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Strategy To Improve The Operation And Maintenance Performance Of Irrigation Networks For Water-Using Farmers (P3A) In The Pekan Dolok Irrigation Area, Sub-District. Dolok Masihul, District, Serdang Bedagai

Eko Pramasto Wardi[1], T Sabrina[2], T Erry Nuradi[3]
[1,2,3]Program Studi Perencanaan Pembangunan Wilayah dan Pedesaan, Universitas Sumatera Utara, Indonesia

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ABSTRACT
Field problems that occur in the Operation and Maintenance of irrigation networks are obstacles for the Water-Using Farmer groups and the relevant Government in improving the effectiveness of irrigation Operation and Maintenance performance which need to be followed up immediately. This research is quantitative research with a SWOT analysis approach. Using the total sampling method with a total of 85 respondents consisting of all members of the Water User Farmers. The research results were proven to have proven validity and reliability with rtable = 0.1796. Analyzed using SWOT (Strength, Weakness, Opportunity, Threat). The results of the SWOT matrix conclude that the performance of Water User Farmers has not been effective in the Operation and Maintenance of Irrigation Networks, as well as conclusions regarding 4 strategies to maximize its effectiveness, namely: (1) Involve all members of Water User Farmers without exception in all activities held by the User Farmer group. Water and programs held by related agencies such as construction and maintenance of irrigation network facilities. (2) Involve local communities around the Irrigation Network Operation and Maintenance area in the construction of irrigation network facilities so that they also feel they can benefit from the government program. Use craftsmen from them and not use craftsmen from other areas. (3) Form a security team consisting of members of the Water Using Farmers group without exception to resolve the problem of unilateral water monopoly by several individuals. (4) Hold regular events involving the parties involved, namely members of Water-Using Farmers, local communities and related agencies so that good communication patterns and a sense of belonging between each other are established.

Corresponding Author:
Eko Pramasto Wardi
Program Studi Perencanaan Pembangunan Wilayah dan Pedesaan, Universitas Sumatera Utara, Indonesia
pramasto1982@gmail.com

INTRODUCTION

Availability of adequate water and a good irrigation system are very important in agriculture. Efficient irrigation systems and sustainable water management practices can increase

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agricultural production. In line with the opinion of Lubis et al (2016), the main sector that best supports agricultural businesses is irrigation. The existence of irrigation is very necessary for farmers and is expected to function as well as possible so that it can guarantee farmers in carrying out their activities as farmers. Growth in the agricultural sector and the consequent increase in national food security can be realized if there is improvement in irrigation performance. If the operational targets can be carried out well, then it can be accompanied by routine maintenance to keep the irrigation network in good condition. It is monitored from an appropriate water distribution system, both time and quantity which have an impact on increasing crop yields and increasing farmers' income (Mustaniroh, 2011). The author sees that there is discontinuity and the performance of P3A has not been optimal in taking appropriate steps to increase agricultural yields, one of which is through managing the irrigation system. Several visible problems that the author discovered while at the location required further handling and strategies so that Operation and Maintenance of the Irrigation Network could be carried out effectively and optimally. Some of these problems are, (1) Low performance of P3A farmers in managing the irrigation system, (2) Lack of coordination between P3As, (3) Internal problems of P3A, (4) Involvement of individuals who want to monopolize the irrigation system, (5) As well as other problems that arise. will be explained next. Based on these initial observations and the theoretical basis supported by experts, the researchers took the locus located in Pekan Dolok Masihul District, Serdang Bedagai Regency as a research location to research and develop an analysis of the performance of P3A farmers in the OP irrigation network. Apart from that, this research is closely related to the rural development study program because this research is directly related to the development of irrigation infrastructure in rural areas. Apart from that, this research will focus on the management of irrigation networks which is an important part of managing natural and water resources in rural areas and in the context of regional development, management of these resources is very important to support agricultural activities and the lives of local communities.

The article begins with an explanation of the background, namely the reasons for the need to do research, supported by supporting references/literature. References are not allowed to use non-standard sources such as Wikipedia or blogs, etc. (Abdul, 2017). Editor (2018) requires that articles be original and not plagiarized by other people's work. Goals are written at the end of the background. The minimum number of references used is eight. Writing references and citations refers to the APA style.

METHODS

The research method used is a descriptive research method with a quantitative approach with the aim of formulating a strategy to improve the operational performance and maintenance of irrigation networks for water-using farmers (P3A) located in the Pekan Dolok irrigation area, Kec. Dolok Masihul, Kab. Serdang Bedagai. The total population is 108 people who are water-using farmers. The sampling method used is the total sampling method using the Slovin formula, namely:

$$n = N/(1+Ne2)$$

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n = 108/1,27 = 85 Responden

The variables studied are variables that describe the internal and external conditions of the organization that influence the operation and maintenance performance of irrigation networks, namely variable (1) The role of P3A in irrigation network operations based on Minister of Public Works Regulation No.32/PRT/M/2007, variable (2)) P3A in maintaining irrigation networks based on Minister of Public Works Regulation No.32/PRT/M/2007, variable (3) The role of district/provincial level technical agencies according to their authority in operating irrigation networks based on irrigation network management (chapter IX articles 55 to 64 PP 20/2006). This variable is studied as a benchmark for filling in the IFAS EFAS Matrix in the SWOT Analysis.

Data collection was carried out in 2 stages, namely the primary data stage through direct surveys using questionnaires on 85 respondents and the second stage, namely the secondary data stage through literature studies, field observations and collection of other related data. Data were processed using a Likert Scale with 5 indicator intervals, namely Strongly Agree (SS), Agree (S), Neutral (N), Disagree (TS), Strongly Disagree (STS). The validity and reliability of the measuring instruments were tested using the Pearson validity test method, the reliability test used the Cronbach's Alpha method via the SPSS version 26 statistics application.

Data were analyzed using a Likert scale descriptive analysis table, the percentage results became a reference for filling in the IFAS EFAS Matrix in the SWOT analysis. The IFAS EFAS Matrix measurement results will produce X-Axis and Y-Axis Coordinates which will indicate the location of the Quadrants on the SWOT Diagram. This quadrant will determine an effective strategy to improve the performance of Operation and Maintenance of the Water-Using Farmer Irrigation Network (P3A) in the Pekan Dolok irrigation area, Kec. Dolok Masihul, Kab. Serdang Bedagai.

RESULTS AND DISCUSSION

Likert Scale

The Likert scale tabulation results show the percentage of responses for each measurement scale consisting of Strongly Agree (SS), Agree (S), Neutral (N), Disagree (TS), Strongly Disagree (STS). The results show the percentage of respondents' responses to questions on the research questionnaire.

Table 1. Likert Scale Measurement Table for 85 Respondents

No	Questions	Likert Scale				
		SS	S	N	TS	STS
1	The Role of P3A/GP3A in Irrigation Network Operations	307	415	181	93	24
		30%	41%	18%	9%	2%
2	The Role of P3A/GP3A in Irrigation Network Maintenance	122	298	130	107	23
		18%	44%	19%	16%	3%
3	The Role of Relevant Government	157	482	159	132	90
		15%	47%	16%	13%	9%

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1. The role of P3A/GP3A in irrigation network operations, 30% of respondents strongly agree, 41% agree, 18% of respondents are neutral, 9% of respondents disagree, 2% of respondents strongly disagree
2. The role of P3A/GP3A in maintaining irrigation networks, 18% of respondents strongly agree, 44% agree, 19% of respondents are neutral, 16% of respondents disagree, 3% of respondents strongly disagree
3. The role of relevant government, 15% of respondents strongly agree, 47% agree, 16% of respondents are neutral, 13% of respondents disagree, 9% of respondents strongly disagree

Validity Test

Degree of Freedom (df=N-2) is 83, the rtable value is 0.1796 and the significance level is 5% (0.05). The results of the Validity Test show valid and significant results as evidenced by the value of each rcount>rttable (0.1796) and the significance level of each item is p<0.05, which means that the measuring instrument has a significant level of correlation, the test results are proven to be valid .

Table 2. Recapitulation of Validity Test Results for items 1-16

	Questionnaire															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Rcount	0,386	0,513	0,262	0,449	0,389	0,236	0,508	0,359	0,480	0,357	0,378	0,384	0,277	0,318	0,202	0,316
Table	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796
Results	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v

Table 3. Recapitulation of Validity Test Results for items 17-32

	Questionnaire															
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Rcount	0,369	0,185	0,218	0,278	0,625	0,313	0,726	0,580	0,736	0,630	0,726	0,761	0,609	0,271	0,307	0,538
Table	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796	0.1796
Results	V	v	v	v	v	V	v	v	v	v	v	v	v	v	v	v

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Realibility Test

The results of the Reliability Test show that the Cronbach's Alpha value is 0.860 > the Alpha value of 0.6, which means that each item is proven to be consistent.

Table 4. Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
.860	32

Matriks IFAS

The IFAS Matrix or Internal Factor Analysis Summary is the conclusion of internal factors, namely Strength and Weakness.

Table 5. IFAS Matrix (Internal Factor Analysis Summary)

No	Strategic Strength Factors	Sig.	Bobot	Rating	Skor
1	The number of P3A members is quite large (108 members)	5	0,12	5	0,60
2	The salary facilities received by P3A members make members enthusiastic in carrying out the duties of the Irrigation Network OP	4	0,10	4	0,39
3	Adequate Irrigation Network Facilities	4,5	0,11	4,5	0,49
4	The picket system in the OP Irrigation Network task makes things easier for P3A members because the workload is shared evenly	4	0,10	4	0,39
5	Direct coordination between farmers and P3A members in resolving problems in the field	4	0,10	4	0,39
	Sub Total X1		0,52		2,25
No	Strategic Weakness Factors	Sig.	Bobot	Rating	Skor
1	There are only a few active members working so that even though the OP Irrigation Network is running, the results are not as expected. This is because many farmers are late and do not even pay the agreed fees	4	0,10	2	0,19
No	Strategic Weakness Factors	Sig.	Bobot	Rating	Score
2	There are still many water users who do not want to pay the agreed fees, thereby disrupting the distribution of wages for P3A members who have worked	4,5	0,11	1,5	0,16
3	Quite often it happens that there are individuals who want to monopolize the water flow in certain rice fields/land only	3	0,07	2,9	0,21
4	Lack of coordination and communication between P3A members means that miscommunication	4	0,10	2	0,19

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	sometimes occurs during operation and maintenance of irrigation networks				
5	Lack of awareness of the farming community or P3A/GP3A members regarding their responsibilities in irrigation management	4,5	0,11	1,5	0,16
	Sub Total X2		0,48		0,92
	Total Keseluruhan		1		3,17

Strength Indicator (Strength), x1 = 2.25,
Weakness Indicator, x2 = 0.92
X-axis (Difference between Strengths and Weaknesses), x1-x2 = 1.33

EFAS Matrix

The EFAS Matrix or External Factor Analysis Summary is a conclusion from internal factors, namely Opportunity and Threat.

Table 6. EFAS Matrix (External Factor Analysis Summary)

No.	Faktor Strategis Opportunity	Sig.	Bobot	Rating	Skor
1	There is an opportunity for cooperation in the issue of development and improvement of OP Irrigation network facilities between the relevant Governments by involving the surrounding community	5	0,11	5	0,54
2	The local community can feel the benefits directly through wages by providing them with work to build and repair Irrigation OPs	5	0,11	5	0,54
3	The government plays an active role and participates in helping the smooth running of OP Irrigation	4	0,09	4	0,35
4	Involving the community in positive activities to build a collective sense of ownership so that the community is not indifferent to the OP Irrigation Network	4,3	0,09	4,3	0,40
No.	Strategic Opportunity Factors	Sig.	Bobot	Rating	Skor
5	The surrounding community can be involved to be more proactive in supporting the P3A program by offering other useful activities that bring prosperity to the community, such as jointly finding ways to deal with waste processing which is often thrown carelessly along the OP Irrigation route.	4,5	0,10	4,5	0,44
	Sub Total Y1		0,49		2,26
No.	Threat Strategic Factors	Sig.	Bobot	Rating	Skor

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1	There are illegal fees/levies from individuals which lead to a monopoly on the use of irrigation channels 4.5	4,5	0,10	4,5	0,44
2	Individuals who work together to monopolize water discharge in certain rice fields/land only 4.5	4,5	0,10	4,5	0,44
3	Delays in construction and repair of OP irrigation network facilities when sudden situations occur such as embankments breaking due to heavy rain 5	5	0,11	5	0,54
4	Garbage problems caused by lack of attention from the surrounding community 5	5	0,11	5	0,54
5	People who do not like OP irrigation network activities because they are not included 4.5	4,5	0,10	4,5	0,44
	Sub Total Y2		0,51		0,65
	Total		1		5,18

Opportunity Indicator (Opportunities), y1 = 2.26
Threat indicator, y2 = 0.65
Y axis (Difference of values between Opportunities and Threats), y1-y2 = 1.61

Grand Strategy

X Axis Coordinate = 1.33; Y Axis Coordinate = 1.61

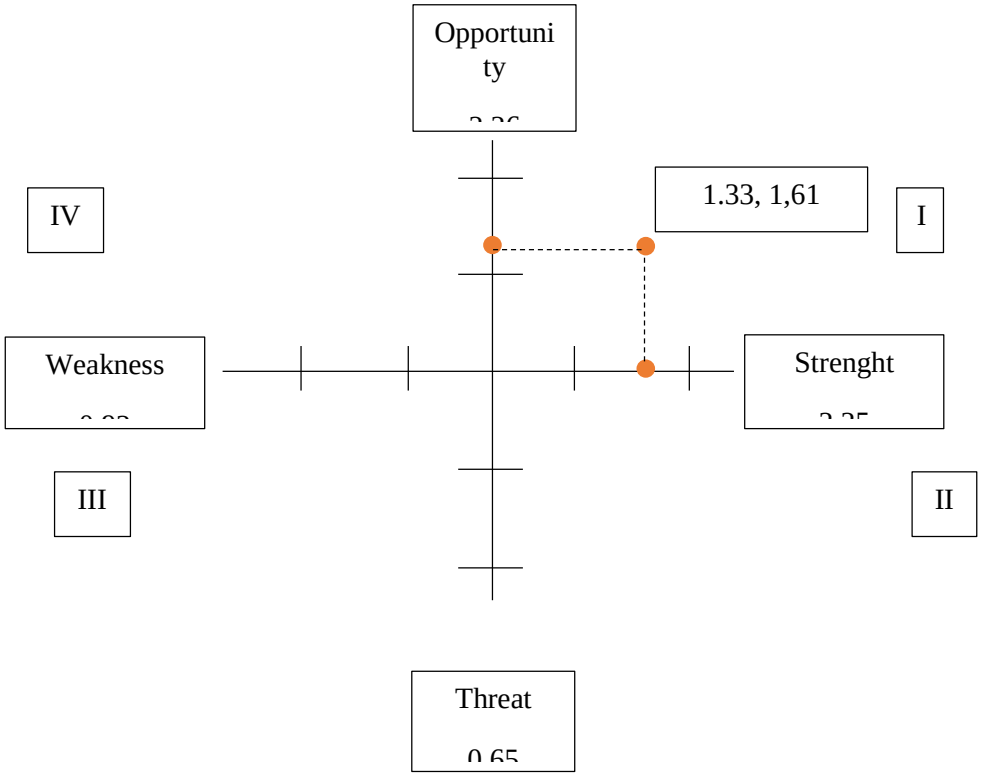

Figure 1. SWOT diagram

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Based on the SWOT diagram above, it can be seen that the calculated coordinate points are in the First Quadrant with coordinates 1.33 and 1.61. Thus, an aggressive strategy will be used. Aggressive strategy is a strategy that prioritizes conceptualization, working on priority things in the long, short or urgent term to be used as a reference in establishing a larger strategy to achieve the desired goals.

Matriks SWOT

Table 7. SWOT Matrix Identification Table

No.	Strength (S)	Weakness (W)	Opportunity (O)	Threat (T)
1.	The number of P3A members is quite large (108 members)	There are only a few active members working so that even though the OP Irrigation Network is running, the results are not as expected. This is because many farmers are late and do not even pay the agreed fees	There is an opportunity for cooperation in the issue of development and improvement of OP Irrigation network facilities between the relevant Governments by involving the surrounding community	There are illegal fees/levies from individuals which lead to a monopoly on the use of irrigation canals
No.	Strength (S)	Weakness (W)	Opportunity (O)	Threat (T)
2.	The salary facilities received by P3A members make members enthusiastic in carrying out the duties of the Irrigation Network OP	There are still many water users who do not want to pay the agreed fees, thereby disrupting the distribution of wages for P3A members who have worked	The local community can feel the benefits directly through wages by providing them with work to build and repair Irrigation Ops	Individuals who work together to monopolize water discharge in certain rice fields/land only
3.	Adequate Irrigation	Quite often it happens that there are individuals who want to monopolize the water	The government plays an active	Delays in the construction and repair of

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	Network Facilities	flow in certain rice fields/land only	role and participates in helping the smooth running of OP Irrigation	OP irrigation network facilities during sudden situations such as embankments breaking due to heavy rain
4.	The picket system in the OP Irrigation Network task makes things easier for P3A members because the workload is shared evenly	Lack of coordination/communication between P3A members means that miscommunication sometimes occurs during operation and maintenance of irrigation networks	Involving the community in positive activities to build a collective sense of ownership so that the community is not indifferent to the OP Irrigation Network	The waste problem is caused by a lack of attention from the surrounding community
5.	Direct coordination between farmers and P3A members in resolving problems in the field	Lack of awareness of the farming community or P3A/GP3A members regarding their responsibilities in irrigation management	The surrounding community can be involved to be more proactive in supporting the P3A program by offering other useful activities that bring prosperity to the community, such as jointly finding ways to deal with	People who don't like OP irrigation network activities because they are not included

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	waste processing which is often thrown carelessly along the OP Irrigation route.

Aggressive Strategy

The results of the IFAS and EFAS matrix calculations determine that the coordinates (0.205, 0.4) are in quadrant I, namely Aggressive Strategy. An aggressive strategy in SWOT is an approach used by a company or organization to face competition with proactive and courageous actions. This strategy aims to aggressively take over market share, gain competitive advantage, and significantly improve company performance. This strategy prioritizes conceptualization, working on priority things in the long, short or urgent term to be used as a reference in determining a larger strategy to achieve the desired goals. In this research, the author has concluded that the appropriate aggressive strategy is,

1. Build strong partnerships with the local government/community
   a. Utilizing the large number of P3A members to collaborate with relevant governments in the development and improvement of OP Irrigation network facilities.
   b. Involve local communities in Irrigation OP development and improvement projects to increase direct benefits for them and build a sense of collective ownership of the project.
2. Increase the efficiency and performance of P3A members
   a. Utilize the salary facilities received by P3A members to increase their enthusiasm and performance in carrying out the duties of the OP Irrigation Network.
   b. Optimizing the picket system for Irrigation Network OP tasks to ensure an even and efficient distribution of workload among P3A members.
3. Strengthen community involvement and support
   1. Encourage direct coordination between farmers and P3A members in resolving problems in the field to build strong and mutually supportive relationships.
   2. Invite the local community to be actively involved in positive activities that support the P3A program, such as overcoming the problem of processing waste that pollutes OP Irrigation lines.
   3. Form a security team consisting of P3A group members without exception to resolve the problem of unilateral water monopoly by several individuals.

CONCLUSION

Based on the research results, several conclusions were obtained as follows: Validity test results show that each rcount>rttable value has a significance level of p<0.05, which means

the questionnaire is proven to be valid. The results of the Reliability Test show that the questionnaire is proven to be consistent with a calculated r value (0.860) > Cronbach's Alpha value of 0.6. Thus, the data collection measuring instruments for SWOT Analysis are proven to be valid and reliable. The aggressive strategy obtained from calculating the IFAS EFAS Matrix and the SWOT Grand Strategy Diagram includes several points, namely (1) Building strong partnerships with the government/surrounding communities by utilizing the large number of P3A members to collaborate with relevant governments in development and improving OP Irrigation network facilities, then involving local communities in development and improvement projects for Irrigation OPs to increase direct benefits for them and build a sense of collective ownership of the project. (2) Increasing the efficiency and performance of P3A members by utilizing the salary facilities received by P3A members to increase their enthusiasm and performance in carrying out the duties of the OP Irrigation Network as well as optimizing the picket system for the duties of the OP Irrigation Network to ensure an even distribution of workload and efficient among P3A members. (3) Strengthen community involvement and support by encouraging direct coordination between farmers and P3A members in solving problems in the field to build strong and mutually supportive relationships, then inviting local communities to be actively involved in positive activities that support the P3A program, such as solving problems processing waste that pollutes OP Irrigation lines and forming a security team consisting of members of the P3A group without exception to resolve the problem of unilateral water monopoly by several individuals. This research shows a strong emphasis on the validity and reliability of the instruments used for data collection. The results of the validity and reliability tests show that the instruments used in the SWOT analysis have been proven to be valid and reliable with an appropriate level of significance. This confirms that the data obtained is reliable and accurate. Through IFAS and EFAS matrix calculations, this research succeeded in determining strategic coordinates in quadrant I, known as the Aggressive Strategy quadrant. This determination shows carefulness in interpreting the internal and external conditions of the organization and determining appropriate strategic direction. This indicates a research contribution to the understanding and application of SWOT analysis in a specific context. The proposed strategy reflects innovation and decisiveness in facing the challenges facing the organization. By utilizing internal strengths, such as the large number of P3A members and motivating salary facilities, as well as external opportunities, such as collaboration with the government and local communities, this strategy emphasizes developing strong partnerships, increasing efficiency and community involvement. The addition of new points, such as the formation of a security team, also shows courage in developing a comprehensive and adaptive strategy. Through this approach, this research not only provides practical solutions, but also opens the door to new thinking and contributes to the strategic management literature, especially in the context of water resources management and agriculture.

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