

Analysis of customer satisfaction of regional drinking water company Tirta Mulia Karimun the Riau Islands

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Abstract

Purpose: The purpose of this study was to determine and analyze the indirect effect of leadership on burnout among Riau Islands Province Regional Secretariat Employees. To determine and analyze the indirect effect of Workload on burnout of Riau Islands Province Regional Secretariat Employees. To determine and analyze the direct effect of emotional factors on burnout of Riau Islands Province Regional Secretariat Employees. As a regional company that provides basic clean water services for the Karimun Regency community, PDAM Tirta Mulia Karimun should provide customer satisfaction. However, many customers still complain about water quality and limited volume. This study aims to determine the effects of quality, volume, tariffs, and services on customer satisfaction.

Research Methodology: This study used a quantitative method. The sample consisted of 200 respondents who were analyzed using the SMARTPLS program. After validity and reliability tests were conducted, a hypothesis test was conducted.

Results: The results showed that quality, volume, and service had a significant direct effect on customer satisfaction. Tariff had an insignificant direct effect on satisfaction. Product quality has a significant direct effect on PDAM services. Volume had a significant direct effect on service. Tariffs have a significant direct effect on PDAM services. Product quality had a significant effect on customer satisfaction through PDAM Tirta Mulia Karimun services, with a P value of $0.001 < 0.05$. Volume has a significant effect on customer satisfaction through services, with a P value of $0.001 < 0.05$. Tariffs have a significant influence on customer satisfaction through PDAM Tirta Mulia Karimun services, with a P value of $0.008 < 0.05$. Customer satisfaction is influenced by product quality, volume, and tariffs by 70.4%. This study concludes that the variables studied, namely, quality, volume, tariff, and service, have a significant influence on customer satisfaction. The dominant improvements that must be made are related to quality and volume.

Keywords: Services, Volume, Satisfaction

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1. Introduction

Water is a basic human need managed by the Regional Government through appointed regional companies. Water management in Karimun Regency, Riau Islands Province, is conducted by the regional drinking water company (PDAM) Tirta Mulia Karimun. One of the regional companies that is part of the Regional-Owned Enterprise (BUMD) and manages water resources in each region is PDAM, which is a company managed by the regional government that acts as a public service agency in its

operations. The Regional Public Company (PERUMDA) Tirta Mulia Karimun is a regionally owned enterprise of Karimun Regency, which was established in 1997. The management and finances of the PDAM are still managed by Perusda Karimun. The purpose of establishing Perumda is to establish, build, organize, manage, and serve the provision of drinking water; distribute drinking water to customers; establish, build, and manage drinking water installations; and build, organize, and manage facilities that support the implementation of Perumda business activities.

Customer satisfaction is one of the general requirements that must be met by a company so that the company is successful in the competition of the business world. By creating and maintaining customers, companies must be able to satisfy their customers wants and needs and capture existing opportunities through their marketing strategies. Customer satisfaction, as a benchmark for companies on how things have been set in the future or even some things that have been determined, must be changed because customers feel dissatisfied or disadvantaged by the company's service. If customers feel dissatisfied, then customers will complain to the company and may also complain about their dissatisfaction with other customers. Therefore, in influencing customer satisfaction, several factors influence the level of high and low satisfaction, namely product quality, cost emotions, price, and service quality.

Product quality is one of the factors that affect customer satisfaction. In general, products can be offered to the market to attract attention, acquisition, and use/consumption to satisfy a desire or need. Therefore, the production of quality products can achieve an effective and efficient product because the product to be produced is in accordance with customer needs and expectations.

To determine drinking water rates is the authority of the regional head, PDAM uses the Cost Recovery principle. This principle implies that a company must be able to finance all its own expenses without using financing sources outside the company. As an extension of the local government's provision of public services, the PDAM is required not to burden the community. Therefore, the determination of water prices set by the PDAM must not burden customers, but also be able to finance the company's operational costs.

Based on initial observations made by researchers, there are several problems faced by customers regarding quality that cause dissatisfaction. The PDAM is considered not to provide satisfaction and has received many complaints from the public. Complaints from residents regarding poor service, such as water use operations, are still limited to 10 h per day. Furthermore, after 14 h, water could not be used by the community. The volume of water is very limited from morning to evening, and when it rains, the water changes color and appears unsterile and unhygienic. Another problem is related to the quality of the water, which is still cloudy and smelly.

This study aims to analyze the direct influence of quality, volume, and tariffs on customer satisfaction of PDAM Tirta Mulia Karimun. This study is useful as information material in determining various policies related to improving services so that they can meet customer expectations and the sustainability of PDAM Tirta Mulia Karimun.

2. Literature Review

2.1 Hypothesis Development

2.1.1 Water Quality on Customer Satisfaction

According to Cabral, Djaha, and Nursalam (2019), customer satisfaction is a feeling of pleasure or disappointment that arises after comparing the performance (or results) of a product that is thought to be against the expected performance. Arimie (2019) explains that customer satisfaction is a customer's response to the difference between the initial expectations and the actual performance of the product as perceived after consuming the product.

Likewise, the results of research conducted by Morande and Marzullo (2019) that product quality has a positive and significant effect on Alfamart customer satisfaction in Metro City. The same results were also shown by research conducted by Acharya (2019), who found that product quality influences customer satisfaction in IndiHome.

H1: There is a direct relationship between product quality and customer satisfaction in the PDAM Tirta Mulia Karimun.

2.1.2 Water Volume/Quantity on Customer Satisfaction

The quantitative requirements for the provision of clean water were reviewed based on the amount of raw water available, which could be used to meet needs according to the number of residents served (Kalensun, Kawet, & Halim, 2016). The provision of clean water must be able to meet the needs of the community; by looking at the clean water discharge, the quantity of clean water used can be known (Lestari & Sriyono, 2021). According to Setiyaningsih and Suwitri (2012), the quantity of clean water services can be seen from the level of community consumption, where many people still use alternative water sources, such as drilled water and wells, to meet their daily needs.

According to Yuliani and Rahdriawan Masikki (2020), the quantity of water can be assessed based on the amount obtained for each month. In general, the volume and quantity of water is the amount of clean water required to meet daily needs. Factors that influence the volume/quantity of water include technical factors, namely the use of water meters, and socio-economic factors, namely the population and level of economic capacity of the community. If the quantity of water or the amount of water distributed to customers is met, and according to customer expectations, it will directly increase customer satisfaction. H2: There is a direct influence between water volume and customer satisfaction at PDAM Tirta Mulia Karimun.

2.1.3 Water Tariffs Against Customer Satisfaction

According to Lupiyoadi (2011:61), pricing strategy is significant in providing value to consumers and influencing product image, as well as consumer decisions to buy. Price is also related to income and influences supply or marketing channels. However, the most important factor is that price decisions must be consistent with the marketing strategy. Price is the value that consumers exchange for a number of benefits by having or using a product or service. Every company marketing its goods or services to be successfully marketed must first determine the right price so that buyers are interested in buying goods or services. In the buying and selling process, price is one of the most important factors because price is a means of exchange in transactions. Price is the only element of the marketing mix that is flexible in nature and can change at any time. Price is also a factor in competition in product marketing.

Price is an important factor influencing customer satisfaction. Price is defined as the sum of all values issued by customers to pay for a product or service that is owned or used. Based on the results of previous research conducted by Hasmira, Guntur, Wardah, and Seppa (2024) showed that the price variable has an effect on customer satisfaction of PDAM Tirta Jeneberang, Gowa Regency. The pricing that has been set by PDAM Tirta Jeneberang, Gowa Regency has been good, where the prices imposed are in accordance with the customer's ability with the volume of water used, the better the price imposed, the more satisfied the customer will feel. H3: There is a direct relationship between water rates and customer satisfaction in PDAM Tirta Mulia Karimun.

2.1.4 PDAM Service Towards Customer Satisfaction

Service is an activity carried out by a person or group of people based on material factors through a system of procedures and with certain methods in order to fulfill the interests of others according to their rights." (Angliawati (2016)).

Research conducted by Prabowo and Burhan (2023) shows that the quality of service of the PDAM Sumber Pocong Bangkalan Regency has a significant influence on customer satisfaction. The same

results were also shown by research conducted by Dayanti, Prabawati, and Supriyanti (2023) that service quality affects customer satisfaction at the Tirta Sewakadarma Regional Drinking Water Company (PDAM) of Denpasar City.

H4: There is a direct relationship between service and customer satisfaction in PDAM Tirta Mulia Karimun.

2.1.5 Water Quality for PDAM Services

According to Chandra, Wijaya, Angelia, and Hayati (2020), product quality is how a product has a value that can satisfy consumers both physically and psychologically, and refers to the attributes or properties contained in an item or result. According to Kotler (2012), product quality is the ability of a product to perform its functions, including durability, reliability, accuracy, ease of operation, repair, and other valuable attributes. Quality reflects all dimensions of product offerings that benefit customers Chandra et al. (2020). Based on this description, product quality is how the product has a value that can satisfy consumers both physically and psychologically, which refers to the attributes or properties contained in an item or result.

Product quality is one of the important factors for companies to increase sales volume; good product quality will make consumers loyal to a product, and providing good service quality will provide its own satisfaction for consumers. Satisfaction provides many benefits for the company, including repeat purchases and recommendations regarding the product or service to friends and acquaintances.

H5: There is a direct relationship between product quality and the PDAM Tirta Mulia Karimun service.

2.1.6 Volume/Quantity of Water for PDAM Services

The volume/quantity of water, including rainfall, topography, and rock type, is generally influenced by the physical environment of the area. Water needs are the amount of water required for basic human needs (domestic) and other activities that require water. Water needs determine the size of the system and are determined based on water usage. The availability of water distributed to customers is also expected to improve the quality of PDAM services.

H6: There is a direct relationship between water volume and PDAM Tirta Mulia Karimun services.

2.1.7 Water Tariffs for PDAM Services

Public service quality according to Wyckoff, as quoted by Tjiptono, is as follows: "service quality is the level of excellence expected and control over the level of excellence to meet customer desires. If the service or service received or felt (perceived service) is in accordance with expectations, the quality of service or service is perceived as good and satisfying.

H7: There is a direct relationship between water rates and the PDAM Tirta Mulia Karimun services.

2.1.8 Water Quality Towards Customer Satisfaction Through PDAM Services

Customers who are satisfied with a product or service are often caused by the fact that they feel that the service provided by the company is not only in accordance with their needs, but also satisfying and in accordance with their expectations. The expectations referred to in this case are in terms of the quality of water obtained by consumers, such as odorless, non-cloudy, and dirty.

H8: There is an indirect influence between product quality and customer satisfaction at PDAM in Tirta Mulia Karimun.

2.1.9 Water Volume/Quantity on Customer Satisfaction Through PDAM Services

Customer satisfaction is influenced by several factors, one of which is the service provided. The service is said to still not be good if the availability of water distributed to customers is still far from sufficient for daily life. The debit or volume of flowing water should have been regulated and checked by PDAM so that PDAM is indirectly said to have tried to improve services in order to achieve customer satisfaction. H9: Water volume has an indirect effect on customer satisfaction at PDAM Tirta Mulia Karimun.

2.1.10 Water Tariffs on Customer Satisfaction Through PDAM Services

Customer satisfaction has become a central concept in business and management discourse. Customers are the main focus of discussions on satisfaction and service quality. Therefore, customers play an important role in measuring the satisfaction with the products and services provided by the company.

H10: Water rates have an indirect effect on customer satisfaction at PDAM Tirta Mulia Karimun.

3. Research Methods

The research was conducted in the Karimun Regency, Riau Islands, Brazil. It has a time period of four months starting from April 2024 to July 2024. In accordance with the problems raised in this study, a quantitative approach was used. Quantitative research emphasizes testing theories by measuring variables with numbers and analyzing data using statistical procedures. Data in the form of numbers were then processed and analyzed to obtain scientific information behind the numbers. The population in this study was all customers at PDAM Tirta Mulia Karimun, totaling 9,424 House Connections (SR). The sample measurement technique used in this study used sampling from the Slovin formula. After calculation, 200 samples were used to represent the population.

The data sources in this study were the subjects from which the data were obtained. The data in this study are quantitative in the form of numbers. The data sources used in this study are primary and secondary data sources, namely, data obtained directly from PDAM Tirta Mulia Karimun customers by distributing questionnaires. Primary data are data collected directly by researchers from the source, such as by providing questionnaires or question lists to customers of PDAM Tirta Mulia Karimun. Secondary data were collected by the researchers from all existing sources. These data usually come from other research conducted by institutions or organizations, including official documents, books, research results in the form of reports, and so on.

4. Result and Discussion

Before conducting the hypothesis test, a validity test was conducted on the data collected from the PDAM Tirta Mulia Karimun customer questionnaires. The results showed that the indicator items against their constructs were greater than the cross-loading value. Thus, it can be concluded that all constructs or latent variables had good discriminant validity. After testing validity, the next test is the reliability test, which is measured by the Composite Reliability and Average Variance Extracted (AVE) values. A construct is declared reliable if the composite reliability value is > 0.60 and the AVE value is > 0.50 . After testing validity, the next test is the reliability test, which is measured by the Composite Reliability and Average Variance Extracted (AVE) values. A construct is declared reliable if the composite reliability value is > 0.60 and the AVE value is > 0.50 . Based on these calculations, it is known that all constructs met the reliability criteria. This is indicated by the Composite Reliability value above 0.60 and AVE above 0.50. After ensuring that the data were valid and reliable, a hypothesis test was conducted. The results are presented in the following table:

Table 1. Results of Direct Influence Test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ($ O/STDEV $)	P Values
Product Quality (X1) → Customer satisfaction (Y)	0,411	0,414	0,071	5,761	0,000
Volume (X2) → Customer satisfaction (Y)	0,206	0,211	0,074	2,792	0,005

Rates (X3) → Customer satisfaction (Y)	-0,100	-0,105	0,071	1,413	0,158
Product Quality (X1) → Service (Z)	0,376	0,368	0,083	4,542	0,000
Volume (X2) → Service (Z)	0,324	0,326	0,083	3,881	0,000
Rates (X3) → Service (Z)	0,211	0,220	0,068	3,098	0,002
Service (Z) → Customer satisfaction (Y)	0,376	0,371	0,070	5,405	0,000

Source: Primary data processed with PLS, 2024

Table 2. Results of Indirect Effect Test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Product Quality (X1) → Service (Z) → Customer satisfaction (Y)	0,141	0,137	0,042	3,390	0,001
Volume (X2) → Service (Z) → Customer satisfaction (Y)	0,122	0,120	0,036	3,353	0,001
Rates (X3) → Service (Z) → Customer satisfaction (Y)	0,079	0,082	0,030	2,653	0,008

Source: Primary data processed with PLS, 2024

4.1 Influence of Product Quality on Customer Satisfaction

The results of the data processing show that the first hypothesis is accepted with a t-statistic value of $5.761 > 1.972$ and a p-value of $0.000 < 0.05$. This proves that product quality has a significant direct influence on customer satisfaction of the PDAM Tirta Mulia Karimun, where the better the product offered, the higher the level of customer satisfaction.

Product quality is the first factor influencing customer satisfaction. Product Quality is the ability of a product to perform its functions, including durability, reliability, accuracy, ease of operation and repair, and other valuable attributes. If PDAM Tirta Mulia Karimun provides product quality, in this case good water quality, and in accordance with customer expectations, customers will be satisfied; however, if the quality of the product provided does not match customer expectations, customers will be dissatisfied.

The results of this study are in line with research conducted by Pahlawan, Nurlia, Laba, Pakki, and Hardiyono (2019) entitled The Influence of Product Quality and Service Quality on Increasing Customer Satisfaction and Loyalty of the Makassar City Regional Drinking Water Company (PDAM), which shows that product quality has a positive and significant effect on customer satisfaction. Several other studies with similar results have also been conducted by HARDIMAS and SOEHARTATIEK

(2022), (Damanik, Sitorus, & Mertajaya, 2021; Falahuddin, Fuadi, Munandar, Juanda, & Ilham, 2022), and Ayunani, Varadina, and Octavia (2023).

4.2 The Influence of Volume on Customer Satisfaction

The results of the data processing show that the second hypothesis is accepted with a t-statistic value of $2.792 > 1.972$ and a p-value of $0.005 < 0.05$. This proves that volume has a significant direct effect on customer satisfaction; the more sufficient and adequate the volume of water distributed, the higher the level of customer satisfaction.

An adequate water volume is important for customer satisfaction. Customers expect sufficient water to meet their daily needs, such as bathing, washing, cooking, and other sanitation needs. In addition to the quantity, the continuous availability of water also has an effect. Customers will be more satisfied if the water flows all day without interruption compared to water supplies that are often interrupted or only available at certain hours. Sufficient water volume is also related to good water pressure. Low water pressure can reduce customer satisfaction even if the total volume is adequate. In short, the provision of sufficient, stable, and even quantities of water is a key factor in maintaining and increasing customer satisfaction. The results of this study are in line with those of ErliantiErlianti et al. (2023) and Khotimah et al. (2018), who discussed the continuity and volume of water and its influence on customer satisfaction.

4.3 The Influence of Tariffs on Customer Satisfaction

The results of the data processing show that the third hypothesis is rejected with a t-statistic value of $1.413 < 1.972$ and a p-value of $0.158 > 0.05$. This proves that tariffs have a direct but insignificant effect on customer satisfaction at PDAM Tirta Mulia Karimun, where an increase or decrease in the tariff imposed does not greatly affect the level of customer satisfaction.

Water is a basic need, and customers may feel they have no alternatives, so the tariff is not a major factor in determining satisfaction, and they consider that the availability of water is more important than its price. If the PDAM provides high-quality and consistent clean water, customers will certainly not mind the tariff because the quality and reliability of the service are more important than the tariff for customers. At PDAM Tirta Mulia Karimun, customers only pay Rp36,000/cubic, equivalent to the use of five 200-liter water drums, compared to the cost of purchasing clean water per drum, which can reach Rp8,000, with usage of up to two drums per day. The results of this study differ from those of previous studies by Mega and Bella (2021), (Damanik et al., 2021), (Falahuddin et al., 2022), who concluded that price affects customer satisfaction.

4.4 The Influence of Service on Customer Satisfaction

The results of the data processing show that the fourth hypothesis is accepted with a t-statistic value of $5.405 > 1.972$ and a p-value of $0.000 < 0.05$. This proves that service has a significant direct influence on customer satisfaction at the PDAM Tirta Mulia Karimun, where the better the service provided, the higher the customer satisfaction.

Service is an effort to meet needs by providing the best possible quality of service to customers. With good service quality, customers obtain goods and services to meet their needs. A good service quality is also important. Every time a business process is carried out, both goods and services must be provided because service quality is closely related to purchasing decisions. If the service received and felt is in accordance with expectations, the quality of the service is considered good and in accordance with what customers want. Service in this case includes responses to complaints, such as speed of handling and solving problems, ease of access to services, such as easy payment processes, and system reliability, such as good infrastructure maintenance. The results of this study support previous research conducted by Ayunani et al. (2023), who concluded that service quality variables have a significant effect on customer satisfaction.

4.5 The Influence of Product Quality on Service

The results of data processing show that the fifth hypothesis is accepted, with a t-statistic value of $4.542 > 1.972$ and a p-value of $0.000 < 0.05$. This proves that product quality has a significant direct influence on PDAM Tirta Mulia Karimun's service; the better the quality of water provided to customers, the better the service of PDAM Tirta Mulia Karimun.

In the context of PDAM, the main "product" is the water distributed to customers. The quality of this product has a significant influence on the overall service of the PDAM. Good quality water contributes to public health. This reduces the potential for health problems that can affect the PDAM services. Meeting water quality standards helps PDAM comply with regulations and focus more on improving services than on dealing with legal issues. With guaranteed water quality, the PDAM can allocate resources for innovation in other aspects of service.

The most complicated aspect of a service is its quality, which is greatly influenced by customer expectations. The results of this study are in line with the theory put forward by Ibrahim (HARDIMAS & SOEHARTATIEK, 2022), namely that service quality is a dynamic condition related to products, services, people, processes, and the environment in which quality assessment is determined at the time the public service is provided. Good water quality reduces complaints and repairs, thereby increasing customer perception of the services provided.

4.6 The Influence of Volume on Service

The results of data processing show that the sixth hypothesis is accepted, with a t-statistic value of $3.881 > 1.972$ and a p-value of $0.000 < 0.05$. This proves that the water volume has a significant direct influence on the service of PDAM Tirta Mulia Karimun, where the more consistent the volume of water distributed, the better the service of PDAM Tirta Mulia Karimun.

Adequate water volume allows the PDAM to provide 24/7 water services, expand service coverage to more areas, and increase customer confidence in PDAM services. Therefore, there were no complaints related to water shortages or water not flowing. Water volume also means sufficient water quantity that can make the PDAM handle peak demand, such as in the morning and evening.

The results of this study are in line with the opinion of Gleick (1996), who states that adequate water quantity is the basis for meeting basic human needs, which then affects the quality of water utility services. From various theories and expert opinions, it has been emphasized that water quantity has a significant and multidimensional influence on PDAM services. Adequate water quantity not only affects the PDAM's ability to meet customers' basic needs, but also plays an important role in aspects such as security, sustainability, fairness, and service efficiency.

4.7 The Influence of Tariffs on Services

The results of the data processing show that the seventh hypothesis is accepted with a t-statistic value of $3.098 > 1.972$ and a p-value of $0.002 < 0.05$. This proves that water tariffs have a significant direct influence on PDAM Tirta Mulia Karimun services, where the better and more reasonable the tariffs set, the better the PDAM Tirta Mulia Karimun service.

The appropriate tariff can support the expansion of the distribution network and increase public access to clean water, which has the potential to improve service quality by reaching more customers. With sufficient funding from tariffs, the PDAM can increase the capacity of the customer service team. Thus, they can accelerate responses to complaints and improvements.

The results of this study support the theory proposed by Rogers et al. (2002), which emphasizes the importance of tariffs in covering the full cost of water services. Tariffs have a complex influence on the PDAM services. Determining the right tariff not only ensures the financial sustainability of PDAM but

also affects various operational and strategic aspects in determining the overall quality of PDAM services.

4.8 The Influence of Product Quality on Customer Satisfaction Through Service

The results of data processing show that the eighth hypothesis is accepted, with a t-statistic value of $3.390 > 1.972$ and a p-value of $0.001 < 0.05$. This proves that product quality has a significant influence on customer satisfaction through PDAM Tirta Mulia Karimun services, where the better the quality of the product or water (clear, odorless, and safe) that is distributed, the better the service provided to meet expectations and increase customer satisfaction.

Good product quality not only satisfies basic customer needs but also improves perceptions of overall service quality. This occurs through various mechanisms, including increasing operational efficiency, building trust, and increasing customer-perceived value.

The results of this study support the research conducted by (Merdekawati & Sulistyawati, 2011) on PDAM in Bali, which shows that product quality has a positive effect on customer satisfaction through service quality. The results of the same study by Putra (2020) on PDAM in Surabaya found that product quality affects customer satisfaction both directly and through service quality.

4.9 The Influence of Volume on Customer Satisfaction Through Service

The results of data processing show that the ninth hypothesis is accepted, with a t-statistic value of $3.353 > 1.972$ and a p-value of $0.001 < 0.05$. This proves that water volume has a significant effect on customer satisfaction through the PDAM Tirta Mulia Karimun services, where the more consistent the quantity and pressure of water provided, the better the service provided to meet expectations and increase customer satisfaction.

The amount of water distributed to customers is an important factor for meeting daily needs. The greater the volume of water that can be distributed, the better the PDAM service, where the provision of sufficient water can increase customer satisfaction. The volume of water affects customer satisfaction, but this influence occurs through the intermediary of PDAM service quality. The better the PDAM can provide sufficient water, the higher the quality of its service, which will ultimately increase customer satisfaction.

The results of this study are in line with the research by the Indonesian Ministry of Public Works and Public Housing (2016), who found that the continuity of water flow has a significant effect on PDAM customer satisfaction, where sufficient water volume is an important indicator of service continuity. Research by Suryaningtyas et al. (2013) on PDAM Malang City also revealed that water quantity has a positive effect on customer satisfaction with PDAM services acting as an intervening variable. Likewise, research by (Pranata, Fari, Suryani, & Handayani, 2023) at the PDAM Tirta Dharma Klaten Regency showed that service quality, including water availability, has a positive effect on customer satisfaction with the mediating role of service.

4.10 The Influence of Tariffs on Customer Satisfaction Through Service

The results of the data processing show that the tenth hypothesis is accepted with a t-statistic value of $2.653 > 1.972$ and a p-value of $0.008 < 0.05$. This proves that water rates have a significant effect on customer satisfaction through the PDAM Tirta Mulia Karimun services, where the high and low rates imposed can affect the services provided so that they indirectly affect customer satisfaction.

Higher rates tend to increase customer expectations of PDAM service quality; therefore, PDAM needs to adjust the quality of service according to the rates set. Adequate rates tend to encourage PDAM to improve infrastructure and service quality to increase customer satisfaction. Customers will certainly

compare the rates paid to the quality of the services received. If a service meets or exceeds expectations based on the rate, customer satisfaction tends to increase.

The results of this study support previous research conducted by Lukman et al. (2019) in PDAM Surabaya City, which found that rates have a significant effect on customer satisfaction with service quality, acting as a mediating variable. Then the research conducted by Syahputra et al. (2014) at PDAM Tirta Mountala Aceh Besar also showed that tariffs have an indirect influence on customer satisfaction mediated by service quality.

5. Conclusion

The results of this study indicate that quality and volume have significant direct and indirect effects on customer satisfaction in PDAM Tirta Mulia Karimun. However, tariffs had no significant effect on satisfaction. However, tariffs have a significant effect on satisfaction through services. It is expected that PDAM Tirta Mulia Karimun can maintain the quality of the water produced, further improve the quality of its service, and create a pricing policy that can improve the company's financial performance, which can ultimately increase investment in service improvements in the future..

References

- Acharya, M. (2019). A review on status and profitability of large cardamom production in Nepal. *International Journal of Financial, Accounting, and Management*, 1(1), 17-22.
- Angliawati, R. Y. (2016). Peran remunerasi terhadap kualitas pelayanan publik: Theoretical review. *Jurnal Ecodemica: Jurnal Ekonomi Manajemen Dan Bisnis*, 4(2), 203-213.
- Arimie, C. J. (2019). Employer-employee relations and employee engagement in a tertiary institution in Benin-City, Edo State. *Annals of Management and Organization Research*, 1(1), 9-24.
- Ayunani, N. A., Varadina, Y., & Octavia, A. N. (2023). Pengaruh Kualitas Produk, Harga dan Kualitas Pelayanan terhadap Kepuasan Pelanggan. *Solusi*, 21(3), 703-712.
- Burhan, F. A. (2023). Rapor Hijau Kinerja Industri Perbankan Indonesia sepanjang 2023 dari OJK.
- Cabral, H. d. C. G., Djaha, A. S., & Nursalam, N. (2019). The development of human resources in the University of Dili, Timor-Leste (A rector's policy study). *Annals of Management and Organization Research*, 1(1), 1-7.
- Chandra, A., Wijaya, F., Angelia, A., & Hayati, K. (2020). Pengaruh Debt to Equity Ratio, Total Assets Turnover, Firm Size, dan Current Ratio terhadap Return on Assets. *Jurnal Akuntansi, Keuangan, Dan Manajemen*, 2(1), 57-69.
- Damanik, S. M., Sitorus, E., & Mertajaya, I. M. (2021). Sosialisasi pencegahan stunting pada anak balita di Kelurahan Cawang Jakarta Timur. *JURNAL ComunitA Servizio: Jurnal Terkait Kegiatan Pengabdian kepada Masyarakat, terkhusus bidang Teknologi, Kewirausahaan dan Sosial Kemasyarakatan*, 3(1), 552-560.
- Dayanti, P. K., Prabawati, N. P. A., & Supriyanti, N. W. (2023). Pengaruh Kualitas Pelayanan Terhadap Kepuasan Pelanggan Pada Perusahaan Daerah Air Minum (PDAM) Tirta Sewakadarma Kota Denpasar. *Business and Investment Review*, 1(5), 162-173.
- Erlianti, D., Hikmah, N., Suhariyanto, D., Sari, V. B. M., Hakim, M. L., & Nurchayati, N. (2023). Pelatihan Penyusunan Karya Tulis Ilmiah Terakreditasi Sinta. *Community Development Journal: Jurnal Pengabdian Masyarakat*, 4(2), 4758-4764.
- Falahuddin, F., Fuadi, F., Munandar, M., Juanda, R., & Ilham, R. N. (2022). Increasing Business Supporting Capacity In Msmes Business Group Tempe Bungong Nanggroe Kerupuk In Syamtalira Aron District, Utara Aceh Regency. *Irpitage Journal*, 2(2), 65-68.
- HARDIMAS, M. N., & SOEHARTATIEK. (2022). PENGARUH KUALITAS PRODUK DAN PELAYANAN TERHADAP KEPUASAN PELANGGAN.
- Hasmira, H., Guntur, M., Wardah, S. S. W., & Seppa, Y. I. (2024). Pengaruh Harga Dan Kualitas Pelayanan Terhadap Kepuasan Pelanggan Perusahaan Umum Daerah Air Minum (PDAM) Tirta Jeneberang Kabupaten Gowa.

- Kalensun, H., Kawet, L., & Halim, F. (2016). Perencanaan sistem jaringan distribusi air bersih di Kelurahan Pangolombian Kecamatan Tomohon Selatan. *Jurnal Sipil Statik*, 4(2), 105-115.
- Kotler, P. (2012). Marketing management : analysis, planning, implementation, and control.
- Lestari, R. D., & Sriyono, S. (2021). The Effect of Economic Value Added, Market Value Added, Operating Leverage and Dividend Policy on Stock Returns in Coal Subsector Mining Companies Listed on the Indonesia Stock Exchange for the 2014-2019 Period. *Indonesian Journal of Public Policy Review*, 15, 10.21070/ijppr. v21015i21070. 21145-21010.21070/ijppr. v21015i21070. 21145.
- Masikki, A. B. (2020). *Analisis Kinerja Pelayanan Distribusi Air Bersih Berdasarkan Persepsi Pengguna Di Kelurahan Prapatan*. Institut Teknologi Kalimantan.
- Mega, S. A., & Bella, F. N. (2021). Pengaruh Kualitas Pelayanan Dan Harga Terhadap Kepuasan Pelanggan Pada Apotek Alifa Bandar Lampung.
- Merdekawati, D. P., & Sulistyawati, A. I. (2011). Faktor-faktor yang mempengaruhi pemilihan karir akuntan publik dan non akuntan publik. *Jurnal Ilmiah Aset*, 13(1), 9-19.
- Morande, S., & Marzullo, M. (2019). Application of Artificial Intelligence and Blockchain in healthcare management-donor organ transplant system. *Annals of Management and Organization Research*, 1(1), 25-38.
- Pahlawan, M. R., Nurlia, N., Laba, A. R., Pakki, E., & Hardiyono, H. (2019). Pengaruh Kualitas Produk Dan Kualitas Pelayanan Terhadap Peningkatan Kepuasan Dan Loyalitas Pelanggan Perusahaan Daerah Air Minum (Pdam) Kota Makassar. *Journal of Applied Business Administration*, 3(2), 228-244.
- Pranata, L., Fari, A. I., Suryani, K., & Handayani, V. Y. W. (2023). Edukasi dan Senam hipertensi dalam menurunkan Tekanan darah Tinggi pada lansia. *SEWAGATI: Jurnal Pengabdian Masyarakat Indonesia*, 2(3), 74-80.
- Putra, Y. (2020). Analisis Faktor-Faktor yang Mempengaruhi Kepuasan Pelanggan pada PDAM Tirtanadi Cabang Cemara. *Jurnal Akuntansi, Manajemen Dan Ilmu Ekonomi (Jasmien)*, 1(1), 20-25.
- Setiyaningsih, S., & Suwitri, S. (2012). Evaluasi Kinerja Dengan Metode Balanced Scorecard Pada Perusahaan Daerah Air Minum (PDAM) Tirta Moedal Kota Semarang. *Journal of Public Policy and Management Review*, 1(3), 51-60.