Vol. 10 No. 2, Tahun 2024, 249 – 258

JIAFE (Jurnal Ilmiah Akuntansi Fakultas Ekonomi)
https://journal.unpak.ac.id/index.php/jiafe/index
E-ISSN: 2502-4159; P-ISSN: 2502-3020

COST-EFFECTIVENESS STRATEGY FOR DEVELOPING CLEAN WATER SERVICE IN SUKAMAKMUR VILLAGE, BOGOR

Hendro Sasongko[1], Asep Alipudin[2], Dessy Herlisnawati[3]
[1,2,3] Universitas Pakuan, Bogor, Indonesia
Correspondence email: [2]asep.alipudin@unpak.ac.id

Article History:

Accepted:
July 21, 2024
Revised:
December 30, 2024
Approved:
December 30, 2024

JEL Classification:
D24, D61

Keywords:

Biaya produksi; cost-effectiveness strategy; drinking water supply system; electromagnetic power generator; incremental analysis.

Kata kunci:

Cost-effectiveness strategy; electromagnetic power generator; incremental analysis; production cost; water supply system.

How to cite:

Sasongko, H., Alipudin, A., Herlisnawati, D. (2024). Cost-effectiveness strategy for developing clean water service in Sukamakmur Village, Bogor. *JIAFE (Jurnal Ilmiah Akuntansi Fakultas Ekonomi), 10*(2), 249 – 258. DOI: https://doi.org/10.34204/jiafe.v10i2.10353

ABSTRACT

This study aims to assess the benefits of PLT-EM in the cost-effectiveness strategy scheme for developing a drinking water supply system. The research approach is descriptive quantitative using incremental analysis methods, water consumption and discharge calculation formulations, and financial analysis models. The data used are secondary in the form of BUMdesa production and financial reports. Based on the assessment results, using PLT-EM can develop a drinking water supply system by increasing the volume of water and consistency of water distribution to the community. The cost-effectiveness strategy can be implemented through incremental analysis between investment and operational costs with revenue from water sales before and after using PLT-EM by considering the addition of water production capacity and the potential for expanding service coverage to the community.

ABSTRAK

Penelitian ini bertujuan untuk mengkaji manfaat PLT-EM dalam skema strategi efektivitas biaya dalam rangka pengembangan sistem penyediaan air minum. Pendekatan penelitian yang digunakan adalah deskriptif kuantitatif dengan menggunakan metode analisis inkremental, formulasi perhitungan konsumsi dan debit air, serta model analisis finansial. Data yang digunakan adalah data sekunder berupa produksi BUMdesa dan laporan keuangan. Berdasarkan hasil pengkajian, pemanfaatan PLT-EM dapat mengembangkan sistem penyediaan air minum dengan meningkatkan volume air dan konsistensi distribusi air kepada masyarakat. Strategi efektivitas biaya dapat diterapkan melalui analisis inkremental antara biaya investasi dan biaya operasional dengan pendapatan dari penjualan air sebelum dan sesudah pemanfaatan PLT-EM, dengan mempertimbangkan penambahan kapasitas produksi air dan potensi perluasan jangkauan layanan kepada masyarakat.

INTRODUCTION

According to the regulations in force in Indonesia, the drinking water supply system is implemented by state-owned enterprises/regional-owned enterprises, technical implementation units, community groups, and/or business entities. Implementation by Community Groups is possible for areas outside the service coverage of BUMN/BUMD and UPT/UPTD. Sukamakmur Village, a village located in the Ciomas District, Bogor Regency, is an area that is still outside the service coverage of the Regional Public Company (Perumda) Tirta Kahuripan, a BUMD of Bogor Regency engaged in drinking water services. Sukamakmur Village has many springs, so it is a water source for the community. As an area with the densest population in Bogor Regency with continuously growing settlements, good drinking water service management is needed because water is a basic human need that cannot be consumed without limits for quality that meets health requirements. Since 2017, a village-owned enterprise (BUMDesa) called BUMDesa Makmur Anugerah Lestari has been implementing the drinking water supply system in Sukamakmur Village. Until mid-2023, five springs will be the source of raw water, with gravity as the distribution system to 1892 consumers. Water meters record water consumption, which is used to bill consumers monthly.

The problem is the inefficiency of water sources, which impacts the limited growth of drinking water services in the community. This growth opportunity is relatively wide open, considering the rapid development of residential areas in recent years. The inefficiency occurs due to using hydraulic ram pump technology to draw water from its source to a certain height as a distribution point by gravity. The mechanism of this pump is simple because it does not use electricity as its supporting energy, and water leakage is relatively high. Several studies, such as Sinaga (2019), Sukamta (2019), Suheri et al. (2023), and Nuraeni (2020), have produced a pump efficiency level ranging from 38% to 48.6% for certain technical conditions, which means that quite a large volume of water is wasted during the pumping process. Using electric water pumps is seen as a solution to reduce this inefficiency. However, it is not economical for BUMDesa Makmur Anugerah Lestari, which still has limited fiscal capacity. The use of alternative energy can be a solution to overcome the problem of business feasibility, as long as the costs incurred due to the use of alternative energy can be recovered by increased income due to improvements in the efficiency of water use from its source (Wijaya & Wijaya, 2024). The discovery of an electromagnetic power generator is an interesting option to overcome this problem. Still, careful study is needed to be utilized in the drinking water supply system in Sukamakmur Village, Ciomas District, Bogor Regency.

Research on Cost Effectiveness Strategy for Clean Water Service Development has been widely conducted. However, in this study, the author proposes utilizing electromagnetic power generators in the cost-effectiveness strategy of Sukamakmur Village, Bogor Regency. Previously, the author had also conducted research related to the Early Warning System in the Drinking Water System in 2021, with the aim of the study to determine the parameters of critical factors in the early warning system in drinking water companies with the Green Business Continuity Management (GBCM) approach and to design an early warning system model. This study uses a decision support system approach involving experts in drinking water companies. This study aims to assess the Utilization of Electromagnetic Electric Generators in Cost-Effectiveness Strategies for Developing Clean Water Services in Sukamakmur Village, Bogor Regency.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Village-Owned Enterprises (BUMDes)

Village-owned enterprises (BUMDes) are economic institutions owned and managed by village communities to improve local welfare and economic development. BUMDes is an essential instrument in supporting village development and community empowerment. Legal basis 4] is the legal basis that regulates Villages, including the formation and management of BUMDes. Bumdes is a legal entity owned by the village community, functioning as a driving force for the village economy by developing various businesses and economic activities. Meanwhile, the view of Bumdes, according to the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration, is a strategic instrument to realize economic equality and poverty alleviation at the village level, focusing on managing local assets and potential. Bumdesa also provides public services and village infrastructure, such as village markets, health centers, and educational facilities. This contributes to improving the quality of life of village communities (Ariutama et al., 2024). One of the main challenges faced by Bumdesa is the lack of managerial and technical capacity. Many Bumdesa experience difficulties in planning, financial management, and human resource development (Trisnawati et al., 2022). Funding issues and economic sustainability are significant challenges. According to Rares et al. (2023), Bumdesa often has difficulty accessing capital and faces financial risks that threaten the sustainability of its operations. Sukamakmur Village is one of the villages in the Sukamakmur District, Bogor Regency, and is the capital of Sukamakmur District. It has an area of ±1,643.61 Ha and consists of 4 (four) hamlets, 8 (eight) residents' associations (RW), and 18 (eighteen) neighborhood associations (RT). The borderline is north-bordered by Sukajaya Village, Jonggol District; east-bordered by Sukamulya Village; south-bordered by Cisarua District & Megamendung District; and west-bordered by Cibadak Village and Pabuaran Village. BUM Desa Makmur Anugerah Lestari a clean water management business field, was established on December 8, 2017, located at Jl. Sukamakmur RT 05 RW 02 Sukamakmur Village, Ciomas District, Bogor Regency, West Java Province.

Cost Effectiveness Strategy

Cost-effectiveness analysis alone does not provide sufficient information for policy-making, such as investment decisions. Still, it provides an advantageous starting point for researchers and policymakers to collaborate in assessing different programs' effectiveness and relevance to a particular situation. Cost-effectiveness analysis offers detailed information on the underlying costs and impacts, combined with understanding the problem being addressed and other contextual factors such as initial costs and costs that could be more efficient. Cost-effectiveness is an analysis that relates all costs to the resulting impacts (Outputs and/or Outcomes). The cost-effectiveness strategy is not interpreted as a money-saving strategy but a strategy that produces the most significant possible benefits. According to Asian Development Bank (2013), a cost-effectiveness strategy is a business approach that focuses on reducing production and operational costs to achieve a competitive advantage. When cost-effectiveness analysis is conducted, assumptions about the main and supporting factors are needed. Cost-effectiveness analysis is an evaluation process that aims to measure the extent to which an organization can achieve cost goals by using available resources optimally—some general steps in conducting a cost-effectiveness analysis (Hulme, 2006). The first is to identify objectives and effectiveness criteria. These steps include determining the specific objectives of the cost-effectiveness analysis. These may include reducing operating costs, increasing process efficiency, or achieving particular cost targets. The second is collecting cost data. This step includes identifying and collecting relevant cost data, including production, distribution, overhead, and other costs associated with the organization's operations. The third is value chain analysis. It includes identifying activities in the organization's value chain and their relationship to costs. Focus on value-added activities and identify opportunities to increase efficiency or reduce costs at each stage.

RESEARCH METHODS

This research used a quantitative descriptive analysis approach in Sukamakmur Village, Ciomas District, Bogor Regency. The types of data used are primary data and secondary data. Secondary data include literature studies, data related to the condition and capacity of springs, the number of customers, financial performance reports, drinking water tariff lists, production reports, and customer development potential. The analysis methods used are comparative analysis and cost-effectiveness analysis. A comparative analysis compares current raw and raw water production capacity if a water pump is utilized based on an electromagnetic power generator. Cost-effectiveness analysis is carried out to assess the current BUMDesa business performance with the BUMDesa business performance if a water pump based on an electromagnetic power generator is used due to an increase in production and sales of drinking water. This research used a quantitative descriptive analysis approach in Sukamakmur Village, Ciomas District, Bogor Regency.

The analysis methods used are comparative analysis and cost-effectiveness analysis. Primary data was obtained through discussions with Village and BUMDesa management, while secondary data includes literature studies. Comparative analysis compared current raw and raw water production capacity using water pumps based on electromagnetic power generators. Cost-effectiveness analysis was undertaken to assess the current BUMDesa business performance if water pumps based on electromagnetic power generators are utilized due to increased production and sales of drinking water. This research was conducted in Sukamakmur Village, Ciomas District, Bogor Regency. Bogor Regency is one of the regencies in Indonesia. It is a regency with the largest population, more than 6 million people. Cost Effectiveness Analysis Formula shown in Formula 1.

$$CE = [P1 - P0] > 0 \; atau \; CE \; RASIO = [\, P_1 \,/\, P0] > 1$$
$$CE = [(TR1 - TC_1) - [(TR0 - TC0)] \qquad (1)$$

Where: P1 = Profit in Period -1; P0 = Profit in Period -0; TR1 = Total Revenue in Period -1; TC1 = Total Cost in Period -1; TR0 = Total Revenue in Period -0; TC0 = Total Cost in Period -0; TR1 = [V1 * Tf1]; V1 = Volume Sold By EMG; Tf1 = Water Tariff Based on EMG; TR0 = [V0 * Tf0]; V0 = Volume available for sale; Tf0 = Available Water Tarif; TC1 = [w1 * TR1 + AC]; w1 = % (weighted) of TR1; AC = Additional Charge Based on EMG; TC0 = [w0 * TR0]; w1 = % (weighted) of TR0 ASSUMPTION; Tf1 = Tf0; w1 = w0; Additional Cost = Depreciation Expense + Repair Cost (Due to New Investment)

RESULTS AND DISCUSSION

Inefficiency in Clear Water Service in Sukamakmur

BUMDesa Makmur Anugerah Lestari implemented the drinking water supply system in Sukamakmur Village from 2017 until mid-2023. Five springs provide raw water with gravity distribution. The system serves 1.788 consumers. The total population is 13,457, with an average of 4 people per household. There are 1,788 homes with water service customers. As shown in Table 1, there are six springs. Table 1 shows that six springs are used as raw water sources, with a total capacity of 37.7 liters per second (L/s) or 3,257,280 liters per day (L/day). This figure shows the availability of relatively large water resources. The springs with the most significant discharge are Ci Selong and Ci Binong 1, each 4 L/s, while the smallest is Ci Encod with 1.5 L/s. This condition shows an imbalance in the distribution of water discharge between springs. In this case, the water distribution system uses the principle of gravity, an efficient and cost-effective method for distributing water without requiring pumps or additional energy costs.

Table 1. List of Springs in Sukamakmur

No	Springs	Water Discharge	
1	Ci Ijong	24	Lt/Sec
2	Ci Encod	1,5	Lt/Sec
3	Ci Selong	4	Lt/Sec
4	Ci Akar	2,5	Lt/Sec
5	Ci Binong 1	4	Lt/Sec
6	Ci Binong 2	1,7	Lt/Sec
	Total Capacity	37,7	Lt/Sec
		3.257.280	Lt/Day

However, this also requires a well-designed pipe system to ensure optimal household water flow. With a limited total capacity, especially with the difference in discharge between springs (for example, Ci Encod is only 1.5 L/s), the sustainability of the water supply must be carefully monitored. The potential for decreased discharge during the dry season or climate change can reduce water capacity, thus threatening the stability of water supply for consumers. Only about 13% of households are served by this system, which means there is inequality in access to clean water in the village. Water distribution needs to be expanded and more evenly distributed throughout the town to improve the population's quality of life and health. The success of this system is highly dependent on the maintenance of existing infrastructure. Monitoring the condition of pipes, springs, and distribution networks is essential to avoid leaks or damage that can reduce efficiency and water quality. Although the current water capacity is sufficient, long-term planning is needed to manage water sources wisely, such as by evaluating existing water sources, planning more efficiently, and maintaining the quality of water sources from pollution.

Based on Table 2, the average water consumption is 20 M3/month, with 60% inefficiency in the spring, an 80% collection rate, a 65% expense-revenue ratio, and an average water tariff of Rp. 2,500. An efficiency of 60% indicates that only 40% of the water taken from the spring is effectively supplied to customers. This means that if the system operates at full capacity, only 40% of the total water can be used by customers. This water loss can be caused by poor infrastructure, for example, leaks, poor distribution systems, or the inability to utilize the spring's capacity to its full potential. Improvements to the pipe network, routine maintenance, and distribution control system will be essential to reduce this water loss. Infrastructure and management improvements are needed to reduce water loss and increase system efficiency. A collection rate of only 80% indicates that not all water supplied is appropriately collected. This can affect water availability and revenue from water tariffs.

With a revenue ratio of 65%, the system operates with a relatively low-profit margin. This means operational costs are high, and only 35% of the revenue is a surplus. This indicates the need for cost evaluation and possible tariff adjustments or operational efficiency to increase profits. Meanwhile, the relatively low water tariff (Rp. 2,500 per m^3) may not cover the operational costs and infrastructure investments needed to improve system efficiency. This means the profit margin is relatively low, indicating that this system operates with less than optimal financial efficiency. Factors affecting this ratio include high maintenance costs, energy costs to distribute water, and labor costs. If the operating costs are too high, it will reduce the financial sustainability of this water supply system, especially if there is an increase in expenses or a decrease in income. What can be done to overcome this problem is to evaluate costs and adjust tariffs. Cost evaluations are carried out thoroughly to identify areas where efficiency can be improved, for example, in terms of maintenance, procurement of raw materials, and energy use. In addition, if operating costs are high, adjusting water tariffs becomes essential to match costs and income. However, this must be done carefully not to burden customers who are already burdened with low tariffs.

Table 2. Clean Water Consumption Analysis

Existing (Hydram Pump Based)		
Wastewater (Inefficiency)	60%	
	1.302.912	Lt/Day
Water can be Distributed	469.048.320	Lt/Day
	469.048	M^3/Year
Total House Connection	1.788	Connections
Average Water Sold	20	M^3/Month
Total Water Sold	35.760	M^3/Month
	429.120	M^3/Year

The water wasted or inefficient is 60%, while the water that can be distributed is 1,302,912 liters per day, 469,048,320 liters per year, and 469,048 m3 per year. The total number of houses connected is 1,788, the average water sold is 20 m3 per month, the total water sold is 35,760 m3 per month, and 429,120 m3 per year. With an inefficiency of 60%, the system supplies more water than needed, and only 40% reaches customers. This shows great potential for improvement in infrastructure and system management to reduce water loss. The system can distribute more water (469,048 m³ per year) than it sells (429,120 m³ per year), indicating the potential to improve distribution and service to customers. The average water consumption per household shows that the tariff and volume available are sufficient to meet household needs with an annual surplus of Rp. 375,480,000, the system is in good financial health, but there is potential to improve operational efficiency and reduce costs further, as well as invest the surplus in system improvements.

Cost Effectiveness Strategy Clear Water Service in Sukamakmur

The first step in designing a cost-efficiency strategy is determining the efficiency goal. The goal of cost efficiency at the clean water provider in Sukamakmur village is to identify and reduce long-term maintenance and operational costs associated with using Water Pumps by switching to Electromagnetic Generators. Analyze the higher annual repair costs of Water Pumps, which reach IDR 5,000,000 per year, compared to IDR 7,500,000 for Electromagnetic Generators, which have a more extended depreciation period (20 years). If EMG can provide better or more stable performance, it will reduce maintenance and repair expenses, resulting in long-term savings. Then, process efficiency can be improved by assessing the impact of changing from water pumps to electromagnetic generators on overall operational efficiency. The main goal is to see if this replacement can enhance the efficiency of tool use in the long term and reduce downtime or the need for repeated repairs that can disrupt the smooth running of the operational process. This strategy design ensures that spending on tool investment (Electromagnetic Generator) does not exceed the predetermined budget and that total operational costs remain within acceptable limits. Through total cost analysis (including equipment purchase, repair cost, and depreciation), ensuring that investment in an Electromagnet Generator can minimize higher cost inefficiencies when compared to a Water Pump. With more extended depreciation calculations and lower maintenance costs, Electromagnet Generators should be able to help companies achieve overall cost-saving targets.

The next step is identifying costs. The cost efficiency goal is to improve operational cost efficiency, so the option is to make a new investment in an electromagnet generator. The investment comparation shown in Table 3. To purchase a new investment in the form of a Water Pump and Electromagnet Generator with a total of 5 Units each, it is necessary to spend Rp. 20,000,000 on the Water Pump and Rp. 30,000,000 on the Electromagnet Generator, so the total amount must be paid is Rp. 100,000,000 on the Water Pump and Rp. 150,000,000 on the Electromagnet Generator. Water Pump has a shorter depreciation period (5 years), so the annual depreciation value is higher. However, the yearly maintenance cost is also lower than that of EMG. Electromagnet Generators have a more extended depreciation period (20 years), which means their annual depreciation value is lower. However, their yearly repair cost is higher compared to Water Pumps. Although the Water Pump depreciates faster, EMG has a higher annual repair cost due to the more complex equipment and longer life.

Table 3. Investment Cost of Water Pupm and Electromagnetic Generator

Investment	Cost per unit (Rp)	Requirement	Total Investment Cost (Rp)	Depreciation Period	Maintenance cost (from investment cost)
Water Pump	20.000.000	5	100.000.000	5	5%
Electromagnet Generator	30.000.000	5	150.000.000	20	5%

Table 4. Clean Water Consumption Analysis

Electromagnet Generator (EMG) Based		
Waste Water (Inefficiency)	5%	
Water can be Distributed	3.094.416	Lt/Day
	1.113.989.760	Lt/Day
	1.113.990	M^3/Year
Total House Connection	3.468	Connection
Average Water Sold	20	M^3/Month
Total Water Sold	69.360	M^3/Month
	832.320	M^3/Year

By using an Electromagnetic Generator (EMG), the total number of connected houses is 3,468, with an average of 20 M3 of water sold per month and a total of 69,360 M3 of water sold per month and 832,320 M3 per year. The water wasted or inefficient is 5%, while the water that can be distributed is 3,094,416 liters per day, 1,113,989,760 liters per year, and 1,113,990 M3 per year. By having consumer potential in 6 areas, namely: 1) Ciomas Hill Housing Phase 1 consisting of 400 houses; 2) Ciomas Hill Housing Phase 2 consisting of 400 houses; 3) Ciomas Hill Housing Phase 3 consisting of 400 houses; 4) Ciomas Hill Housing Phase 4 consisting of 400 houses; 5) Cluster Pinus 1 consists of 30 houses; 6) Cluster Pinus 2 consists of 50 houses.

Based on Table 4, compared with Table 2, the EMG-based system can distribute significantly more water—about 2.38 times the volume—than the Hydram pump-based system. The EMG system's water distribution capacity is much higher, which is beneficial for serving more connections or handling higher demand. The EMG-based system is far more efficient, with only 5% of water wasted, compared to 60% inefficiency in the Hydram pump system. This means more water is effectively used by consumers in the EMG system, leading to better overall water management. With its lower inefficiency rate (only 5% compared to 60% for the Hydram Pump system), the EMG system reduces water wastage. This can help maintain more efficient and sustainable water resources, which is essential in the context of climate change and the need for water conservation. The EMG-based system serves more than twice as many connections as the Hydram pump-based system. This suggests the EMG system can handle larger populations or more extensive service areas. Capital goods are lumpy, but they may also exhibit economies of scale in that as they are used more for even a single purpose, they drive down the cost of that single output (Acharya et al., 2022). Both systems have the same average water sold per household, which is 20 cubic meters per month. This indicates that the usage patterns are similar. Still, the scale of water distribution and total consumption is much higher in the EMG system due to the more significant number of connections. The EMG system distributes almost 2.4 times more water annually, serves more than twice as many households, and sells nearly twice the amount of water annually. The Hydram pump system is more constrained by inefficiency, with a higher level of water loss, which reduces the adequate amount of water available for consumption. In conclusion, the EMG-based system appears to be a more efficient and scalable solution than the Hydram pump-based system, particularly regarding water distribution, efficiency, and the capacity to serve a more significant number of households.

Financial Performance Analysis

Comparative Financial Performance Comparison between existing and EMG Based (Estimate) is as follows: using the existing method, the revenue collected is Rp. 1,072,800,000, if using EMG Based, it is Rp. 2,080,800,000. The collection rate of both is the same, at 80%. Using the existing method, the revenue in cash is Rp. 858,240,000, if using EMG Based, it is Rp. 1,082,016,000. The total expense rate is the same at 65% of the revenue in cash, whereas if using the existing method, the total expense is Rp. 557,856,000 while using EMG Based, it is Rp. 1,082,016,000 were added with additional expenses, namely water pump depreciation of Rp. 20,000,000, EMG depreciation of Rp. 7,500,000 and repair costs of Rp. 8,750,000, and the total burden using EMG-based is Rp. 1,118,266,000. Meanwhile, the profit before tax for the existing method is Rp. 300,384,000, while if using EMG Based, it is Rp. 546,374,000. The cost-effectiveness strategy aims to maximize the desired results (in this case, revenue and profit) by minimizing costs. The EMG system has greater expansion potential due to its wider distribution capacity and ability to serve more customers. With more households connected, the EMG system generates more revenue and provides higher operational efficiency.

Table 5. Comparative Financial Performance

Existing			**EMG Based (Estimated)***			
Billed Revenue		1.072.800.000	Billed Revenue			2.080.800.000
Collection Rate	80%		Collection Rate		80%	
Revenue in Cash		858.240.000	Revenue in Cash			1.664.640.000
Total Expense	65%	557.856.000	Total Expense		65%	1.082.016.000
Profit Before Tax		300.384.000	Profit Before Tax & Additional Expenses			582.624.000
			Additional Expenses: **			
				Depreciation of Water Pump		20.000.000
				Depreciation of EMG		7.500.000
				Maintenance Cost		8.750.000
						36.250.000
			Profit Before Tax			546.374.000

The EMG-based method produces higher profit before tax, indicating better cost-effectiveness. From the analysis above, the EMG-based method shows superior financial performance compared to the existing process, although it has additional burdens. Higher revenue and increased profit before tax make the EMG-based method a more cost-effective choice. Based on Table 4, the EMG-based system generates significantly more revenue and cash flow due to its larger distribution capacity and higher efficiency. This is because the EMG can distribute more liters of water, hoping to connect with more households and get more consumers. This leads to better liquidity and operational flexibility. Both systems have similar expense ratios (65% of revenue), but the EMG-based system has much higher overall expenses due to its more extensive scale. The additional costs related to depreciation and maintenance increase the total burden. Despite the higher fees and extra costs for the EMG system, the EMG-based system still outperforms the existing system in terms of profit before tax. The increased revenue more than compensates for the additional expenses, making the EMG system more cost-effective in terms of profitability. The EMG-based method offers superior financial performance to the existing method due to its higher revenue and profit despite incurring additional costs such as depreciation and maintenance. This indicates that the EMG system is a more cost-effective investment, generating higher returns and offering better financial outcomes. Therefore, the EMG-based system is a more financially viable option in the long run.

CONCLUSION

Electromagnetic generators (EMG) can be an alternative energy source in drinking water supply systems if the PLN electricity network is unavailable or economically provides better results. The use of EMG will be effective if the additional costs due to new investments can be returned with additional revenue due to increased sales volume caused by customer growth, namely the addition of residents who use EMG. The comparison of financial performance shows that EMG can significantly benefit in terms of revenue and profitability if the initial investment can be offset by higher operational efficiency and sales volume growth. With more revenue accruing in cash, EMG-based systems can provide better liquidity to cover operational costs and infrastructure expansion. Greater cash flow also provides more financial flexibility to meet urgent needs or to make further investments in system upgrades. Although the EMG system has higher costs, especially in terms of depreciation and maintenance, the greater benefits of revenue and profit before tax indicate that this system is more cost efficient. Companies or agencies that manage this system must ensure better cost management to maximize profits, for example by planning maintenance more effectively to reduce extra expenses.

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