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The Effectiveness of Clean Water Services of PAMSIMAS Program in Marioriwawo District

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Abstract. Community-based drinking water and sanitation (PAMSIMAS) program is a government program that aims to meet the community's drinking water needs. The implementation of the PAMSIMAS program in Marioriwawo District needs to be evaluated the effectiveness of its services to the community and analyze ways to improve service quality. Data was collected by distributing questionnaires to 50 respondents in five villages and then processed by using the SPSS application. The model for the effectiveness of the clean water service of PAMSIMAS in Marioriwawo District is Y= 0.534 + 0.133 X1 + 0.020 X2 + 0.024 X3 + 0.203 X4 + 0.173 X5 where X1 is the quality variable, X2 is the quantity variable, X3 is the continuity variable, X4 is the ability to pay contribution variable, and X5 is the institutional variable. Correlation coefficient (R) is 0.780. The average of clean water service of PAMSIMAS in Marioriwawo District is 2.83 which is categorized as effective. Improving clean water services for PAMSIMAS in Marioriwawo District can be done by checking water quality at least once every six months, monitoring pipelines regularly, applying contribution rates based on water usage and applying sanctions for customers who break the rules.

1. Introduction

Water is a special type of liquid used for different purposes and makes life possible on our planet [1]. Clean water is one of the basic needs that are indispensable for human life in a sustainable in order to improve the health status of the community. As its position as a basic need, clean water is not only because 80% of the human body consists of water, but also almost all aspects of life.

With regard to the need for clean water, in Soppeng Regency, efforts have been made to fulfill it by the Regional Drinking Water Company (PDAM) of Soppeng Regency. The PDAM's production capacity has been attempted to be fulfilled distributed in the five sub-districts. However, the reality is that the production capacity is not able to meet all the needs of the community because the community's water needs are greater than the production capacity. Marioriwawo District is one of the sub-districts experiencing the largest shortage of clean water supply in Soppeng Regency.

PAMSIMAS in Soppeng Regency began to be implemented in 2019 in six sub-districts (Donri-Donri, Lalabata, Liliriaja, Lilrilau, Marioriawa, and Marioriwawo) and intervened 24 villages, where each village has different data regarding access to clean water and sanitation.

The implementation of the PAMSIMAS program in Soppeng Regency can realize one of the efforts to fulfill the need for clean water in Marioriwawo District which has not been fulfilled by utilizing other water sources as an alternative to planning for meeting water needs in Marioriwawo District.

Achieving the fulfillment of drinking water needs by ensuring aspects of quality, quantity and continuity, the ability to pay contributions and community institutions, requires supporting facilities with design criteria in accordance with regulations.

2. Literature Review

2.1. Service Effectiveness

The effectiveness of public services can be seen from the level of success of services that have been provided to the public according to the goals or objectives of the public service itself [1]. PAMSIMAS program services can be said effective if the PAMSIMAS program is able to realize its goal, namely to increase public access to sustainable drinking water and sanitation services in rural areas.

2.2. Clean water

Clean water is a vital need of every human being so that its availability determines the health and welfare of the community [2]. In planning the provision of clean water, it must meet the 3K concept, namely quality, quantity and continuity [3].

2.3. Raw Water Source

Raw water is water that comes from a water source (place of origin or water reservoir) that can be used as a water supplier for a clean water production system in accordance with the amount and time to fulfill the needs of the existing clean water system and has not undergone any processing. Raw water can come from springs, surface water sources (which include rivers, lakes, dams, reservoirs, etc.) or ground water [4].

2.4. Clean Water Supply System

Drinking Water Supply System, Drinking Water Supply System, hereinafter abbreviated as SPAM, is an integral part of drinking water supply facilities and infrastructure. The implementation of SPAM aims to ensure the certainty of the quantity, quality and continuity of drinking water produced and distributed [5].

2.5. Provision of Community-Based Clean Water and Sanitation (PAMSIMAS)

Water Supply and Sanitation water the community (PAMSIMAS) is a drinking water supply system that involves community groups (women and men, rich and poor, etc.). Community involvement starts from the planning, implementation, operation and maintenance stages of the facilities that have been built. The PAMSIMAS program that involves the community has a target that is districts that have rural safe drinking water coverage that has not yet reached 100%.

The achievement of the PAMSIMAS program aims to determine the quality, quantity, continuity of water, the ability to pay contribution and institutions in accordance with technical guidelines and service standards that have been set.

2.5.1. Quality. Water quality according to service standards based on the parameters set by the Regulation of the Minister of Health Number 492 of 2010 includes 4 (four) properties, namely physical, chemical, biological and radioactive [6].

2.5.2. Quantity. The amount of water distributed to the community must at least be sufficient for bathing, eating or drinking. The Department of Public Works (Technical Guidelines for the Management of Urban Drinking Water Supply Systems, 1998) found a standard with the village category of 60 liters/person/day [7].

2.5.3. Continuity. Continuity means that water flows or is distributed to the community for 24 hours a day or based on the needs of the community.

2.5.4. Ability to Pay Contribution. The ability to pay dues is related to the water usage rates paid by the community. Based on the Community Level Planning Technical Guidelines for the 2021 PAMSIMAS program, contribution are determined based on calculations with several categories, namely: operational costs, labor wages, water quality testing and health promotion, electricity/fuel costs, oil or generator changes costs, depreciation costs, maintenance costs and development costs. [8].

2.5.5. Institution. The sustainability of the PAMSIMAS program can be guaranteed if it is supported by good and regular management and maintenance of facilities.

3. Research Methods

3.1. Research Location and Time

The research is located in, Marioriwawo District, Soppeng Regency. Primary and secondary data collection is collected in July – August 2021.

3.2. Sample and Population

The population is all KP-SPAMS administrators in five villages in Marioriwawo District, namely Marioritengnga Village, Gattareng Village, Gattareng Toa Village, Watu Village and Watu Toa Village. There are 65 administrators in the five villages. The sample used in this study was 50 samples.

3.3. Research variable

3.3.1. Dependent Variable (Y). The dependent variable of this study is the effectiveness of the PAMSIMAS program in Marioriwawo District. The average evaluation of all respondents on the variable effectiveness of the clean water service of the PAMSIMAS with indicators, namely: the increase of drinking water costumers, the facilities managed and financed by the community and the function of the facilities. The evaluation then interpreted to determine its effectiveness.

Table 1. Interpretation of Effectiveness

No	Relationship Level	Interval
1	Very Effective	3,26 – 4,00
2	Effective	2,51 – 3,25
3	Less Effective	1,76 – 2,50
4	Not Effective	1,00 – 1,75

3.3.2. Independent Variable (X). The independent variables of this study are aspects that affect the fulfillment of the PAMSIMAS program achievement, namely: quality (X1), quantity (X2), continuity (X3), ability to pay contributions (X4) and institutions (X5).

3.4. Research Stages

The first stage of this research was to conduct a field review and then distribute questionnaires to 50 KP-SPAMS administrators in Marioritengnga Village, Gattareng Village, Gattareng Toa Village, Watu Village and Watu Toa Village.

After all the data is collected, then the data is analyzed using the SPSS (Statical Package for the Social Science) application. Data analysis techniques used to analyze primary data are as follows:

3.4.1. Data Quality Test. To test the quality of the data on this primary data, the researchers then testing the validity and reliability of data. The validity test with significance level of 0,05 and reliability test with certain limits such of 0,6.

3.4.2. Classic assumption test. To test the feasibility of the regression model, it is necessary to first test the classical assumption test. Tests carried out include: multicollinearity test with tolerance value > 0.1 or equal to VIF < 10 [9], and heteroscedasticity test the significant value > 0.05.

3.4.3. Hypothesis test. Hypothesis testing is used to show whether there is a correlation and the influence of the independent variable.

4. Results and Discussion

4.1. Overview of the PAMSIMAS Program in Marioriwawo District

Table 2. Overview of the PAMSIMAS Program in Marioriwawo District

Data/Village	Marioritengnga	Gattareng	Gattareng Toa	Watu	Watu Toa
Population (Soul)	3866	3101	2103	3027	3764
Costumer (Soul)	745	1766	587	668	1747
Fasilities condition	Works well				
Contribution Status	> Operational Cost	> Operational Costs and Recovery	< Operational Cost	> Operational Cost	< Operational Cost
House Connections (SR)	122 SR	300 SR	121 SR	192 SR	102 SR

4.2. Hypothesis testing

4.2.1. Multiple Linear Regression Test. This model is used to determine the effect of quality (X1), quantity (X2), continuity (X3), ability to pay contributions (X4) and institutional (X5) on the effectiveness of PAMSIMAS program services (Y).

Table 3. Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	0.534	1.635		0.327	0.746					
X1	0.133	0.038	0.285	3.475	0.001	0.454	0.464	0.233	0.666	1.502
X2	0.020	0.067	0.023	0.303	0.763	0.191	0.046	0.020	0.794	1.260
X3	0.024	0.031	0.065	0.765	0.448	0.517	0.115	0.051	0.630	1.586
X4	0.203	0.028	0.552	7.217	0.000	0.739	0.736	0.483	0.766	1.305
X5	0.173	0.036	0.356	4.796	0.000	0.638	0.586	0.321	0.815	1.227

Based on Table 3, the regression equation can be determined as follows:

$$Y = 0.534 + 0.133\ X1 + 0.020\ X2 + 0.024\ X3 + 0.203\ X4 + 0.173\ X5 \quad (1)$$

Y : Effectiveness of PAMSIMAS program services
a : Constant (Y value if X = 0)
b : Regression Coefficient (shows the number of increase or dependent variable based on the relationship with the value of the independent variable)
X1 : Quality; X2 : Quantity; X3 : Continuity; X4 : Ability to pay contribution; X5 : Institution

The results of the regression equation above can be interpreted that all variables are positive, it can be said that the higher or better the quality (X1), quantity (X2), continuity (X3), ability to pay contributions (X4) and institutions (X5) provided by PAMSIMAS, the more effective the clean water services of PAMSIMAS program in Marioriwawo District.

4.2.2. Correlation coefficient. The coefficient of determination of Adjusted R2 is 0.780 or 78%. This identifies that the magnitude of the influence of the quality, quantity, continuity, ability to pay contributions, and institutional variables is 78% and the remaining 22% is influenced by other variables outside the regression model of this study.

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change
1	.896[a]	.803	.780	.502	.803

4.2.3. Effective Contribution. Contribution aims to determine how much influence the independent variable has on the dependent variable.

Table 5. Effective Contribution and Relative Contribution

Variable	Regression Coefficient (Beta)	Correlation Coefficient (R)	R Square	Effective Contribution	Relative Contribution
X1	0.285	0.454		12.96%	16.13%
X2	0.023	0.191		0.44%	0.54%
X3	0.065	0.517	0.80	3.34%	4.16%
X4	0.552	0.739		40.81%	50.82%
X5	0.356	0.638		22.70%	28.27%
Total				80.2%	100%

Based on Table 4, all variables contribute effectively by 80.2%. The effective contribution of all variables is 80.2% and the remaining 19.8% is influenced by other indicators. The variable of ability to pay contributions (X4) has the most dominant relative contribution to the effectiveness of the clean water service of the PAMSIMAS program in Marioriwawo District (Y). This is indicated by the value of the relative contribution of the X4 variable which is the highest compared to the other four variables.

5. Conclusion

The effectiveness of the PAMSIMAS program of clean water services in Marioriwawo District can be said effective based on the condition of proper access of clean water users through PAMSIMAS facilities that have exceeded the target users. Supported by the condition of drinking water facilities, all of which are 100% functioning properly and all villages apply contributions.

The model for the effectiveness of PAMSIMAS clean water services in Marioriwawo District is Y= 0.534 + 0.133 X1 + 0.020 X2 + 0.024 X3 + 0.203 X4 + 0.173 X5 where X1 is the quality variable, X2 is the quantity variable, X3 is the continuity variable, X4 is the ability to pay contributions, and X5 is the institution variable. The correlation coefficient (R) is 0.780. The average assessment of the KP-SPAMS management in Marioriwawo District on the clean water service of the PAMSIMAS program is 2.83 which can be categorized as effective.

The improvement of clean water services for the PAMSIMAS program in Marioriwawo District can be done by checking water quality at least once every six months, maintaining water quality at the source, monitoring pipelines on a regular basis, applying contribution rates based on water use, paying monthly management incentives and applying sanctions. for customers who break the rules.

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