

Study on Optimization of Irrigation Systems in Gongseng Village Megaluh District Jombang Regency

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ABSTRACT

Irrigation infrastructure management from a historical perspective is closely related to national food security. In the management of facilities and infrastructure, irrigation must be able to meet the needs of farmers. Every plant needs enough air to increase agricultural productivity. Fulfilling air needs requires adequate irrigation and drainage channels in each area. One of them is Gongseng Village, which is a village located in Megaluh District, Jombang Regency. Optimizing the performance of irrigation and drainage channels in Gongseng Village requires concrete and precise steps. This irrigation and drainage literature review discusses the optimization of irrigation channel performance. All irrigation channel buildings have the same condition, where the walls of the building are overgrown with wild plants, some of the walls of the channel buildings are damaged due to the lack of structural strength of the building. The effectiveness of irrigation channels in Gongseng Village is still not optimal, because the maintenance of facilities and infrastructure is still lacking, and public knowledge is still lacking.

Keyword : Optimization of irrigation, Irrigation system, Gongseng Village

INTRODUCTION

Gongseng Village is one of 13 villages in Megaluh District. Gongseng Village is an area bordering the Brantas River and has an area of 3.36 square kilometers. Based on BPS data (2022), it is known that 53% of the people in Jombatan Village work as farmers. For irrigation water needs, the community relies on the Brantas tributary. The river will flow tertiary water to the rice fields. This must be balanced with adequate facilities and infrastructure, as well as maintenance of channels to drain river water. The facilities and infrastructure in question are channel buildings, water gates, and garbage filters. It is known that along the irrigation channel there are many problems, such as the large amount of domestic waste from the community being dumped along the irrigation channel, causing blockages. In addition, there is a lot of soil sediment at the bottom of the river and lack of building maintenance. According to (Sadad, 2020), the factors that affect channel efficiency are the growth of grass and piles of sedimentation and garbage in the irrigation and drainage channels, which hinder the flow of water.

It is necessary to optimize irrigation channels by measuring the condition of the infrastructure and the level of channel efficiency. According to (Hidayat et al., 2021), the low level of efficiency of irrigation channels is caused by the age of the channels. The results of monitoring in the field show that many canal walls are damaged, sediment deposits, wild plants, and exploitation that is not in accordance with the techniques used by the surrounding community. Therefore, the author is interested in discussing it. It is hoped that in the end the irrigation and drainage channels can work optimally to meet the water needs of each rice field area.

METHOD

This study uses a descriptive qualitative research type. The approach used in this study is a sample approach type. This study was conducted in May 2022 in Gongseng Village, Megaluh District, Jombang Regency. The questionnaire collection system was carried out randomly. Interviews and distribution of questionnaires to 35 respondents in the village. The determination of this sample used purposive sampling by taking 30 respondents from farmers and five respondents from the irrigation administrator of Gongseng Village. The tools used in the data collection process were stationary equipment, notebooks and cellphone cameras. Researchers collected data using interview, observation, documentation and questionnaire methods. The data analysis technique used the Likert scale method, with the highest score criteria assessment given a score of 5 and the lowest weight given a score of 1, which will later be analyzed to determine the conditions in the field.

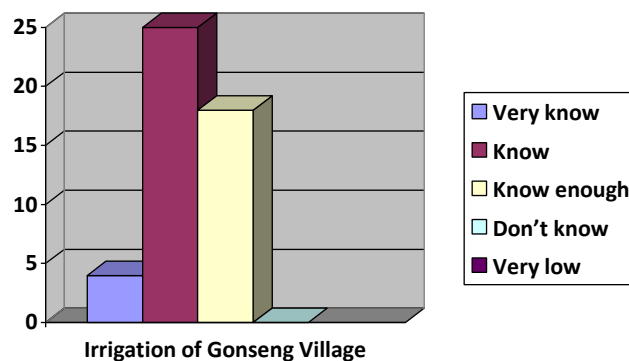
RESULT AND DISCUSSION

Data collection was obtained from the results of a questionnaire that had been compiled based on theories and opinions of experts filled out by respondents who would be used as information. Respondents involved were 35 people, namely 30 farmer groups and 5 people from the Village Water User Farmers Association (HIPPA). Response measurement used a Likert scale with a score of 5 = agree, score 4 = agree, score 3 = neutral, score 2 = disagree, score 1 = strongly disagree.

Result

Knowledge of Irrigation

The results of the responses from farmer groups and HIPPA, namely knowledge about irrigation systems along with the total score and percentage of knowledge about irrigation can be seen in picture 1. Based on table 1, it can be seen that 4% of community knowledge is categorized as very high, 25% is categorized as high and 18% is categorized as moderate. It can be concluded that the community as a whole is aware of the importance of knowing the irrigation system.



Ticture 1. Knowledge of Irrigation

Condition of Buildings

The results of the building condition analysis show that 7% of buildings are in good condition, while 18% and 10% of community respondents stated that the condition of the buildings was moderate and low. It can be concluded that the condition of the irrigation buildings in Gongseng Village is in poor condition.

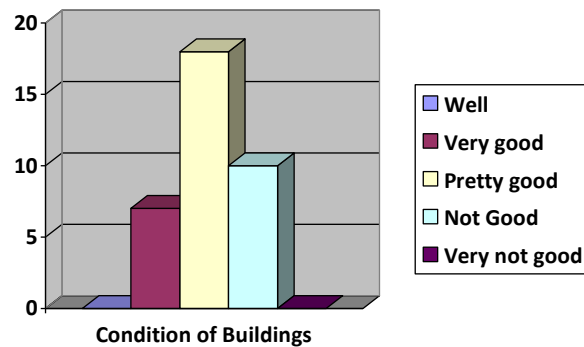




Figure 2. Public Perceptions of Building Conditions

No	Channel Type	Detail Information	Picture
1	Secondary Channel	The secondary channel in Gongseng Village uses irrigation networks technically. With permanent building conditions along the secondary channel. The results of the interview are that in the secondary channel there are plants attached to the walls of the secondary channel, so that it can affect the mass of the building's age.	Gongseng Village secondary channel 
2	Tertiary Channel	Tertiary channels in Gongseng Village use technical networks, this is because there are still many semi-permanent buildings. Field observations show that there are still many buildings on the irrigation channels that are still natural buildings.	Gongseng Village Tertiary Channel 

Conditions of Canal Irrigation

The canal building has the same condition, namely the building walls are overgrown with plants, some of the canal building walls have been damaged due to the lack of structural strength of the building. These problems will have an impact on canal construction and water loss. Meanwhile, the need for water during the pre-planting to post-harvest period must be adjusted to the needs of the plants in order to produce optimal production results. According to (Kharisma, 2017) water needs include the problem of providing water, both surface water and groundwater. In the construction of irrigation projects to obtain optimal production results, water provision must be adjusted to the time needed by

plants and the amount of water needed for agriculture so that the provision of irrigation water can be efficient.

Irrigation channels are one of the main factors in the agricultural process. The construction of irrigation channels must be in accordance with the guidelines for the construction of infrastructure. This must be a serious concern for related agencies related to problems in the field. If these problems are not resolved properly, it will result in a decrease in agricultural production due to water distribution. Therefore, improvements and supervision by related agencies must be tightened in accordance with applicable laws and regulations. According to (Jombang Regent Regulation Number 4 of 2015 concerning the Main Duties and Functions of the Jombang Regency Irrigation Public Works Service Chapter 2 Article 4), among others, carrying out the construction and improvement of primary and secondary irrigation systems in irrigation areas, supervision of water resource management in river areas, implementation of construction and maintenance of Drainage Facilities (PS), supervision and control of drainage and flood control.

Irrigation operational activities have been carried out by hipa management and farmer groups so that there is a distribution or schedule that has been determined by the UPTD. Each discharge given to irrigate rice fields in the Gongseng village area is 4 water discharges. Similarly, according to (Ludiana et al, 2017) that there are stages regarding the operation of irrigation, namely, the planning for the operation of the irrigation network is carried out every year which is useful for calculating the estimated demand for water supply, the implementation of monitoring and evaluation is carried out on the implementation and control activities.

In the maintenance of irrigation which is carried out routinely, waste transportation in each irrigation and drainage canal is carried out once every 7 days. By lifting the garbage carried by the flow of water in the river. Garbage transportation is one of the way to clean irrigation channels in order to not hinder the flow of water which will later be channeled to a lower place. The problem of transporting waste is indeed still a very difficult problem to overcome due to the lack of public awareness in protecting the environment by still throwing garbage into existing irrigation and drainage channels. Maintenance of irrigation and drainage systems does not necessarily only become the responsibility of government agencies, but the participation of the community to jointly maintain drainage irrigation channels in their respective environments.

Periodic maintenance is one of the efforts made by the management of the HIPPA in the village of Gongseng to maintain and repair irrigation and drainage buildings, that removing silt when the silt is very thick, usually according to field conditions. Repairs and maintenance have been carried out but not completely. As for the repairs carried out on the Melik River, namely around the hamlet of Gongseng 1. According to (Directorate General of Irrigation, 1997: V-1), several factors cause poor maintenance, it is Maintenance costs that are not sufficient or come not on time, there is no sense of belonging to the tertiary network, Responsible organization is not well organized.

Regular and periodic maintenance of irrigation channels needs to be done to keep the canals in good condition. According to (Directorate General of Irrigation, 1997: V-1) the maintenance is divided into three, there are routine maintenance work, periodic maintenance work, and special maintenance work. To improve the quality of production and the efficiency of water channels, irrigation the government must carry out maintenance activities and preserve the function of irrigation networks diverting productive land use by increasing community participation in the responsibility for the functioning of irrigation networks through cooperation system activities. in carrying out maintenance and care.

The condition of irrigation buildings in Gongseng Village is not optimal because there are many plants on the walls of the building and there are old buildings, there are also semi-permanent buildings that affect the irrigation system. Maintenance of irrigation is quite effective because it is following existing procedures, but the lack of government's role in implementing procedures for maintaining irrigation systems and public awareness is still lacking in the maintenance of irrigation.

CONCLUSIONS

Based on the results of the research and discussion that have been described, it can be concluded that the management of the irrigation system in Gongseng Village, Megaluh District, Jombang Regency has been running but is still not optimal, this is obtained from the condition of the old channel building,

there are plants on the channel walls and the building is still semi-permanent. The next factor is the lack of public and government awareness in maintaining irrigation channels, obtained from the large amount of sedimentation and piles of garbage along the irrigation channels.

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