



Public perceptions on the quality of raw water source of Ikk Alalak Pdam of Barito Kuala District

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Abstract

The provision of clean water to the community has a very important role in improving the health of the environment or community, which has a role in reducing the number of people with diseases, especially those related to water quality, and contributing to improving the standard or quality of life of the community. PDAM are needed by urban communities to meet the need for clean water that is suitable for consumption. Because groundwater in urban areas is generally polluted. Excessive use of groundwater has reduced groundwater levels and sea water intrusion, resulting in a decrease in groundwater quality. The purpose of the study are: 1. Analyzing the perception of the customer community on water quality PDAM IKK Alalak Batola District. 2. Review the quality of raw water resources of PDAM IKK Alalak Batola District against physical parameters (Odor, Turbidity, TDS) and chemical parameters (pH, Sulfate). This research is divided into two stages of research, namely the first stage; the perception of the community of PDAM customers of IKK Alalak Batola District and the second stage; study on the quality of raw water sources of PDAM IKK Alalak Batola District in Installation of PDAM IKK Alalak Batola regency (water source, water in shelter, customer water). Based on the results of the research, the following conclusions can be drawn: The public perception of water quality of IKK PDAM is positive/beneficial with 67 respondents (74%) while the negative/unhelpful are 23 respondents (26%). The results of respondents who stated that PDAM water has experienced 100% disturbance means that all people have experienced disturbance both in terms of water debit that is less swift, the color of water, smell, taste and even not flowing sekalli even without any prior notice if the PDAM wants do cleaning, only part of society (55, 56%) that can information if there is disruption/constraint about the distribution of clean water. Based on the result of F test indicates that the old variable of usage, education, and occupation have an effect on the real perception of society with indigo $F > F$ table (15,191 > 2.71). Based on the results of laboratory tests on the quality of river water, clean water and drinking water showed pH below the maximum water limit showing the results for pH of river water 2.86, pH of clean water 6.02 and pH of drinking water A and B showed the number of 6.32 and 5.54 This shows the pH of acidic water but can still be consumed.

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Introduction

Water is very important in life after the air. The provision of clean water to the community has a very important role in improving the health of the environment or society, which has a role in reducing the number of people with diseases, especially those related to water quality, and contributing to improving the standard or quality of life of the community. Until now, the provision of clean water for people in Indonesia is still faced with several problems that are quite complex and until now can not be overcome completely. One of the problems still faced to date is the low level of clean water service for the community. Definition of clean water according to Permenkes RI No 416/Menkes/PER/IX/1990 is water used for everyday purposes and can be drunk after cooking.

PDAM are needed by urban communities to meet the need for clean water that is suitable for consumption. Because groundwater in urban areas is generally polluted. Excessive use of groundwater has reduced groundwater levels and sea water intrusion, resulting in a decrease in ground water quality. People often complain that the water distributed by PDAM is often jammed, muddy and *kelat* (four). People in some service areas end up using only PDAM water for bathing and washing, while for drinking and cooking they spend extra money to buy AMDK (Bottled Drinking Water). The availability of clean water has a very important role in improving the health and welfare of the people of Indonesia. In realizing clean water service, Local water company (PDAM) is present which has a strategic function of providing drinking water or at least clean water for the community. However, the provision of water for the people of Indonesia is still faced with a problem that until now has not been fully addressed. The problem is still the low level of quality and quantity of clean water service for the people of Indonesia, especially the Barito Kuala district of Alalak.

In general, based on the results of public complaints, the flow of water debit is less (often jammed) and according to director of PDAM Batola mr. Sumadi about water quality in IKK (Capital City District)

Alalak is raw water quality is not good and will soon be good in 2017 with the completion of IPA 200 liters/second in North Circle (not yet operational).

In general, based on the results of public complaints in Alalak Subdistrict, the water debit is less traffic (often jammed) and according to PDAM director Batola Sumadi regarding water quality in IKK (Capital City District) Alalak is raw water quality is not good and will soon be good in 2017 with the completion of IPA 200 liters/second in North Circle (not yet operated). In general, the quality of raw water as water source processed PDAM Batola kualitasnya more ugly compared with other areas in South Kalimantan (Banjarmasin). Characteristics of the raw water such as high acidity, low pH, *kelat* (*sepat*) and turbidity (NTU) is high. The river that surrounds Barito Kuala District besides 3 major rivers (Barito River, State River and Kapuas River) is also tens of small rivers (tributaries), but the abundant quantity of water cannot be used as raw water source because the quality is not possible that is: Sungai Andai IKK Alalak unit (easy to penetrate sea water, low pH and turbidity) according to the Acceleration of Construction of Sanitation Settlement 2013.

The provision of clean water for public purposes must meet the requirements set by the government such as physics, microbiology, chemical factors that are mandatory and standard. But recently the water quality of Barito Kuala PDAM especially in Sub Alalak has decreased quality. Based on Company Profile of PDAM Kabupaten Barito Kuala 2016, from 17 Subdistricts in Barito Kuala Regency only 15 sub-districts can be served by clean water, while 2 sub-districts still do not enjoy clean water. Based on the current calculation of 104,110 people (34.90%) of the 298,282 Batola residents who served and enjoy water facilities. PDAM's efforts to increase service coverage is by increasing production capacity and distribution network with priority scale at potential location. While the target set by the government is 80% of the urban population and 60% of the rural population. Recently the water quality of PDAM Batola (IKK Alalak) decreased that is known from the public

response that the water is not yet feasible for consumption, the water is often jammed and the water debit is less swift. Based on public complaints in Banjarmasin Post (April 6, 2017) that the tap water has been stagnant for several months has not been smooth, even if the road at night especially in the area of Handil Bakti Komplek Raya 4 lane 4. even writer also feel this way for the spirit area in the Block B complexity komplek B, the small water discharge cannot even walk, so to get tap water from PDAM add a water pump machine to increase the water debit and the water is turbid.

Based on the data from laboratory test of Indonesian Environmental Health Engineering and Banjarbaru Disease Control Center 2016, the turbidity level on the water sample of customer 1 is 7.80 NTU which exceeds the threshold value of PERMENKES RI No 492/2010 on drinking water quality requirement of 5 NTU. One of the efforts to know the certainty of the consequence of the decreasing of water quality of PDAM Batola (IKK Alalak) is to know the status of water quality standard, and to conduct a study of public perception toward the quality of raw water source of IKK Alalak PDAM which is expected to be considered by related parties in determining special treatment of clean water management in the future.

Material and methods

Formulation of the problem

The specific problem formulation is:

1. How is the perception of PDAM customers' society on water quality of PDAM IKK Alalak Batola District.
2. How is the quality of raw water source of PDAM IKK Alalak Batola reGENCY in terms of physical parameters (Odor, Flavor, Turbidity, TDS) and chemical parameters (pH, Sulfate).

Research purposes

The purpose of the research are:

1. Analyzing the perception of the customer community on water quality of PDAM IKK Alalak Batola District.

2. Review the quality of raw water resources of PDAM IKK Alalak Kab. Batola against physical parameters (Odor, Taste Turbidity, TDS) and chemical parameters (pH, Sulfate).

Hypothesis

1. Allegedly the customer's perception of the water quality of IKK Alalak Batola PDAM is positive.
2. Suspected of the quality of raw water source of IKK Alalak Batola District is not in accordance with the applicable maximum Water Limit Rule based on South Kalimantan Governor Regulation No 05/2007, Permenkes RI No 416/Menkes/PER/IX/1990, Minister of Health Decree No. 492/Menkes/Per/IV/2019 naik physical parameters and chemical parameters.

Benefits

1. For the authors are expected to provide input for the government and relevant agencies in taking the policy to take raw water if the river water as raw water PDAM IKK Alalak Batola District.
2. For the public can find information about the quality of raw water used PDAM IKK Alalak Batola District.

Concept Research Framework

The framework of the research concept is structured as follows:

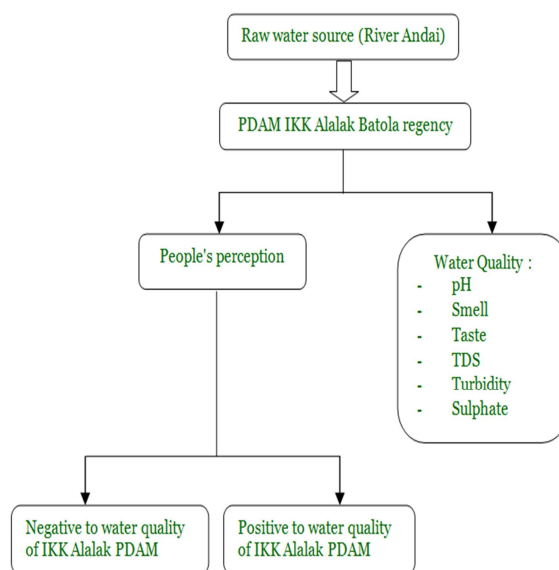


Fig. 1. Concept Research Framework.

Place and time of research

This research is divided into two stages of research, namely the first stage; the perception of the community of PDAM customers of IKK Alalak Batola District and the second stage; study on the quality of raw water sources of PDAM IKK Alalak Batola District in Installation of PDAM IKK Alalak Batola District (water source, water in shelter, customer water). The study was conducted from March to December 2017 including observation and data collection in the field, data processing and report writing of research results.

Methods

First Stage (perception of customer community of IKK Alalak Batola District)

Determination technique of respondents In this research, sampling technique is done by using Taro Yamane formula (Riduwan, 2009), that is:

$$n = \frac{N}{N \cdot d^2 + 1}$$

Information:

n = Number of samples

N = Number of PDAM Subscribers in Alalak District Th.2016 (Head of Family)

d = Precision set

Based on the formula, the sample (n) of the research is as follows, with a precision value of 10% (0.1): so the number of respondents to be taken is 99 respondents.

Distribution of samples

The number of respondents is 99 respondents spread on the banks of the pinang river for 9 respondents, in Alalak district ie 3 urban villages including Berangas Barat, Berangas urban village and Handil Bakti district. Kelurahan Berangas Barat with 18 respondents, 18 villages of Berangas village, Handil Bakti district as many as 18 respondents and 4 respondents each village in Tatah Mesjid village, Semangat Karya, Semangat Dalam, Handil Bakti, East

Berangas, Lumbah River, Sugara Island, Sewangi Island, and Alalak Island.

Method of collecting data

Data collection methods used in this study are as follows:

- a. Method of observation.
- b. Questionnaire
- c. Interview

The first stage

Public Perception of Customers of PDAM IKK Alalak Batola Regency

To analyze the study of the quality of raw water resources of IKK Alalak Batola District used Guttman scale (Siregar, 2010). Guttman scale can be made in the form of multiple choice as well as checklist list. For negative answers such as wrong, no, low, bad, and such are given a score of 0 and a positive answer as true, yes given a score of 1.

- a. Perception Value Data Analysis (NP)
- b. Based on the measurement of community perceptions (respondents) on the quality of raw water resources of IKK Alalak Batola District, conducted through data analysis by Supriyanto (2007) as follows:

$$NP = \frac{n}{N} \times 100\%$$

Where :

NP (100%) = Perception Value

n = scores obtained

N = maximum score

Then set the class interval and criteria in Table 1.

Table 1. Class interval and perception value criteria.

No	Interval (%)	Procedures	Information
1	> 70%	Positive preceptions	Helpful
2	< 70%	Negative preceptions	disadvantageous

Reference. Supriyanto 2007

- a. Test Regression coefficient Together (Test F)
- b. F test is a statistical test simultaneously to the regression model obtained, is a test to determine

whether the independent variable (independent variable) together influence or not affect the dependent variable with the formula:

$$F_{\text{Hitung}} = \frac{R^2 / k}{(1 - R^2) / (N - K - 1)}$$

Where:

N = Number of samples

K = Constant

R² = Coefficient of determination

c. Partial Regression Coefficient Test (t test)

d. The t test is performed if the overall test results show H_0 is rejected. Knowing whether there is influence of independent variable (independent variable) individually (partial) to dependent variable (dependent variable) done by statistical test with T test. The value of T test indicates that the role of each independent variable is independently controlled by other independent variables in the regression equation model. The t test formula is:

$$t_{\text{hitung}} = \frac{\beta}{S_e \beta}$$

Where:

β = Regression coefficient

Se = standard error

Second Phase (review of quality of raw water source of IKK Alalak Batola PDAM in Installation of PDAM IKK Alalak Batola regency)

Test sampling technique

Technique of taking sample of test which done there are 2 parameter that is physics (smell, taste, turbidity, TDS) and chemical parameter (pH, sulfate).

Each of the physical parameters and chemical parameters is done at several points, namely the standard water source from the river (3 points: upstream, middle, downstream) and then in the composite, tub and tap water in the community.

a. Sampling Location

The location of water sampling is done in several locations, including:

- Water of the river if
- Shelter
- Tap water in the community

b. Sampling technique

- Water in the river
- Water is burned
- Water tap

c. Laboratory Test

Parameters tested include:

- Physical Parameters (TDS, Turbidity)
- Chemical Parameters (Sulfate)

The sample test was conducted at Government Health Laboratory by South of Kalimantan province.

d. Data analysis

The results of the analysis (Odor, Flavor, Turbidity, TDS, pH, Sulphate) were conducted descriptively by comparing the standard of water quality standard according to Permenkes RI No 416/Menkes/PER/IX/1990 on clean water quality requirements, Pergub Kalimantan Selatan. 05 of 2007 on the water quality standard of water bodies and KepMenKes No 492/Menkes/Per/IV/2010 regarding the quality requirements of drinking water

Results and discussion

District Overview Alalak

Brief History and Geography Conditions

Administratively Alalak district is one of the 17 districts in Barito Kuala District. Alalak District has an area of 106.85 km² divided into 15 villages and 3 villages with kelurahan berangas as the capital District. Alalak District has administrative boundaries including:

- a. East: Mandastana district
- b. West side: Anjir Muara district
- c. North side: Mandastana district
- d. South: Banjarmasin City

The area of Alalak district only reaches 3.57% (106.85 km²) of the whole Kecamatan area is 2,996.96 km². The village that has the widest area is Balandean village which is 15.78% from Alalak District. Then followed by the village of Pitung River which has an area of 11.16% or 11.92 km². The village with the smallest area is the village of Pulau Sewangi which only has an area of 0.51% of Alalak District or 0,55 km².

Land cover area of Alalak district in 2010 for settlement 255,57 ha, river 756,90 ha, 291,16 ha and garden 2,340,12 ha.

Demography

As a district with the highest population in Barito Kuala District, Alalak District faces complex problems compared to other sub-districts. The population of Alalak District in 2015 is 56339 inhabitants consisting of 28110 men and 28229 women.

Level of education

The percentage most of them are senior high school graduates as much as 46.46%. Graduated from Elementary School / Elementary School 20.20%, Junior High School by 19.19%, Diploma 4.04% and Bachelor Degree 10.11%. Most of the people living in Alalak sub-district, especially the respondents of the study, only graduated from senior high school. However, some of his children have higher education up to the undergraduate level, because the community is already aware of the importance of education.

PDAM IKK Alalak

General description

The clean water facility of Barito Kuala Regency was started in Budget Year 1987/1988, through the Director General of Cipta Karya Water Supply Improvement Project of South Kalimantan with initial capacity of 10 liters/sec. In 1988, the Barito Kuala District Water Management Agency (BPAM) was established until 1992. Through the District Regulation of the Second Level Region of Barito Kuala No. 01 of 1993 dated March 9, 1993, the Regional Water Company (PDAM) of Barito Kuala Regency was established. For further development, until now PDAM Batola has served 15 districts of 17 districts in Barito Kuala District. Until 2015 through the funds of District, Provincial and Central Government funds have been built units covering IKK Alalak in 1997/1998.

Vision and mission of the company

Vision of PDAM Barito Kuala "Making Healthy Area Company Healthy, Independent and Profitable".

Mission of PDAM Barito Kuala "1. Improving K4 service (Quality, Quantity, Continuity and Affordability 2. Improving the Quality of Human Resources (Increasing Competency Capability) 3. Improving Employee Welfare 4. Promoting "

Corporate Objectives and Functions

Company Objectives

1. Providing clean water service for the whole community in a fair, equitable manner, running continuously and meeting health requirements
2. Participate and develop the regional economy in particular and economic activities nasioanal in general, in order to meet the needs of society and as one means for the source of local revenue

Company Functions

1. General services / services
2. Conducting public benefit
3. Fostering income

Public Perception on Water Quality of IKK Alalak PDAM

Public perception of water quality of IKK Alalak PDAM mostly positive (beneficial). Based on the results of perceptual value analysis (NP) obtained based on the field through the filling questionnaire, the results obtained from the perception of the customer community of IKK Alalak Batola regency as presented in Table 2 below.

Table 2. Classroom Interval Analysis and Criteria of Community Perception Values.

No	Respondent (people)	Assessment of perception (%)	Interval (%)	Information
1	90	74,4	> 70 %	Helpful
2	9	25,6		
	99	100		

Reference: Primary Data that is processed, 2017

Based on Table 2 above, the level of public perception of the customer community of IKK Alalak Batola district most argue useful with the number of respondents 90 people (74.4%) while the opinion is not useful as much as 9 people (25.6%). This shows that the water quality of IKK Alalak PDAM

contributes greatly to the community for the existence of clean water, although sometimes the water disbursed by PDAM is not in accordance with clean water standards.

The result of the respondents who stated that PDAM water has experienced 100% disturbance means that all the people have experienced the disturbance both in terms of water debit that is not swift, water color, smell, taste even had no flow at all even without any prior notice if the PDAM wanted do the cleaning, only some people who can information if there are disruption/constraints about the distribution of clean water. The results of the scores of respondents stated 100% using PDAM water and there has been a disruption of PDAM water distribution. Respondents who stated that the quality of clean water distributed by IKK Alalak's PDAM is not good with the score 53.33%, availability and clean water quality in the dry season 82.22% and 58% of the people still buy clean water offered by the seller around water.

Clean water is one of the basic necessities that always consumed by Alalak District community because it is very influential to the smoothness of daily activities of society. Clean water is the key to the development of economic activity and productivity and is of great importance. The increasing number of residents in Alalak district raises the number of clean water distribution that is used, but it is not worth it that the contribution of clean water in Alalak district is inadequate so that the need for clean water is less benefited by the community. The problems that arise when the dry season occurs so that the flow of water is smaller and the quality of water that changes in

terms of taste and water disturbance often does not flow according to the interview on the PDAM. Even for new customers who want to enjoy clean water must wait for waiting list of tap water installation for 3 months and even more. People who want to be a customer of PDAM must also provide a fairly expensive cost if you want to become a customer soon. They must provide time for registration procedures, surveys, and installation of PDAM pipeline installations. According to the PDAM if you want to be a PDAM customer simply register to the PDAM office and immediately processed to conduct a survey and if approved by the director of PDAM, it will be processed immediately for installation fee.

Based on the results of research Adrianto (2006) states that the involvement of communities in the construction of settlement infrastructure should be balanced as well as the ease of handling.

PDAM IKK Alalak Currently wants to improve the quality of clean water for the surrounding community by building IPA 200 liter/second in North Circle which previously only 105 liter/second.

Study of Water Resources Sources of PDAM IKK Alalak Batola District in Installation of PDAM IKK Alalak Batola District

Based on the results of data obtained through laboratory tests of parameters in the test are physical parameters (TDS, turbidity) and chemical parameters (Sulfate) from the sampling sites covering water and river water and tap water in the community. Thus obtained the results of laboratory tests as follows, presented in Table 3, 4, 5 and 6.

Table 3. Laboratory Test Results (River Water).

No	Examination	Unit	Results	Maximum Limit			
				I	II	III	IV
A.	Physics						
1	TDS #	Mg/L	28,5	1000	1000	1000	2000
2	Turbidity #	NTU	3,93	-	-	-	-
3	Smell	-	No smell		No smell		
4	Taste	-	Does not taste		Does not taste		
B.	Chemistry						
5	pH	-	2,86	6-9	6-9	6-9	6-9
6	Sulphate	Mg/L	174,0300	400	-	-	-

River Water Quality Standard Governor Regulation of South Kalimantan Number 05 Year 2007 Date January 29, 2007.

Information:

- I. Raw water drinking water
- II. For recreation, freshwater fish farming, farming, irrigating crops
- III. For freshwater fish cultivation, irrigate crops
- IV. To irrigate crops

Those marked with fence (#) do not include accredited parameters

Information :

Those marked with fence (#) do not include accredited parameters

Table 4. Laboratory Testing Results (Water Supplied by PDAM Storage).

No	Examination	Unit	Results	Maximum limit
A.	Physics			
1	TDS #	Mg/L	30	1500
2	Turbidity #	NTU	5,04	25
3	Smell	-	No smell	No smell
4	Taste	-	Does not taste	Does not taste
B.	Chemistry			
5	pH	-	6,02	6,5-9,0
6	Sulphate	Mg/L	66,5360	400

Water Quality Standard of Permenkes RI no. 416 / MENKES / PER / IX / 90

Information :Those marked with fence (#) do not include accredited parameters

Table 5. Laboratory Test Results (Drinking Water A).

No	Examination	Unit	Results	Maximum limit
A.	Physics			
1	TDS #	Mg/L	46,4	500
2	Turbidity #	NTU	0,23	5
3	Smell	-	No smell	No smell
4	Taste	-	Does not taste	Does not taste
B.	Chemistry			
5	pH	-	6,32	6,5-8,5
6	Sulphate	Mg/L	77,3780	250

Water Quality Standard KepMenKes no. 492 / Menkes / Per / IV / 2010 Date of 19 April 2010

Table 6. Laboratory Test Results (Drinking Water B).

No	Examination	Unit	Results	Maximum limit
A.	Physics			
1	TDS #	Mg/L	93,2	500
2	Turbidity #	NTU	2,90	5
3	Smell	-	No smell	No smell
4	Taste	-	Does not taste	Does not taste
B.	Chemistry			
5	pH	-	5,54	6,5-8,5
6	Sulphate	Mg/L	83,6310	2590

Water Quality Standard KepMenKes no. 492/Menkes/Per/IV/2010 Date of 19 April 2010

Information:

Those marked with fence (#) do not include accredited parameters. Based on Table 3, 4, 5, 6 can be seen the results of laboratory tests on water quality PDAM IKK Alalak. Table 3 laboratory results of river water quality results can be seen for pH results showing 2.86 this indicates the pH of acid river water should threshold value maximum water pH 6 - 9. In Table 4 laboratory test of water quality for pH water 6, 02 while the maximum water limit value should be

6.5-9.0. In Table 5 and 6 the laboratory test of drinking water quality showed a water pH of 6.32 and 5.54 with a maximum water limit value of 6.5 - 8.5.

Population demands for adequate water quality and quantity and continuity of water flows which are operational and clean water services are also a problem faced in the construction of a clean water supply system. In the development of a clean water supply system for the development of districts and

districts, raw water resources and land use change are very important aspects. Land use is closely linked to the source of raw water and the environment for the fulfillment of clean water needs.

River water treatment is used as clean water until now there are some processing done, according to Hanum (2002) raw water treatment process into clean water must go through several stages, ranging from screening, sedimentation tank, klarifier, sand filter, and reservoir. In general, clean water treatment includes intake, first

precipitation, rapid stirring, slow stirring, second precipitation, filters, disinfection, and reservoir.

Initial stages are done by making raw water through the screen for large waste separator included in the intake stage. The second stage is the first precipitation (pre-sedimentation). Sedimentation is the separation of suspended solid particles (TSS) from the solution using gravity (Cheremisino, 2002). Sedimentation serves to precipitate dirt in the form of mud and sand (Hanum, 2002).

Test Regression coefficient Together (Test F)

Table 7. Test F.

Model	The sum of squares	Degrees Free	Average Squares	F	Sig.
Regression	455.841	8	56.980	15.191	.000 ^b
Residual	303.815	81	3.751		
Total	759.656	89			

1. Make a conclusion
2. F arithmetic > F table (15,191 > 2,71) and significant <0,05 (0,000 <0,05), hence Ho is rejected, so it can be concluded that the duration

of usage, education and work together influence to public perception on quality source of raw water of IKK Alalak Batola regency.

Partial Regression Coefficient Test (T test)

Table 8. Test T.

Model	The sum of squares		Average Squares	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	13.101	.476		27.551	.000
Duration of Use	.229	.139	.140	1.646	.104
Primary school	-2.438	1.112	-.321	-2.191	.031
D3	-.033	1.146	-.002	-.029	.977
unemployment	-1.487	1.299	-.154	-1.144	.256
Farmers	-2.955	.842	-.379	-3.509	.001
Retired.	-.058	1.406	-.003	-.041	.967
entrepreneur	-2.570	.689	-.278	-3.728	.000
Civil servants	2.379	.705	.297	3.373	.001

Table 9. Conclusion Test T.

Variables	T count	T table	Conclusion
Duration of Use	1.646		Ho is rejected
D3	-0.029		Ho is rejected
unemployment	-1.144		Ho is rejected
Retired.	-0.041	1.998	Ho is rejected
Primary school	-2.191		Ho accepted
Farmers	-3.509		Ho accepted
Civil servants	3.373		Ho accepted
Entrepreneur	-3.728		Ho accepted

So it can be concluded that the long usage, D3, not working and retired partially does not affect the perception of the community on the quality of raw water resources IKK Alalak Batola District. While elementary school (elementary school), farmer, entrepreneur and

civil servant (Government employees) partially influence to society perception on quality of raw water source of IKK Alalak Batola District.

Conclusions and recommendations

A. Conclusion

Based on the research results obtained, it can be concluded as follows:

1. Public perception on water quality of IKK PDAM is positive/beneficial with 90 respondents (74,4%) while negative/unhelpful 9 respondents (25,6%).

2. The result of F test indicates that the old variable of usage, education, and occupation have an effect on the perception of society with $F > F_{table}$ ($15,191 > 2.71$)
3. Based on the results of laboratory tests on the quality of river water, clean water and drinking water showed pH below threshold value Maximum water limit showing yield for pH of river water 2.86, pH of clean water 6.02 and pH of drinking water A and B indicating number 6.32 and 5.54 shows the pH of acidic water but can still be used.

B. Suggestions

1. It is expected that the water quality of IKK Alalak's water supply should be feasible to be consumed, not to distribute the distended water (water cleanliness, water quality, and water clarity).
2. Expectations from the public/customers of water debit should be smooth not to stall *let alone* not to flow.
3. Need to conduct further research on the causes and factors that result in acidic water pH.

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