



Analysis of User Satisfaction Index of Clean Water Providers by PDAM in Bireun Regency

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Abstract

PDAM Tirta Krueng Peusangan is a Regional Drinking Water Company located in Bireuen Regency which has duties and obligations in the process of organizing, processing, providing, and providing clean water services which are required to always be able to make improvements in the field of service as an effort to provide satisfaction to its customers. Based on the 2021 BUMD performance report, it was found that PDAM Krueng Peusangan was in the healthy category, but the 2014 RISPAM stated that there were still many water leaks. Therefore the purpose of this study was to analyze the level of customer satisfaction with the provision of clean water provided by PDAM Tirta Krueng Peusangan. The research was conducted by distributing questionnaires to respondents who are customers of PDAM Tirta Krueng Peusangan, Bireuen Regency. Customer satisfaction was assessed using the Importance Performance Analysis (IPA) method. The results obtained are that customers are very satisfied with the services provided with a percentage of 93%.

Keywords: Satisfaction Level, PDAM Krueng Peusangan, IPA, Clean Water, Service

INTRODUCTION

Perusahaan Daerah Air Minum (PDAM) is a local government-owned business entity that has a business scope in managing drinking water and managing clean water facilities to improve the level of community welfare. Urban communities are highly dependent on the availability of good clean water, the issue of water is not just the quality of water, but also the issue of quantity and continuity (Haiqal, Azmeri and Fatimah, 2021). PDAMs have duties and obligations in organizing the processing, supply and service of clean water, through the management of clean water facility infrastructure and distribution system arrangements, are required to always be able to make improvements in the field of service by developing professional services in order to provide satisfaction to its customers (Putra, 2011).

PDAM Tirta Krueng Peusangan is located in Bireuen Regency. The company serves 25,909 customers residing in Bireuen Regency. The PDAM is among the top 8 PDAMs in Region 1 with a performance score of 3.39 (healthy) based on the "Performance of Regional-Owned Enterprises (BUMD) Drinking Water 2021" report. The performance criteria assessed include aspects of Finance, Service, Operations and Human Resources. In the service indicator, the indicators assessed are service coverage, customer growth, complaint resolution rate, customer water quality and domestic water consumption (PUPR, 2021). Based on the 2014 Drinking Water Supply System Master Plan (RISPAM), in the technical aspect, there were disruptions in water production and distribution due to leaks in both delivery and distribution pipes. The amount of water loss due to leaks is very high, reaching 42%. In non-technical aspects, there are obstacles in the implementation of work that is not optimal and inadequate human resources (HR) (PUPR, 2014).

This research was conducted on customers for the level of customer satisfaction with the

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provision of clean water by PDAM Tirta Krueng Peusangan. Measuring customer satisfaction allows an organization to conduct proper self-evaluation and identify the key drivers that increase its customer satisfaction (Ohwo and Agusomu, 2018).

LITERATURE REVIEW

Customer Satisfaction

Satisfaction comes from the Latin "satis", which means enough and something that satisfies definitely meets expectations, needs, or desires, and does not cause complaints. Satisfaction according to the Indonesian dictionary comes from the word satisfied which is defined as a pleasant feeling, because of the fulfillment of heart desires and satisfaction itself is defined as a matter that is satisfied or the pleasure of the soul because it has been sufficient (Putra, 2011).

Customer satisfaction is a feeling of pleasure or disappointment that arises after comparing the perception or impression of the performance or results of a product and expectations. Customer satisfaction is a label used by customers to summarize a set of visible actions or actions related to a product or service. Consumer satisfaction or customer satisfaction is a condition that occurs when the wants, needs and expectations of customers for a product can be fulfilled (Maulana, 2017). Customer satisfaction is also explained as the customer's reaction to the fulfilled state and the customer's assessment of the fulfilled state (Ohwo and Agusomu, 2018).

Importance Performance Analysis

In this technique respondents are asked to rank various attributes or elements of the offer based on the degree of importance of each attribute (Marantika, 2019). By using the IPA method, an improvement strategy is obtained based on priority. There are four quadrants in the IPA method, where each quadrant can provide management information or service strategies (Sulistyo, Rafauzi and Wijaya, 2022).

- a. Quadrant I: Is an area that contains important considerations by consumers, but has not fulfilled consumer desires or the level of satisfaction obtained is still low. Variables included in quadrant I are prioritized in service improvement.
- b. Quadrant II: Is an area of attributes that are considered important by consumers and have fulfilled consumer desires so that consumers are satisfied, attribute included in this area must be maintained.
- c. Quadrant III: Is an area of attributes that are considered less important by consumers or not a top priority in improvement. To improve the variables included in this area can be reconsidered because their effect on customer satisfaction is very small.
- d. Quadrant IV: Contains variables that are considered less important by consumers but consumers are satisfied with the existing attributes and the company does not need to improve the attributes in this area.

RESEARCH METHODOLOGY

Primary data collected from results of questionnaires that distributed to respondents. The respondents considered were PDAM Krueng Peusangan user. The method that can be used for sample withdrawal is the Cochran formula. The Cochran formula can be seen below (Sugiyono, 2022):

$$n = \frac{Z^2 pq}{e^2} \frac{(1,96)^2 (0,5)(0,5)}{(0,1)^2} = 96,04 = 97 \text{ people}$$

Notes:

N = Number of samples given

Z = The level of confidence required in the sample, which is 95% with Z 1.96

p = 50% chance of being correct

q = 50% False Chance

e = The maximum tolerable error rate is 10%.

Based on calculations based on the Cochran formula, the number of samples in this study was 97 people. In this study the dependent variable (Y) is Customer Satisfaction and the independent variable (X), namely service quality, is obtained based on previous research which can be seen at the table 1.

Table 1. Independent Variable of Research

Variable	Indicator	Sources
Tangible (X1)	X1.1	Water clarity (Putra, 2011; Maulana, 2017; Kalsum, et.al 2021)
	X1.2	Water odorless (Putra, 2011; Maulana, 2017; Kalsum, et.al, 2021)
	X1.3	Water meets needs (Putra, 2011; Maulana, 2017; Kalsum et.al, 2021; Tangaja et al., 2021)
	X1.4	24-hour water availability (Putra, 2011; Maulana, 2017; Tangaja et al., 2021)
Reliable (X2)	X2.1	Availability of officers in solving customer problems (Putra, 2011; Gowela et.al, 2017; Tangaja et al., 2021)
	X2.2	Ease of paying bills (Putra, 2011; Kalsum et. al, 2021)
	X2.3	Ease of filing a complaint (Putra, 2011; Kalsum, Suzana and Harahap, 2021)
	X2.4	Ability to solve problems related to water supply (Putra, 2011)
Responsiveness (X3)	X3.1	Response to complaints (Putra, 2011; Gowela et.al, 2017; Kalsum et.al, 2021; Tangaja et al., 2021)
	X3.2	Availability of information (Maulana, 2017)
	X3.3	Complaint handling speed (Maulana, 2017)
Assurance (X4)	X4.1	Good water quality assurance (Putra, 2011; Gowela, Alleyne and Chinopfukutwa, 2017; Kalsum, Suzana and Harahap, 2021)
	X4.2	Good service assurance (Putra, 2011; Kalsum, Suzana and Harahap, 2021)
	X4.3	Officers are courteous (Putra, 2011; Gowela et.al, 2017; Kalsum et.al, 2021)
Empathy (X5)	X5.1	Staff show willingness and care in helping customers (Gowela, Alleyne and Chinopfukutwa, 2017)
	X5.2	Attention in treating customers customers personally (Putra, 2011)
	X5.3	Efforts to prevent service delays (Putra, 2011; Gowela, Alleyne and Chinopfukutwa, 2017)

The customer satisfaction index is an assessment based on user perceptions and expectations. Measurement of user perceptions and expectations is done using a Likert Scale in 5 categories. Assessment of the level of user perception of clean water services of PDAM Krueng Peusangan clean water services of PDAM Krueng Peusangan is scored with the answer "very important" given a score of 5, to "very unimportant" has a score of 1. Assessment of the level of customer expectations of clean water services of PDAM Krueng Peusangan is assessed with an answer score indicating "very satisfied" given a score of 5, to "very dissatisfied" given a score of 1. Data collection was carried out by interviewing and distributing questionnaires to users of PDAM Krueng Peusangan. After the data from the questionnaire was obtained, the average of each question from all respondents was calculated using the following equation.

$$\bar{X} = \frac{\sum X}{N}$$

$$\bar{Y} = \frac{\sum Y}{N}$$

Notes:

\bar{X} = Average score of performance level

\bar{Y} = Average score of expectation level

X = Number of performance level scores

Y = Total score of expectation level

n = Number of respondents.

Analyze the quality of service that has been provided by the company, using the following equation:

$$\text{Gap } (Q) = \text{Performance Score } ((\bar{X})) - \text{Expectation Score } (\bar{Y})$$

If the gap is positive, it means that the service is very satisfying. Conversely, if the score is negative, it means that the level of service is lower than what respondents expect. Meanwhile, if the gap score is equal to zero, it means that the service is the same as what is expected by its customers [2]. To measure the level of customer satisfaction, the percentage comparison of the perception score and the expectation score is calculated using the following equation.

$$\text{CSL} = \frac{\text{Performance Score } (\bar{X})}{\text{Expectation Score } (\bar{Y})} \times 100\%$$

Notes:

CSL = Customer Satisfaction Level

\bar{X} = Average performance level score

\bar{Y} = Average score of expectation level

Table 2. Scale of Customer Satisfaction Level

Customer Satisfaction Level	Rating Scale Value
20-35%	Very unsatisfied
36-51%	Unsatisfied
52-67%	Netral
68-83%	Satisfied
84-100%	Very Satisfied

Importance Performance Analysis (IPA) describes each attribute in a Cartesian diagram, where the data needed is the average value of expectations and the average performance of all respondents who are known from previous calculations. From the Cartesian diagram, 4 quadrants will be seen which show the area of customer satisfaction (Sulistyo et. al., 2022).

- a. Quadrant I: Is an area that contains important considerations by consumers, but has not fulfilled consumer desires or the level of satisfaction obtained is still low. Variables included in quadrant I are prioritized in service improvement.
- b. Quadrant II: Is an area of attributes that are considered important by consumers and have fulfilled consumer desires so that consumers are satisfied, artibut included in this area must be

- maintained.
- c. Quadrant III: Is an area of attributes that are considered less important by consumers or not a top priority in improvement. To improve the variables included in this area can be reconsidered because their effect on customer satisfaction is very small.
 - d. Quadrant IV: Contains variables that are considered less important by consumers but consumers are satisfied with the existing attributes and the company does not need to improve the attributes in this area.

FINDINGS AND DISCUSSION

Data processing obtained the results shown in table 3 below.

Table 3. Results of Performance and Expectation Calculations

No.	Attributes	Performance	Importance	Gap	Percent
Tangible					
1	Water clarity	3,75	4,40	-0,65	
2	Water odorless	3,92	4,39	-0,47	
3	Water meets needs	4,07	4,42	-0,35	
4	24-hour water availability	4,10	4,55	-0,44	
Mean		3,96	4,44	-0,48	89%
Realible					
5	Availability of officers in solving customer problems	3,91	4,11	-0,21	
6	Ease of paying bills	4,09	4,12	-0,03	
7	Ease of filing a complaint	3,89	4,16	-0,28	
8	Ability to solve problems related to water supply	3,93	4,12	-0,20	
Mean		3,95	4,13	-0,18	96%
Responsiveness					
9	Response to complaints	3,93	4,05	-0,12	
10	Availability of information	3,90	3,92	-0,02	
11	Complaint handling speed	3,88	4,04	-0,16	
Mean		3,90	4,00	-0,10	98%
Assurance					
12	Good water quality assurance	3,86	4,26	-0,40	
13	Good service assurance	3,86	4,10	-0,25	
14	Officers are courteous	3,97	4,33	-0,36	
Mean		3,89	4,23	-0,34	92%
Empathy					
15	Staff show willingness and care in helping customers	3,90	4,25	-0,35	
16	Attention in treating customers customers personally	3,93	4,18	-0,25	
17	Efforts to prevent service delays	3,74	4,01	-0,27	
Mean		3,86	4,14	-0,29	93%
Total		3,91	4,19	-0,28	93%

Then based on table 2 above, the following Cartesian diagram is obtained which is shown in figure 1.

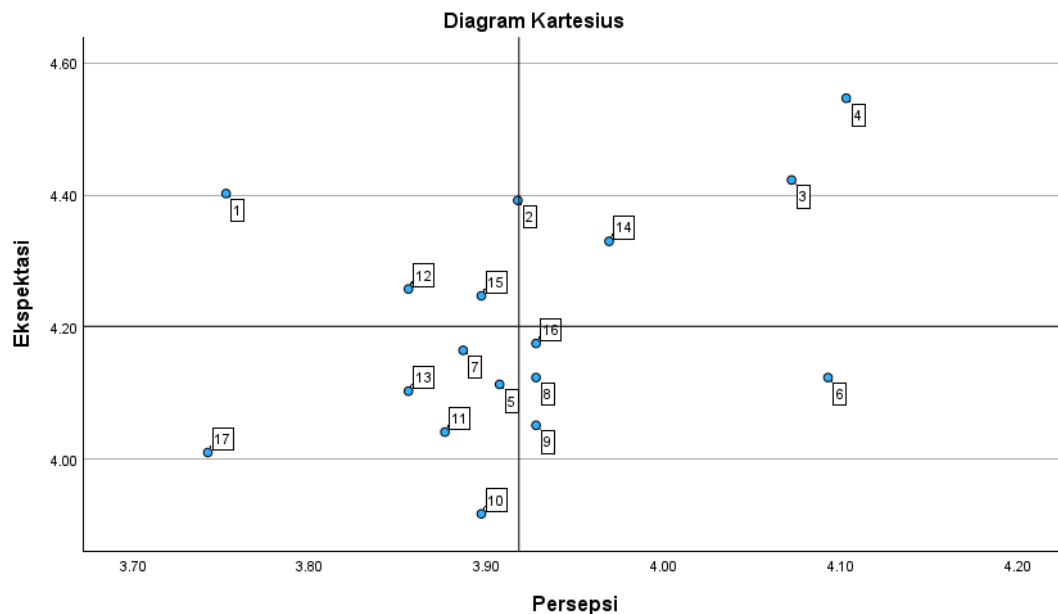


Figure 1. Cartesian Diagram

Based on table 2, it can be seen that overall each component has a negative gap value, which means that the service obtained is lower than what respondents expect in all service dimensions. The dimension with the highest gap value lies in the tangible dimension, namely the water clarity attribute (-0.47). This shows that the level of interest in water clarity is high but not matched by the corresponding level of satisfaction. The dimension with the gap value is the availability of information attribute in the responsiveness dimension, which is -0.02.

Of the five groups that have been analyzed, all aspects of satisfaction, namely Tangible, Reliability, Responsiveness, Assurance, and Empathy have a level of customer satisfaction with a very satisfied category with a rating scale value of 93% according to the results of the analysis based on questionnaires that have been distributed to 97 respondents. This shows that in providing services in the five aspects of Tangible, Reliability, Responsiveness, Assurance, and Empathy, PDAM Krueng Peusangan Bireuen Regency shows customer satisfaction. The highest level of satisfaction lies in the dimension of responsiveness, which is 98% and the lowest level of satisfaction in the dimension of tangible evidence, therefore PDAM Krueng Peusangan must improve services in the dimension of tangible evidence.

Based on the Cartesian diagram, it is divided into four quadrants, which are as follows:

a. Quadrant I: Is an area that contains important considerations by consumers, but has not fulfilled consumer desires or the level of satisfaction obtained is still low. Variables included in quadrant I are prioritized in service improvement. Attributes included in quadrant I include:

- Attribute 1, namely water clarity
- Attribute 2 is odorless water
- Attribute 12 is good water quality assurance
- Attribute 15 is that the officer shows desire and concern in helping customers

PDAM Krueng Peusangan must improve the four attributes above as a priority in order to improve service quality.

b. Quadrant II: Is an area of attributes that are considered important by consumers and have fulfilled consumer desires so that consumers feel satisfied, attribute included in this area should be

maintained. Attributes included in quadrant II include:

- Attribute 3, namely water meets the needs
- Attribute 4 is 24-hour water availability
- Attribute 14 is that the officer is polite

PDAM Krueng Peusangan must maintain the above attributes in order to maintain service quality.

c. Quadrant III: Is an area of attributes that are considered less important by consumers or not a top priority in improvement. To improve the variables included in this area can be reconsidered because their effect on customer satisfaction is very small. Attributes included in quadrant III include:

- Attribute 5, namely availability in solving customer problems
- Attribute 7, namely the ease of filing a complaint
- Attribute 10 is the availability of information
- Attribute 11 is the speed of complaint subscription
- Attribute 13 is a guarantee of good service
- Attribute 17 is an effort to prevent service delays

The above attributes are not the main focus of improvement in efforts to improve services by PDAM Krueng Peusangan.

d. Quadrant IV: Contains variables that are considered less important by consumers but consumers are satisfied with the existing attributes and the company does not need to improve the attributes in this area. Attributes included in quadrant IV include:

- Attribute 6, namely the ease of paying bills
- Attribute 8 is the ability to solve problems related to water supply
- Attribute 9 is the response (response) to complaints
- Attribute 16 is attention in treating customers personally

Consumers are satisfied with the attributes above and PDAM Krueng Peusangan does not need to make improvements to these attributes.

CONCLUSIONS AND FURTHER RESEARCH

Customer satisfaction with the clean water supply of PDAM Tirta Krueng Peusangan obtained a gap value in the dimensions of tangible, reliability, responsiveness, assurance and empathy which indicates that the quality of service provided has not met customer expectations. However, the level of satisfaction obtained is 93% which means very satisfied. PDAM Krueng Peusangan must improve services on the attributes of awareness, namely water clarity, odorless water, guaranteed good water quality and officers showing desire and concern in helping customers.

LIMITATION & FURTHER RESEARCH

The limitations of the study are those characteristics of design or methodology that impacted or influenced the interpretation of the findings from your research. Further research should suggest the number of gaps in our knowledge that follow from our findings or to extend and further test of the research.

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