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IN THE EFFORTS OF IMPROVING CLEAN WATER SERVICE:
REVIEW IN DISTRICT AREA**

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WILLINGNESS TO PAY AS AN INDICATION OF PUBLIC SHARING IN THE EFFORTS OF IMPROVING CLEAN WATER SERVICE: REVIEW IN DISTRICT AREA

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The research is aimed to analyze the amount of public's WTP as an indication of public sharing value and to identify the level of public affordability for clean water. The method used in this research was the Contingent Valuation Method. The results indicate that nominally, the amount of public sharing increases in line with increasing income, as indicated by the WTP value. The public willingness to pay with pipeline service is higher than the non-pipeline services in each income group. The amount of individual WTP, at around IDR 58.333 to IDR 140.909 per month varies based on the income level.

Keywords: clean water, willingness to pay, public sharing, CVM, water source, pipe line service, non pipe line service

INTRODUCTION

Background

The main pillar in the strategy of development in a region is by ensuring the fulfillment of clean water needs in the region (Vasquez W 2013). Based on this, various parties should allocate adequate investment in water infrastructure. More often, the provision of clean water infrastructure done by the government is based on political aspects and less considers the public participation, both in terms of material and non-materials. It results in the discontinued water service that has been provided; hence there are plenty of investments that are not functioning optimally. The success in clean water service can be met by estimating the value of clean water services, so it can be adapted to the existing policies, economic incentives, and institutional management (Birol E 2006; Vasquez W 2013).

Bekasi Regency is one of areas with highly rapid development prospects. It is due to the location of Bekasi Regency which is relatively close to Jakarta and Bekasi City, in which the cities have extremely high density and are difficult to develop horizontally. This development has a consequence on the increasing population, which in turn leads in increasing clean water needs of the community (Cheng Qi 2011; Pingali 2007). The local government as the authority in the development of clean water infrastructure and facilities in its jurisdiction requires the support of many parties, including the public. One of the roles/ involvement of the society is on the economic aspect, where people contribute to the efforts made by the government to meet the of public's clean water needs.

Willingness to Pay (WTP) is a description of public purchasing power based on consumers' perceptions (Dinauli

2006). The WTP value implies indicators of utility obtained from goods or services. The high utility of a product would encourage someone to be willing to contribute to the sustainability/ benefits of these goods and services (Delaney L 2004). The amount of WTP value can be used to predict the amount of public participation, and can also be used to estimate the clean water service tariff from the consumers (Yudariansyah H 2006), as well as to determine the condition of the existing water service based on the perception of the public /users (Irawan 2009).

In this study, the amount of WTP value used is to provide an illustration of public contribution in addressing the needs of clean water and to evaluate existing water service in Bekasi. Bekasi is one of district are in Indonesia. The results of this study can be used by local government and Regional Water Company to formulate strategic and tactical policies in addressing the clean water needs in a sustainable manner in Bekasi Regency.

Objectives

The objectives of this research are:

- a. To analyze public perception on clean water service that they currently receive.
- b. To analyze the value of public sharing based on the willingness of the community to pay in efforts of improving water service
- c. Identifying the factors affecting the selection of clean water main source

THEORETICAL BASIS

The community participation in the provision of clean water is influenced by many factors, including socio-cultural condition and the public economic abilities. The high level socioeconomic condition in the community will lead to increased participation in water supply activities, especially activities in meeting the needs in their neighborhood. According

to (Wirdanaf 2006), the forms of community participation in the development process that is commonly found are:

1. Participation in decision making: the role undertaken on the stage of an activity being planned, all provisions which are later used are prepared and determined in the implementation of development activities.
2. The participation in plans implementation activities, namely the roles of the public when the plans are being carried out.
3. The participation in enjoying the outcome; it is the community who should enjoy the outcome of an activity.
4. The participation in the evaluation, namely the role of the community to provide feedback after the implementation of the development is completed.

In generating public participation, a real program is required that can be utilized by the community directly. Various efforts for the fulfillment of public facilities requiring public involvement in maintaining the sustainability of the program need the fulfillment of the three basic principles of community-based services, namely (McIntosh 2003):

1. Affordability, i.e. fee for utilizing service facilities should result in access to the services provided.
2. Capable of self-financing, thus the services can be sustained.
3. Capable to be applied in other places; it does not only apply in particular locations only.

One of community participation in water supply is realized in the form of public sharing economically which is used to maintain the sustainability of clean water supply system. The public will use their income to obtain maximum satisfaction from water services which will

be enjoyed and reflected on the price scale by the willingness to pay on clean water supply services. McIntosh (2003) states that someone willingness to pay in the household scale (domestic) depends on the household income, the amount of water consumption, the amount of tariffs and their alternative water sources.

Someone willingness to pay certainly will not grow by itself, instead comes from certain factors. Jacobsen et al. (2013) argue that the concept of willingness to pay (WTP) highly depends on economic abilities, preferences and awareness of individuals related to the benefits for the use of a product. Preferences can emerge due to excellent service, whilst the awareness will emerge due to awareness efforts undertaken by the government by performing a variety of dissemination on the importance of environmental security and participation of all segments in the society within. Yudarniansyah H et al. (2006) proposes that the value of public willingness to pay for clean water services implemented by Malang Regional Water Company is IDR 750/ m³, lower than the ability to pay the community of IDR 1768/ m³ and also lower than water tariff prevailing at that time, i.e. IDR 1300/ m³. In research done in different location, namely in Surakarta Regional Water Company, conducted by Irawan (2009), it is showed that WTP value is still between IDR 489/ m³ up to IDR 1065/ m³ depending on customers' classification. From two similar studies, it appears that WTP value remains under water price prevailing currently and in each location. It implies that the water service performed by both Regional Water Companies have not met the desired expectations of the society, thus they would only contribute in a relatively small amount in the fulfillment of clean water needs. Nonetheless, the condition of both Regional Water Companies is included in good work performance category. It

indicates that the fulfillment of good clean water cannot only relies on a Regional Water Company as the provider of clean water, but there must be synergy efforts of all stakeholders involved in the provision of clean water.

METHODOLOGY

Sampling

The sampling was done based on purposive method. The number of samples in this research was 250 families, composed of the community using the non-pipeline and pipeline services. Sample points were determined based on the development areas of Bekasi Regency set forth in the RTRW. The development areas in question were divided into four groups; each development area was represented by the development centers and areas with poor clean water service. The number of samples from each sample location was taken proportionally.

The information taken through a questionnaire in this stage included:

- 1) General data of the respondents, including name, age, education, occupation, gender and address.
- 2) The socioeconomic data of respondents, including the number of people living at the same house, family income, costs incurred for electricity and water consumption per month and the allocation of household expenditures in a month.
- 3) The data related to the fulfillment of clean water needs, including clean water sources, the condition of the water source, the distance to the water source, the distance between the water source and septic tank, the types of activities using clean water, the amount of water used, methods to obtain clean water, costs incurred for clean water fulfillment, the amount of funds that incurred for the needs of sustainable clean water.

The Analysis of Public Willingness to Pay

The Willingness to Pay (WTP) is the willingness of users to incur reward upon services obtained or the amount of average rupiahs incurred by the public as payment of clean water supply service unit that they enjoy. WTP is an individual economic assessment on a service being received (Irawan 2009). WTP is highly influenced by the quality of care received, public economic ability, and socio-cultural condition of the society (Wicaksono 2006).

The determination of the clean water fulfillment's economic value in Bekasi Regency is done through sampling. Willingness to Pay value or WTP is directly obtained directly from respondents (direct approach) on the performance clean water needs fulfillment in Bekasi Regency. The method commonly used to determine the WTP value based on the survey results is Contingent Valuation Method (CVM).

In this context, the bid value is set based on fund allocation used to meet the clean water needs, as determined by UNICEF (4% of the average income). The form of the services offered is a piped water supply system which can be utilized directly in their houses by fulfilling qualify, quantity and continuity.

Steps taken in this method include:

1. First Step: Making Market Hypothesis

This stage is a preliminary stage that is aimed to obtain a preliminary description on water services in Bekasi Regency. Questionnaires containing information on clean water supply in Bekasi Regency meets the requirements for clean water provision and the means on how the government obtains funds to meet public access to quality clean water needs.

2. The Second Step: Getting the Bids Value

The auction value got through direct surveys using questionnaires spread to the respondents. Via the questions in the questionnaires, the information of maximum value in willingness to pay of the respondents. The value of public willingness to pay in a certain range set earlier. This value is shown to the respondents via the card or using the structured questions thus the respondents can choose the answers provided.

3. The Third Step: Calculating the Average WTP

WTP average value calculated from the average value and the median value of the bids value obtained from the survey. At this stage, the existence of data outliers (values deviated much from the average is highly possible), in case any outlier value exists, then the value is not included in the calculation.

4. The Fourth Step: Aggregating the Bids Curve

The bids curve is obtained by regressing WTP as the dependent variable with several independent variables.

5. The Fifth Step: Aggregating the Data

At this stage, the bids mean obtained is being aggregated in step three. This process involves the conversion of sample mean data to population mean as a whole. One way to convert the sample is by multiplying the sample mean with the number of households in the population (N).

RESULTS AND DISCUSSIONS

Respondents

The total respondents used in this research are 250 families. They are spread in 12 districts out of 23 districts in Bekasi Regency. The sampling site is determined based on the development area (WP) set forth in the RTRW of Bekasi Regency;

each WP is taken three districts representing the central development area, clean water areas of which clean water service is poor and the areas with good clean water service. The total respondents from each sampling location are set proportionally. The determination of the location has been confirmed to Bekasi Regional Water Company to minimize error in determining the sample location.

The respondents are consisted of 61.2% males and 38.8% females at the age distribution between (25- > 55) years, with the dominant age (25-34) years. The dominant age profile of the respondents is in line with the dominant age profile of the Regional Socio-Economic Survey (Suseda) of Bekasi Regency, 2014. From these survey results, the he society's dominant age is (25-34) years old (Regency BPS, 2014). In terms of education, the respondents are relatively varied, from elementary school to university graduates; with dominant education level is High School of 54%. This condition is in line with the results of Bekasi Regency's Suseda 2014, stating that the dominant education level is high school graduates (BPS 2014). The type of respondents' work is quite varied with the dominant type being the private sector employees at 59.6% .They work mostly in the industry, spread in the area of Bekasi Regency. The result is in line with the dominant profile of workers' livelihood as industrial sector

workers conveyed in the result of Suseda 2014 (Regency BPS of 2014). Based on the description of the respondents in general, the respondents' profile is similar with the community profile in Bekasi Regency surveyed by BPS in 2014.

From the economic side, the dominant income of the respondents ranges from IDR 1,000,000 – IDR 3,000,000 at 35.6%. The dominant amount of respondents' monthly spending is between IDR 1,000,000 - IDR 2,000,000, and IDR 2,100,000 - IDR 3,000,000 at 33%. The dominant total people within one household are around 4-5. The result of 2014 Suseda shows that the average spending per capita population is IDR 646,843 or equivalent to IDR 2,587,374 per family. The description of expenditure per family amongst the sampling is relatively the same with 2014 Suseda result. Based on the description of respondents' economic condition, it shows that the community income and expenditure is relatively balanced, thus the potential for income monthly saving is relatively low. The economic condition of the respondents is in line with the dominant education level and the type of work. The description of socioeconomic respondents can be seen in Table 1.

Table 1. The Socioeconomics Condition of the Respondents

Socio-economic Condition	Category	Total (%)
Education	Did not finish elementary school	2.4
	Elementary School	4.0
	Junior High School	15.6
	High School	54.0
	Diploma	11.2
	Bachelor	12.8
Age	<25 years old	14.0
	(25-34) years old	37.0
	(35-44) years old	22.0

Socio-economic Condition	Category	Total (%)	
	(45-54) years old	14.0	
	>55 years old	7.0	
Occupation	Doctor/Teacher/Consultant/Service Sector	4.0	
	Farmer	2.4	
	Housewives	11.2	
	Industry/ private sector employees	59.6	
	Students	1.6	
	Retiree	2.4	
	Civil servants	2.0	
	Police Officers/ Soldiers	1.6	
	Self-employed	13.2	
	Unemployed	2.0	
	Income	< IDR 1 million	8.8
		IDR 1 million – IDR 3 million	38.0
		IDR 3.1 million – IDR 5 million	30.4
> IDR 5 million		22.8	
Expenditure	< IDR 1 million	8.4	
	IDR 1 million – IDR 2 million	34.3	
	IDR 2.1 million – IDR 3 million	33.8	
	IDR 3.1 million – IDR 4 million	11.2	
	IDR 4.1 million – IDR 5 million	8.4	
	> IDR 5 million	4.0	

Source: Survey Results, 2017

Public Perception on Clean Water Service

The public water needs are fulfilled through a pipeline system and non-pipeline system. Sistem perpipaan The pipeline system is a centralized clean water supply system. In this system utilizing surface water sources that are treated with a standardized treatment system, so that the water that is distributed according to quality standard which determined by the government. Pipeline system is served by Regional Water Company and private water company, whilst the non-pipeline is served independently for each family or community. Non-piping system utilized by the community in the form of ground water with pump

wells and a small portion using surface water. Water quality from non-piped sources is not standardized and has a high risk of being polluted. Based on sampling results, the dominant source of water used by the respondent is pumped wells of 36% and 22% for water gallons, while the Regional Water Company at 28% and the rest uses surface water, public hydrants and bulk water.

Each water service must meet the requirements of quality, quantity, continuity (Alayla 1998) and affordability (Regulation of Minister of Home Affairs No 23 of 2006). The quality aspect can affect the safety of water users from the health side. The quantity aspect and water continuity can affect sanitation and health, whilst

the affordability will affect welfare of the water users.

The sampling results show that in terms of quality, 61.9% of respondents using the pipeline water users are satisfied, and the rest are unsatisfied with the quality of water that they use. Meanwhile for the respondents using non-pipeline water, 62.7% of them are satisfied and the rest are unsatisfied with the quality of the water resources that they use. The level of satisfaction on water quality between the pipeline system and non-pipeline system is relatively almost equal, but the satisfaction level on non-pipeline water sources is higher. It becomes an input as an initial indication on the water quality supplied through the pipeline system. In general, the quality of the pipeline system should be more secure than non-pipeline system, as it has gone through the treatment process. The test result on water quality samples at several locations show that most samples do not meet the drinking water standards set by Regulation of Minister of Health 416 of 1999. All samples of well water using pumps and dipper does not meet the standard, especially for minerals and metals parameter (such as iron, magnesium, hardness, chloride), Total Dissolved Solids (TDS) and bacteriology, except for ground water source using jetpump. As for the resources managed by the community, there are also some parameters that do not meet quality standard, such as organic matter and bacteria. This would potentially disrupt and endanger users, especially in the long run, both in terms of health aesthetics. For samples of pipeline water, some sources are derived from the Regional Water Company management still have incompatible parameters with such standards,

including clor, bacteria, and pH. This parameter needs to get attention from the Regional Water Company as it is thought to emerge due to leaks in the distribution network, causing water cross connection. Meanwhile the quality of pipeline water is managed by private Regional Water Company has met the standards. The incompatibility of water quality consumed by the public is relatively difficult or does not visible by naked/physical eye, thus people commonly do not feel that the water source is not in trouble or is not fit for consumption, or in some areas, the community basically know that the water resource quality is not feasible, but they do not have other alternatives, hence they still use it, but only for limited use or not for cooking and drinking. The water needs for cooking and drinking for the community are met by utilizing recycled water gallons.

The respondents' perceptions of the quantity of water in the context of clean water adequacy for meeting their daily needs show that dissatisfied respondents are more dominant compared to satisfied respondents. Based on the service type (pipeline or non-pipeline) satisfied respondents proportion is higher in those using non-pipeline system compared to the pipeline system. It occurs because the non-pipeline resources vary, thus there are more clean water alternative source. In water pipeline system, there are many factors affecting water adequacy on customers, including leakage of distribution network, processing condition, or disorders of the source. If there is disturbance on one of these factors, it will affect the water quantity received by the society. Thereby, the performance of treatment plants, distribution networks and source become one of determinant in

the fulfillment of customers' clean water source. The illustration of respondents' satisfaction level proportion on the quantity of clean water can be seen in Figure 1.

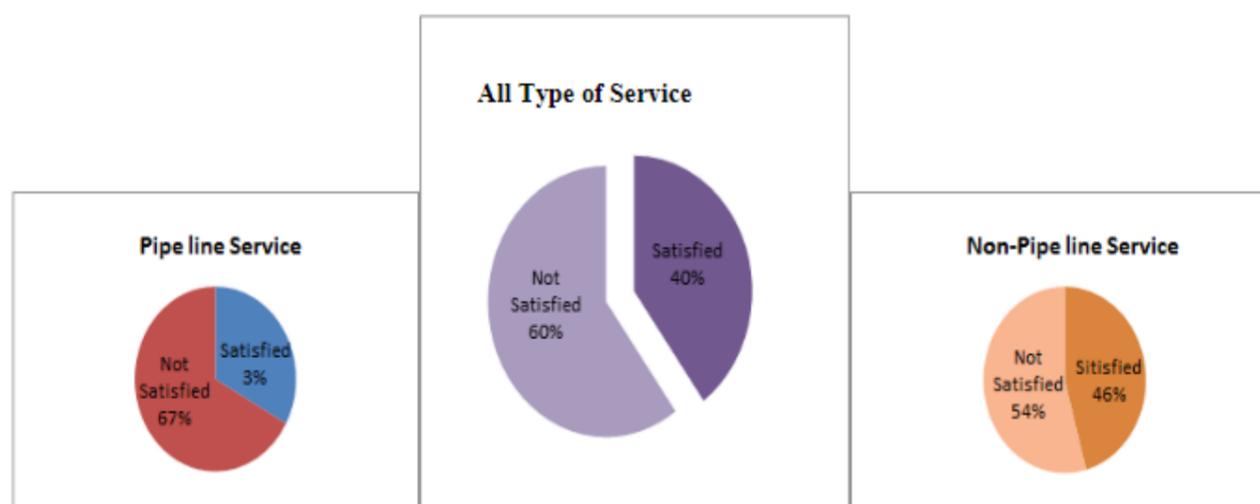


Figure 1. The Proportion of Satisfaction Level on Clean Water Quantity

Based on the continuity, in the context that the existing water source can be utilized for 24 hours, the result obtained is that 75.6% of respondents have water source that can be used 24 hours, and there are still 24.4% of the respondents whose water source cannot be utilized within 24 hours. In proportion, the respondents who have not been able to take advantage of clean water source for 24 hours are higher than the respondents groups who use pipeline water resources, compared than those utilizing non-pipeline system. Based on 2014 performance evaluation result on Regional Water Company, average service time from Regional Water Company reaches 20:31 hours per day. This evaluation result also shows that the regional water company has not been able to meet the water needs of

the society according to the requirements of service continuity. The community that cannot utilize the water in 24 hours are doing individual water reservoirs to meet the clean water needs for 24 hours.

The affordability of water service is related to public ability in terms of economic sector in meeting water needs. The Regulation No. 23 of 2006 requires that costs allocated public to meet monthly water needs should be no more than 4% of family income. If the spending on clean water is more than 4% of the income, it will affect the welfare level of the community. The sampling results indicate that the average respondents' expenditure based on income is shown in Table 2.

Table 2. The Proportion of Water Cost Expenditure on Income

No	Income	Average Expenditure for Water (IDR)	The proportion of expenditure on income (%)
1	< IDR 1 million	50.000	5.00
2	IDR 1 million – IDR 3 million	87.000	4.35
3	IDR 3.1 million – IDR 5 million	120.000	3.00
4	> IDR 5 million	140.000	2.80

Source: Sampling, 2017

Based on Table 2, it appears that the expenditure burden to meet the clean water needs for very low-income people (< IDR 1 million) is the highest amongst the other groups that are classified based on income. It shows that the public with income < IDR 3 million are vulnerable to non-prosper condition due to spending to meet the clean water needs. Judging such condition, the government role in ensuring the fulfillment of water needs and building prosperous society, thus it is necessary to be focused on a program that is intended for families with income < IDR 3,000,000/ month. Besides, for Regional Water Company managing the water supply pipeline system, the water pricing with full-cost recovery criteria should be set for customers with family income > IDR 3,000,000 / month. Currently, the full-cost recovery is IDR 5.183/m³ with an average water usage of 16.9 m³ per month shows that the cost of clean water in an average is IDR 87.593/ month. If compared with the dominant income of respondents, i.e. between IDR 1,000,000 - IDR 3,000,000, the water expenditure at 4.38% of the average family income or larger than the maximum water expenditure standards set by Regulations of

Minister of Home Affairs No. 23 of 2006.

The Clean Water Service Value Willing to be Paid

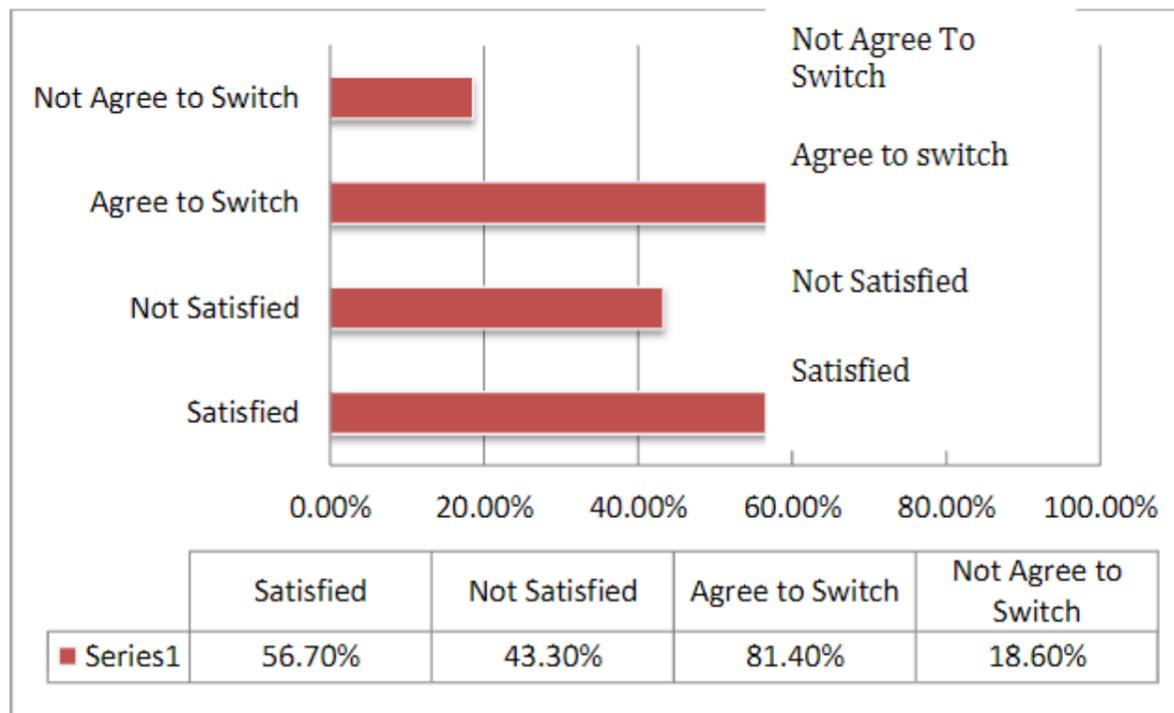
The public willingness to pay a water service is in line with public perception on the service quality that they receive. The higher the level of community satisfaction on clean water service, the willingness value to pay for service improvement efforts will also be higher. Failure in clean water services can be caused by several factors including the unavailability of adequate water resources, or the non-optimal management of water supply system.

If the water service is treated as public goods (monopoly is inapplicable and not included in the market mechanism), the results of the public desire survey on the service quality would be made as input in the policy and planning in order to improve the water service quality (Freeman 2003). The service quality achievement can be calculated based on public participation (sharing) (Vasquez 2009).

In the context of clean water service in Bekasi Regency, the sampling results show that 56.7% of respondents are satisfied with the services of clean water, and the remaining at 43.3% of respondents are unsatisfied with the clean water

services that they receive. nevertheless, when the respondents are offered whether they would switch to using pipeline clean water supply system of which quality, quantity and continuity are guaranteed, thus 81.4% of respondents would switch to the system offered; and the remaining 18.6% respondents are not prepared to switch to the new system (sticking

with the old system) (the visualization of respondents' perception can be seen in Figure 2). Respondents who do not wish to switch to the system offered are mostly respondents who have been served by the Private Drinking Water Company; they state that the water service system that they currently receive is in accordance with their expectation.



Series 1: Respondents' Preference

Figure 2. The Respondents' Preference on Clean Water Service

The value of respondents' willingness to pay in the efforts of increasing clean water provision into the pipeline system with a guarantee of quality, quantity and continuity varies based on the level of income. The WTP value is classified by variations in monthly income and type of service.

The amount of WTP value per family ranges from IDR 58.333 - IDR 140.909, the details of WTP value can be seen in Table 3.

Table 3. The WTP Value per Family based on Income

Willingness to Pay	Income				Average
	< 1 million	1 – 3 million	3,1 – 5 million	> 5 million	
Total Service	67,500	77,353	87,500	121,296	89,956
Pipeline System	95,000	111,111	115,385	140,909	123,077
Non-pipeline System	58,333	61,638	71,023	90,476	70,471

Based on Table , it is visible that the public sharing value initialized with the largest WTP value is the respondents who have enjoyed the clean water system service via pipeline system is IDR 123.077, whilst for respondents with a non-pipeline system, the sharing value lower, i.e. IDR 70.471. It indicates that respondents are more satisfied with the water pipeline service system compared to non-pipeline system so they are willing to do higher sharing. The clean water supply provision via pipeline is done centrally by a governing body, such Regional Water Company of private water company, thus in terms of quality, it is more guaranteed because it is equipped with management. It causes the respondents to be willing to give higher share.

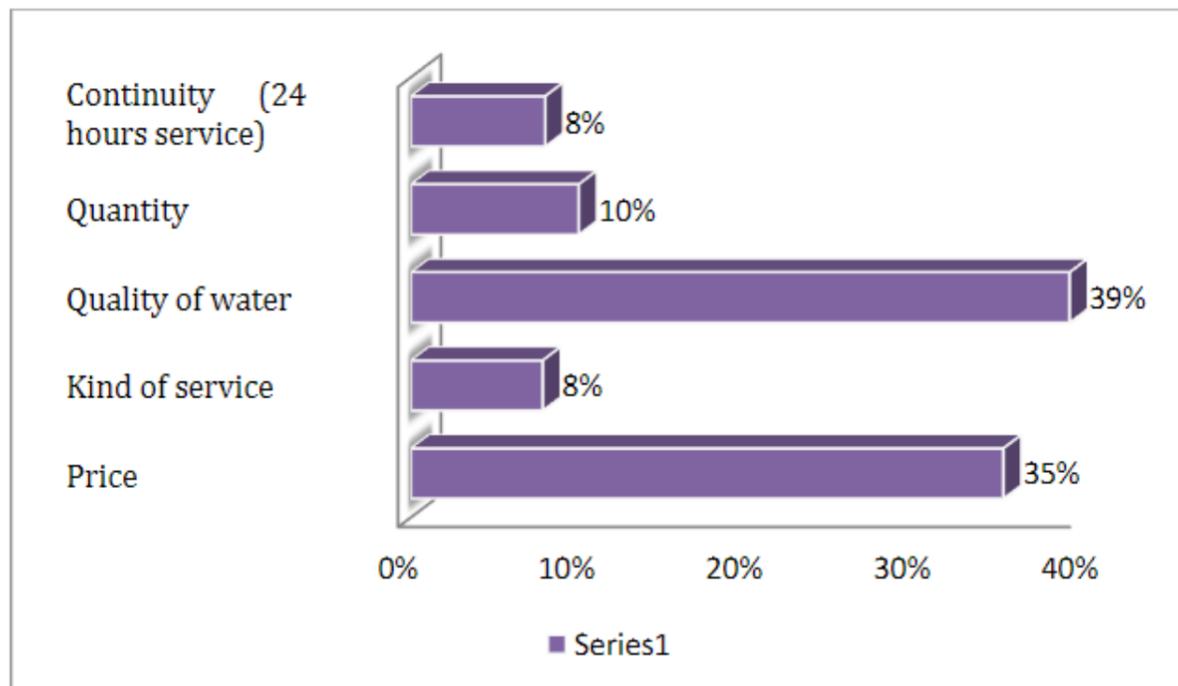
Based on variations in income, it appears that consistently, the higher the income level, the willingness to pay or public sharing is higher. The level of someone willingness to pay to a service will consider their economic abilities and income level is one indicator to express the level of one's ability. However, when compared to the proportion of water expenditure burden, the community public sharing of people with high income is lower than respondents with low income (< IDR 3 million). Actually, the anomaly

condition on ideal condition in which the public burden with higher income provides greater sharing, or in other words the cross-subsidy is currently not optimal. Judging this condition, the government, especially the local government having the authority in the water provision in their regions controls tariffs imposition and an average public burden, especially in low-income communities. The full cost recovery tariff progressively regarding clean water supply for high-income people (> IDR 3,000,000). Through this control mechanism, the water burden for low-income people is expected not to exceed 4%, thus the level of community welfare can be fulfilled.

The survey results say that there are several factors influencing the selection of the respondents in considering clean water main source. These factors will become input to the management of water services as a key factor in maintaining the performance having orientation towards the consumers. Those factors are: (1) the water quality, the community realizes that the water quality is very important because it can affect their health. The condition existing in some parts of Bekasi Regency, the potential of water resources quality used by many people is in polluted condition, and partly in particular the Northern areas, the groundwater and surface water has

been exposed to sea water intrusion. Therefore, the water quality becomes a primary consideration for selecting the clean water system service. (2) Price, the price factor becomes an consideration for most respondents, because of the survey result, it is shown that the dominant income of the community ranges IDR 1,000,000 – IDR 3,000,000, and it is classified as low income (below minimum wage). The Socioeconomic survey results from Bekasi Regency in 2014, shows the level of per capita expenditure in the community is classified as middle down, i.e. < IDR 700,000. Thereby, the price consideration becomes an important thing, given the respondents' income level which is still relatively low. (3) The quantity, the amount of water available becomes their consideration; because if the water supply becoming the main source is insufficient, hence the respondents will seek other alternative water sources,

namely refill water gallon. With alternative use, it will affect the amount of spending in order to meet water needs. (4) Continuity, this factor is deemed important only by a small amount of the respondents because they can adapt to the existing service pattern, for example by using water tanks to be filled in during the operation of water service. (5) the service type of clean water services. There are only a few respondents who consider this type of service become the deciding factor in the selection of clean water source, as for them the most important is the availability of water resources, whilst for the service type, they can adapt to the existing condition. The description visualization in the factors taken into consideration in the selection of the main clean water source can be seen in Figure 3.



Series 1: Factors to Chose the type of water service
Figure 3. The Factors in Main Clean Water Source Selection

To maximize the quality of clean water services, it is necessary to have sharing from the community in

the form of community willingness to switch from non-pipeline clean water service systems to pipeline service

systems. Thus the community can meet the needs of clean water that is of good quality according to the standard, the quantity that is in accordance with the needs and is continuous. To support this, local water supply companies must increase service coverage and streamline water treatment processes so that water prices are affordable to the community. Whereas for areas where the people have very low income, the pipeline service system is assisted by the local government by activating the management of piped water managed by the community.

CONCLUSIONS

The fulfillment for public clean water takes huge investment. The government should not ignore the obligation to fulfill the basic rights of the public. However, the government also has their limitations in terms of resources. Therefore, active community participation in supporting the government's obligation becomes a crucial thing. The community participation should be realized in the form of economic public sharing. The amount of public sharing is influenced by the service quality received by the public and their income. Public sharing can be utilized to improve public water clean service either in quality, quantity or continuity.

The public sharing value in the efforts of improving the quality of clean water services increases along with increasing public income, as well as satisfaction on the clean water service received by the community. The public sharing value based on income variation ranges from IDR 67,500 to IDR 121,000 per family. Meanwhile, by including the service type factor, the public sharing value ranges from IDR 59,333 to IDR 140,000 per family, where the public

sharing amount of respondents served by pipeline connection is greater than those served with non-pipeline system.

To make efforts in fulfilling clean water needs, the public mainly prefer the water quality factor that can be utilized, followed by price, quantity and continuity factors. Therefore, various government's attempts in upgrading the water service should consider the quality and price of the services. Government intervention should be carried out also in order to protect the basic needs of low-income community (< IDR 3 million) by regulating the lowest tariff for such community class, either served by Regional Water Company or private water company with an indication of water expenditure not exceeding 4% of family income. In addition, it is necessary to educate water users to make savings and adjustment in water consumption as one of non-material sharing.

REFERENCES

- Alayla(1998). *Water Supply Engineering*.US: Mc Graw Hill.
- Birol E, Karoundouri , Karousakis K (2006).Using Economic Valuation to Inform Water Resource Management: a survey and Critical Appraisal of Available Techniques and Application 1 . *Total Environ* 365(1-3): 105-122.
- BPSKabupaten (2014). *Economic and Social Surveyin Bekasi Regency*. Bekasi Regency: Baappeda.
- Cheng Qi, Ni-Bin Chang(2010).System Dynamic Model for Municipal Water Demand Estimation in Urban Region Under Uncertain Economic Impact. *Journal of Environmental Management* 92: 1628-1641.

- Delaney L, Francis O(2004).Irish Public Service Broadcasting: A Contingent Valuation Analysis. *The Economic and Social Review* 35(3): 321-350.
- Dinauli. 2006. *Analisis Ability To Pay dan Willingness To Pay Tarif Angkutan Kota (Studi Kasus: Kotamadya Medan)*. Thesis, Bandung. ITB.
- Freeman, AM (2003). ³ *The Measurement of Environmental and Resource Value: Theory and Methods*. Washington DC: Resources for Future 2nd edition.
- Irawan (2009). Willingness and Ability To Pay To Pay Customers Households as Response to Clean Water Services PDAM Surakarta. *Jejak* 2(1): 29-43.
- Jacobsen, JB Hedemark TL, Thorsen J (2013).The effects of Current Income and Expected Change in Future Income on Stated Preferences for Environmental Improvements . *Journal of Forest Economic* 19: 206-219.
- McIntosh, Arthur, C (2003). *Asian Water Suplies, Reaching the Poor Urban*. Anual Report, London: Asian Development Bank.
- [Permen], Minister of Home Affairs Regulation No. 23 of 2006. *Technical Guidelines and Procedures for Setting Rates Water in taps*. Regulation of the Government, Minister of Home Affairs.
- Pingali, P (2007).Westernization of Asian Diet and Transformation of Food Systems: Implication for Research and Policy.*Food Policy* 32: 281-298.
- Vasquez F W, Mozumder, Harnandez-Arce J, Berrens P R (2009).Willingness to pay for Safe Drinking Water : Evidence from Parras, Mexico. *Journal of Environmental Management* 90: 3391-3400.
- Vasquez W, F (2013).An Economic Valuation of Water Connections Under Different approaches of Service Governance. *Water Resource and Economics* 2-3,: 17-29.
- Wicaksono, Bambang & Dianita (2006). Analysis Capabilities Pay Rates City Transport (Case Study Using Municipal Transport Services on the Fourth District in Semarang). *Pilar*: 31-35.
- Wirdanaf (2006). *Pubic Capacity of Jang River Tanjungpinang in Alternative Water Supply*. Thesis, Semarang: Program of Urban and Regional Development Studies Universitas Diponegoro.
- Yudariansyah H, Supriharyono, Nasrullah (2006). Affordability Analysis Purchasing Power Communities Against Water Rates PDAM Malang (Case Study of Sawojajar Housing). *PILAR* 15(2) : 78-85.