RELATIONSHIPS AMONGST IRRIGATION FACILITIES, FARMER'S PARTICIPATION AND ORGANIZATIONAL CLIMATE TO FARMING GOALS

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Abstract

The greatest governmental investments to farming were irrigation facilities. Those were important to developed and built Indonesian farming. To preserved the conditions, it needed caring from everyone especially their user. It means that farmer's participation, and user organizations were the most important thing.

The research was conducted in Molek irrigated zone, on Kepanjen, Malang regency. Used three independent variables i.e. irrigation facilities, farmer's participation, and user organizational climate, and one dependent variable that was farming goals, then analyzed by statistics included validity and reliability test, correlation and linear regression.

The result showed that irrigation facilities (X_1), farmer's participation (X_2), and user organizational climate (X_3) had a positive correlation (direct relationship) with the farming goals (Y), followed equation $Y = 0.455 + 0.3322\ X_1 + 0.2845\ X_2 + 0.1662\ X_3$.

PREFACE

Agricultural growth purposed to increased the quality of its products, farmer's income, and the ability to executed the farming well. The greatest governmental investment to farming were irrigation facilities, in order to fulfill water needs on farming. So, it's important to kept them running well. Farmer's participation and user organizational climate might become the biggest influenced factor to the well running irrigation facilities.

The objectives of this study were to understood the relationship amongst irrigation facilities, farmer's participation, and organizational climate to farming goals, by using the increased of crop and quality of products, farming income and the ability to execute well farming as the indicators.

For farmers, this research gave a conclusion, that amongst the three research factor which one of them had to be increased in order to optimized the agriculture goal more. And for the government, especially local watering service, this research gave a suggestion which steps has to be taken in order to raised farmer's income and at last to support national development.

LOCATION

This research conducted on Molek irrigated zone, on Kepanjen, Malang regency from April to May 2000.

METHOD

The data filled by a questioner and direct interview to 97 farmers from 927 farmers on the area that decided by using "Proportional Sampling Method". The proportion of sample could be seen at Table 1 below.

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Table 1.
Proportion of population and sample

No	Name of Village	Population	Sample
1.	Kepanjen	88	9
2.	Kdg Pedaringan	74	8
3.	Panggungrejo	85	9
4.	Mangunrejo	77	8
5.	Tegalsari	88	9
6.	Penarukan	89	9
7.	Kemiri	85	9
8.	Cepokomulyo	94	10
9.	Sengguruh	87	9
10.	Jenggolo	86	9
11.	Talangagung	74	8
		927	97

The questioner instrument consisted of 47 questions, and those covered three independent variables and one dependent variable. The independent variables were:

1. Irrigation facilities (X_1) was irrigation means, that is, completed irrigation building and channel to control water from supplying and using for irrigation process. Covered 19 questions, i.e.:
   - Irrigation channel: primary, secondary, tertiary, quarterly and thrown channels.
   - Main irrigation buildings: separating, tapping, and measuring buildings.
   - Complement irrigation buildings: waterfall building, water tunnel, and sluice.
2. Farmer's participation (X_2) was organizational willing of farmers to be active as natural organizer, manpower and working capital on production process. Covered 10 questions, i.e.:
   - Activity on farmer's meetings.
   - Willing to contribute with money or power.
   - Water management on irrigation channel.
   - Operation and maintenance.
3. Organizational climate (X_3) was farmer's organizational condition that covered 9 questions, i.e.:
   - Practical decision making.
   - Communications flow.
   - Honored to farmer's performance.
   - Technology providing.

While the dependent variable was farming goal (Y), that is physical goals (field harvest and incomes) on one growing season and evaluation to water irrigation management. Covered 7 questions, i.e.:

- Water acceptance in irrigation channel.
- Farmer's income.
- Water acceptance in paddy field.
- Crop production.

The value index has a interval dimension (score) with four alternative answers for each question. Score 1 for very disagree, score 2 for disagree, score 3 for agree and score 4 for very agree.

The collected data then grouped as a quantitative data. And then analyzed by parametric statistical analysis as validity and reliability test, correlation and linear regression.

The validity test used equation:

$$r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$$

With:

r_{xy} = Correlation coefficient between variable X and Y
N = Total of the respondent
ΣN = Total score of variable X
ΣY = Total score of variable Y
ΣXY = Total product of multiplication between variable X and Y
ΣX^2 = Total duplication of variable X
ΣY^2 = Total duplication of variable Y
$\Sigma(X)^2$ = The duplication of total variable X
$\Sigma(Y)^2$ = The duplication of total variable Y

If r_{xy} value > 0.33, can be said that the question is valid.

Reliability test, used equation:

$$r_{tt} = \frac{n(r)}{1+(n-1)r}$$

With:
r_{tt} = Reliability coefficient symbol
n = Total empirical indicator used to measure the concept
r = Interrelation average between empirical indicators

Correlation analysis, used equation:

$$r_{y1,2,...} = \sqrt{\frac{b_1 \sum X_1 Y + b_2 \sum X_2 Y + ... b_k \sum X_k Y}{\sum Y^2}}$$

Simple linear regression, used equation:

Y = A + BX

where: Y = dependent variable
X = independent variable
A, B = constant of the equation

$$a = \frac{\sum Y_i - b \sum X_i}{n}$$

$$b = \frac{n \sum X_i Y_i - \sum X_i \sum Y_i}{n \sum X_i^2 - (\sum X_i)^2}$$

Double linear regression, followed equation:

$$\mathbf{Y = b_o + b_1 X_1 + b_2 X_2 + b_3 X_3}$$

RESULT AND DISCUSSION

1. Validity and Reliability Test

The validity and reliability test showed that almost the entire question given on questioner were valid and reliable, except 2 questions are invalid (Table 2). It means that both of the questions could not guaranteed the consistent answer from respondents.

The coefficient of validity were excepted if stands at $\geq$ 0.33 with error opportunity (p) < α (0.05), while the coefficient of reliability was excepted if the r_{tt} value stands at $\geq$ 50 (Ebel and Frisbie, 1991; in Saukah and Kasbolah, 1995).

Validity and reliability coefficient can be seen at Table 2.

Table 2 showed that most of variables on the research had a high validity and reliability coefficient. It means that perception to answer all the questions given were similar, so the research phenomena could be explained.

2. Variables Description

Irrigation facilities

The conditions can be seen at Table 2 below:

Table 2.
The conditions of irrigation facilities at Molek

No	Conditions	Frequency (%)			
		VA	A	DA	VDA
1.	Irrigation channel	13.1	72.7	13.6	0.6
2.	Main Irrigation buildings	12.4	69.9	17.4	0.3
3.	Complement irrigation buildings	16.2	72.9	10.9	-

Notes: VA : Very agree
DA : Disagree
A : Agree
VDA : Very disagree

Table 2 showed that the conditions were in good. Water supply from primary, secondary and tertiary channels always smooth and enough so did the quarterly and throwing channel. The caring conditions were also including management and maintenance activities. The irrigation buildings were also in good condition, it proved by the respondent's answer that more than 80 % of the answers were agreed. Nevertheless, the complement irrigation buildings were functionally good, because more than 80 % respondent were agree.

Farmer's participation

The farmer's participation can be seen at Table 3 below:

Table 3.
The farmer's participation at Molek Irrigation Channel

No	Conditions	Frequency (%)			
		VA	A	DA	VDA
1.	Activity on farmer's meetings.	25.8	74.2	-	-
2.	Willing to contribute money or power.	8.3	61.6	29.1	1
3.	Water management on irrigation channel.	12.4	80.4	6.2	1
4.	Operation and maintenance.	13.4	69.1	17.5	-

Notes: VA : Very agree
DA : Disagree
A : Agree
VDA : Very disagree

Table 3 showed that the respondents were already active to be organized. They also attended to paid organization regularly payment in order to support organization's programs, but they wanted to know the using of their payments, so the organization officer had to reported the using money. Farmers also attended to caring and maintaining the irrigation channel and building, but not to operating the sluice. Generally, the water management on irrigation channel was the responsibility of all farmers and they attended to participated on the activities. They were also realized that the activities would influence to their good field harvesting.

Organizational climate

The organizational climate conditions can be seen at Table 4 below:

Table 4.
The organizational climate at Molek Irrigation Channel

No	Conditions	Frequency (%)			
		VA	A	DA	VDA
1.	Practical decision making.	22.7	64.0	12.8	0.5
2.	Communications flow.	26.1	63.9	9.3	0.7
3.	Honored to farmer's performance.	11.3	86.6	2.1	-
4.	Technology providing.	28.3	71.2	0.5	-

Notes: VA : Very agree
DA : Disagree
A : Agree
VDA : Very disagree

Table 4 showed that the respondents were already did the practical decision-making, through discussion or by following the officer suggestions, because the communication flow was also in good. A rewards for farmer's performance were required in order to support the organizations work. Technology providing were also required in orders to motivate the farmers to raising their productivity.

Farming goals

The farming goal conditions can be seen at Table 5 below:

Table 5.
The farming goals at Molek Irrigation Channel

No	Conditions	Frequency (%)			
		VA	A	DA	VDA
1.	Water acceptance in irrigation channel.	16.5	77.3	6.2	-
2.	Farmer's income.	37.1	40.2	20.6	2.1
3.	Water acceptance in paddy field.	6.2	84.5	9.3	-
4.	Satisfactions	14.4	57.7	26.8	1

Notes: VA : Very agree
DA : Disagree
A : Agree
VDA : Very disagree

Table 5 showed that water acceptance in paddy field, especially in dry

season always enough for farming process, and attended to farmers satisfactory on irrigation services.

4. Relationship analysis

The relationship analyzed by Linear Regression Analysis method.

Relationship between irrigation facilities and farming goal.

Relationship between irrigation facilities and farming goal were explained by formula $\mathbf{Y = -0.9484 + 1.3286\ X_1}$, and the errors estimation for each coefficient and constant were 10.5% and 31.4%. The coefficient of determination (R^2) was 0.6278, its mean that about 62.78% farming goal variable variation could be explained by the formula. That is, water supplies on the irrigation channel, the channel operating and maintaining and the irrigation buildings, both main and supplement buildings, and the functional. The contribution of irrigation facilities variables to the farming goal were straight involve because it has F calculated 160.232 that more than F table i.e. 3.94. It means that the variable could give a contribution to predicted farming goals.

The correlation between the two variable were positive (direct relationship) with coefficient 0.7923. It could be said that the better of irrigation facilities, the better of farming goals reached out.

Relationship between farmers participation and farming goal.

Relationship between farmer's participation and farming goal were explained by formula $\mathbf{Y = -0.341 + 1.38\ X_2}$, with error estimation for each coefficient and constant were 10.2% and 30.1%. Determinate coefficient (R^2) was 0.5685, its mean that about 56.85% farming goal variable variation could be explained by the formula. That is, the activity to follow the meetings, the idea and power contribution, the work planning, the money contributing, and the responsibilities to operate and maintain the irrigation facilities. The farmer's participation variable contribution to the farming goal were straight involve because it has F calculated 125.169 more than F table i.e. 3.94. It means that the variable could give a contribution to predicted farming goals.

The correlation between the two variable were positive (direct relationship) with coefficient 0.754. It could be said that the better of farmer's participation level, the better farming goals reached out.

Relationship between Organization climate and farming goal.

Relationship between organization climate and farming goal were explained by formula $\mathbf{Y = 1.214 + 0.3323\ X_3}$. Determinate coefficient (R^2) was 0.4942, its mean that about 49.42% farming goal variable variation could be explained by the formula. That is, organizational communication, problem solving, information flow to the new technologies. The organization climate variable contribution to the farming goal were straight involve because it has F calculated 85.002 more than F table i.e. 3.953. It means that the variable could give a contribution to predicted farming goals.

The correlation between the two variable were positive (direct relationship) with coefficient 0.703. It could be said that the better organizational climate, the better of farming goals reached out.

Relationship amongst irrigation facilities, farmer's participation and organization climate to farming goal.

Relationship amongst irrigation facilities, farmer's participation and organization climate to farming goal were explained by formula: $\mathbf{Y = 0.455 + 0.3322}$

X_1 + 0.2845 X_2 + 0.1662 X_3, the error estimation for each coefficient and constant were 20.1%, 18.1%, 16.3%, and 31.4%. The coefficient determination (R^2) was 0.6482, its mean that about 64.82% farming goal variable variation could be explained by the formula. The irrigation facilities, farmer's participation and organization climate variable contribution to the farming goal were straight involve because it has F calculated 86.596 more than F table i.e. 3.94. It means that the variable could give a contribution to predicted farming goals.

The correlation between the two variable were positive (direct relationship) with coefficient 0.8051. It could be said that the better of irrigation facilities, farmer's participation and organization climate variable, the better of farming goals reached out.

CONCLUSION

1. The relationship between irrigation facilities and farming goal were explained by formula **Y = -0.9484 + 1.3286 X_1**. The relationship between farmer's participation and farming goal were explained by formula **Y = -0.341 + 1.38 X_2**. The relationship between organization climate and farming goal were explained by formula **Y = 1.214 + 0.3323 X_3**., And the relationship amongst irrigation facilities, farmer's participation and organization climate to farming goal were explained by formula **Y = 0.455 + 0.3322 X_1 + 0.2845 X_2 + 0.1662 X_3**.
2. The influence of irrigation facilities, farmer's participation and organization climate to the farming goal, explained by R^2 value i.e. 64.82%.
3. The correlation coefficient was 0.8051 showed that there is 80.51% relationship amongst irrigation facilities, farmer's participation and organization climate with farming goal.
4. The irrigation facilities are the biggest influenced factor to farming goals in Molek Irrigating area.

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Table 2.
Instrument's Validity and Reliability coefficients.

Variable	Point	Validity			Reliability	
		r_{xy}	p	Status	r_{tt}	Status
Irrigation facilities (X_1)	1	0.189	0.307	Invalid	0.834	Reliable
	2	0.567	0.000	Valid		
	3	0.433	0.000	Valid		
	4	0.645	0.000	Valid		
	5	0.388	0.000	Valid		
	6	0.574	0.000	Valid		
	7	0.559	0.000	Valid		
	8	0.485	0.000	Valid		
	9	0.540	0.000	Valid		
	10	0.729	0.000	Valid		
	11	0.371	0.004	Valid		
	12	0.448	0.000	Valid		
	13	0.474	0.000	Valid		
	14	0.433	0.001	Valid		
	15	0.494	0.000	Valid		
	16	0.569	0.000	Valid		
	17	0.539	0.000	Valid		
	18	0.527	0.000	Valid		
	19	0.508	0.000	Valid		
	20	0.578	0.000	Valid	0.702	Reliable
	21	0.520	0.000	Valid		
	22	0.425	0.002	Valid		
	23	0.586	0.000	Valid		
	24	0.572	0.000	Valid		
	25	0.506	0.001	Valid		
	26	0.575	0.000	Valid		
	27	0.692	0.000	Valid		
	28	0.297	0.068	Invalid		
	29	0.653	0.000	Valid		
	30	0.450	0.004	Valid	0.672	Reliable
	31	0.565	0.000	Valid		
	32	0.622	0.000	Valid		
	33	0.621	0.000	Valid		
	34	0.621	0.000	Valid		
	35	0.468	0.019	Valid		
	36	0.314	0.017	Valid		
	37	0.553	0.000	Valid		
	38	0.546	0.000	Valid		
	39	0.546	0.000	Valid	0.686	Reliable
	40	0.492	0.000	Valid		
	41	0.758	0.000	Valid		
	42	0.706	0.000	Valid		
	43	0.599	0.000	Valid		
	44	0.516	0.001	Valid		
	45	0.490	0.006	Valid		