

Analysis Of Willingness To Pay (WTP) To Improve The Services Of Pdam Tirta Lamaindo In Bahari Village, Sampolawa District, South Buton Regency

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Abstract

The purpose of this study was to determine the willingness to pay of the community towards PDAM Tirta Lamaindo and to identify the factors that influence willingness to pay or WTP in Bahari Village, Sampolawa District, South Buton Regency. This study was conducted in April–May 2025 with a sample size of 67 households determined using the Slovin formula and purposive sampling technique. Data were collected through questionnaires, observations, interviews, literature studies, and documentation. The types of data used included quantitative and qualitative data, with primary and secondary data sources. Data analysis was performed using the Contingent Valuation Method (CVM) to calculate the WTP value and multiple linear regression analysis to determine the factors affecting WTP with the help of SPSS 25 software. The results showed that the average WTP of the community was IDR 23,283.58 per month per household, with the majority of respondents willing to pay IDR 20,000. Factors influencing WTP included user age, income, highest level of education, number of users, water quality, and monthly water payments. Income influenced the amount of WTP, with higher income leading to greater willingness to pay. Conversely, higher education and current monthly water payments tend to decrease WTP. Age, number of water users in the household, and physical water quality do not significantly affect WTP. These findings indicate that the economic aspects of the community are an important consideration in efforts to improve service quality and adjust clean water tariffs.



KEYWORDS: Willingness to Pay (WTP), Contingent Valuation Method (CVM), PDAM, Clean Water

INTRODUCTION

Environmental service valuation is carried out using the benefit transfer method, where the value of environmental services is based on the results of previous assessment studies. Environmental services are defined as various benefits that humans obtain from their surrounding environment. Historically, this concept began to develop in the 1970s and became an important part of the global environmental agenda in the 1990s, along with efforts to understand the economic values of environmental services. Systematically, the Millennium Ecosystem Assessment (MEA) classifies environmental services into four main categories: provisioning, regulating, supporting, and cultural services. This approach is the main reference in estimating the economic value of an ecosystem's environmental services (Rahma et al., 2020).

According to Law Number 17 of 2019 concerning Water Resources, water resources are water or water sources and the water power contained therein. Surface water is water found on the ground surface, while groundwater is water found in soil or rock layers below the ground surface. This Law also discusses water resource management as efforts to plan, implement, monitor, and evaluate the conservation of water resources, the utilization of water resources, and the control of water damage, as well as water resource management as institutions given tasks and responsibilities by the central government or local government in water resource management based on the provisions of laws and regulations.

Water resource management faces increasing challenges as the population grows and socio-economic development progresses. The increasing demand for water has led to excessive exploitation of water resources, which ultimately reduces environmental carrying capacity and decreases water supply capacity. In addition, one of the problems in water resource management is uncontrolled changes in land use in watershed areas. This has caused environmental degradation in watershed areas, as seen in the increasing difference between maximum and minimum river discharge.

The Regional Water Company (PDAM) is a regionally-owned business unit engaged in the treatment and distribution of clean water to the general public. PDAMs exist in every province, district, and city throughout Indonesia, including in South Buton District. According to South Buton Regency Local Regulation (PERDA) Number 1 of 2021, a Regional Public Company is a business entity that manages regional assets in providing services to the community, which is established based on local regulations. The Regional Public Water Company (PDAM) Tirta





Lamaindo, hereinafter referred to as Perumda Air Minum Tirta Lamaindo, is a Regionally Owned Enterprise (BUMD) that carries out business activities in providing drinking water to the communities of Bahari Village, Bahari 2 Village, Bahari 3 Village, Gaya Baru Village, Windu Makmur Village, Tira Village, Lapandewa Village, Burangasi Village, and Sandang Pangan Village.

In an effort to improve the quality of drinking water services for the community, Bahari Village and its surroundings face unique challenges in providing clean water, such as limited infrastructure, limited water resources, and environmental factors that can affect the quality and quantity of available water. By conducting research in Bahari Village, more accurate data can be obtained regarding community needs, problems faced, and solutions that can be implemented to improve the efficiency and effectiveness of Perumda Air Minum Tirta Lamaindo's services.

The community's response to the services provided by Perumda Air Minum Tirta Lamaindo varies. Some residents feel that the provision of clean water has helped them in their daily needs, especially in areas that previously had difficulty accessing water. However, there are still complaints about uneven distribution, low water pressure, and delays in handling technical problems. This is due to the high operational costs. Therefore, new sources of funding are needed. One of them is using the WTP approach. WTP is an approach to determine the amount that the community is willing to pay for the use of natural resources, in this case water resources. Therefore, the researcher is interested in conducting a study on "Willingness to Pay Analysis to Improve the Services of PDAM Tirta Lamaindo in Bahari Village, Sampolawa District, South Buton Regency".

RESEARCH METHOD

Place and Time of Research

This research was conducted in Bahari Village, Sampolawa District, South Buton Regency, Southeast Sulawesi Province, which is geographically located at coordinates 5°40'58" S and 122°44'23 E. This research was conducted in April-May 2025.

Materials and Tools

The materials used in this research were a map of the research location to illustrate the research location and a questionnaire sheet as a guide during interviews. The tools used in this study were a Global Positioning System (GPS) to determine the research location, writing instruments for writing during interviews, a camera to document the research, a Personal Computer (PC) to store data, and a voice recorder to record interviews.



Research Sample

The population in this study consisted of 200 households using PDAM water, with a sample of 67 households determined using the Slovin formula ($e = 10\%$) and purposive sampling techniques based on the criteria of PDAM Tirta Lamaindo users who had been residents for at least 10 years. The data collected were quantitative (water price, usage, income, education, age) and qualitative (facilities, characteristics of users), sourced from primary data (direct interviews) and secondary data (PDAM data and related publications).

RESULTS AND DISCUSSION

The data analysis method used in this study was the Contingent Valuation Method (CVM), an economic approach used to estimate the monetary value of non-market goods or services by measuring WTP or respondents' willingness to pay for service improvements or enhancements. In the context of this study, CVM was used to determine the willingness of the community of Bahari Village, Sampolawa District, South Buton Regency, to pay for improvements to the services of PDAM Tirta Lamaindo. The results of the Total WTP calculation are presented in Table 1

Table 1. Calculation of the Total Willingness to Pay of the Community of Bahari Village, Sampolawa District, South Buton Regency

WTP/Rp/Household/month	Ni	N	P	TWTP
10.000	4	67	200	119.403
20.000	42	67	200	2.507.463
30.000	16	67	200	1.423.836
40.000	5	67	200	597.015
Total				4.656.716

Source: Primary data, processed 2025

Note:

ni : Number of respondent willingness to pay (people)

N : Number of respondent (people)

P : populasi size(people)

TWTP: Total willingness to pay

Based on Table 1, it shows that the total willingness to pay (WTP) of the community for improving the services of PDAM Tirta Lamaindo in Bahari Village is Rp4,656,716 per month. This value reflects the accumulation of all WTP groups based on the proportion and number of respondents willing to pay at a certain price level, taking into account the target population of 200 people. To clarify the distribution of respondents' WTP values directly based on nominal values and frequencies, the following recapitulation of Total WTP based on the proposed nominal values can be presented in Table 2.

Table 2. Summary of Total Willingness to Pay Based on Nominal Value

No	WTPI/Rp/Household/Bulan	Number of Respondent (ni)	Total WTPI (Rp)
1.	10.000	4	40.000
2.	20.000	42	840.000
3.	30.000	14	480.000
4.	40.000	5	200.000
	Total	67	1.560.000
		Average	23.283,58

Source: Primary data, processed 2025

Table 2 shows a summary of the willingness to pay (WTP) of the community of Bahari Village, Sampolawa Subdistrict, South Buton Regency, based on the nominal value proposed. Of the 67 respondents interviewed, the majority, or 42 people (62.69%), stated that they were willing to pay IDR 20,000 per month for improved clean water services by PDAM Tirta Lamaindo. A total of 16 respondents (23.88%) were willing to pay Rp30,000, while 5 respondents (7.46%) were willing to pay Rp40,000. Meanwhile, 4 respondents (5.97%) were only willing to pay Rp10,000. Based on the total WTP collected from all respondents, the total amount was IDR 1,560,000.

From this total, the average willingness to pay (Expected Willingness To Pay/EWTP) was Rp23,283.58 per respondent per month. This average value shows that the community is generally willing to allocate around Rp23,000 per month to obtain better clean water services.

To determine the factors that influence the community's willingness to pay (WTP) for improved clean water services from PDAM Tirta Lamaindo in Bahari Village, a multiple linear regression analysis was conducted using SPSS version 25. The results of the analysis are presented in the following tables:

Table 3. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.748	0.559	0.515	0.241

Source: Primary data, processed 2025

Table 3 shows that the coefficient of determination (R Square) value of 0.559 indicates that 55.9% of the variation in willingness to pay (WTP) can be explained by the independent variables included in the model. The remaining 44.1% is explained by other factors outside the model. The Adjusted R Square value of 0.515 indicates that the model has been adjusted for the number of variables and still shows good predictive power. The R value shows a figure of 0.748, which means that the six variables used have an influence on the WTP value.

Table 4. Uji Anova (F-Test)

Model	Sum Of Square	Df	Mean Square	F	Sig
Regression	4.430	6	0.738	12.689	0.000
Residual	3.492	60	0.058		
Total	7.922	66			

Source: Primary data, processed 2025

Table 4 shows that the significance value (Sig.) is 0.000, which is smaller than 0.05. This indicates that simultaneously, all independent variables in the model have a significant effect on willingness to pay. With a calculated F value of 12.689, this regression model is suitable for predicting WTP.

Table 5. Multiple Linear Regression Results (Coefficients)

Variabel	B (Koefisien)	Std. Error	Beta	TP	Sig
(Konstanta)	2.958	0.214	-	13.834	0.000
Usia	-0.001	0.040	-0.002	-0.021	0.983
Pendidikan Terakhir	-0.199	0.040	-0.596	-4.978	0.000

Variabel	B (Koefisien)	Std. Error	Beta	TP	Sig
Pendapatan	0.143	0.038	0.407	3.788	0.000
Jumlah Pengguna	0.002	0.028	0.010	0.063	0.950
Kualitas Air secara Fisik	-0.005	0.042	-0.011	-0.119	0.906
Pembayaran air per bulan	-0.209	0.061	-0.519	-3.444	0.001

Source: Primary data, processed

Based on Table 5. The results of multiple linear regression (coefficients) show that the variables that significantly influence willingness to pay (WTP) are highest education, income, and monthly water bill. The highest education variable has a negative effect of -0.199 with a significance value of 0.000, indicating that the higher the respondent's education, the lower their willingness to pay; this is suspected because more educated individuals tend to be more critical in assessing the benefits of services. Meanwhile, the income variable has a positive and significant effect with a coefficient of 0.143 ($p = 0.000$), meaning that the higher a person's income, the greater their willingness to pay for improved clean water services. The monthly water bill variable has a significant negative effect with a coefficient of -0.209 ($p = 0.001$), indicating that the higher the current water bill, the less willing people are to pay more. On the other hand, the variables of age, number of users in the household, and physical water quality do not have a significant effect on WTP because the significance value is far above 0.05, so it can be concluded that these three variables do not significantly influence people's decisions in paying for clean water services in Bahari Village.

From the coefficient table above, the following regression equation model can be constructed:

$$Y^{\wedge}=2.958-0.001X_1-0.199X_2+0.143X_3+0.002X_4-0.005X_5-0.209X_6.$$

Community Willingness to Pay (WTP)

The results of the study show that the average WTP of the community for the improvement of PDAM Tirta Lamaindo services is Rp23,283.58 per month per household. This average was obtained from the total willingness to pay of all respondents, which amounted to



Rp1,560,000, which was then calculated per individual respondent totaling 67 people. When adjusted to the target population of 200 people, the Total WTP value reaches Rp4,656,716.

More specifically, the majority of respondents were in the WTP group of Rp20,000, namely 42 people or 66.67% of the total respondents. This group represents people with medium payment capabilities who want to get better clean water services. Meanwhile, 16 respondents (25.40%) stated their willingness to pay IDR 30,000, indicating that there is a group willing to pay more. Respondents willing to pay only IDR 10,000 numbered 4 (6.35%), and those willing to pay more than IDR 40,000 numbered 5 (7.94%).

WTP can be influenced The willingness to pay (WTP) of the community for improved clean water services is not only determined by need alone, but is also influenced by various social, economic, and psychological factors. In this study, to determine the factors that influence the WTP of the people of Bahari Village towards improvements in the services of PDAM Tirta Lamaindo, a multiple linear regression analysis approach was used with six independent variables, namely age, highest level of education, income, number of users, physical water quality, and monthly water payments.

This shows that, in general, the community is willing to pay, although there are still variations in economic capacity. Based on the characteristics of the respondents, most of them are in the income group below IDR 2,000,000 per month. However, the moderate WTP value indicates that the community is still willing to allocate part of their income to obtain better quality clean water services.

Factors influencing willingness to pay (WTP)

The regression analysis results show that there are three variables that significantly influence the community's WTP, namely income, highest level of education, and monthly water payments. First, the income variable has a significant positive effect on WTP, with a regression coefficient of 0.143 and a significance value of 0.000. This means that the higher a person's income, the greater their ability to pay for better clean water services. This is in line with the economic theory of consumption, which states that people's purchasing power is greatly influenced by their income level. The majority of respondents in this study were in the Rp1,000,000–2,000,000 per month income group (44.78%), but some of them still showed a willingness to pay more for improved services. This is also in line with the research by Yasri et al. (2018), which shows that average income is one of the main factors that influence people's willingness to pay for clean water services.





Second, the variable of highest level of education had a negative influence with a regression coefficient of -0.199 and a significance value of 0.000. This indicates that the higher a person's level of education, the lower their willingness to pay for clean water services. Most likely, this is due to the increasing critical attitude of highly educated people towards the quality of services provided, making them more selective and rational in determining the appropriate amount to pay. This is in line with research conducted by Lestari et al. (2014), which found that the level of knowledge or education is one of the dominant factors that influence people's willingness to pay PDAM fees for service improvements, where people with higher levels of education tend to be more critical and carefully consider the amount of fees to be paid.

Third, the variable of monthly water payment also has a negative/significant effect on WTP, with a regression coefficient of -0.209 and a significance value of 0.001. A negative coefficient indicates that the higher the current expenditure of the community to pay for water, the lower their willingness to pay additional costs. This indicates that there is a saturation point or maximum limit to the costs that the community is willing to bear, so that tariff increases must be carried out carefully so as not to cause resistance. This is in line with the research by Yolinda and Kancitra Pharmawati (2019), which shows that the higher the current payments, the less willing the community is to pay additional costs, indicating a limit to their ability or unwillingness to pay more.

Meanwhile, age (coefficient -0.001; $p=0.983$) does not have a significant effect on willingness to pay. This can be explained by the fact that the decision to pay for PDAM services is more influenced by household economic conditions than by the age of the respondent. Both young and old age groups will consider their economic capacity and the real benefits of clean water services, not just their age. Research by Talahatu et al. (2017) in Kupang City also found that age has no significant relationship with WTP, because the preference to pay more is determined by financial capacity rather than demographic factors.

The number of users in a household (coefficient 0.002; $p=0.950$) did not have a significant effect on WTP. This means that even though there are more users in a household, this does not automatically increase or decrease willingness to pay. One reason for this is that people tend to adjust their water usage patterns to the available budget. These results differ from those of Yasri et al. (2018), who found a relationship between family size and WTP, but are consistent with Whittington (2002), who emphasizes that in some contexts, family size is not a major factor because households usually adjust their water consumption to their income.

Physical water quality (coefficient -0.005; $p=0.906$) did not have a significant effect on WTP. This shows that even though some people complain about water quality, they still see





PDAM as the main provider of clean water, so willingness to pay is not entirely determined by the physical condition of the water. In other words, people still consider the existence of the service to be more important than its physical quality. Ashar's (2023) research at PDAM Tirta Anoa Kendari found that water quality has a positive effect on WTP, so this difference in results may be due to the local conditions in Bahari Village, where limited alternative water sources mean that the community continues to rely on PDAM even though the physical quality is not optimal.

Therefore, it can be concluded that the three factors, namely user age, household water users, and physical water quality, do not have a significant effect on WTP. Significance values well above 0.05 indicate that these three variables do not contribute significantly to explaining the variation in WTP among the community in Desa Bahari. This means that the decision to pay more for clean water services is not greatly influenced by factors such as age, the number of household members using water, or physical perceptions of the available water quality.

Therefore, PDAM Tirta Lamaindo's tariff policy and clean water service management should consider the significant factors found. Tariff adjustments should be tailored to community income and payment patterns, accompanied by tangible improvements in service quality to ensure acceptance by all segments of society.

CONCLUSION

Conclusion

The conclusions of this study are as follows:

1. The average willingness to pay of the Bahari Village community is IDR 23,283.58 per month per household. This shows that the community is willing to allocate part of their monthly income to obtain access to higher quality clean water, with the hope of improvement and sustainability in PDAM services.
2. Based on the regression analysis results, there are three variables that significantly influence the community's willingness to pay for PDAM services, namely income, highest level of education, and monthly water payments.

Recommendation

Based on the results of the study, PDAM Tirta Lamaindo is advised to set water tariffs that are adjusted to the community's ability to pay, considering that the average willingness to pay (WTP) of respondents is Rp23,283.58 per month. Tariff adjustments should be carried out gradually and still consider low-income communities, for example by implementing a cross-





subsidy system. In addition, PDAM needs to continue to improve the quality and continuity of its services to meet community expectations, as well as increase water pressure, expand the pipe network, and provide pipe services, especially for those who currently pay high rates but are not satisfied with the services provided.

Local governments and PDAM also need to educate and socialize the community about the importance of maintaining the sustainability of clean water services and the transparency of the management of funds received. This education is especially important for people with higher levels of education who tend to be more critical. On the other hand, it is necessary to conduct periodic monitoring and evaluation of services and community satisfaction levels to ensure that the tariffs set remain relevant and fair. With this strategy, it is hoped that clean water services can run optimally and sustainably in Bahari Village.

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