
2	Water consumption norm for flat rate * *Rationality*	3.70	3.35
	Water consumption norm for public tank * *Rationality*	*3.69*	3.42
	Water consumption norm for accumulated price applied to improved areas * *Rationality*	4.25	*3.15*
	Supplied water quality * *Purity* * *Taste*	4.22 4.05	3.52
	Supplying duration * *Rationality*	4.21	3.60
	Water pressure * *Adequacy*	4.24	3.43
	Service attitude * *Respectiveness*	4.25	***3.79***
	Sense of responsibility * *Duty fulfilment*	***4.48***	3.74

In comparing the evaluation given to the respective factors by the customer group, the most visible issue can be: the evaluation seriousness of customers. Generally, customers give 0.5 point lower than the staff group. This can be spelled out by the customers' higher demand on the service quality. The staff group, however is reasonable to say that they have fulfilled their duties.

However, the common saying in the market context "customers are gods" or "customers are always right" implies that the continued service quality improvement remains the unavoidable obligation of the Company should it really do business on market orientation.

3.3 Comments on customers

Understanding of customers is seen as a foremost value applied to all business operating in the market system. This is served as the basis to expand the market, rapidly respond to customers' demand and to improve the productivity.

Comments on different groups of customers

What the Company should study first is the customers' awareness and attitude toward the water supply service in the transitional period (from subsidy to accounting). This can be referred to the Table 7 below.

An important principle applied to the market-oriented service is "user-pay". From the interviews with the staff group, the overwhelming majority of the customers are conscious and acceptable with the principle. More than a half of those interviewed hold that over 90% of the customers accept the principle. Another two third of the customers (state employees' households, small business and service-makers or mixed households) are conscious and acceptable with the principle.
A small number of the interviewed customers (businessmen and some wealthy families who often return home late) accepts this principle with demand of higher quality.

Table 39: **Comments on different groups of customers**

Code	Customer's awareness and attitude	Customer groups	Rate
1	Understand and accept with the "user-pay" principle	- Mixed occupations - State' employees - Trade-service makers	40-60% (4 resp.) 65-85% 11 >90% 18
2	Accept the principle "user-pay", but with require of higher quality	- Mixed occupations - Night shift - Teachers - High income	No idea (22 resp.) 2-5% 7 10-30% 5

			90-100% 2
3	Accept the principle "user-pay", but due to financial difficulties, asking for delay to pay or paying at certain days	- Mixed occupations - Pensioners - Poor	< 10% (10 resp.) 15-25% 8 30-40% 15 80% 1
4	Accept but still wait for partial subsidy	- Trade-makers - War-invalids	No idea (21 resp.) <10% 7 30% 2 70-100% 7
5	Accept with reluctance, delay or refuse to pay water charge	Poor families Marginal families	< 5% 20 10 - 20% 13
6	Influent by habit of subsidised, tending to enjoy free service	Serious war invalids	1% 15 0% 13 2-5% 8 7-10% 3

A relatively numerous customers - around 20% out of the interviewees, who "accepts this principle but due to financial problem, asks for delay or payment at certain days". Regarding the social positions, customers of this group comprise retired families, mixed occupations and poor families. Those families who mainly rely on salary or pension often settle the bill at the end of the month upon receiving salary and pension. The poor families often ask for delay.

Different views are given to the group No 4 (with the attitude of "accept but still wait for partial subsidy"). Over half of the responses note that none of the customers express such an attitude, while the rest hold that under 10% of such customers.

Most of the responses acknowledge the existence of the attitude of "Accept with reluctance, delay or refuse to pay water charge". This takes around 10% mainly from the poor or marginal families.

Besides, there exists a portion customers holding the attitude "Influent by habit of subsidised" who tends to enjoy free service. They are of serious war invalids.

Evaluation of difficulties upon contacting customers

In general, only two groups: Heads of Group and Reader/Collectors are in face of difficulties upon their contacting with customers, namely :

- customers' improper attitude/misbehaviour;
- Taking many turns, overtime to contact customers.

Table 40: **Difficulties upon contacting customers**

Interviewed groups	Difficulties	Number of responses
Company staff (7 persons)	+ Large area, overload work	1
	+ Customer's high demand, unimmediate settlement	**1**
	+ Free from contacting customers	2
	+ Facing no difficulties upon contacting customers	2
	+ No idea	1
[illegible]	+ Customers' refusal to repair cost, taking time for explanation	**1**
	+ High demand, cannot be met	**1**
	+ Facing no difficulty	3
[illegible]	+ Large area, unmanageable	2
	+ Customers' improper attitude/ misbehaviour	**2**
	+ Taking many turns to contact customers	**2**
	+ Taking overtime turns	2
[illegible]	+ Customers' improper attitude/ misbehaviour	**10**
	+ Facing professional difficulties due to inadequate training	2
	+ WM irrational position	1
	+ Taking many turns, overtime to collect fees	13
	+ Others	2

Solutions to difficulties upon contacting customers

Firstly, 41.4% of the staff stress on information and educational measures with a view to strengthening the

awareness among customers of the business nature in the water supply service so that they are willing to pay fully and timely.

Secondly, 17.2% of the ideas mention the managerial and organisational measures : Concrete regulation plus exclusive preferential policy applied to invalids and marginal groups must be issued.

Thirdly, 13.8% draws attention to economic and technical measures : Due investment should be put in improving the ageing network with a view to meet the citizens' demand.

Nearly 10% of the ideas focus on the supervision and training measures.

3.4 Evaluation on the water losses

To overcome the situation of water loss is considered as an important measure to enhance productivity and the service quality. Reasons leading to water losses and water revenue, which affects the service quality and productivity, can be classified into the following three main reason groups as follow:

- **Customers-related reasons,** namely : illegal connection; connecting ahead of WM; neutralising WM, dripping water flow to stop WM; waste of water; remaining reluctant or refused to pay water charge.

- **Organisational - managerial reasons,** namely: the irrational and inadequate and unproductive manner in water consumption/ business management ; the lack of adequate management and consumption regulations; the lack of strict supervision measures; the improper salary and incentive system...

- **Technical-related reasons,** namely : the worn-out, leaking pipe network; the unqualified construction material, equipment and quality; the loosening in construction supervision; insufficient capacity; insufficient supplied water; inadequate condition for large-scale (in the entire city) upgrading

The company staff were asked to give assessment to the three groups of reasons on both the improved and unimproved areas. Half of the interviewees have ranged the reasons in the following order:

Table 41: **Order of reasons causing water losses**

Groups of reasons	Rate of comments (%)	
	Upgraded area	Not upgraded area
Customers	54.1	57.9
Technical	35.1	31.6
Managerial	10.8	10.5

Looking at Table 9, the prominent reasons in both areas are given to *customers*. Then the technical reason is ranked second, and comes next the managerial reason.

Most of the later half of the staff did not follow such an order. Despite of the complexity in evaluating and classifying reasons, however, this group has its own way in indicating concrete reasons described as follows :

Table 42: **Main reasons causing water losses**

Code	Group of reasons	Number of response	Rate (%)
	Technical reason Ageing and leaking tubes, unqualified construction quality	25	67.6
	Customer reason - Dripping water flow to stop WM - Wasting water	12 19	51.4 32.4
	Managerial reason Inadequate supervision/ management	13	35.1

The order arranged in this explanation is different : Technical - Customer - Managerial.

Finally, one among the Company managers proposes the following arrangement:

1. Technically, "*the unqualified operation of the supply network and the leaking situation is due to the poor facilities and infrastructure*".

2. Managerial reason.

3. Customers: *"Customer' improper attitude is unavoidable. Yet they shall follow should good management be in place ".*

That means there remains a divergence in arranging reasons. Specific arguments and concrete reasons, however, have been clarified. What should be done would be to seek solutions to the reasons.

IV. Recommendations by the interviewed staff

4.1 The needs and proposals of staff members

1. Opening or sending them to training courses.

64.9% of the interviewees put forth such a proposal with hope to strengthen their profession and skills. This is comparative to the actual need: 71.4% of the staff have undergone only short-term training courses.

2. Due attention to remuneration issues (salary, bonus, allowance...)

35.1% of the interviewed express the idea. Although almost every interviewee regards the sense of responsibility, material motivation is seemingly no less important.

3. Better equipment and working
Especially for repair workers; set up telephones in WMG' office in wards to allow convenient communication with customers, operational management and report to Company, ...

4.2 Recommendations for improving water supply service

1. Combining upgrading in each area and overall pipeline network (56.8%).

2. Streamlining administrative procedures for customers (27%).

3. Accelerating information/ propaganda and education activities (16.2%).

4. Considering and adjusting water tariff (13.5%).

5. Improving management activities (8.1%)

Part three

CONCLUSIONS AND RECOMMENDATIONS

I. Conclusions

The survey has studied 3 key subject matters with the major findings summarised as following:

1.1 The present situation of city's water supply service

The study has provided data (in average and of various groups) of access to piped water, volume of used water, monthly fee, forms of payment, the percentage of water charge in expenditure and income structure of household, etc.. These data show that water supplying service has generally met basic demand for domestic use water of the majority of people in the city. However, only about 60% of the households have piped water available right in their house. Others have uneasy access to pipe water or have to use other water sources which are not always clean. There are 2 indicators to be noted here:

- 99% of the household-customers use water containers (mainly cement tanks of 1-3m^3) for such reasons as: to take precautions against water, electricity failure, to have cleaner water and less chlorine smell, etc..)

- 22% of the household-customers have access to piped water but still continue using other water sources (as drill well, dig well, rain water) due to economical reason or habit.

These two indicators only reflect the inadequacy (incompleteness) of the water supply service as well as of the people's awareness about water source sanitation. This also means the necessity of programme to further

improve and perfect the quality of water supply service and related problems in the coming time.

1.2 Awareness of customers and suppliers about some issues related to the water supply service at present

A/ Awareness about the business nature of the water supply service at present is not the same among customers as well as among staff group- suppliers. There is a big gap between the customer's awareness and that of the supplier: Customers think that water supplying service is of a market oriented business nature, while suppliers still emphasise the subsidy characteristic of this public service. However, in general, the market oriented business nature of the water supply has been more or less aware by a considerable part of the customers and suppliers (about 60-70 percent). This is an advantage in the aspect of awareness to further improve the quality of this service.

B/ A number of communication themes related to water supply service (as economical using water, protecting water source sanitation, paying charge in time) have been known by many of the customers (about 60%) through different communication channels, especially through mass media (television, broadcasting, press). 78 percent of the customers have known/heard about their rights and obligations when using the city's water supply service. Most of the customers know about wrong behaviours in using water and their damage. Especially, in relation to the capital sources for investment in upgrading the city's present water supplying system, only 9 of the 300 household-customers (3%) know about World Bank loan.

In short, through a number of key issues as " the nature of the water supply service"; "the rights and obligations of customers"; "capital sources for investment in upgrading water supplying system", etc.. it can be recognised that the customers' understanding and

knowledge about the above-mentioned issues are relatively positive. However, in order to improve the customers' knowledge and this service itself, there remain a gap to be filled by IEC activities, through mass media or other communication channels.

C/ For HPWSCo's staff (also called the supplier), the study on their knowledge, attitude and level of satisfaction about their present job is a relatively interesting and useful information. The study shows that the majority (86 percent) of the interviewees think that their present job is quite suitable for them. Meanwhile, only 18.7 percent of female staff (most of them are bill collectors) think that their present job is suitable for women.

Especially, 92 percent of the interviewees think that the most important element in their job is "*sense of responsibility and enthusiasm*", an element that shoots through opinions and comments of the Company's staff. The level of satisfaction in the elements of their present job is relatively high: with the average point of 3 to 4 on a 5-point scale. The lowest mark (2.8 point) in "*the relationship with customers*" (mostly from collectors' opinion) shows the present situation as well as reflects a high demand in human relationship in their job.

So, the emphasis on human relationship and sense of responsibility can be considered as a traditional feature and strength of the HPWSCo' staff . These should be brought into full play. On the other hand, it should be noted that there are different opinions on the level of satisfaction among staff groups. In the three first and job's direct elements: *labour intensity, working duration and relationship with customers*, the evaluation points on level of satisfaction gradually reduce from the staff group in the Company's Utilisation Section to the repair worker group, the heads group and finally, collector group. It is necessary to pay attention to this in order

to have appropriate adjustment to improve the working condition for the staff groups working in grassroots level (wards).

1.3 Comments of customer and supplier on the present water service

A/ All the 10 operations and services supplied by HPWSCo have been assessed by its staff (according to appropriate criteria), with the evaluation point of 3.5 to 4.5 over 5-point scale. This shows that the company's staff, with their sense of responsibility and enthusiasm as a typical characteristic, appear to be relatively self-confident (and they have foundation to be self-confident) in their working results and quality of the service they provide for customers. However, apart from the highly appreciated activities and services as reparation, communication work, etc.. a number of other activities with lower points show some problems to be noted. For example, the procedures for installation of new piped water is still inconvenient due to the failure in implementing "one-door, one-seal" policy. Or the periodical maintenance work hasn't been implemented.

B/ The assessment of water supply service's elements has been implemented by both customer and supplier groups. On the same element, there is a difference between the assessment of the customer and that of the supplier. Customer give points 3- 3.6 over 5 to these elements. The level of satisfaction in water supplying service is generally marked at 3.4 (16 percent of customers are not satisfied). While the supplier group give higher points 3.69 to 4.25. Customers are generally are more serious in deciding points, in average 0.5 point lower than the staff's. It can be recognised that customers have increasing demand for the quality of water supply system. While the supplier group has enough basis to say that they have fulfilled their tasks. However, in the market mechanism, as people say: "the customer is the God" or

"the customer is always right". This means that the further improvement of water supplying service's quality is an undeniable task of the supplier- HPWSCo, in the coming time if the company does business on the basis of market principles.

C/ The relationship between the customer and the supplier is reflected more clearly in reviewing the "cross assessment" between them. On the customer's side, their assessment on the working manner and behaviour of the supplier is relatively good: in average marked at 3.5 to 3.8 over 5. The highest marks (3.8) is given to "the working attitude and behaviour" toward the customer. In general, customers show their goodwill acceptance of the supplier's completion of their professional tasks.

On the supplier side- the staff said that the majority of the customers are aware of and accept the principle "user - pay". More than half of the interviewees think that more than 90 percent of the customers accept this. Others estimate that two thirds of the customers understand and accept this principle. Besides, the staff also estimate that 10 percent of the customers show reluctance to pay water charge. It is rather interesting that there is a coincidence between the above-mentioned comment of the supplier (90 percent of the customers accept the principle "user-pay" and the results confirmed by the customers, also about 90 percent of the customers pay monthly water charge, 75 percent of them pay in time.

According to the supplier, the difficulties in dealing with customers include: i) some customers (mainly those among the 10 percent mentioned above) have improper behaviours; and ii) it is difficult to meet with customers, it often takes time and efforts to collect fee.

So, generally, there is no serious problem in the relations between the customer and the supplier. If yes,

the problems are mainly among the 10 percent as Vietnamese saying "a worm spoils the whole pot of vegetable soup". Those heavy impression of collectors is mainly in relations with this solitary group of customers.

However, it should be noticed some "psychological" factors effecting possibly to concrete evaluations by groups of customers. They are: i) the character "afraid of criticising government services/staff, want to keep a "peaceful co-operation"; and ii) the level of socio-economic development, and therefore, living standard of the city is low (in comparison with other city like Hanoi). This may lead to customer's demand on WS service quality also is at modest mode. They are possibly easy to accept a popular quality than request the best in existing context.
Although that, we think, such kind of impacts do not seriously affect the representativeness of the result of our surveys. The results reflect rather objectively the reality of WS service as well as relation between customer and supplier in the city and can be use for prepare action plan for continuing improvement of WS service of Hai Phong city in coming time.
D/ As mentioned earlier, 87 percent of the customers understand the negative impact of the violation of regulations in using water toward the quality and price of water supply service. According to these customers, in order to overcome this situation, apart from inspection and supervision measures and punishment of HPWSCo, the development of self-control in using water at community level might be of important role. 72 percent of the household customers have confirmed this possibility. This suggests a number of new approaches in the campaign against loss of water.

E/ Finally, there are some opinions around the ranking of three causing groups of water loss. Within the staff interviewee alone, there are at least three ways of

ranking different causing groups: either Customer - Technical - Management; or Technical - Management - Customer; or Technical - Customer - Management?

So, there hasn't been unanimity in the ranking of causes. However, main causes have been clearly pulled out. It is more important and necessary to look for solutions to overcome those causes.

II. SOME RECOMMENDATIONS

2.1 Customer-related recommendations

It is recommended to implement and promote an IEC campaign among the population. In order to implement this, it is necessary to have a concrete Action Plan and an identified and separate fund. Apart from traditional themes, this IEC may include the following:

- Clean water is a precious resource which should be properly exploited and used
- The obey of the principle "user - pay", timely and adequate payment is a manifestation of a civilised lifestyle, with awareness about law.
- The investment in water supply system is costly. Apart from the state budget, loans is being taken from international financial organisations (like the World Bank, ADB, etc..). The users should have a sense of contribution in paying debts through timely and adequate payment of fee. We should not leave a heavy burden of paying debts with our children generation.
- All the wasting of water, violation of water using principles directly affect the quality of water supply service and price, which is facing honest customers. All people are, therefore, responsible for practising thrift in using water and contributing to the control of using water at the community level.

- The relation between clean water, sanitation and health of the community. The using of piped water should be encouraged in replacement of other water sources.
- The polite behaviour and respect to water supplying staff, especially bill collector, are considered as element of the civilised lifestyle and cultural behaviour.
- Communication channels can be diversified. Apart from television, broadcasting, press, panel and poster, leaflet can be used to raise awareness about clean water and sanitation, responsible of citizen in using water, etc.. IEC activities also can be carried out through school students as an effective channel.

Attention should be focused on special customer groups (war invalids, poor households, households using other water sources, etc..). It is necessary to raise awareness of the community and encourage the community to participate in appropriate activities against water loss; to criticise improper behaviours; to use the community's pressure in fighting against reluctance behaviours in fee payment, improper attitude toward water supply staff, etc..

2.2 Managerial and organisational recommendations

- Promoting consultancy activities, responding to customers' complains and questions
- Improving, simplifying procedures in installation of new home connection, especially for individual customers
- Promoting inspection, supervision activities. Being seriously in commending and punishing both the customer and the supplier
- Continue collecting fee at the customer's house, concentrating on the 10 last days of the month
- Improving working conditions for staff group working at grassroots level (ward)

- The city's People's Committee is proposed to promulgate Regulations on special customers as war invalids and households with special needs.
- Studying the decentralisation of management and recommending appropriate organisational forms for the Consumption Service (Utilisation) Section. Studying management model in sub-branches, conforming to the phases in completing the city's water supply system.

2.3 Economical, technical recommendations

- For the Programme to upgrade water supply system at ward level: promoting supervision in implementation; linking management with supervision on construction works (staff of ward's water management groups should participate in supervision in the areas under their management.
- Ensuring the synchronous improvement of the pip-line network in each area and the whole system
- Ensuring the periodical reparation and maintenance in the whole system.
- Studying to use suitable water meter in different areas
- Studying an water price strategy conforming to each development phase of the city's water supply system. Attention should be paid on advocacy activities before changing price
- Reviewing the flat rate norm of $5m^3$/ capita in some areas.