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Analysis of Determination of Production Costs and Full Cost Recovery (a Case Study at PDAM XYZ Banda Aceh City)

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A B S T R A C T

PDAM XYZ's complete cost recovery rates in 2020 and 2021 is another goal of this study. This study uses a qualitative, descriptive methodology. Primary data from interviews and secondary data from PDAM XYZ performance evaluation reports that have undergone an audit by BPKP serve as the research's data sources. The Miles & Huberman research model is the data analysis technique that is applied, consisting of data gathering, reduction, presentation, and conclusion drawing. The study's findings indicate that employing PDAM XYZ's genuine NRW yields a higher manufacturing cost than utilizing standard NRW. This study also demonstrates that, when employing the real cost of production, PDAM XYZ has not achieved the entire cost recovery rate, but, when using the standard cost of production, PDAM XYZ has achieved the complete cost recovery rate.

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INTRODUCTION

In 2015, the Sustainable Development Goals (SDGs) were agreed upon during the 70th United Nations General Assembly. SDGs set objectives for new development, marking a new chapter in global development from 2016 to 2030 (Wulandhari, 2019). The era of SDGs commenced with a meeting held on September 25-27, 2015, at the United Nations headquarters in New York, United States. The event served as a ceremonial endorsement of the SDGs document, attended by representatives from 193 UN member countries, who adopted the document titled "Transforming Our World: The 2030 Agenda for Sustainable Development" in acclamation (Ishartono & Raharjo, 2016). SDGs represent a global and national commitment to improving the welfare of communities, encompassing 17 goals, including access to clean water and adequate sanitation (BAPPEDA Central Java, 2023). According to the United Nations' Sustainable Development Agenda 2030, there is a target to ensure the sustainable availability and management of water and sanitation for all, as outlined in SDGs target 6. SDG 6 prioritizes the safety of drinking water and qualifying sanitation, as well as the protection of water resources from pollution. This goal includes halving the proportion of untreated wastewater and substantially improving the recycling and safe reuse of water globally (Larsen et al., 2021). Safe and affordable drinking water, access to sanitation and hygiene, improving water quality, wastewater treatment, enhancing water use efficiency, ensuring the supply of fresh water, implementing integrated water resource management, and protecting and restoring anything related to water are the six outcome targets of SDGs under the water theme that have been established (Mustafa et al., 2022).

The International Water Management Institute (IWMI), with a long-term commitment to partnership and dialogue, possesses expertise to contribute to the implementation of SDGs. Subsequently, it collaborates with relevant countries on indicators, monitoring, and practices necessary to meet their respective national targets (Van der Bliek et al., 2018:3). Therefore, specifically, SDG 6 identifies ways to manage water resources by introducing the International Water Management Institute (IWMI) as a managerial solution for better water resource governance (Di Vaio et al., 2021). Innovation in the water and sanitation sector plays a significant role, but to realize this potential, solutions offered by the scientific community must integrate environmental, social, and economic perspectives (Daliakopoulos & Keesstra, 2020). Hence, to achieve SDG 6 targets related to clean water and sanitation, effective water management is required in every location or country. Indonesia is recorded to represent approximately 6% of the world's water resources, indicating that the country possesses relatively abundant water resources. However, the reality is that many regions in Indonesia, such as East Nusa Tenggara, Java, Bali, Sulawesi, are facing a shortage of clean water supply (Suryani, 2020). According to data from the Central Statistics Agency (BPS) in 2020, the percentage of households with access to proper sanitation was recorded at 79.53%, and it increased to 80.29% in 2021. With the rising percentage of access to clean water, this represents a commendable progress. To ensure a consistent increase in household access to clean water, strategies are needed, including the construction of clean water

infrastructure. One such infrastructure is the Regional Drinking Water Company (PDAM), a government-facilitated piped infrastructure development enabling residents to access clean water for cooking and drinking purposes (Air Kami, 2022).

PDAM is a service for the use of clean water, paid monthly based on the water consumption observed through the water meter in front of the customer's house (Housing & Settlement Area, 2021). PDAM is not privately owned because all natural resources, including water, are managed by the state, as stated in Article 33 of the 1945 Constitution, which reads, "The land, water, and the natural riches contained therein are controlled by the state and used for the greatest possible prosperity of the people." Water is crucial as it is a fundamental necessity for living beings, and 71% of the Earth's surface is composed of water (Pertiwi, 2021). Humans and other living beings require water for survival; hence, access to clean water is essential. To establish clean water and sanitation management for the community, Government Regulation No. 16 of 2005 on the Development of Drinking Water Systems in the form of PDAM was created. PDAM XYZ experienced a decline in revenue, leading to a loss of Rp2,313,008,428.76 in 2021. One of the components contributing to PDAM's revenue is the water tariff rate, which is crucial to support the operational activities of PDAM (Azhar, 2022). In this case, PDAM XYZ applies an average water tariff based on full cost recovery, utilizing a standard rate for water loss. However, if the basic rate is applied with the actual percentage of water loss, the average tariff of PDAM XYZ cannot cover the entire cost or achieve full cost recovery (BPKP Representative Aceh, 2021).

Non Revenue Water (NRW) is the result of subtracting the volume distributed from the volume sold or billed. In other words, NRW is water that is lost but measurable and known in quantity, yet cannot be calculated or claimed for revenue. However, it can be justified (Widianto & Hadi, 2023). The magnitude of NRW significantly impacts the ability of a PDAM to achieve full cost recovery. To determine full cost recovery, the production cost of water must be calculated first, and one of the elements in calculating the production cost, according to Regulation Number 71 of 2016, is the level of NRW of a PDAM. As reported by Kompas.com, the national level of Non Revenue Water (NRW) is at 33.37%, which is 8.7% higher than the allowable national NRW tolerance limit of 25% for the operation of Drinking Water Supply Systems (SPAM) by Regional Water Supply Companies (BUMD Air Minum) (Kompas, 2023). This issue of water loss causes significant losses, both for Regional Drinking Water Companies (PDAM) and the public as PDAM consumers. Some of the losses due to water loss issues include reduced revenue for PDAM, decreased quantity and pressure of water available for consumers, and diminished quality of drinking water distributed to consumers (Directorate of Drinking Water Supply System Development, 2018). Therefore, NRW indirectly can be one of the reasons why a PDAM may or may not have a Full Cost Recovery (FCR) tariff.

Previous research by Azhar et al. (2022) stated that it was found that the company incurred financial losses, indicating that the tariffs applied by the East Lombok District Drinking Water Company (PDAM Kabupaten Lombok Timur) were not appropriate. PDAM Kabupaten Lombok Timur, with its inappropriate tariffs, has not achieved full cost recovery. Hendri et al. (2023) presented research results indicating that the production costs calculated using the company method (full cost recovery) and full costing for each outcome were higher than the selling tariffs set by the government. Thus, the selling price of water from 2019 to 2021 remained below the cost of water according to the full cost recovery and full costing methods. These studies only focused on either production costs or full cost recovery, while this research will address both aspects, not only production costs but also full cost recovery. This study will examine how PDAM XYZ determines production costs, whether PDAM XYZ has its own calculations or follows a production cost method in line with general theory. In addition to examining how production costs are determined, this research also explores full cost recovery at PDAM XYZ, whether PDAM XYZ has set tariffs that achieve full cost recovery or not.

LITERATURE REVIEW

Pricing Policy

Pricing determination is an issue when a company has to set prices for the first time and is a crucial task that supports the success of both non-profit and for-profit organizational operations (Batubara & Hidayat, 2016). Pricing policy is a decision regarding the prices to be followed over a specific period (Alma, 2014:170). According to Triputranto (2016:92), there are two factors influencing prices: internal factors originating from the company and external factors originating from outside the company.

The Meaning of Price

According to Kotler & Armstrong (2018:345), price is an amount of money paid for a product or the value exchanged by customers for the benefits of its existence or use. Price is the only element in the marketing mix that generates revenue; all other elements are costs. Price, unlike product features and seller commitments, is one of the most elastic elements in the marketing mix. At the same time, pricing is the most common issue faced by many companies, making them unable to manage prices effectively. A common problem is that companies often lower prices quickly to make sales, instead of convincing buyers that their higher-value products justify a higher price.Explanation of theory here.

Cost-Based Pricing

According to Noviasari & Alamsyah (2020), there are three methods of cost-based pricing, namely cost plus pricing, markup pricing, and product pricing. Revenue must cover the company's costs to generate profits, and many companies begin to implement price quotas. In other words, they calculate the product's cost and add the necessary profit. The mechanism behind this approach is simple, usually using cost as a basis and a markup representing a percentage applied to the base cost (Hansen & Mowen, 2018:938).

Cost of Production

According to Mulyadi (2015), product cost is the sacrifice of economic resources in processing raw materials to acquire assets. Additionally, product cost is a summary of the total costs incurred over a specific period (Hansen & Mowen, 2013). According to Mulyadi (2015:65), the advantages of determining the cost of production include setting the selling price of a product, monitoring the realization of production costs, calculating periodic profit and loss, and determining the cost of inventory in the balance sheet by calculating finished goods and goods in process.

Raw Material Cost

According to Mulyadi (2015), production cost is the sacrifice of economic resources in processing raw materials to obtain resources, and production cost is a summary of the total costs incurred over a specific period (Hansen & Mowen, 2013). According to Mulyadi (2015:65), the benefits of product costing include determining the selling price of the product, checking the accuracy of production costs, calculating current profit or loss, and valuing finished goods and goods in process presented in the balance sheet.

Direct Labor Costs

Direct labor costs, included in production cost calculations, are classified into direct labor costs and indirect labor costs (Permana, 2020). Direct labor costs are the expenses incurred by direct labor users when processing a product from raw material to finished product. Direct labor costs include compensation for all labor that can be traced to cost objects economically (Tongah, 2021).

Factory Overhead Costs

Factory overhead costs encompass all production costs, excluding indirect raw material costs, indirect labor costs, and other indirect production costs (Fajarini & Nursanti, 2021). Overhead costs also include all costs except for direct raw material costs and direct labor costs (Mulyadi, 2015). Factory overhead costs are usually interpreted as indirect costs of auxiliary raw materials, indirect labor, and all other factory costs. These costs must be determined physically or calculated directly using orders, products, or other specific cost elements (Dewi & Kristanto, 2013).

Formula for Calculating the Cost of Production of Water

The cost of production for a service company can be calculated using the method specified by PDAM (Regional Drinking Water Company) regulated in Article 4 of Minister of Home Affairs Regulation No. 71 of 2016 as follows: (Total Operating Expenses)/(Total Production Volume - (Non-Revenue Water % x Total Production Volume)

Non-Revenue Water

Non-revenue water (NRW) or unaccounted-for water is the result of subtracting the allocated volume from the sold or calculated volume. In other words, NRW is water that is lost but can be measured, known in quantity, but cannot be measured or accounted for as revenue (Widianto & Hadi, 2023).

Operating Expenses

According to Jusup (2011), operating expenses are costs incurred in the process of generating sales revenue. These costs are similar to the operational costs of service companies. Operational expenses are costs directly related to operational activities, which, if not well controlled, can result in operational costs that may reduce revenue (Khadijah et al., 2023). Operating expenses refer to expenses related to the operation of a company, such as selling and management expenses, advertising expenses, depreciation expenses, as well as repair and maintenance expenses (Widearahim, 2019).

Cost Accounting for Lost Products in Process

According to Sinurat et al. (2021:113), in the implementation of the process, the quantity of products produced, completed, or in process may differ from the parts involved in the process. This happens because products are lost in the process. Products lost in the process may be unusual or usual. Product loss is caused by the nature of materials that are easily evaporated, and this can be calculated generally. Products lost due to carelessness or unforeseen events can be accounted for. Management usually decides that even though finished products are lost due to defects, as long as it is below a certain percentage, it can be calculated as a general rule.

Full Cost Recovery (FCR)

Full cost recovery (FCR) is the owner's or investor's desire to ensure that the costs incurred will be recovered profitably or at least cover the costs (Istichori et al., 2018). Full cost recovery can also be defined as ensuring the total investment costs incurred to obtain profits to limit losses at the company (Pratiwi, 2021). Full cost recovery is obtained based on the calculation of the average tariff that is at least equal to the basic cost. Full cost recovery or FCR is required for setting water tariffs by water providers to obtain the most optimal value. Alternative cleaning methods for water tariffs for Regional Drinking Water Companies (PDAM) and the community (Amalia, 2023).

Guidelines for Determining PDAM Drinking Water Tariffs

According to Regulation No. 71 of 2016, the calculation and determination of water tariffs are based on the following principles:

Accessibility and Equality

The determination of basic drinking water tariff needs to be adjusted to the payment capabilities of customers whose income is equivalent to the Provincial Minimum Wage (UMP), and does not exceed 4% of the income of customer communities. Equalization is attempted through the application of differentiated tariffs with cross-subsidies between customer groups and the application of progressive tariffs to encourage water usage savings.

Service Quality

The determination of tariffs needs to consider a balance with the level of service quality received by customers. This also means that the services provided by PDAM are commensurate with the costs paid. The tariffs set by PDAM are calculated according to the level of service that PDAM can provide to the community.

Cost recovery

According to Minister of Home Affairs Regulation No. 21 of 2020 concerning Changes to Minister of Home Affairs Regulation No. 71 of 2016 concerning Full Cost Recovery aimed at covering operational needs. Full cost recovery is based on the calculation of the minimum average tariff equal to the basic cost.

Efficient use of water and protection of water sources

Efficient water use and protection of water sources are achieved through the application of progressive tariffs. Progressive tariffs are calculated through the formation of consumption blocks. Progressive tariffs are applied to customers whose

RESEARCH METHOD

Scope of Research

This type of research is descriptive research with a qualitative approach. Descriptive research aims to present an objective description of a specific phenomenon. True to its name, the research is conducted using a descriptive method, which involves analyzing and interpreting the meaning of the collected data (Brier & Lia Dwi Jayanti, 2020:19). Qualitative research is a type of research that generates findings that cannot be obtained using statistical procedures or other quantitative methods (Murdiyanto, 2020:19).

Subject and Object of Research

According to Sugiyono (2019), the subject of the research is the person, place, or object observed in the context of the research objectives. The subject of the research is the financial head of PDAM XYZ. According to Sugiyono (2019), the object of the research is something or an object that becomes the focus of the research. The object of the research in this work is secondary data, namely reports related to the research.

Sources and Data Collection Techniques

The sources of data used in this research are primary and secondary data. Primary data used in this research is information obtained through observation and interviews. Meanwhile, secondary data used in this research is the annual performance evaluation reports and financial reports of PDAM XYZ from 2020 to 2021. The data collection techniques used in this research are as follows:

Literature review

This data is obtained by studying and connecting literature related to the issues faced, namely the mechanism of setting the basic production cost of water and determining the total cost recovery at PDAM XYZ.

Field study

This technique is carried out by collecting data directly from the subject to obtain the required data and a real picture of the problems that arise in the company. The data collection stage of this research consists of observation and interviews.

Data Analysis Method

Data analysis, according to Sugiyono (2019), is the process of systematically arranging data obtained from interviews, field notes, and documentation, organizing data into categories, explaining them into units, synthesizing them, organizing them into patterns, selecting what is important and what is important. Draw conclusions so that what is learned is easily understood by oneself and others. The data analysis method in this research consists of 4 stages: 1) data collection stage, 2) data reduction stage, 3) data presentation stage, and 4) final image stage.

RESEARCH RESULT

Presentation of Data

After reducing the data, the next step is to introduce them. In qualitative research, the presentation of data can be in the form of tables, graphs, or similar forms through data presentation. Data are organized and arranged in relational patterns that are easier to understand. The data presented in this study are displayed in the form of tables that show the calculation of production and FCR at PDAM XYZ.

Calculation of Production Cost

Table 1. Calculation of Production Cost of Water for PDAM XYZ in 2020

Using the standard NRW of 25%	Using the riil NRW
$\frac{\text{Total Operating Expenses}}{\text{Production Volume} - (\text{std NRW} \times \text{Production Volume})}$	$\frac{\text{Total Operating Expenses}}{\text{Production Volume} - (\text{riil NRW} \times \text{Production Volume})}$
$\frac{70.043.203.010,68}{22.029.738\ m^3 - (25\% \times 22.029.738\ m^3)}$	$\frac{70.043.203.010,68}{22.029.738\ m^3 - (34,50\% \times 22.029.738\ m^3)}$
Rp 4.239,31	**Rp 4.845,17**

Source: Performance Evaluation Report of PDAM XYZ (2020)

From Table 1, when calculating the reference price for PDAM XYZ water production in 2020, it is evident that the price difference between the standard NRW reference and the actual water production is Rp 605.68. The total production cost for standard non-revenue water, based on the regulation of the Ministry of Home Affairs, is Rp 4,239.31. This amount is lower than the total production cost using the actual non-revenue water from PDAM XYZ itself, which is Rp 4,845.17. The reason is that the water loss figure is still high, reaching 34.50%, compared to the Ministry of Home Affairs' target of 25%. To increase sales and operational profits, PDAM XYZ will reduce the level of water loss/non-revenue water (NRW) by replacing damaged customer water meters, replacing the main water distribution network, and repairing the network to minimize and reduce water production costs. This is because eradicating leaks and illegal connections is the responsibility of NRW itself.

Table 2. Calculation of Production Cost of Water for PDAM XYZ in 2021

Using the standard NRW of 25%	Using the riil NRW
$\frac{\text{Total Operating Expenses}}{\text{Production Volume} - (\text{std NRW} \times \text{Production Volume})}$	$\frac{\text{Total Operating Expenses}}{\text{Production Volume} - (\text{riil NRW} \times \text{Production Volume})}$
$\frac{70.793.017.494,25}{20.549.859,00 - (25\% \times 20.549.859\ m^3))}$	$\frac{70.793.017.494,25}{20.549.859,00 - (33,17\% \times 20.549.859\ m^3))}$
Rp 4.593,25	**Rp 5.154,41**

Source: Performance Evaluation Report of PDAM XYZ (2020)

Table 2 shows the calculation of PDAM XYZ water production costs in 2021, indicating a difference in water production costs between standard NRW and actual NRW of Rp 561.16. It is known that the total production cost with standard NRW based on the regulation of the Ministry of Home Affairs is Rp 4,593.25. This amount is lower than the total production cost using PDAM XYZ's actual NRW, which is Rp 5,154.41. The reason is that the percentage of water loss is still higher, reaching 33.17%, compared to the Ministry of Home Affairs' target of 25%. To increase revenue and business profits, PDAM XYZ can reduce water production costs by minimizing water loss/non-revenue water (NRW). This can be achieved by replacing damaged customer water meters, replacing the main

distribution network, fixing network leaks, and replacing illegal connections, as these are the causes of NRW itself.

Calculation of Full Cost Recovery

Table 3. FCR Analysis of PDAM XYZ in 2020

Keterangan	Jumlah Standar	Jumlah Riil
Rata-Rata Persentase Tarif Air	110,58%	96,57%
Laba/Rugi per m^3	Rp 448,57 (Laba)	Rp 166,29 (Rugi)

Source: Processed Primary Data (2023)

From the data in Table 3, it can be seen that the average water tariff per m^3 is 110.58% of the standard production cost of water or 10.58% higher than the breakeven point. Therefore, in this case, PDAM XYZ experienced a profit of Rp 448.57 (Rp 4,687.88 - 4,239.31) per m^3 of water sold. This means that XYZ Daroy has achieved Full Cost Recovery (FCR) when calculated using the standard production cost because the average water tariff per m^3 is greater than the basic cost of water per m^3. If using the actual production cost, the average water tariff per m^3 is obtained at 96.57% or 3.43% lower than the breakeven point. Therefore, in this case, PDAM XYZ experienced a loss of Rp 166.29 (Rp 4,687.88 - Rp 4,845.17) per m^3 of water sold. This means that PDAM XYZ did not achieve Full Cost Recovery when calculated using the actual production cost because the average water tariff per m^3 is smaller than the basic cost of water per m^3.

Table 4. FCR Analysis of PDAM XYZ in 2021

Keterangan	Jumlah Standar	Jumlah Riil
Rata-Rata Persentase Tarif Air	103,26%	92,02%
Laba/Rugi per m^3	Rp 149,72 (Laba)	Rp 410,44 (Rugi)

Source: Processed Primary Data (2023)

From the data in Table 4, it can be seen that the average water tariff per m^3 is 103.26% of the standard production cost of water or 3.26% higher than the breakeven point. Therefore, in this case, PDAM XYZ experienced a profit of Rp 149.72 (Rp 4,742.97 - Rp 4,593.25) per m^3 of water sold. This means that XYZ Daroy has achieved Full Cost Recovery (FCR) when calculated using the standard production cost because the average water tariff per m^3 is greater than the basic cost of water per m^3. If using the actual production cost, the average water tariff per m^3 is obtained at 92.02% or 7.98% lower than the breakeven point. Therefore, in this case, PDAM XYZ experienced a loss of Rp 410.44 (Rp 4,742.97 - Rp 5,154.41) per m^3 of water sold. This means that PDAM XYZ did not achieve Full Cost Recovery when calculated using the actual production cost because the average water tariff per m^3 is smaller than the basic cost of water per m^3.

Data Reduction

Determination of Production Cost

The following is a summary of data reduction, key points, and important information obtained from interviews regarding the determination of production costs. Therefore, it is expected that data reduction on the topic of determining production costs will facilitate researchers in collecting further data related to production costs. PDAM XYZ, as a company that manages water for public needs, has its own calculations in determining production costs. PDAM XYZ uses calculations based on the regulations of Permendagri No. 71 of 2016 by calculating all operational costs, then dividing them by the volume of water production multiplied by the NRW rate. In this formula, there are still two ways, namely calculating the production cost of water according to the standard NRW set by the government at 25% and the real NRW, which is the actual water loss rate that occurs at PDAM.

For example, illustrated by the following interview statement:
"For the method of determining production costs, we use the formula from Permendagri, and all PDAMs have the same rules [...] Permendagri is the total business or operational costs for this year divided by the production amount multiplied by 25%." (Head of Finance Section of PDAM XYZ). The capital source of PDAM XYZ is 100% from the Banda Aceh City Government in the form of infrastructure grants, and this infrastructure is managed by PDAM XYZ. However, in financial records, it is seen that PDAM XYZ had received capital from humanitarian institutions and private companies at one time when the Aceh tsunami hit in 2004. Because the capital source owned by PDAM XYZ is 100% from the Banda Aceh City Government, if the service coverage is above 70%, PDAM XYZ is required to make a Regional Original Income (PAD) contribution of 55% of the total net profit obtained.

For example, illustrated by the following interview statement:
"Here, because the owner is the City Government, here, we are the capital user. So, 100% ownership of the capital belongs to the City Government [...] So, in the form of infrastructure, we receive and manage it; the capital is in the form of infrastructure." (Head of Finance Section of PDAM XYZ). The water processing process starts from collecting raw water sources distributed to the intake building, which functions to ensure a continuous supply of raw water. Then, the raw water is conveyed through transmission pipes to the production unit in the form of the Water Treatment Plant (IPA). After the raw water is processed, it is then conveyed through transmission pipes to the reservoir, which is a storage unit for treated water ready to enter the main distribution network. From the main distribution network, water is distributed to the service distribution network to be supplied to the public. For example, illustrated by the following interview statement: "The management process of clean water begins with the collection of raw water sources distributed to the intake building [...] From the main distribution network, water is distributed to the service distribution network to be supplied again to the public." (Head of Finance Section of PDAM XYZ)

Determination of Full Cost Recovery

The following is a summary of data reduction, key points, and important information obtained from interviews regarding full cost recovery. Therefore, it is expected that data reduction on the topic of full cost recovery will facilitate researchers in collecting further data related to FCR. In fulfilling FCR, PDAM XYZ does not have a target related to the amount of profit that must be generated because PDAM XYZ is a profit-oriented company but still does not neglect social needs. Therefore, PDAM XYZ does not set water tariffs for places of worship. For example, illustrated by the following interview statement: "No target, we still refer to being profit-oriented but do not neglect the water needs of the community [...] because it is mandated in the Water Law that the water needs are the responsibility of the state." (Head of Finance Section of PDAM XYZ)

PDAM XYZ experienced financial difficulties in 2009, which means that PDAM XYZ had poor values from all aspects, whether financial, operational, or organizational aspects. PDAM XYZ recovered in 2015 but did not experience FCR. PDAM XYZ began achieving FCR in 2017 due to tariff adjustments, so with tariff adjustments, operational costs can be covered, employees are prosperous, and can contribute to PAD. example, illustrated by the following interview statement: "We were sick before, back in 2009 when I entered, XYZ was sick [...] Well, we indeed achieved full cost recovery at the time when the tariff was adjusted in 2017. That's when FCR started; we achieved FCR, employee welfare increased, and we could contribute profit." (Head of Finance Section of PDAM XYZ)

For the past 6 years, PDAM XYZ has not experienced an increase or adjustment in tariffs due to political factors. For now, the existing tariff can still cover operational costs, but for the coming years, this existing tariff may no longer be able to cover operational costs because the currency continues to experience inflation, while water tariffs do not adjust to the inflation that occurs. For example, illustrated by the following interview statement: "For now, we are still covering it; next year, it may not be possible because our last tariff increase was in 2017. So now it has been 6 years without an increase, it might be a bit difficult this year and next year to cover production costs." (Head of Finance Section of PDAM XYZ)

DISCUSSION

Direct observation by the researcher of the research subject, PDAM XYZ, was conducted from July 16, 2023, to June 23, 2023, to monitor the activities of PDAM XYZ's annual report in order to monitor the basic price of water production and the level of full cost recovery. Meanwhile, the data collection process took place over two weeks starting from June 2, 2023, by collecting secondary data (data related to company reports) and conducting direct interviews with parties related to this research. This means that before conducting the research, the researcher attempted to observe and collect data related to the research, such as annual reports and interview activities. After collecting the necessary data, the researcher processed the data related to the required data, resulting in information related to the analysis of determining the

basic price of water production and determining full cost recovery at PDAM XYZ.

Determination of Production Cost

PDAM XYZ, in the process of water production, uses raw water from surface water sources, namely river water. Therefore, PDAM XYZ uses the Networked Piped Water Supply System (SPAM) because the water source comes from the Krueng Aceh river. The distribution of clean water begins with the collection of raw water sources distributed to the intake building, which functions to ensure a continuous supply of raw water. Then, the raw water is conveyed through transmission pipes to the production unit in the form of the Water Treatment Plant (IPA). After the raw water is processed, it is then conveyed through transmission pipes to the reservoir, which is a storage unit for treated water ready to enter the main distribution network. From the main distribution network, water is distributed to the service distribution network to be supplied to the public.

During the production process, there will always be costs incurred, and these costs are calculated as operating or operational expenses because operating expenses are costs directly or indirectly related to the company's core business activities (Supriadi, 2022). Based on interview results, it is known that the cost of production is calculated according to the regulations of Permendagri No. 71 of 2016, in which the calculation includes the total operational expenses to calculate the cost of water production at PDAM XYZ. By knowing the cost of water production, PDAM can determine whether the set tariff still requires subsidies from the government or not.

In addition to the total operating expenses, there is the volume of water production and the level of Non-Revenue Water (NRW) that must be known to calculate the cost of water production. According to an article by News Banda Aceh, due to the drastic decrease in river water levels, the condition of the water volume usually produced by PDAM XYZ, which was 800 liters per second, has now become 400 liters per second (News Banda Aceh, 2023). The decrease in the volume of water production can affect the increase in production costs due to changes in the number of expenses, coupled with the high level of NRW if the NRW exceeds the standard set by the government.

Currently, the government has set a minimum NRW standard of 25%, which means that if the NRW level exceeds this standard, PDAM must pay more attention to ways to overcome water loss levels so that PDAM does not incur losses due to lost water bills that cannot generate income. Based on interviews with the Head of Finance at PDAM XYZ, it is stated that the NRW level in PDAM XYZ is currently at 30%, mainly due to old and leaky distribution pipes. Water loss is the amount of unrecorded water and water that does not generate income. In PDAM XYZ, the calculation of production costs is presented in the performance evaluation report, which has been audited by the Financial and Development Supervisory Agency (BPKP) of Aceh Province. The performance evaluation report is a report made by BPKP to present the results of audits covering financial, operational, administrative, production, and company health

aspects at PDAM. In the performance evaluation report of PDAM Tirtra Daroy, the calculation of production costs is attached through attachment 13 of the Performance Evaluation Report of PDAM XYZ, which includes the calculation method and details of operational expenses calculated, such as the installation of source/pump expenses, processing installation expenses, transmission distribution installation expenses, as well as administrative and general expenses.

Determination of Full Cost Recovery

Full cost recovery or FCR, whether at PDAM XYZ or any other PDAM, cannot be determined but calculated. This is because the amount of FCR depends on the amount of production costs and water tariffs. Therefore, indirectly, the amount of operating expenses, the volume of water production, and the level of NRW are related to whether a PDAM has FCR or not. Based on interviews conducted at PDAM XYZ, it is stated that PDAM has achieved FCR at present (2023), and if calculated with the standard NRW rate, PDAM XYZ continues to achieve FCR every year since 2015. Some guidelines for PDAM XYZ in determining FCR are the basis for calculating financial reports, the structure of water tariffs, and the existence of the Governor's Regulation regarding upper and lower tariff rates. However, these upper and lower tariff rates are rates set by the Governor's Regulation but have not been ratified by the Mayor of Banda Aceh because the most significant decisions of PDAM XYZ are held by the Banda Aceh City Government.

One reason behind the non-approval of new tariffs by PDAM XYZ Daroy is related to political reasons. This occurs because changes in tariffs can affect elections related to those in Banda Aceh. The water tariff currently in use is the realization of the latest water tariff update, which was done in 2017, but adjustments have been made since 2008. At that time, there was no determination of upper or lower tariffs at PDAM XYZ. Based on findings in the performance evaluation report of PDAM XYZ, it is mentioned that the calculation of FCR can be determined by calculating the average tariff of PDAM, then comparing the results of the average tariff with the production cost of water per m^3. If the average tariff result is greater than or equal to the production cost of water per m^3, then the tariff can be considered as FCR; however, if the opposite is found, the PDAM tariff cannot be considered as FCR. In meeting FCR, PDAM XYZ does not have a target related to how much profit should be generated because PDAM XYZ is a profit-oriented company but still does not ignore social needs. Therefore, PDAM XYZ does not set water tariffs for places of worship.

The benefits of having an FCR tariff in this company are that employees at PDAM become prosperous with benefits such as 17 times the salary, a salary above the regional minimum wage (UMR), employee insurance, health insurance, workers' social security (BPJS Ketenagakerjaan), and a pension fund. Additionally, PDAM XYZ can contribute to stocking the Regional Original Income (PAD) since 2018. This means that PDAM XYZ has a service coverage above 70% because one of the requirements for making PAD deposits is that a Regional-Owned Enterprise (BUMD) has service coverage and profits above

70%. The total percentage of profits deposited into PAD is 55% of the total net profit generated by PDAM XYZ.

Although PDAM XYZ can be considered a stable and healthy Regional-Owned Enterprise for several years and has had an FCR tariff since 2015, PDAM also experienced a decline in 2009. PDAM XYZ was declared unwell in 2009 and did not achieve FCR, resulting in low salaries for employees. In other words, PDAM XYZ employees at that time were not prosperous, and operational costs could not be covered. PDAM XYZ began to be declared healthy again in 2015 but achieved FCR in 2017 and began making profit deposits to PAD. PDAM's efforts to recover from a sick condition and become healthy again, as well as achieve FCR, involve cost savings in various aspects. This has an impact on the reduced water quality because PDAM XYZ has to cut costs to ensure that the income generated at that time can cover at least some of the operational costs.

CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis and discussion conducted earlier, the following conclusions can be drawn:

Determination of Production Cost

The calculation of the water production cost at PDAM XYZ in 2020 and 2021 shows that the production cost of water using standard NRW in 2020 is Rp 4,239.31/m^3 and in 2021 is Rp 4,593.25/m^3. If using actual NRW, the production cost of water in 2020 is Rp 4,845.17/m^3 and in 2021 is Rp 5,154.41/m^3. This indicates that the production cost using standard NRW is lower than using actual NRW because the actual NRW level is higher than the standard NRW level during 2020 and 2021. The conclusion drawn from the discussion on the determination of production cost at PDAM XYZ is that PDAM XYZ uses Permendagri No. 71 of 2016 as the basis for determining the production cost of water. Based on the analyzed data related to the production cost in 2020 and 2021, it is found that the production cost of water at PDAM XYZ in 2020 and 2021, when calculated using the standard NRW, is smaller compared to the production cost of water when calculated using actual NRW. Thus, NRW is a crucial component in influencing the size of a water production cost.

Full Cost Recovery Determination

In 2020 and 2021, PDAM XYZ has achieved FCR when calculating the production cost using the standard NRW. However, if the production cost of water at PDAM XYZ is calculated using actual NRW, the result is that PDAM XYZ has not achieved FCR. This can be seen from the profit per m^3 of water obtained by PDAM XYZ in 2020 and 2021. When using the standard production cost, a profit of Rp 448.57 per m^3 of water sold was obtained in 2020 and Rp 149.72 per m^3 in 2021. Using the actual production cost, there was a loss of Rp 166.29 per m^3 of water sold in 2020 and Rp 410.44 per m^3 in 2021. The conclusion regarding the FCR determination at PDAM XYZ is that the average tariff per m^3 can cover the production cost per m^3 or has achieved FCR if the production cost is calculated based on standard NRW. However, PDAM XYZ has not achieved FCR, meaning the average tariff per m^3 has not covered the production cost per m^3 when the production cost is calculated based on actual NRW.

Based on the conclusions outlined, the following recommendations can be proposed:

1. It is hoped that future researchers can examine this topic from a different perspective to establish continuity between this study and subsequent research.
2. Future researchers are encouraged to expand the scope to achieve a broader coverage and produce better results.

Research Limitations

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