Proceedings of International Conference : Problem, Solution and Development of Coastal and Delta Areas
Semarang, Indonesia – September 26th, 2017
Paper No. C-61

Declining Analysis of Service Function Area Irrigation Sragi Pekalongan Regency

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Abstract- Irrigation Area Sragi is one of irrigation areas of central government authority with a standard acreage of 3426 ha and functional area of 3212 ha located in Pekalongan Regency. The availability of water and the water supply from the weir is sufficient but the downstream supply can not be met. The purpose of this research is to get index of irrigation network performance of Sragi Irrigation Area and priority scale of handling to decrease function of irrigation network service of Irrigation Area of Sragi. Descriptive approach method to collect information about the conditions that are happening on the Irrigation Network Dareah Irrigation Sragi Pekalongan Regency. The results are the variables of irrigation buildings, the implementation of water distribution of buildings in tapping buildings, anticipation of water loss, sedimentation in irrigation networks, human resources and water management affect the decline in service function D.I Sragi. The most influential variable to the decline of irrigation area service function is irrigation building variable which is shown by regression coefficient value equal to 0,106.

Keywords**:** service function, irrigation area, Sragi

1. Introduction

The management of irrigation networks aims to meet the demand for irrigation water service areas. Irrigation water demand is determined by the age and types of plants to be planted and the weather occurring, so that the management of the irrigation network will follow the established pattern and planting system.

As the main motor of the implementation of good irrigation network management, network infrastructure (tapping building / for giver, channel, irrigation water regulator and building) should be ready and in good condition. For that Maintenance of irrigation network infrastructure must be done regularly and periodically in order to prevent the decrease of irrigation network service function.

Irrigation Area Sragi is one of the Central Government Irrigation Authority with a standard acreage of 3426 ha and functional area of 3212 ha located in Pekalongan Regency. Irrigation Area Sragi has 2 weirs, 1 main channel, 2 secondary channels and 2 suplesi channels. Irrigation Area Sragi was built in 1911 until 1930. The infrastructure of this irrigation network has been rehabilitated several times and last rehabilitation in 1981 is heavy rehabilitation or special maintenance covering all network infrastructure and weir.

The availability of water and the water supply from the weir is sufficient. However, in the most downstream areas water needs can not be fulfilled well especially during planting period II include the area in the Sumub Kidul Village, Kalijambe Village,

Purworejo Village, Kedungjaran Village, Klasik. So that the farming community to siphon irrigation water in the river channel discharged by using the pump to meet the needs of irrigation water. The community complained of a substantial loss of irrigation water in the Ponolawen secondary channel so that in the downstream area there was no water supply. This condition has been running for years and there has been no proper handling to address the condition.

From the above description can be formulated problems that need to be studied in more detail first: How is the existing condition of the main tract and secondary channel Sragi Irrigation Area? Second: What is the role and active participation of water user farmer association (P3A) of Sragi Irrigation Area in operation and maintenance of irrigation networks? Third: How is the plan to optimize service / performance of irrigation network in Sragi Irrigation Area?

The purpose of this research is first, to know the condition of existing drum carrier and ponolawen secondary channel; second, to know the institutional performance and role of active participation of P3A in Operation and Maintenance of irrigation network of Sragi Irrigation Area; third, to get index of irrigation network performance of Sragi Irrigation Area and priority scale of handling to decrease function of irrigation network service of Sragi Irrigation Area.

2. Literature Review

Jaringan Irigasi adalah saluran, bangunan, dan bangunan pelengkapnya yang merupakan a unity required for the provision, distribution, delivery, use and disposal of irrigation water (Peraturan Pemerintah No. 20, 2006).

The variables used in this study are:

1. Irrigation building

The existence of irrigation buildings is needed to support irrigation water harvesting and management. The types of irrigation buildings include the main building, the carrier building, the building for tapping buildings, water facing buildings, disposal and drainage buildings and complementary buildings.

2. Implementation and distribution of water in tapping buildings

The distribution of irrigation water is the activity of dividing the water in buildings for the primary and / or secondary networks. (government public works regulations 32/PRT/M, 2007). Given the unfavorable availability of water in uneven (constant) water sources throughout the year, at the beginning of the rainy season at the time of cultivation, the available discharge from the source of water or rain is still low, the planting plan is regulated by a class system.

3. Loss of water

Water losses in the channel of irrigation (conveyance loss) include the components of water loss through evaporation, percolation, seepage and leakage. In impermeable coated channels, water loss can be suppressed and only through a relatively small evaporation process.

4. Sedimentation on irrigation networks

Sediments in the channel can cause changes in the channel dimension from the origin of the channel, and may affect the specific energy of the channel cross-section so that it may indirectly result in less optimum performance of irrigation channels

(Wirosoedarmo, et al, 2011). Sediment is the result of erosion, either in the form of surface erosion, trench erosion, or other types of soil erosion.

1. Transfer of agricultural land;
2. Pattern and system of planting; and
3. Water gatekeepers and duty guards.

3. Research Methodes

This study aims to analyze the decrease of irrigation network service function of Irrigation Area of Sragi Regency of Pekalongan Regency. Therefore, in this research, descriptive method is used, that is research method designed to collect information about current situation in Irrigation Irrigation Network of Sragi Regency of Pekalongan Regency. According Sugiyono (2001), that the main purpose of descriptive research is to describe the nature of a situation that is happening at the time the research is done, and examine the causes of a particular symptom.

Judging from the objectives, this study is a correlation study with the aim to know the existence or relationship (relationship) between the variables that affect the decrease function of irrigation network services Irrigation Area Sragi Pekalongan Regency.

The research will be conducted to analyze the decrease of irrigation network service function in irrigation area Sragi Pekalongan Regency in the following way:

1) Drive the walktrough of the Brondong and Ponolawen secondary channels to determine the physical performance index of the irrigation network.
2) Through questionnaire and sampling test of government institution and P3A to get index of institutional / service operation and maintenance performance of Sragi Irrigation Area of Pekalongan Regency.

The population of this research is irrigation network covering Brondong and Ponolawen Secondary Channel, and also government institution of PSDAESDM Department of Field of PSDA amounting to 40 personnel, UPT Irrigation Brondong totaling 60 personnel, P3A Organizational Farmers Institution amounting to 32 P3A and 1 GP3A. From the above formulation for population kelembagan amounted to 132 personnel, so that used purposive random sampling method.

The data types of this study include primary data and secondary data. Primary data consist of channel condition and irrigation building, availability of irrigation water, drainage channel condition done by survey and investigation method in field worktrough including interview with officer in field. And also institutional data of government and farmers in irrigation network management through data request by sending questionnaire (questionnaire) to all respondents.

Secondary data is general data consisting of wide area data of Irrigation Area, personnel, material requirement and equipment of operation and maintenance, employee salary and annual operation and maintenance cost and regulation related to irrigation water management obtained from Dinas Pengairan and Unit Pengelolaan Teknis Dinas Pengairan Kabupaten Pekalongan.

The variables in this study include the independent variables (X) and the dependent variable (Y). Technical variables include irrigation buildings; implementation and distribution of water in tapping buildings; water loss; sedimentation on irrigation networks; conversion of agricultural land; pattern and planting system; water gatekeepers and guard officers and non-technical variables include Human Resources (HR); water

user farmer activities; water management; weather; the central, provincial and local government authority rules. While the dependent variable includes the timeliness of the watering season; sufficient irrigation water needs; fulfillment of allocated costs.
Methods of data analysis include descriptive analysis, validity analysis and reliability questionnaire and regression analysis.

3. Analysis

Uji Validitas dan Reliabilitas

Determination of whether or not a question is valid by comparing the value of r arithmetic with r table. If r is a positive result, and r result> from r table, then the item or variable is valid. If r results are not positive, and r results <of r table, then the item or variable is invalid (Santoso, 2000).

In testing the validity of this number of respondents as many as 100 people. For the number of respondents (N) of 100 with a significance level of 5% obtained r table value is 0.195. Testing the validity using the help of SPSS Program 20. From the calculation, the results obtained that the variables of irrigation buildings (X1), Implementation of Water Distribution Building in Sadap Building (X2), Water Loss Anticipation (X3), Sedimentation Variables In Irrigation Network (X4), Source Human Power (X5), Water Management (X6) and the variable service function decline irrigation area (Y) have r count above r table so it is said valid.

While the reliability test of the six variables that in this study has Cronbach Alpha count (0,510 - 0,892) bigger than r value (0,195). Thus it can be said that all variables in this study is reliable.

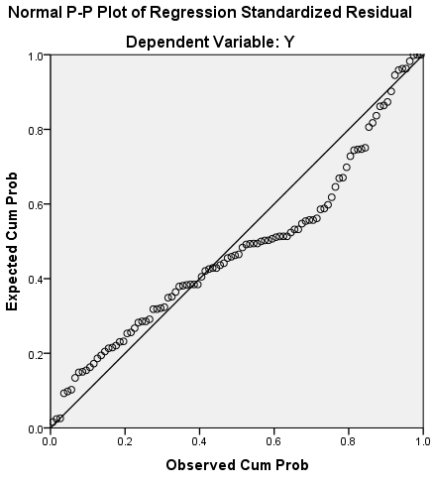

Fig. 1. P-Plot normal curve

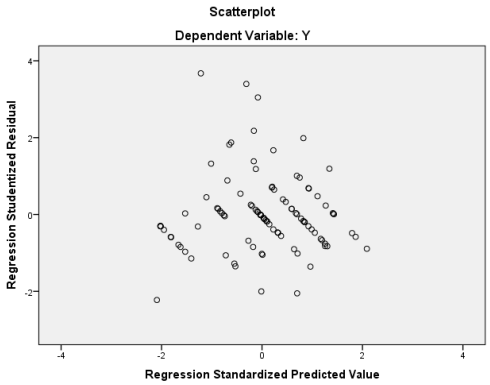

Fig. 2. Hasil uji heteroskedastisitas

Classic Assumption Test

In the Normal P-Plot image it appears that the data (point) spreads around the diagonal line and follows the direction of the diagonal line, then the regression model meets the assumption of normality.

The result for multicolenierity test found that all VIF values <10, this means no multicollinearity and concluded that the multicollinearity test is met.

From the picture above can be seen that there is no heteroskedastisitas the points spread out above and below the number 0 on the Y axis, so it can be said heteroskedastisitas test is met.

Hypothesis Testing and Discussion

The hypothesis proposed in this research is then tested to determine the influence of independent variables (independent variable, that is irrigation building variables, the implementation of water distribution of buildings in tapping buildings, anticipation of water loss, sedimentation on irrigation networks, human resources and water management) to dependent variable, namely the decline of irrigation area service function). To determine the effect, multiple linear regression analysis was used, followed by regression coefficient significance test with F (F test) test and t test (t test). The results of multiple linear regression analysis are summarized in the following table.

Table 1. Results of Multiple Linear Regression Estimates

No	Information	Coefficient
1	Constants	.012
2	Variable Irrigation Building (X1)	.106
3	Variable implementation of the distribution of building water in tapping buildings (X2)	.086
4	Variable Water Loss Anticipation (X3)	.097
5	Variable Sedimentation On Irrigation Network (X4)	.097
6	Variable Human Resources (X5)	.004
7	Variabel Management of Water (X6)	.070

Based on the coefficient value of each variable can be made multiple linear regression model as below:

$Y = 0{,}012 + 0{,}106\ X_1 + 0{,}086\ X_2 + 0{,}097\ X_3 + 0{,}097\ X_4 + 0{,}004\ X_5 + 0{,}070\ X_6$

Information:

Y = Variable decline in irrigation area service function (dependent variable)

X_1 = Variable irrigation building

X_2 = Variable implementation of the distribution of building water in tapping buildings

X_3 = Variable water loss anticipation

X4 = Variabel sedimentation on irrigation networks

X5 = Variable human resources

X4 = Variable management of water

a = constants (*intercept*),

b_1, b_2, ... b_n = partial regression coefficient.

Furthermore, a simultaneous test (F-test) was conducted to determine the simultaneous effect of all independent variables on the decline of irrigation area service function.

Table 2. Result of Test F

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	182.619	6	30.436	28.845	.000[a]
	Residual	98.131	93	1.055		
	Total	280.750	99			
a. Dependent Variable: Y						
b. Predictors: (Constant), X6, X2, X3, X4, X5, X1						

In Table 2. it can be seen that the significance value of the F test result (0.000) is less than 0.05 and the F value of the result (28.845) is greater than F table (2.19). This means that all independent variables simultaneously or together significantly influence the irrigation area service function.

The next step is to perform a partial test (T-test) to determine the influence of each independent variable on the irrigation area service functions. The result of regression coefficient significance test of all independent variables is presented in the table below.

Table 3. Result of tes T

No	Variabel Bebas	t Hasil	t Tabel	Sig.	Influence on dependent Variables
1	Variable irrigation building (X1)	2.171	1.66	.033	Significant Influence
2	Variable implementation of the distribution of building water in tapping buildings (X2)	2.424	1.66	.017	Significant Influence
3	Variable Water Loss Anticipation (X3)	2.119	1.66	.037	Significant Influence
4	Variable Sedimentation On Irrigation Network (X4)	2.099	1.66	.039	Significant Influence
5	Variable Human Resources (X5)	.099	1.66	.921	No Significant Influence
6	Management of Water (X6)	1.995	1.66	.049	Significant Influence

Based on Table 3. it appears that t results for all independent variables other than human resource variables (1,995 to 2,424) are greater than t table (1.66). And the significance value of these variables (0.017 to 0.049) is less than 0.05. Hence the hypothesis which states that partially there is at least one factor that significantly influence the service function of irrigation area, proven. Not even one variable but five variables and only one variable that is not significant to the function of irrigation area services.

To find out how big influence of independent variables including irrigation building, implementation of water distribution of buildings in tapping buildings, anticipation of water loss, sedimentation in irrigation networks, human resources and water management on the reduction of irrigation area service function is shown by coefficient of determination (R^2). The value of the coefficient of determination can be seen Table 4. below:

Table 4. Results of Coefficient Determination Test (R^2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.807[a]	.650	.628	1.027

a. Predictors: (Constant), X6, X2, X3, X4, X5, X1
b. Dependent Variable: Y

Table 4 shows that the value of R2 is 0.650; this shows that 65.0% variation of the Irrigation Area Service Function Reduction (Y) analysis can be explained by independent variables which include: irrigation building variables, the implementation of water distribution of buildings in tapping buildings, anticipation of water loss, sedimentation on irrigation networks, human resources and water management, while the remaining 35.0% is explained by other causes outside the model.

Based on Table 1. it is known that the irrigation building variable (X1) is the most dominant variable to the decline of irrigation area service function. This is indicated by regression coefficient (bi), where the coefficient value of regression variable of irrigation building is highest (0,106).

4. Conclusion

Based on the results of the analysis and discussion can be drawn some conclusions as follows:

1) Variables that affect the decline of irrigation area service function are variables of irrigation building, implementation of water distribution of buildings in tapping buildings, anticipation of water loss, sedimentation on irrigation networks, human resources and water management. The value of the regression coefficient of each variables area: irrigation building is 0,106; the implementation of water distribution of buildings in tapping buildings is 0,086; anticipation of water loss is 0,325; sedimentation on irrigation networks is 0,325; human resources is 0,004 and water management is 0,070.
2) Based on the value of the regression coefficient, the most influential variable on the decline of the irrigation area service function is the irrigation building variable shown by the regression coefficient value of 0.106.

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