

## COMMUNITY PARTICIPATION IN THE IRRIGATION NETWORK DEVELOPMENT AND MANAGEMENT PROGRAM IN THE NGULANAN VILLAGE AREA OF DANDER DISTRICT

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### ABSTRACT

This research uses logic model analysis to evaluate the effectiveness of the HIPPA Program (Productive and Safe Rural Irrigation Revitalization Program) in Ngulanan Village. The main objectives of the research are to assess the program's compliance with the technical guidelines of P3TGAI in 2021 and to understand the impact of community participation on program effectiveness. The analytical method involves the formation of a logical framework that encompasses program stages and issues related to sanitation infrastructure, as well as evaluating program compliance based on established criteria. The research results indicate that approximately 53% of the program's success criteria have been met, but there is still room for improvement, especially regarding community participation and effective communication. The analysis also reveals disparities among stakeholders, which can affect community participation. Implementation factors such as a lack of effective communication and resource constraints are also obstacles to program implementation. Therefore, efforts are needed to enhance community participation, improve communication, and allocate resources more efficiently to enhance the effectiveness of the HIPPA Program in the future. The research concludes that evaluation adopting the technical guidelines of P3TGAI 2021 is an essential instrument in assessing and improving program quality, along with a commitment to providing a positive and sustainable impact for the Ngulanan Village community.

**Keywords** : *Logic Model Analysis* , *HIPPA Program* , *Program Effectiveness*

### 1. INTRODUCTION

Although a cornerstone of Indonesian society, the agricultural sector has yet to receive priority

commensurate with its strategic role. Consequently, its productivity needs to catch up to that of other sectors, leading to several problems, one of which is water availability for rice cultivation. Water availability is often neglected in its use and management. Therefore, efforts are needed to balance water availability and demand through development, preservation, enhancement, and protection. Agriculture is vital for food supply, but irrigation issues due to uneven water resources affect productivity. An irrigation system is needed for optimal agricultural output (Saputra, 2018)

According to the Constitution of the Republic of Indonesia, Number 17 of 2019, concerning water resources, it is stated that there must be sufficient availability of water resources to meet needs as referred to in paragraph (1). Furthermore, the priority in fulfilling water needs is focused on water services for irrigation to support people's agriculture (RI, 2019). According to the Directorate of Indonesian Water Management, water needs for irrigation account for 81.4% of total water needs, making the agricultural sector the largest user of water resources (Floren *et al.* 2019)

At the beginning of 2021, Ngulanan Village, Dander District, received irrigation network assistance from the P3TGAI program, which was subsequently handed over and managed by HIPPA (Farmers Water Users Association) of Ngulanan Village. This assistance, in the form of a verocement irrigation network, was expected to improve agricultural quality and attract other farmers to join the water user group managed by HIPPA. However, the reality on the ground differed from the expectations of HIPPA administrators and the village government. After the irrigation network was established, there was no increase in the number of farmers participating in the HIPPA water user group in Ngulanan Village.

In this research, the HIPPA program has a significant relationship with society, which is

indirectly reflected in the results of social network analysis. It is essential to evaluate its logic model analysis, which is closely related to the success and continuity of the HIPPA program in Ngulanan Village, where active public participation is a critical factor in the program's success.

**1.1 HIPPA (Farmers Water Users Association)**

To realize the involvement of farmers in government policies, a legally recognized village-level irrigation network management agency is needed. This management body is known as the Farmers Water Users Association (P3A) or the Farmers Water Users Association (HIPPA). The government's role in forming P3A or HIPPA is to facilitate and provide education about the importance of having an irrigation network management institution.

HIPPA is an organization of water-using farmers that encompasses social, economic, and cultural dimensions, focusing on environmental sustainability and the spirit of cooperation. Following Regional Regulation Number 24 of 1997, HIPPA is recognized as a social organization aimed at achieving optimal results in water and irrigation network management in one or more tertiary plots, rural irrigation areas, and pump irrigation areas to improve the welfare of its members.

HIPPA, or the Farmers Irrigation Water Users Association, was established to manage irrigation water and the operation and maintenance of irrigation facilities and infrastructure based on the President's directive in 1980. The development of the Combined Farmers Water Users Association (HIPPA) aims to facilitate and encourage organizational and technical development. This development process is carried out by the guidelines stated in Presidential Instruction No. 2 of 1984, Minister of Home Affairs Regulation No. 12 of 1992, Minister of Home Affairs Instruction No. 42 of 1995, and Governor's Decree No. 77 of 1995.

HIPPA or P3A institutions are expected to be capable of carrying out their duties and responsibilities, including the construction, repair, use, and maintenance of irrigation networks and their infrastructure at the tertiary, quarterly, and village levels. Therefore, these facilities are expected to play an important role in the management of irrigation water at the tertiary level (Aristanto, 2020).

Within the HIPPA organization framework, it is mandatory to compile the Articles of Association (AD) and Bylaws (ART). These laws and procedures are developed considering the financial capabilities of the farmers and are signed by the Chairman and Secretary. These documents are then submitted to the village head and sub-district head to obtain official approval from the regent/mayor. To obtain legal status, the Articles of Association must be registered with the state court.

**1.2 Logic Model**

According to Wholey (2010:1), program evaluation is an approach to identifying questions that will be answered by the resource person, collecting relevant data, processing the data, and using the resulting information to obtain an accurate and objective understanding of a program. Knowlton & Philips (2013) detail various benefits logic models provide in increasing organizational efficiency, from the design, planning, and monitoring stages to evaluation.

According to Bappenas (2007), logic model analysis consists of four main elements, namely:

1. Inputs, which include human resources, financial resources, physical facilities, and public participation in project implementation.
2. Outputs, which are the direct results of project activities.
3. Outcomes, which are the desired achievements from project activities
4. Impact, which is the results of the project over a certain period of time in accordance with the type of projects carried out.

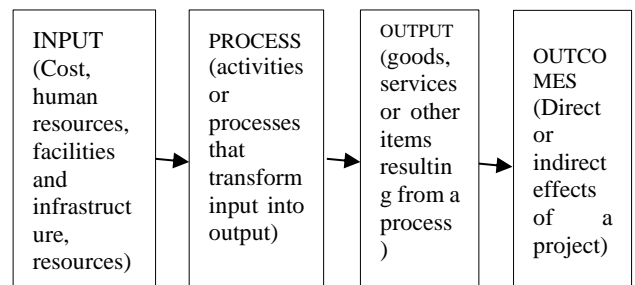


Figure 1. Logic Model Matrix  
Source: Planning Bureau, 2024

### 1.3 Society participation

According to Kaehe *et al.* (2019), participation refers to the contributions of individuals or groups in the development process, either through expressing opinions or involving themselves in activities and by providing donations in the form of ideas, energy, time, expertise, and capital. Public involvement is considered an essential instrument for understanding the conditions and attitudes of the local public. With their participation, the risk of failure can be manageable for development programs and projects. Therefore, it can be abstracted that public participation becomes a primary marker of success in implementing development programs.

The primary purpose of public participation is to open opportunities for making decisions based on the public's needs, priorities, and capacities. This will result in more realistic and appropriate planning, programs, and policies. Additionally, involving society also improves their possibility to contribute resources such as money and energy. One of the essential objectives of including the public in programs is to obtain data about the situation, needs, and views of the public, which is crucial for development. With a deep understanding of this information, development programs and projects can avoid the potential risk of failure (Herman, 2019).

Differences with previous similar studies exist. Some studies that have been conducted include (Ani Muharni *et al.*, 2018), who utilized Deep Chi-Square Analysis to study the level of farmer participation in irrigation management. Others, such as (Lili *et al.*, 2017) and (Ismail, 2016), identified the participation of P3A farmer members in irrigation network maintenance solely through Descriptive Random Sampling Analysis. On the other hand, (Niam, 2023) employed Qualitative Analysis to understand the extent of public involvement in farmers' empowerment efforts via P3-TGAI. The findings from this study demonstrate differences from those of similar studies previously discussed. While previous analyses focused solely on measuring activity and membership within an organization, this research measures activity and membership and illustrates the extent of social capital within the organization's area.

## 2. DATA AND METHODS

### 2.1 Location

The study location in this research is in the Ngulanan Village area, Dander District, Bojonegoro Regency. Ngulanan Village covers an area of 346 hectares, with 242 hectares dedicated to agriculture (Ngulanan Village Profile in 2022).

The tertiary irrigation network, Hanging Out, is located near the Sukoharjo irrigation network. The Hanging Out irrigation network currently manages irrigation areas covering approximately 150 hectares, including 70 hectares in Ngablak Village, around 7 hectares in Leran Village, and approximately 73 hectares in Ngulanan Village.



Figure 2. Condition network existing service irrigation Ngablak – Ngulanan

### 2.2 Variable Study

In research this, analysis network social was used for study structure social issues in Ngulanan Hamlet, especially in communities that use the HIPPA program.

### 2.3 Measurement Conformity at Stage Program Planning (*Input*)

As for measurements suitability of the development program channel irrigation in stages program planning as following:

Table 1 Stage Program Planning

Variable	Parameter	Source
Availability of development programs	Criteria Recipients of p3-tgai must in accordance	Book Technical Guidelines P3-TGAI
Irrigation by Government	with standard	2021

Program Socialization	Socialization of joint programs public accompanied by government local and HIPPA	Book Technical Guidelines P3-TGAI 2021
Actors Involved	Amount the actor has to involved based on standard	Book Technical Guidelines P3-TGAI 2021
Implementation discussion village 1	Implementation Village Deliberation 1 is appropriate with standard	Book Technical Guidelines P3-TGAI 2021
Location Determination	Suitability location network irrigation In accordance with standard	Book Technical Guidelines P3-TGAI 2021
Conference II	Implementation Village Deliberation II is appropriate with standard	Book Technical Guidelines P3-TGAI 2021
Establishment of HIPPA	Suitability establishment of HIPPA In accordance with standard	Book Technical Guidelines P3-TGAI 2021

At the input stage, the variables used, that is, socialization of the program to the public, are related to the increase in understanding regarding the program. Next, identify the actor. Next is the implementation discussion village, where the planning and gathering of input from the public is done actively. After that determination, the exact location becomes the main, later discussed in the discussion village second. Finally, the formation of HIPPA was carried out to ensure efficient and sustainable irrigation management.

**2.4 Measurement Conformity at Stage Program Implementation (Process)**

As for measurements suitability of the development program channel irrigation in stages implementation of the program as follow:

Table 2 Stages Program Implementation

Variable	Parameter	Source
Marker PKS's hand	Document PKS signing is mandatory in accordance with standard	Book Technical Guidelines P3-TGAI 2021
Funding	The criteria for the fund disbursement process are appropriate with standard form p melting Stage I (70%), Thawing Stage II (30%)	Book Technical Guidelines P3-TGAI 2021
Planning and Development	Criteria Planning and Development based on standard	Book Technical Guidelines P3-TGAI 2021
Supervision Implementation	Criteria Supervision and Implementation based on standard	Book Technical Guidelines P3-TGAI 2021
News	Criteria activity minutes in accordance with standard	Book Technical Guidelines P3-TGAI 2021
Deliberation III	Implementation Village Deliberation III is appropriate with standard	Book Technical Guidelines P3-TGAI 2021
Report solution implementation activity	Document report solution implementation activity in accordance with standard	Book Technical Guidelines P3-TGAI 2021

At the process stage, variables used include PKS signing and funding management, which are the main focus. The planning and development process is conducted following the approved PKS.

Supervision is carried out periodically to ensure consistency with plans and budgets. Minutes are recorded for every activity as formal proof of progress. Village Deliberation III is utilized to communicate with society and gather input. Finally, reports document the results and achievements of irrigation program implementation activities.

**2.5 Measurement Conformity at Stage Program Maintenance (Output)**

As for measurements suitability of the development program channel irrigation in stages program maintenance as following:

Table 3. Stages Program Maintenance

Variable	Parameter	Source
Utilization Infrastructure and Existing Irrigation Facilities Built	Criteria utilization infrastructure dance facilities irrigation based on standard: a. Evaluation performance b. Carrying out maintenance	Book Technical Guidelines P3-TGAI 2021
Enhancement to access irrigation	Enhancement percentage community and farmers utilize irrigation	Book Technical Guidelines P3-TGAI 2021
Institutional	HIPPA criteria-based standard: HIPPA enforces organization that can increase program sustainability	Book Technical Guidelines P3-TGAI 2021

At the output stage, the variables used include the utilization of infrastructure and irrigation facilities that have been constructed, as well as the improvements of access to irrigation.

Additionally, attention is also given to the development and sustainability of institutions, considering HIPPA criteria.

**2.6 Measurement Suitability Impact After Irrigation Program Entry (Outcomes)**

As for measurements suitability impact after inclusion of irrigation programs as following:

Table 4. Stages Program Outcomes

Variable	Parameter	Source
Amount farmers who use irrigation	Enhancement percentage amount farmers who understand and utilize it irrigation	Book Technical Guidelines P3-TGAI 2021
Change Community Behavior	Enhancement percentage Change attitudes and behavior Public	Book Technical Guidelines P3-TGAI 2021
Change results harvest	to Enhancement percentage to results farmers ' harvest	Book Technical Guidelines P3-TGAI 2021

In the outcomes stage, the variables used include the number of active farmers utilizing irrigation, changes in public behavior related to irrigation management, as well as the impact of these changes on the achieved harvest results.

**2.7 Data collection**

In this research, data is collected using two methods: primary research and secondary research. Primary research involves distributing questionnaires, conducting interviews, and making direct observations in the research area. Meanwhile, secondary research is conducted to study literature, academic papers, books, journals, reports, and other related references (Putri *et al.*, 2021).

### 3. RESULTS AND DISCUSSION

#### 3.1 Logic Model Analysis

In this section, the researcher evaluates various related variables in the irrigation program stages based on the techniques presented in the P3-TGAI 2021 technical guidelines. Evaluation is conducted at each stage of the Irrigation Program, starting from the planning stage (input), through the implementation stage (process), the stage after implementation (output), and up to the impact after the Irrigation program is implemented (outcomes). The input stage includes the availability of government irrigation development programs, program outreach, actors involved, village-level implementation discussions, site determination, village-level deliberations, and HIPPA establishment. Process stages include PKS signing, funding planning and development, implementation supervision, activity logging, village-level deliberations, and reporting on implementation activities. Meanwhile, the stage after the implementation of irrigation programs covers the utilization of infrastructure and irrigation facilities, improvement in access to irrigation, and institutional aspects. The stage of impact after the program includes the number of farmers using irrigation, societal behavioral changes, and changes in harvest results. Each program stage is evaluated in five categories: very inappropriate, inappropriate, moderately appropriate, appropriate, and very appropriate, with adjustments made according to field conditions and the existing guidelines. The evaluation results are then entered into a logical framework matrix to determine the extent to which the criteria have been fulfilled according to standards and to identify problems that arise before, during, and after the program. Subsequently, these evaluation results are described and analyzed in detail to determine the necessary repair steps and strategies to overcome the identified problems.

#### 3.2 Analysis of Input Results

At the input stage, the Government has achieved 71% of the irrigation development program's availability process. This includes several key steps, such as socializing the program with society, identifying actors involved in implementation, and conducting the first village-level implementation discussion, which is essential for gathering input

from various relevant parties, as can be seen in Figure 3.

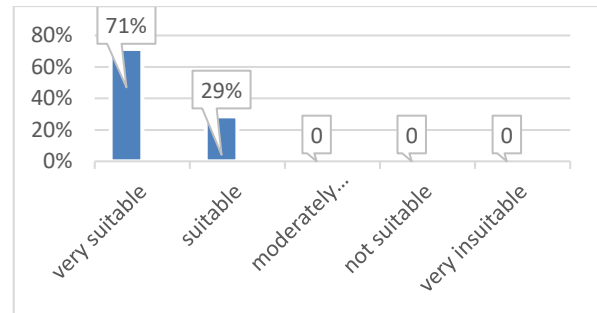


Figure 3. Input Diagram

Subsequently, the exact location is determined through discussions in the second village-level deliberation, which becomes a crucial step in the direct implementation of the program. During this process, the Farmer Water Users Group (HIPPA) is formed to ensure effective and sustainable irrigation management. These stages create a solid framework for continuing the Government's irrigation development program with measurable and targeted steps.

#### 3.3 Process Results Analysis

At the process stage, 43% of the steps taken are assessed to be carried out in accordance and very suitable. as can be seen in Figure 4. This stage covers signing the Cooperation Agreement (PKS), which formalizes the commitment of all parties involved. Next, funding is confirmed to be available to support all stages of planning and development as stated in the agreement in the PKS.

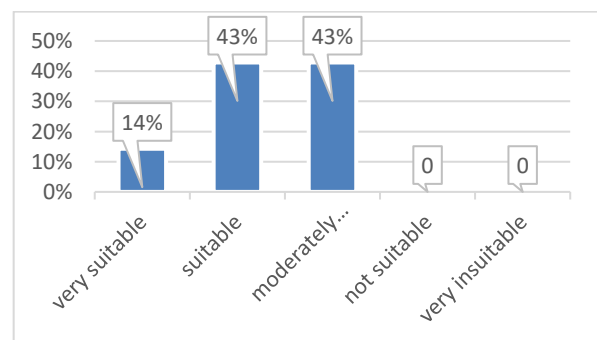


Figure 4. Process Diagram

The planning and development process is conducted thoroughly and systematically, following the agreed-upon outline. Implementation supervision is carried out

periodically to ensure the project progresses according to the previously approved plans and budgets. Every activity is documented in minutes, including Village Deliberation III, which serves as a platform to communicate the development project to society and gather further input from them. Lastly, a report on the activities is arranged to record all the results and achievements accomplished during the irrigation development program implementation, providing a clear picture of the entire process.

### 3.4 Analysis of Output Results

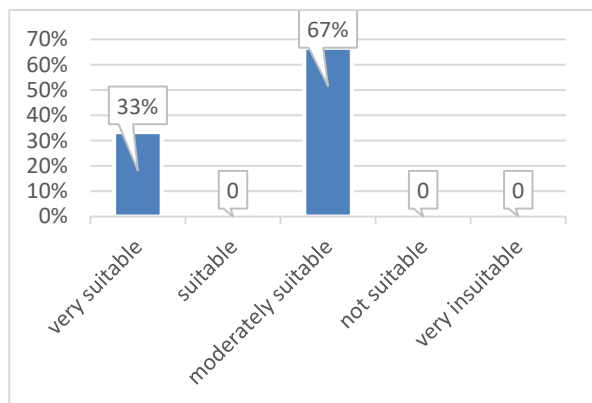


Figure 5 Output diagram

At the output stage, 33% of the planned steps have been achieved. This includes several important aspects, such as the utilization of infrastructure and irrigation facilities that have been built, which is a critical step in ensuring that farmers optimally utilize existing infrastructure. Additionally, there has been a significant enhancement in access to irrigation, enabling farmers to optimize their agricultural production. Furthermore, progress has been made in institutional aspects, with steps taken to strengthen HIPPA or similar institutions, which play a crucial role in effectively managing water resources and irrigation. Although the progress has reached only 33%, the advancements at this output stage indicate a positive direction toward achieving the objectives of the irrigation development program more broadly.

### 3.5 Analysis of Outcomes Results

At the Outcome stage, 67% of the set target has been achieved. This is reflected in several key aspects. as can be seen in Figure 6. Firstly, there has been an enhancement in the number of active farmers utilizing the irrigation system that has

been built. With more farmers using the irrigation system, it can be interpreted that the irrigation infrastructure has provided real benefits for them. Additionally, there has been a positive change in public behavior regarding irrigation management, such as an increased awareness of the importance of efficient water use and sustainable environmental practices.

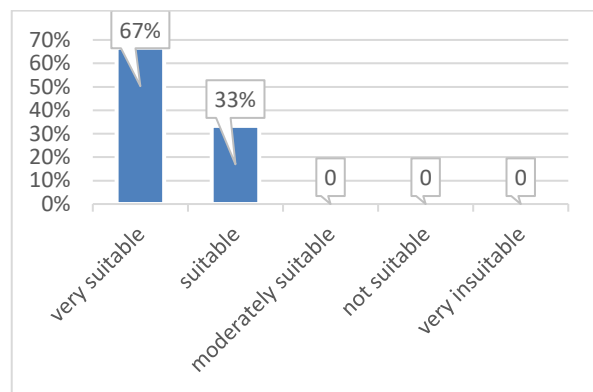


Figure 6. Outcomes Diagram

This change in behavior indicates that the irrigation development program has not only impacted technical aspects but has also influenced broader patterns of thinking and acting among the public regarding the management of natural resources. Lastly, there has been a significant change in the results of harvests achieved by farmers. This shows that the improved irrigation infrastructure and changes in public behavior have had a real positive impact on agricultural productivity and the welfare of farmers. Although the full target has yet to be achieved, the 67% achievement at the outcome stage indicates encouraging progress towards reaching the end objective of the irrigation development program.

### 3.6 Causal Factor Analysis Failure in Management and Development Programs Channel Irrigation in Ngulanan Village

Logic model analysis is used in this study to address the first and second objectives, resulting in a logical framework or matrix framework with vertical and horizontal connections. The matrix covers program stages and issues related to sanitation infrastructure and facilities. Horizontally, it includes descriptions, success criteria, suitability based on standards, and the timeframe. The arrangement of the logic model matrix begins with identifying needs or problems identified by researchers based on water issues in



Ngulanan Village before, during, and after program implementation. Researchers then explain the evaluation results regarding the suitability of irrigation program stages based on the P3-TGAI 2021 technical instructions horizontally. This logical framework is used to summarize, monitor, and evaluate program implementation, enabling the identification of differences in field application.

Generally, the role of logic model analysis is to evaluate the irrigation program from a physical aspect, measuring the suitability of program objectives based on the P3-TGAI technical guidelines for 2021. The irrigation program emphasizes the importance of public participation as key to its success, leading researchers to evaluate non-physical aspects more deeply. This research reveals that 73 people have benefited from irrigation programs, indicating strong linkages between irrigation programs and society, which indirectly relates to subsequent analyses, such as social network analysis.

It is important to note that the results of the logic model analysis indicate that the program's socialization is already following the standard. However, there needs to be an explanation regarding the equality of position between farmers, the general society, and HIPPA administrators. Thus, the different characteristics of the public can result in varying levels of participation, especially if there is no explanation for the equality of position between these groups. Therefore, researchers need to conduct a social network analysis after performing the logic model analysis to evaluate the program's standard goals' suitability and impact when implemented in Ngulanan Village.

Based on observations and interviews, it is evident that the HIPPA program has been evaluated using Table 7.15 to assess its suitability level. A matrix analysis of the logic model was formed, and the results show that more than 53% of the program's success criteria already comply with the guidelines of the P3TGAI technical in 2021. The data analysis that has been conducted reflects a commitment to ensuring that the implementation of the HIPPA program complies with the principles established by HIPPA itself, while also referring to the guidelines of the P3TGAI technical in 2021. Evaluation of this program is not simply a routine task but reflects a commitment to continually improving implementation quality. These findings provide a

basis for necessary adjustments and improvements to ensure the HIPPA program is implemented effectively and following established standards. Therefore, the evaluation that adopts the guidelines of the P3TGAI 2021 technical becomes an essential instrument in assessing and improving program quality, in line with the commitment to delivering positive and sustainable impacts for the public.

A comprehensive analysis of the research data describes three main dimensions: input, process, and output, as well as the related outcomes associated with the management and development of irrigation channels in Ngulan Village. Based on the analysis, it is evident that the HIPPA program in Ngulanan Village still needs to be more effective, with only 53% of the entire program being implemented. This aligns with the theory of effectiveness (Anis *et al.*, 2021), which emphasizes the importance of effectiveness in measuring the extent to which efforts or successes can impact or achieve desired effects. Effectiveness reflects how far the set targets have been achieved, with a high level of effectiveness indicating a high level of target achievement. In other words, effectiveness indicates success in reaching previously set goals. It is measured based on how output levels, organizational policies, and procedures can achieve the set goals.

Furthermore, if we examine the program's lack of success, it becomes apparent that the Ngulan Village HIPPA Program needs to involve public participation sufficiently. This aligns with the theory of public involvement by Sanoff in Suciati (2007), which highlights the main objective of involving the public in the design decision-making process and engaging respondents, HIPPA administrators, and rice field owners/tenants to ensure their voices are heard in designing decision-making processes and repair plans, thereby promoting public participation as part of the overall objectives.

Moreover, the failure of the HIPPA Program may also be linked to implementation policy factors, as explained in George C. Edwards III's theory (Agustino, 2016). These factors include communication and power sources. Effective communication in policy implementation requires clear and practical information delivery from the implementing party to the relevant stakeholders. Clear and effective communication can lead to understanding among policy implementers and society regarding program objectives and



procedures. In the case of the HIPPA Program in Ngulanan Village, inadequate communication may have contributed to misunderstandings among policy implementers and society regarding program implementation.

Additionally, power sources are crucial to policy implementation. More power sources, including human resources, budget, equipment, and authority, can seriously hinder program implementation. The need for more implementation of the HIPPA Program may be due to limitations in adequate power sources.

#### 4. CONCLUSION

Overall, the logic model analysis used in this study plays an essential role in addressing the first and second objectives by producing a logically structured and connected framework both vertically and horizontally. Program stages and issues related to sanitation infrastructure in Ngulanan Village can be identified through the logical framework matrix. Additionally, evaluating the suitability of the irrigation program based on technical standards is also possible using this framework.

This analysis not only considers the physical aspects of the program but also non-physical aspects, especially public participation. Findings indicate that public participation in the irrigation program is crucial to program success. However, it was found that there is inequality among various related parties, which can affect the level of participation. Therefore, social network analysis becomes essential for understanding the impact of program suitability targets on the public.

The evaluation results show that around 53% of the success criteria of the program have been fulfilled, which is in line with the specified technical guidelines. However, this also indicates that there is still room for improvement in program implementation, especially in ensuring public participation and effective communication. The program's effectiveness is measured based on the achievement of the goals set beforehand, so compliance with technical guidelines is only one aspect of overall effectiveness.

The failure of the HIPPA program in Ngulanan Village can be linked to a lack of public participation and the need for more adequate policies to be implemented. Ineffective communication and limited resources have become obstacles to the optimal implementation of the program. Therefore, improving public

participation, enhancing communication, and allocating more resources are essential steps to increase the effectiveness of this program in the future. Thus, evaluation referring to the guidelines of the P3TGAI 2021 technical becomes an essential instrument in assessing and improving program quality, in line with the commitment to delivering positive and sustainable impacts for the people of Ngulanan Village.

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