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## Identifying The Causes Why Some of The Households in Bogor Have Not Yet Utilized The Service of The Tirta Pakuan Water Company (PDAM) of Bogor

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**Abstract.** PDAM will remain focused on improving the quality of services with a variety of planned development programs. With strong commitment and strong cooperation, PDAM is optimistic to serve 100% of the people of Bogor City by 2019. Currently, the number of Bogor Household Households served by PDAM is 138,705 from the number of Households 261,898 (BPS Kota Bogor, 2017).

What factors caused some people of Bogor City not to utilize drinking water service from PDAM? What strategy does PDAM use to reach 100% service target by 2019?

This study is to find out why some Households in Bogor City have not utilized PDAM service yet. And this research uses relationship analysis, to identify the influence of revenue and availability of PDAM pipeline installation network to Household interest to become PDAM customer.

The result of the analysis shows that there is no strong relationship between Household Income and Punishing Network Instability of PDAM Installation, to Household Interest to become PDAM's customer. of the 402 respondents used responded, as follows:

A total of 192 respondents are interested in becoming a PDAM customer, by reason of need, drought anticipation, deep well water and decreasing water quality.

A total of 85 respondents who stated hesitantly gave the reason, that well water is still feasible, because of the cost factor, because still living in contract house, PDAM is often problematic, depends on the surrounding neighborhoods, and the availability of alternative water source.

A total of 125 respondents who expressed no interest in the reasons, that related to financial problems, living in rented houses and taps are often problematic.

Keywords: Household Consumer PDAM

### INTRODUCTION

#### Background

This research is based on the statement of the President Director of PDAM Tirta Pakuan Kota Bogor (PDAM) which quoted from <https://mediabogor.com/inilah-rapor-akhir-tahun-2016-pdam-tirta-pakuan-kota-bogor/>, that it remains committed to being the best water supply company in Indonesia. Going forward, the PDAM will remain focused on improving the quality of service with various planned development programs. With strong commitment and cooperation, PDAM is optimistic that 100 percent of drinking water service coverage for Bogor city's people will be fulfilled in 2019.

The number of Households in Bogor according to the Central Bureau of Statistics of Bogor in 2017, is 261,898 Households, and those served by PDAM reach 138,705 Households (52.96%). So the number of Households that have not connected PDAM service, is as many as 123,093 Household (47.00%).

However, according to information cited from Media Bogor (2016), that during the year 2016, the addition of the number of Tirta Pakuan City's Bogor Customers increased 9.4 percent from the previous year.

Recorded at the end of December 2015, the number of subscribers was 138,151 direct connections, while up to December 20, 2016, reached 147,230 or increased by 9079. The addition of this new subscriber surpassed the 2016 additional target of 9000 SL service coverage as the number of new subscribers increased. Coverage of customer service amounted to 3.1 percent, from 82.79% as of 31 December 2016 to 85.89%.

### **Identification and Problem Formulation.**

In addition to paying attention as described in the background, identification is also done as an effort to obtain a description of the cause of some households in Bogor City has not yet utilized a water connection from PDAM.

From the results of problem identification, then the formulation of problems that can be stated, are as follows:

1. Is there a strong relationship between household income and the availability of the PDAM pipeline installation network to the household interest in becoming a PDAM customer?
2. What factors caused some households in the city of Bogor not to use clean water service from PDAM?

### **The Objectives**

The purpose of this study are:

1. Considering the influence of household income and the availability of PDAM pipeline installation network in the interest of the household to become a customer.
2. Knowing the causes of some households in the city of Bogor have not utilized the PDAM water supply services.

### **The Benefit**

The benefits expected from the research are:

1. Obtaining information about why some of the households in Bogor have not utilized the clean water service by PDAM.
2. Providing input to the management of PDAM Tirta Pakuan Bogor City, about the causes of some Bogor city residents who have not utilized PDAM water supply services, so that PDAM management can align beneficial service programs in reaching 100% service target by 2019.

## **LITERATURE REVIEW**

### **Tirta Pakuan PDAM Kota Bogor.**

Regional Water Company (PDAM) in the city of Bogor, is the only provider of clean water located in the city of Bogor. History shows that the city of Bogor, formerly known as *Buitenzorg*, has had a drinking water service system since 1918 which was built by the Dutch government at that time. The drinking water service system utilizes Batu city springs located in the Bogor regency area and is about 7 km from the city of Bogor. The name of the drinking water company was *Gemeentelijke Waterleiding te Buitenzorg*. Batu spring water source is the embryo of the existence of PDAM Bogor city and in 1918 is considered as the start of the drinking water service city of Bogor.

In its development, PDAM Bogor city as BUMD owned by Bogor city government was formed based on regulation of Bogor city area No.05 year 1977. Tirta Pakuan Water Supply Company (PDAM) is located in Bogor city, precisely at Jalan Siliwangi no. 121 South Bogor.

Unicef Indonesia (2012) states that clean water and sanitation are the seventh Millennium Development Goal (MDG) objectives and by 2015 it is expected that up to half the population without access to safe drinking water and basic sanitation can be reduced. PDAMs that are given authority to carry out clean water fulfillment tasks, especially in urban areas, still face several obstacles. High operating costs result in not all operational and maintenance costs can be borne. As a result, urban water supply systems are generally poorly maintained and damaged.

According to BPS data of Bogor city in 2017, it was noted that the number of households that have been PDAM customers, is estimated to be 130,705 households. The number is about 51 percent from 261,898 households in Bogor city

Taking into account Table 2.1 shows that the increasing number of households served by the PDAM percentage each year does not always show a high increase. Constraints faced by PDAM Bogor city in increasing the number of services, among others, the increase in population and the difficulty of increasing the availability of raw water to be managed as clean water.

Coverage Service Area Tirta Pakuan PDAM Bogor city, is all households in the city of Bogor. Table 2.1 below shows the improvement of PDAM water services from 2013 to 2016.

Tabel 2.1.  
Household Clean Water Service  
PDAM Tirta Pakuan Kota Bogor 2013-2016.

Year	Number of Subscribers Household
2013	102 765
2014	110 940
2015	131 089
2016	138 705

Source: BPS city of Bogor in 2017.

To find out why the high number of Bogor city households who have not utilized the PDAM service, then need to know the causes and factors that influence it.

Understanding Interest.

Interest according to the big dictionary of Indonesian language, it is said as a high liver tendency towards something, passion, desire (<https://kbbi.web.id/minat>). Interest is the drive or desire in a person on a particular object. Interest is closely related to one's motivation, something learned, and may vary depending on needs, experiences, and fashion trends, not innate. Factors influencing the emergence of one's interest depend on the physical, social, emotional, and experience needs. Interest begins with happy feelings and positive attitudes.

There are several factors that influence the demand for an item, ie the price of the good itself, the price of other related goods (substitution or complementary), per-capita rate, taste or habit, population, price forecast in the future, producer efforts to increase sales (promotion). Economic analysis is considered that demand for a good is primarily influenced by its price level. Therefore, in demand theory which is mainly analyzed is the relationship between the amount of demand for a good and the price of the goods. (Sukirno: 2008).

#### **Factors affecting people's interest in using PDAM services.**

From the results of the study desk conducted can be obtained picture related to factors that affect PDAM water supply by the community. As in Didin Lukmanul Hakim's research in 2010, about the accessibility of clean water for the people in the protected settlement of Pontang District, Serang District. The research is seen from the demand (demand) and the provider (supply) of clean water, based on the basic variables of access examined, including the amount/volume, distance, time, cost, and quality. The result is the access variables, ie distance, time and cost of clean water become the main priority to be overcome, and the volume and quality of clean water become the second priority. The results of the development direction analysis will be a recommendation to the Regional Government, PDAM, and community in residential areas.

Rumahorbo (2009), which in his study used variables, water prices, the number of family members and income, obtained the results that the three variables showed significant results on demand for clean water. However, the high demand for clean water is not accompanied by the availability of water owned by PDAM Tirta Nadi Medan.

In all cities and districts in Indonesia that already have clean water services managed by Perusahaan Daerah Air Minum (PDAM) in general have not been able to meet the needs of clean water for the community that is the responsibility within the scope of its service area. This situation is caused by the lack of government in anticipating the adequacy of water in the region.

To obtain a water source as a raw material of clean water by PDAM, more and more difficult day. The situation is exacerbated by the neglect of encroachment in parts of the land supporting the availability of water. So when the water needs more urgent and the PDAM needs raw water to be processed as drinking water, it takes a long time and effort, as a result of land tenure on water sources from upstream to downstream.

In the end, the government needs to provide substantial funding for land acquisition with water resources and land acquisition and compensation when the pipeline is built to drain the water. The situation is not only against the community but also occurs in the government because the use of water sources occur and across different administrative regions.

Prior Research.

There has been much research on the factors that affect the community in relation to demand clean water or PDAM drinking water conducted in several regions in Indonesia. Here are some previous studies that have been done:

1. Research conducted by Mujiyanti (2004) in Boyolali using income variable, number of family and duration as PDAM customer, and its effect on demand of clean water, showed that the three variables significantly influence the demand of clean water.
2. Merysa Rohma Dwi Sakina (2008), in his research on the analysis of several factors that influence the level of drinking water consumption of PDAM in Surabaya with variable income per capita, the number of household customers, and the inflation rate shows the result, that simultaneously shows a real relationship between the independent variable of income per capita, the number of household customers, and the inflation rate significantly affect the bound variation of drinking water consumption PDAM in the city of Surabaya.
3. Yuni Masdayani Harahap, Faigiziduhu Bu'ulolo, and Henry Rani Sitepu (2013), in his research on the factors affecting the demand of drinking water at drinking water supply companies (PDAM) Tirtanadi Medan using population variables, income per capita population, drinking water rates, the amount of water produced. of the four variables that are a very dominant influence on demand for drinking water, is the population, the tariff of drinking water, and the amount of water produced.
4. Fauziah (2016), in his research on the factors affecting water demand in drinking water companies (PDAM) in Yogyakarta Special Region (DIY) for the period of 2004-2013, shows that PDAM water prices have a positive correlation to water demand at PDAM. Then the GRDP per capita DIY and the population of DIY positively affect the demand for clean water at PDAM. Similarly, the number of people who also have a positive effect. While the number of households and the number of industries in DIY no significant effect on the amount of demand for clean water in PDAM.
5. The results of I Nyoman Sutarna and Muhammad Iqbal (2017), the factors affecting demand for clean water in PDAM Kota Sumbawa show the result that income, the number of family members, and the price or water tariff significantly influence the demand of clean water.

If we look at the results of previous research on the factors that influence the demand for clean water, the variables that often arise are the income variable, the number of family members and the price. Other variables, is inflation, duration as a customer of PDAM.

## RESEARCH METHODOLOGY

### Research Methods.

This study aims to determine the causes of 123,093 households (47.00%) in the city of Bogor, has not utilized the clean water service from PDAM Tirta Pakuan Bogor city. To get information about this research, then used method Descriptive by Survey.

### Types and Data Sources.

This research uses primary data obtained from field observation. Secondary data is processed data used as support in this research.

### Operationalization of Variables.

Dependent Variables: interest

Independent Variables 1. Income 2. PDAM Network

### Data Collection Techniques.

The data used were from the sample, which had previously been determined using the random sampling specified by Slovin with  $\alpha = 5\%$ . Instruments used in data collection are questionnaires and interviews. The collected data are grouped according to the criteria used.

### Data Analysis.

Data analysis used is a statistical descriptive analysis. Conducted grouping according to the criteria used, ie interested respondents, hesitant respondents, and respondents who are not interested. From each group will be noted the reasons presented by the respondent according to each answer criterion.

Relationship analysis is done by looking at the relationship between income and the availability of PDAM pipeline network around the respondent's residence, to the respondent's interest to be a PDAM customer.

## RESULTS AND DISCUSSION

### Results

The research area covers four sub-districts in Bogor City area, each in West Bogor District, South Bogor Subdistrict, East Bogor Subdistrict, and West Bogor District are concentrated in densely populated urban areas. Respondents in West Bogor were set in Balumbang Jaya urban village, in East Bogor in Hardjasari urban village, in North Bogor in Sindang Sari urban village and in Bogor Utara sub-district in Ciparigi village.

#### 1. Joint descriptive analysis.

Descriptive analysis of all respondents from all sample areas as presented in Table 4.1 and the combination of reasons given by respondents to PDAM service leadership are presented in Table 4.2.

Tabel 4.1. Respondents' Interest  
In PDAM Connection

Criteria	amount	Percent
Interest	192	47.76
Doubtful	85	21.14
No Interests	125	31.09
	402	100.00

Table 19 shows that 192 Household Respondents (47.76%) are interested in using PDAM water supply service, 85 respondents (21.14%) are hesitant and 125 respondents (31.09%) are not interested.

Tabel 4.2.

#### Grouping of reasons stated by respondents according to criteria

No.	Criteria	Reason
1	respondents were interested in utilizing PDAM services	Reasons respondents who are interested in: 1) 94 respondents stated that because of the need 2) 32 respondents stated as an alternative when dry 3) 43 respondents said the more well water in 4) 23 respondents said the quality of well water decreases
2	respondents were hesitation meng-Use PDAM services	Reasons respondents were undecided: 1) 27 respondents said they have a well and the water is nice. 2) 13 respondents did not give a reason 3) 15 respondents said cost issues 4) 9 respondents lived contracted 5) 6 respondents family problems 6) 6 respondents stated that depending on the environment (if many pairs, want to come in pairs) 7) 4 respondents expressed fear of the sudden water drought taps into alternative 8) 4 respondents stated that the problem of taps (should know the policy, small water supply, availability of network taps) 9) 1 respondents claimed for alternative
3	Respondents who are not interested in using the services of PDAM	The reason respondents are not interested: 1) 98 respondents said it is still great and the water wells 2) 8 respondents did not give a reason 3) 16 respondents said financial problems 4) 2 respondents live in the housing contract 5) 1-Taken taps respondents have problematic
4	Respondents who are not interested in using the services of PDAM	The reason respondents are not interested: 1) 98 respondents said it is still great and the water wells 2) 8 respondents did not give a reason 3) 16 respondents said financial problems

		4) 2 respondents live in the housing contract 5) 1 respondents said taps problematic
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Analysis of Relations.

Table 4.3. Descriptive Statistics

Variable	Mean	Std. Deviation	N
Interest	1,8483	0,88	402
Income	1838034,83	1249683,00	402
PDAM network	0,6045	0,49	402

Table 4.3 above shows that all variables have a standard deviation that is smaller than the average value of the count. The situation can be interpreted, that the data qualify according to statistics.

Table 4.4.

Correlation Coefficient and Determination Coefficient		
Variable	Interest	Contribution
Income	0,059	0,003
PDAM network	-0,226	0,051

Table 4.4 above shows that income has the correlation coefficient of 0,059, which translate into earnings that income has a very weak relationship with the interest.

#### Discussion

From the results of the grouping of respondents of household respondents, it is known that the interest of the household respondents in Bogor City is still dominant enough to be the PDAM water supply customers, compared with the hesitant and uninterested respondents. Although the surveyed household respondents all have other wells and springs, the consideration of respondents interested or uninterested is largely determined by the condition of the respondent and the local conditions.

Bogor known as the rain city and its area has many water sources such as surface water and groundwater causing many people who use it for daily needs. Utilization may be surface water, such as rivers and springs, or groundwater such as dug wells and drill bores. But in some areas of the city Bogor surface water and groundwater has decreased both quantity and quality. Environmental Agency of Bogor, West Java, revealed that underground water in the city area is already in critical condition. Among others, due to reduced forest area and pollution. The situation has been known for a long time, but the handling has not gone ahead.

As the research conducted by Wigena (2004) mentioned, that Bogor is one of the suburbs of the capital city of Jakarta which became the goal of the urbanization of Java. This causes a high rate of population growth that affects the quality of water resources degradation. Although the quantity of Bogor City can meet the needs of water supported by high rainfall, the quality of surface water resources problems (river water and water) and groundwater (wells). This is related to the utilization of water for household, industrial, market and agricultural purposes. From this utilization, the source of surface water pollutant comes from household waste, market, factory, and agricultural waste which is indicated by high levels of COD and folic acid.

Variable Income used in this study did not give a strong effect, considering the average income is below the minimum City Minimum Wage (MSE), which while in the Rp. 3.200.000.-. This condition is possible as the cause of some respondents to be uninterested (as many as 125 respondents from 403 respondents (31.09%) to become clean water subscribers managed by PDAM Tirta Pakuan Bogor City The number of respondents who have income under UMK is 310 respondents. description of respondents according to the income under MSEs and respondents who earn above MSEs, can be seen in the Frequency Distribution in Table 4.6 below.

## CONCLUSIONS AND SUGGESTIONS

### Conclusion.

From the discussion, it can be concluded that:

1. As many as 402 respondents participated in this study, 192 respondents (47.76%) are interested to subscribe to clean water managed by PDAM Tirta Pakuan Bogor City. A total of 85 respondents (21.14%) expressed doubt. And as many as 125 respondents (31.09%) stated no interest.
2. Reasons given by respondents who are interested is 94 respondents because of need, 32 respondents argued as an alternative when drought, 43 respondents said because the wells deeper and 23 respondents stated because the quality of water decreased.
3. The reasons given by the doubtful respondents are 27 respondents stated that the water is well and the water is good, 13 respondents did not give a reason, 15 respondents stated the cost problem, 9 respondents for occupying rented house, 6 respondents stated that they have family approval 6 respondents depend on the environment (neighbors), 4 respondents feared suddenly drought, 4 respondents said PDAM problematic and 1 respondent stated as an alternative.
4. Reasons put forward by respondents who are not interested, is 98 respondents stated there are still wells and water is good, 8 respondents did not give a reason, 16 respondents due to financial problems, 2 respondents live in rented house and 1 respondent said PDAM problematic.
5. The result of relationship analysis shows that the income and existence of PDAM pipeline installation located near the respondent did not give significant influence to respondent's interest to subscribe to water managed by PDAM.

Table 4.6  
Table of Frequency Distribution

Classes	Frequency	Valid Percentage
≤ 499999	25	6,3
500000 - 999999	57	14,3
1000000 - 1499999	56	14,0
1500000 - 1999999	79	19,8
2000000 - 2499999	75	18,8
2500000 - 2999999	18	4,5
3000000 - 3499999	64	16,0
3500000 - 3999999	3	0,8
4000000 - 4499999	4	1,0
4500000 - 4999999	2	0,5
5000000 - 5499999	10	2,5
5500000 - 5999999	5	1,3
6000000 - 6499999	2	0,5
8000000 ≥	400	100,0
Total		
System	2	
Total	402	

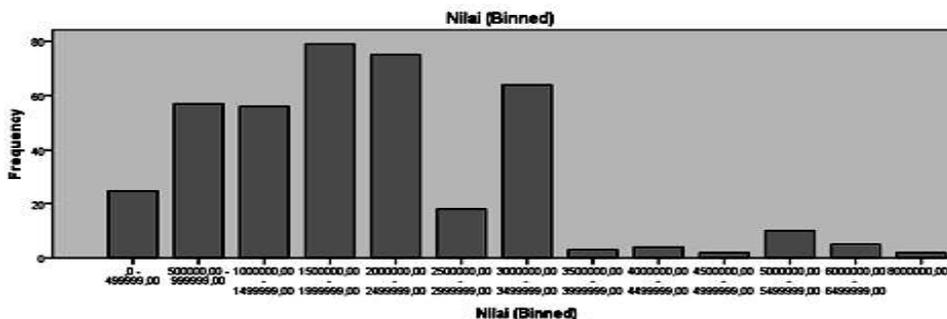


Figure 4.1  
Illustration of Respondents' Income Selected on the Research

#### Suggestions.

1. It takes effort from the Government and PDAM Kota Bogor targeting 100% Service in 2019 by accommodating low-income people to get clean water service with mitigating programs such as cheap water and free installation.
2. It is advisable for the government to be more assertive about land use as mandated by the river basin law and the use of land around the water source. As stated in the Conclusion that respondents who are interested to become PDAM customers partly argue for fear of drought, deep wells, and deteriorating water quality. The situation indicates that the condition of groundwater and surface water in the city of Bogor is deteriorating.
3. The condition of groundwater and surface water in the city of Bogor is getting worse, it is suggested to the Government and PDAM Bogor City provide compensation upstream both to the community and reforestation for the quantity and quality of groundwater and surface water in the city of Bogor is not getting worse.

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