Public Perception of Tiro Reservoir Development in Blang Rukui Village, Tiro District, Pidie Regency

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ABSTRACT

Development and environment are two components that influence each other. The physical environment is needed as a provider of natural resources which will be further processed, while the social environment provides human resources as development actors. In the implementation of development, knowledge becomes a very important component. Because knowledge is a strong basis for consideration in generating critical thinking. Knowledge, experience, expectations, information will shape the public's perception of a phenomenon, in this case the construction of the Tiro Reservoir. One of the sub-districts that has agricultural potential that has not been managed properly is Tiro District in Pidie District. The government through the Sumatra River Basin I (BWS SI) plans to build a reservoir located in Blang Rukui Village, Tiro District, Pidie Regency. The impact of the refusal of some communities can be clearly seen in the land acquisition process that has not been carried out to date, which means that some communities do not give their land to be paid for by the government. The method in this study is to conduct direct observations to the research site by using a questionnaire to see whether the public's perception supports or does not support the construction of this reservoir. Based on the results of the questionnaire, it is known that the average public perception of the construction of the Tiro Reservoir is 62%, which is included in the criteria for being quite supportive in the construction of the reservoir. From the calculation results, the village affected by the development (village to be relocated) is Blang Rukui Village. Of the 29 samples in the village (Blang Rukui Village) affected by the construction, 25 samples did not support the construction of the reservoir and 4 samples were quite supportive. Meanwhile, in the villages (Pulo Kenari, Dayah Teungoh, Dayah Baroh, Panton Beunot) who received the benefits 47 samples supported the construction of the reservoir and the remaining 19 samples were sufficient to support the construction of the reservoir. Based on the results of calculations and discussions, it can be concluded that the results of community perceptions, although in the low category, are still quite supportive for development.

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1. Introduction

Currently in Aceh Province there are many reservoir construction projects, because this work is very much supported by the Government, because the construction of reservoirs is believed to increase agricultural production and can improve the economy of the Acehnese people who work as farmers, especially in the Pidie district which is very aggressive to increase agricultural production. In recent years, Pidie Regency has experienced a fairly rapid population growth, resulting in an increase in water demand for domestic and agricultural purposes. Therefore, the fulfillment of raw water needs must be increased to keep pace with these developments. Reservoir is one solution for utilizing surface water which serves to accommodate water as raw water reserves during the dry season.

One of the potential places for the construction of this reservoir is in Blang Rukui Village, Blang Keudah Village, Tiro District with a dam at Krueng Tiro. The initial plan for the construction of the Tiro Reservoir has a capacity of 41.44 million m of water, after the design change the capacity of the Tiro Reservoir became 15.02 million m of water, while the annual average is very large, reaching 6.67 m^3/s. The initial plan for the construction of the Tiro Reservoir to irrigate 6,330 Ha, after a design change and merging with the Rukoh Reservoir, the construction of the Tiro Reservoir serves to irrigate 12,928 Ha, this dam can reduce flood discharge by 350 m^3/s, and can provide a water supply of 0.85 m^3 /s, as well as increasing planting intensity up to 300% including rice and secondary crops with a planned service life of 50 years. Raw water, flood control, PLTM 2X2MW (2MW total), tourism and increasing the income of the Pidie community in general (Aceh Water Agency, 2017).

Prior to the implementation of the development, a feasibility study of the infrastructure project is carried out. Technically, the Tiro Reservoir planning has met the technical specifications in the construction of the reservoir, but this physical development cannot only be viewed from the technical aspect, but also the economic aspect, given the limited availability of development funds, while on the other hand, the community welfare aspect. should be further improved. PT. Wahana Adya Consultant as a planning consultant has conducted SID (Detail Investigation Design) and DED (Detail Engineering Design) which estimates the construction costs and operational costs of the reservoir. While on this problem the author wants to recalculate the investment feasibility method of the costs incurred for the construction of the reservoir, from land acquisition until the reservoir is operational.

Reservoir construction includes businesses or activities that are estimated to have an important impact on the environment, because dam construction is an activity that changes the shape of the land or landscape, exploitation of water resources, processes and activities whose results can affect the social and cultural environment, the economics of implementing resource conservation. water, the application of technology that has the potential to affect the environment (PP Number 27 of 1999 Article 3 paragraph 1). From this thought, an economic feasibility analysis of the construction of the Tiro Reservoir in Aceh Province will be developed. This study uses the investment eligibility criteria method with indicators of NPV (Net Present Value), Net B/C Ratio (Net Benefit Cost Ratio), IRR (Internal Rate of Return), PP (Playback Period). & Sensitivity Analysis.

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Based on the background of the problem in this study, how are the results of the feasibility analysis for the construction of the Tiro Reservoir, and see how the Perceptions of the people affected by the Tiro Reservoir construction, so that it can be concluded that the Tiro Reservoir is feasible or not to be carried out.

Analysis of investment in the field of reservoir construction is to measure the value of costs and benefits. There are various ways to measure the value of costs and benefits. In this study, the feasibility analysis method is used with indicators of NPV, Net B/C Ratio, IRR, PP, and sensitivity analysis as parameters in determining the policy to be taken. In this study, the data collection method used was direct observation to the research site by using a questionnaire to obtain primary data. To obtain secondary data, data collection was carried out by non-participant observation, namely by reading, copying and processing existing written documents and records. The data were collected through literature or journals obtained from related agencies, namely the Aceh Provincial Public Works Service, the Agriculture Service and the Central Statistics Agency (BPS). The data obtained are summarized and placed according to the needs so that they can describe the required position or situation.

2. Methods

The research method used is through several stages, starting with problem formulation, literature study, secondary and primary data collection, data processing, data analysis and discussion. Assistance with data analysis using excel 2013 computing tools.

2.1. Data Collection

In this study, the data collection method used was direct observation to the research site by using a questionnaire to obtain primary data. To obtain secondary data, data collection was carried out by non-participant observation, namely by reading, copying and processing existing written documents and records (Sugiyono: 2010). The data were collected through literature or journals obtained from related agencies, namely the Aceh Provincial Public Works Service (PU), the Agriculture Service and the Central Statistics Agency (BPS).

2.2. Population and Sample

The population in this study is the community in Blang Rukui Village, Tiro District. The population is a generalization area consisting of objects/subjects that have certain characteristics that are determined by the researcher to be studied and then conclusions are drawn by taking samples from villages that are in the location of the construction of the reservoir.

There are various formulas that can assist researchers in determining the number of samples that can be taken from the population data. Basically, the use of the sampling formula is to make it easier for researchers to be able to determine the right number of samples from the population data. The method of calculating the number of samples using the Slovin formula is (Wahyudi 2017).

While the sampling in this study used a sampling technique by means of Simple Random Sampling. Simple Random Sampling is a sampling technique where the researcher mixes subjects in the population so that all subjects are considered the same.

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Thus, the researcher gives equal rights to each subject to have the opportunity (chance) to be selected as a sample.

The number of samples taken is obtained from the calculation of the Slovin formula as follows:

Formula :

$$n = \frac{N}{1 + Ne^2} = \frac{2029}{1 + 2029\,(0.1)^2} = 95{,}30 \approx 95 \text{ Respondent/}$$

Keterangan:
n = sample
N = population
e = *standart error*= 10%

2.3. Questionnaire

Questionnaires will be distributed to the community in Tiro District with 95 respondents from a population of 8,220 people with 2,029 households with Family Cards (Source BPS 2019 Catalog No. 1102001.11090 page 12). Population is a generalization area consisting of objects/subjects that have certain characteristics that are determined by the researcher to be studied and then conclusions are drawn.

Structured interviews with respondents using a questionnaire that is about the public's perception of the construction of reservoirs. This data collection is intended to be used as an analysis material for the construction of the reservoir.

The research data processing method that will be used in this study is with the help of computing tools Microsoft Excel 2013 and Microsoft word 2013. The results of this questionnaire processing are the percentage of public perceptions regarding agreeing or disagreeing with the reservoir development plan to be implemented in Blang Rukui Village, Tiro District, Pidie Regency.

2.4. Questionnaire Data Analysis Method

The percentage descriptive method is used to describe or provide an overview of the object to be studied through sample or population data as it is, without giving conclusions to the public (Sugiyono, 2010:29). This method is used to describe and explain the research objectives. In this study, the percentage descriptive analysis method was used to describe the public's response or perception to the construction of the reservoir in Blang Rukui, Tiro District, Pidie Regency.

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The steps taken in using this analysis technique are:

a. Check data completeness
b. Compile a tabulation of the data and then enter the answers according to their scores into the table. The amount of the score given for each alternative answer is:

Num	Option	Score
1.	A	4
2.	B	3
3.	C	2
4.	D	1

c. Counting the number of answers for each question item according to their respective categories, then adding them up.
d. After the scores are added up, then look for the percentage of each by entering the total score into the formula as follows:

$$DP = \frac{n}{N} x\ 100\%$$

Explanation :
DP: percentage price (%)
n : total value obtained
N: total value

From the research results obtained, processed and analyzed and calculated by descriptive percentage, the score is used the following calculation perhitungan:

1. Maximum score percentage = (4:4) x 100% =100%
2. Minimum score percentage = (1:4) x 100% = 25%
3. Range = 100% - 25% = 75%
4. Interval class length = 75%:5 = 18,75 ≈ 19 %

Based on the calculation, the interval class length is 15% and the minimum score percentage is 25%, then the interval classes are as follows:

Num	Criteria	Interval
1	Don't Understand/ Never/ Don't Support	**25% – 43,9%**
2	Fairly Understanding / Rarely / Moderately Supporting	**44% – 62,9%**
3	Understand/ Often/ Support	**63% - 81,9%**
4	Very Understanding/ Always/ Very Supportive	**82% - 100%**

3. Results and Discussion

Tiro Reservoir is located in Blang Rukui Village, Tiro District, Pidie Regency. This reservoir project is planned to be built by the Government with a construction cost of Rp. 821,023,346,560.67 The Tiro Reservoir provides supplementation to the Baro Raya Kanan Irrigation Area and Tiro Irrigation Area by constructing canals that are channeled through the Krueng Baro River and the Krueng Tiro River. The topography of the Tiro Reservoir area has a water storage volume of 15 million m3 with an effective storage volume of 4,654 million m3. With the construction of the Tiro Reservoir, it is hoped that

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water problems in the Baro Raya Kanan irrigation area and the Tiro Irrigation area will be resolved and the water needs of the community will be fulfilled.

3.1. Public perception of the construction of the Tiro Reservoir

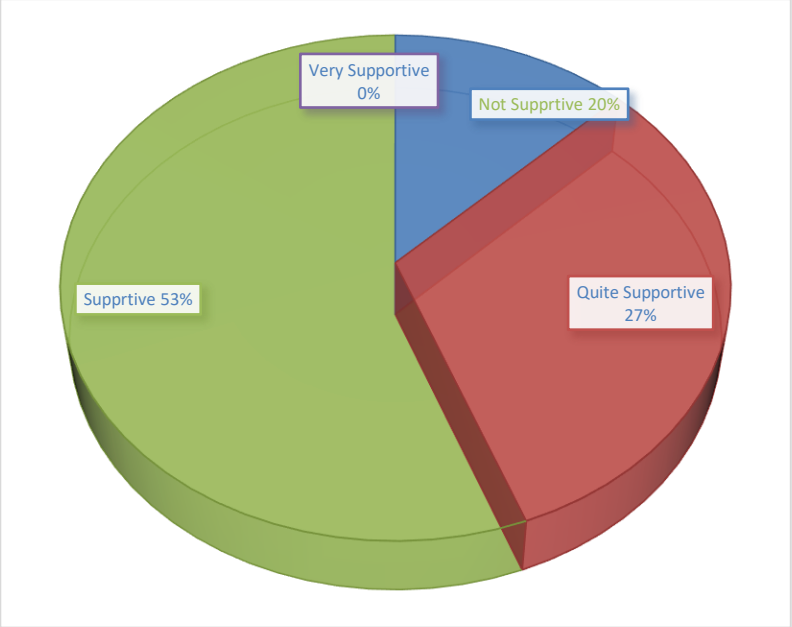

Figure 1. Public Perception

Based on Figure 1, it can be seen that the community's perception of the construction of the reservoir in Tiro District is mostly included in the supportive category with a percentage of 53%. While the criteria do not support only 20%, quite supportive at 27%, while for the criteria strongly support none or 0%.

From these data it can be concluded that the average public perception of the construction of the Tiro Reservoir is included in the criteria for being quite supportive with a percentage of 62%. Furthermore, these perceptions can be translated into 3 sub-variables, namely:

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a. Community Knowledge Level

Figure 2. Community Knowledge Level

Based on Figure 2 above, it can be seen that public knowledge about the reservoir is dominated by the criteria of not understanding with a percentage of 33% followed by the criteria of understanding enough with 30%. Meanwhile, the criteria for understanding are only 37%, and for the criteria of very understanding there is no 0% .

From the data above, it can be concluded that the average knowledge of the people of Tiro District about the reservoir is included in the category of quite understanding with a percentage of 52%.

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b. Community outreach and participation

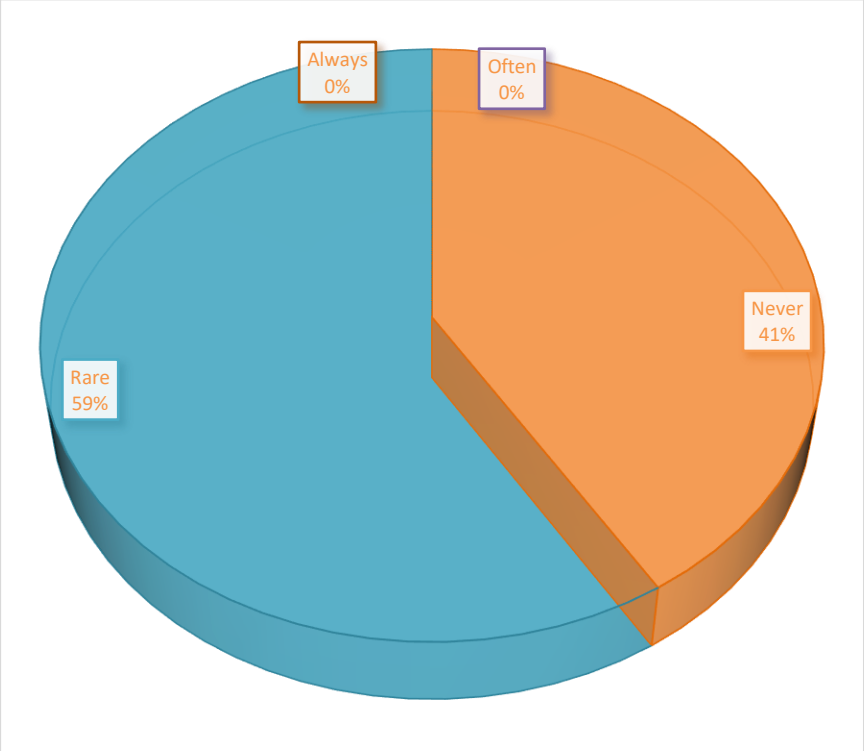

Figure 3. Community Knowledge Level

Based on Figure 3, it can be seen that the sub-variables of government socialization and community participation in socialization activities in Tiro District are mostly included in the Rare category, namely 59% with a frequency of 56 out of 95 respondents.

The second largest percentage is the never category, which is 41%, and for the frequent and always category, each of these sub-variables is 0% or none. Based on these results, it can be concluded that the government's socialization and community participation in socialization activities on average are still in the never category, at 42%. Looking at the percentages generated on the sub-variables of government socialization and community participation in socialization activities, there are two factors that influence it, it could be that the government has not made socialization and it could be that the socialization made by the government has only been made 1 or 2 times in the wrong time.

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c. Community Responses About Reservoir Construction

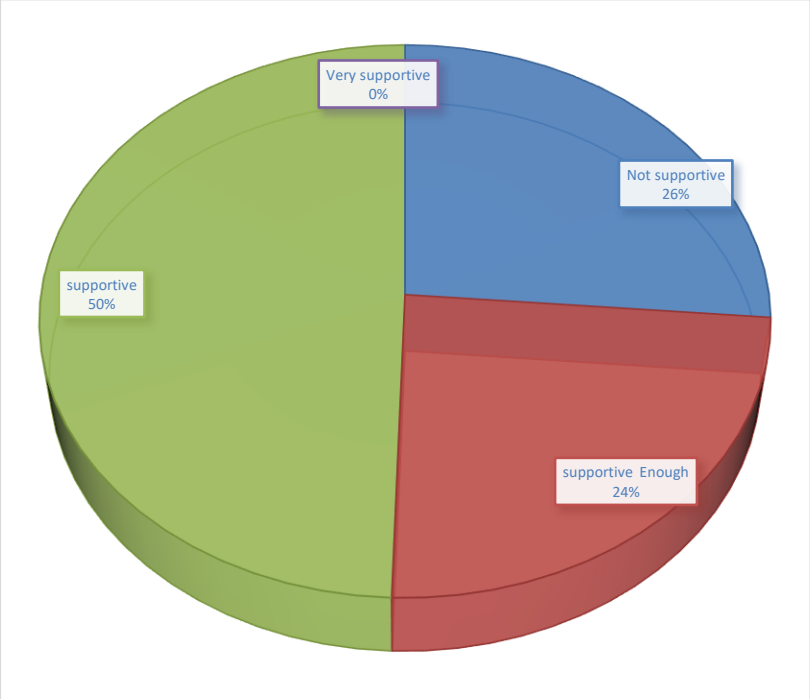

Figure 4. Community Responses About Reservoir Construction

Based on Figure 4 above, it can be seen that the responses of the people of Tiro District regarding the construction of the reservoir are mostly in the supportive category with a percentage of 67%, followed by the moderately supportive category at 33%, and the unsupportive and very supportive categories are 0% or none. . Based on these results, it can be concluded that the average community response to the construction of the Tiro Reservoir is included in the supportive category, which is 65%.

So from table 4.5 it can be concluded that the average community perception of the construction of the Tiro Reservoir is included in the criteria for being quite supportive with a percentage of 62%. From the data from figure 2 to 4, it proves that the most influential factors are the sub-variables of public knowledge about reservoirs and government socialization about reservoir development.

From Figure I, the average public perception of the construction of the Tiro Reservoir is included in the criteria for being quite supportive with a percentage of 62%. If you explore more clearly about these perceptions.

Looking at the percentages generated in the 3 sub-variables above in Figures 2-4, there are 2 variables that influence the perception of the community that they do not fully support the development of the Tiro Reservoir, including the variables of government socialization & community participation in socialization activities in the criteria of never and responsive. The community regarding poor dam construction in the category is quite supportive.

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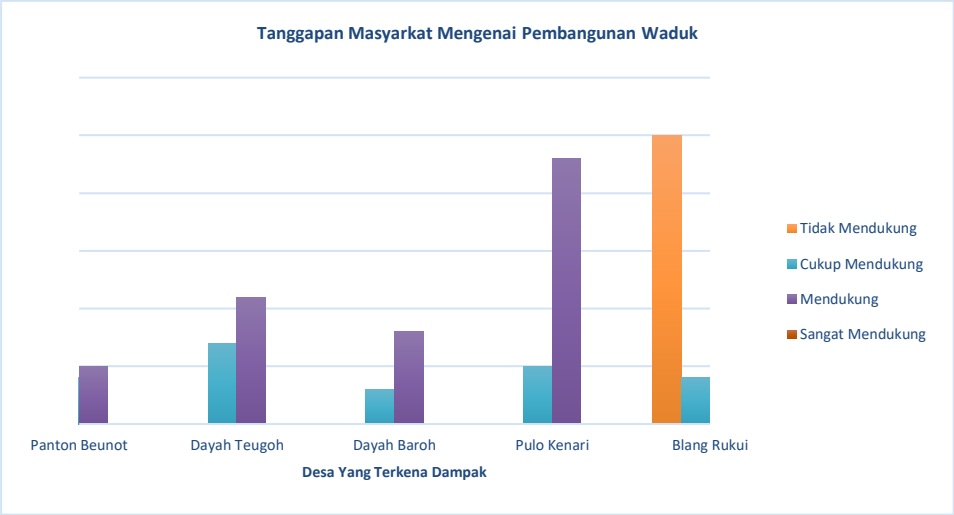

Figure 5. Affected Community Response

From the results of the calculations presented in Diagram 1 regarding the response of the affected community, there are 4 (four) villages that received benefits (from the first development to operation), namely Panton Beunot Village, Dayah Teugoh Village, Dayah Baro Village and Pulo Kenari which are located in close to development, while the village affected by the development (village to be relocated) is Blang Rukui Village, all of these villages are located in Tiro District, Pidie Regency. Of the 29 samples in the village (Blang Rukui Village) affected by the construction, 25 samples did not support the construction of the reservoir and 4 samples were quite supportive. Meanwhile, in the villages (Pulo Kenari, Dayah Teungoh, Dayah Baroh, Panton Beunot) that received the benefits, 47 samples supported the construction of the reservoir and the rest in the Villages (Dayah Teungoh, Dayah Baroh, Panton Beunot) 19 samples were sufficient to support the construction of the reservoir.

From the problems in the variables above, there are two factors that influence it, it could be that the government has not made socialization and it could be that the socialization made by the government has only been made 1 or 2 times in an inopportune time so that people cannot follow the socialization. So that people do not know the benefits of dam construction and the purpose of dam construction. If it is concluded that the role of government is very important for the community through socialization. This socialization can be categorized as very important for the community, because it can change the community's response to the benefits of dam construction and the purpose of dam construction, so that it can change people's perceptions towards a better direction for dam construction.

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4. Conclusion

From the results of the calculations that have been carried out and the discussion in this study, conclusions and suggestions can be drawn as follows:

a. Analysis of Social Feasibility through Community Perception of the Tiro Reservoir Development in Blang Rukui Village, Tiro District, Pidie Regency is included in the quite supportive category, which is 62%. This perception score indicates that there is community support in the low category for the Tiro Reservoir Development. Even if it is studied more deeply, the community has not been able to fully support this development. In addition, some people consider that the construction of the Tiro Reservoir is still quite well implemented and makes a positive contribution.

b. Based on the results of perceptions and feasibility analyzes that have been calculated and discussed, it can be concluded that the results of community perceptions, although in the low category, are still quite supportive for development and the results of the calculation of the Economic Analysis which are very profitable for government investment, the Tiro Reservoir Construction in Blang Rukui Village, Tiro District Pidie Regency is very feasible to implement.

Suggestion

a. In this development, the government is expected to be open and frequently socialize and accept inputs and fulfill the demands desired by the surrounding community. This is intended to accelerate and expedite the course of development projects, so that they do not drag on.

b. The government must be able to convince people who are not convinced that the construction of this reservoir is very beneficial for the economy and people's income.

c. The surrounding community as the party directly affected by the development is expected to be able to think critically and wisely.

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