

**IRRIGATION NETWORK PERFORMANCE INDEX ANALYSIS CASE STUDY OF BANDAR
 SAPAN KAYU MANANG IRRIGATION AREA, SOLOK REGENCY**

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Abstract

Utilization of irrigation networks for rice fields in West Sumatra in 2021, is able to produce 1.317 million tons of rice with a harvested area of 272,392 hectares which is spread throughout the urban districts in West Sumatra. One of them, in Solok Regency. Rice production in Solok Regency has experienced a deficit from 2018 to 2021. Therefore, it is necessary to assess the physical performance index of the irrigation network in Solok Regency, whether the decline in rice production is caused by the poor performance of the irrigation network. Determination of the physical performance index value of irrigation networks refers to the Regulation of the Minister of Public Works and Public Housing no. 12/PRT/M/2015 Regarding exploitation and maintenance of irrigation networks by modifying the assessment of the performance index, the performance index category is divided into 5 categories: very good, good, moderate, bad and very bad. The assessment is carried out by reviewing and evaluating the physical irrigation network in each Irrigation Area in Solok Regency. The results of the evaluation and assessment of the physical performance of the irrigation network in the irrigation area in Solok Regency, Bandar Panjang Selayo Irrigation Area, the physical performance index of the irrigation network is 67.63% in the good category, the Bandar Pamujan irrigation area the performance index value is 62.56% in the good category, the Irrigation Area Batang Lembang performance index 59.57% in the medium category, Bandar Lawas Sirukam irrigation area 68.90% in good category, Muaro Danau irrigation area 59.02% in the medium category, Bandar Paneh Gadang Irrigation Area performance index 59, 25% in the medium category, the Bandar Sapan Kayu Manang Irrigation Area with a performance index of 47.64% in the medium category, the Bandar Bitungan Irrigation Area with a performance index of 67.47% in the good category and the Bandar Gadang Irrigation Area with a performance index of 64.51% in the good category. The priority in handling improvements to the physical irrigation network in Solok Regency is the Bandar Sapan Kayu Manang Irrigation Area, Muaro Danau Irrigation Area, Paneh Gadang Irrigation Area and Batang Lembang Irrigation Area. Evaluated irrigation.

Keywords: Irrigation Network, Evaluation and Assessment, Performance Index, Priority

INTRODUCTION

Irrigation networks are channels, buildings, and complementary buildings which are a unit needed for the supply, distribution, giving, use, and disposal of irrigation water and have benefits for the continuity of agriculture, especially in the field of rice fields. One part of the irrigation network is an irrigation weir, an irrigation weir is a building designed across the river and is useful for raising the water table, so that water can flow from a high place to a low place for irrigation purposes. The weir building is made of river masonry, concrete and beonjong. Eman Mawardi, 2010

In addition to the benefits of irrigation weirs, it should be realized that irrigation weirs also have the risk of damage and failure and can cause collapse, if damage occurs it has an impact on the beneficiary communities and the water supply from the weir is also reduced due to water loss, from this event it can cause drought to the irrigated land and farmers' rice fields, so that farmers' yields are reduced. Therefore, in the construction and management of irrigation networks, assurance of aspects of sustainability of functions and benefits as well as the function and safety of irrigation networks is very important. (Basic Dam Planning Technical Training, 2015)

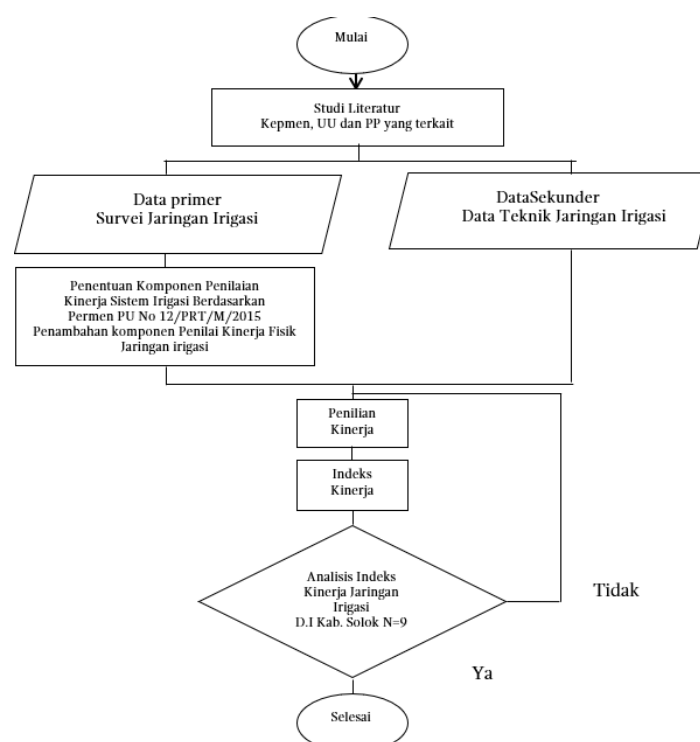
The function of irrigation networks is a factor that greatly influences the use of water as survival for farmers in farming and the use of irrigation networks. Assessment of irrigation network performance is an effort to minimize the occurrence of failures in the weir and irrigation network, but in the development of irrigation network performance has decreased caused by several factors including delayed network repair and maintenance, damage caused by humans and natural damage, from these factors causing reduced weir function for irrigation purposes and The damage has an impact on water-using farming communities. To minimize the occurrence of failures in irrigation networks, it is necessary to take a step or effort to assess the performance of irrigation weirs, as a form of reducing the impact of losses and ineffective use of irrigation networks starting from the weir as a water supply, to the rice field area.

To determine the performance of irrigation networks, it is necessary to review the performance of irrigation networks, guidelines for assessing the performance of irrigation networks through the Regulation of the Minister of Public Works and Public Housing no. 12 / PRT / M / 2015 concerning exploitation and maintenance of irrigation networks, assessment Assessment of irrigation performance index is needed to determine the quality of irrigation network services and the impact on farmers.

In connection with the description of the explanation, the author seeks to conduct research, Analysis of the performance index of irrigation networks case study of the Bandar Sapan Kayu Manang irrigation area in Solok Regency.

RESEARCH METHOD

This research process is divided into three stages, starting from collecting data in the form of primary data and secondary data, processing research data so that the output of the research is in the form of conclusions and recommendations of research results. The *flowchart* in the process of this study is described in the figure as follows.



Flowchart Image

RESULT AND DISCUSSION

Bandar Sapan Kayu Manang Irrigation Area



Picture of Bandar Sapan Kayu Manang Irrigation Area Location

Irrigated Area (D.I.) Bandar Sapan Kayu Manang is a D.I. located in Kabupaten-Solok. Geographically located at coordinates -1.248017,100.855100, DPL 1208, administratively located in Pantai Cermin District. The main building is a weir, and irrigates 1,007 ha of rice fields. The irrigation water requirement for D.I. Sapan Kayu Manang is $Q = 1.13 \text{ m}^3/\text{s}$.

For the value of the overall physical irrigation network studied and analyzed using the performance index of the irrigation system permenPUPR No.12 / PRT / M / 2015, the results of the performance index of each irrigation area in Solok Regency are explained in the following table.

Table of Physical Performance Index of Irrigation Network in Solok District

| NO. | NAME D.I | PHYSICAL PERFORMANCE INDEX | CATEGORY |
|-----|-------------------------|----------------------------------|----------|
| 1 | Bandar Panjang Selayo | 67.63 | Good |
| 2 | Banda Pamujan | 62.56 | Good |
| 3 | Batang Lembang | 59.97 | Keep |
| 4 | Banda Lawas Sirukam | 68.90 | Good |
| 5 | Lake Estuary | 56.71 | Keep |
| 6 | Paneh Gadang | 59.25 | Keep |
| 7 | Banda Sapan Kayu Manang | 47.64 | Keep |
| 8 | Bitungan | 67.47 | Good |
| 9 | Banda Gadang | 64.51 | Good |

Table 4.3 above explains that from the calculation of the physical performance index value of irrigation networks from 9 irrigation areas in Solok Regency, there are 4 irrigation areas that have low performance index values in the medium category, namely the Banda Sapan Kayu Manang irrigation area with a performance index value of 47.64%, Muaro Danau irrigation area 56.71%, Paneh Gadang irrigation area 59.25% and Batang Lembang irrigation area 59.57%, The low value of the physical performance index of irrigation networks is caused by damage to each component assessed.

CONCLUSION

For the index value of each irrigation area, Bandar Panjang Selayo irrigation area gets a physical performance index value of irrigation network 67.63% in the good category, Bandar pamujan irrigation area gets a physical performance index value of irrigation network 62.56% in the good category, Batang Lembang Irrigation Area gets a physical performance index value of irrigation network 59.57% in the medium category, Bandar Lawas Sirukam Irrigation Area gets 68.90% irrigation network physical performance index value in good category, Muaro Danau Irrigation Area gets 59.02% irrigation network physical performance index value in medium category, Bandar Paneh Gadang Irrigation Area gets 59.25% irrigation network physical performance index value in medium category, Bandar Sapan Kayu Manang Irrigation Area received a physical performance index value of irrigation network 47.64% in the medium category, Bandar Bitungan Irrigation Area received a physical performance index value of irrigation network 67.47% in the good category and Bandar gadang Irrigation Area received a physical performance index value of irrigation network 64.51% in the good category.

From the calculation of the physical performance index of irrigation networks using references to the Regulation of the Minister of Public Works and Public Housing No. 12 / PRT / M / 2015 with the development of assessment categories, development of physical performance index categories of irrigation networks and conducting surveys in Irrigation Areas in Solok Regency, the results of research on the physical performance index of irrigation networks on average Solok Regency 55.69% are in the medium performance index category.

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