

PRODUCTIVITY ANALYSIS OF RICE FARMING SYSTEM IN RIAM KANAN IRRIGATED AREA BANJAR, SOUTH KALIMANTAN

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Abstract

Irrigation of Riam Kanan is project financed by Japanese Government with potential area 25,900 hectare, which covered sub area A,B,C,D and E. The purpose of the project was to fullfil the need of all plants according to planting pattern that was schedule, technically through system and drainage.

The research has purposed to recognize Riam Kanan irrigation astablishment effect on frequency of plantation, productivity and income of rice farming system.

To get data in this research use methods survey and observation, respondent or farmer object by random data shortinty. Research result that by Rian Kanan irrigation project can increase frequency of plantation, productivity and income of rice farming system, although not optimally obtained. For all condition is enough to realized that result of rice farming system irrigated area higher than unirrigated area.

Key words : productivity analysis, Riam Kanan irrigation project

INTRODUCTION

Irrigation since the 1st five years development plan (Repelita) has been developed along with government's program to achieve food sovereignty, especially rice. Guarantee of water for irrigation has an important role in the production of rice because hybrid seeds, fertilizers, pesticide, and a good planting system, will results goods producyion if the irrigation is sufficient and water supply as adjusted with needs of plants, besides that it has and the advantage to enlarge plantation area, adds the sum of planting per year also escalates the productivity of the field per hectare (Suparmoko, 1980).

The irrigation is an important produc tion factor to succeed plant's life, there by the availability in quality and quantity

manner is crucial and determining the successfullness of agricultural development. According to Asnawi in Varley (1995) that irrigation not only escalates production directly but also gives plant the response to chemical fertilizer. Hybrid rice variety will be higher is given proper doze of chemical fertilizer and the plant's response will appear fit is well irrigated.

In South Kalimantan, there is irrigation project finance by Japanese Government, the Sumitomo Foundation. This project is irrigation of Riam Kanan was done in for steps since 1988. Step I was finished and started operating in 1992 which covered sub area B with potential area 6202,5. The purpose of the project was to fullfil the need of all plants according to planting pattern that was scheduled technically through system and drainage on 25,900 hectare. Physical target of project development partially achieved by subs B farming area about 6000 hectare. Although from project enabling point of view at is not

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optimally obtained because from 6000 hectare of the irrigated field only 4237 hectare used.

Planting pattern done by farmer is Local per year, Unggul-Local per year and Unggul-Unggul per year that forwards two times planting intensity a year with results 2.02 tons per hectare (Local) and 2.36 tons per hectare (Helwiyen, 1986). Last production is Local 2.8 tons per hectare and Unggul 3.2 tons per hectare (Henny, 1991). Local rice that produce one time a year (IP 100) then Unggul produce twice a year (IP 200) The kind of local rice in sub area B are Siam, Unus, Pandak and the Unggul rice are IR 64 and IR 66. Supposively by Riam Kanan irrigation project rice production will increase to 4-4.5 tons per hectare.

In effort to develop irrigation field to increase rice production in South Kalimantan, it is necessary to do practices to improve the water arrangement, by building water dams to ensure water availability in the planting area and drainage channels to ease and speed field draining.

Water usage system that used optimally in this particular rice planting, causing irrigation functioning system to decrease. Many fields still cannot be obtained in sub area B about $\pm 22\%$ and most of the bushy field or sleeping field or absentee. The impact is that rice production decrease with low crop and it caused farmers income to decrease also. Besides that, planting pattern causing unoptimum and inefficient user of production factors.

This research has purposed to recognize Riam Kanan irrigation establishments's effect on frequency of plantation schedule, productivity and income of rice farming system.

METHODS OF RESEARCH

Area and Schedule of Time

This research done in Riam Kanan irrigation project, Banjar, South Kalimantan on

August 1998 (sub area B) for irrigated and unirrigated area by purposive and respondent farmer by random in Penggalaman, Sungai Batang, Sungai Rengas and Gudang Hirang.

Data Analysis Methods

To analysis data in this research there are some analysis as follow:

1. Frequency of plantation schedule of rice farming system.

We use data vast of area and vast of rice field for irrigated and unirrigated area.

$$I = L/T$$

Where:

I = frequency of plantation schedule

L = vast of rice field

T = vast area

Value of frequency of plantation schedule proportionally with rice farm inflow or revenue.

To realized significant or not, make t-statistic mean different testing :

$$t\text{-account} = \frac{I(1)-I(2)}{[S^2(1/N_1+1/N_2)]^{1/2}}$$

where:

I(1) = average for frequency of plantation schedule in irrigated area

I(2) = average for frequency of plantation schedule in unirrigated area

S^2 = combination variance

$$S^2 = \frac{(N_1-1)S^2_1 + (N_2-1)S^2_2}{(N_1 + N_2 - 2)}$$

N_1 = amount of sample irrigated area

N_2 = amount of sample unirrigated area

t-table = $(n_1 + n_2 - 2 ; \alpha / 2)$

If $t\text{-account} > t\text{-table}$ means irrigation influential for frequency of plantation schedule that irrigated higher than unirrigated area.

If $t\text{-account} \leq t\text{-table}$ means irrigation no influential for frequency of plantation schedule that irrigated lower than unirrigated area.

2. Productivity analysis of rice farming system.

We use data production of rice (kg/ton), Value of production of rice (Rp) and vast of area (hectare), in irrigated and unirrigated area.

$$P = \frac{\text{Production or value production rice}}{\text{Vast of area}}$$

To realized significant or not, make t-statistic mean different testing :

$$t\text{-account} = \frac{P(1) - P(2)}{[S^2 (1/N_1 + 1/N_2)]^{1/2}}$$

where:

$P(1)$ = average for productivity in irrigated area

$P(2)$ = average for productivity in unirrigated area

If $t\text{-account} > t\text{-table}$ means irrigation influential for productivity that irrigated higher than unirrigated area.

If $t\text{-account} < t\text{-table}$ means irrigation no influential for productivity that irrigated lower than unirrigated area.

3. Income of rice farming system analysis

We use data production of rice (kg/ton). Value of production of rice (Rp) for total revenue and total cost (fertilizer,

pesticide, seed and wage man hour) in irrigated and unirrigated area.

$$\begin{aligned} NR &= TR - TC \\ &= P_y.Y - P_x.X \end{aligned}$$

where:

NR = total income of rice farming system (Rp)

TR = total revenue (Rp) = amount of product times price of product

TC = total cost = amount of input times price of input

To realized significant or not, make t-statistic mean different testing :

$$t\text{-account} = \frac{NR(1) - NR(2)}{[S^2 (1/N_1 + 1/N_2)]^{1/2}}$$

where:

NR (1) = average for income in irrigated area

NR (2) = average for income in unirrigated area

If $t\text{-account} > t\text{-table}$ means irrigation influential income that irrigated bigger than unirrigated area.

If $t\text{-account} \leq t\text{-table}$ means irrigation no influential for income of rice farming system that irrigated lower than unirrigated area.

ESTIMATION RESULT AND DISCUSSION

Irrigatin is a technology in a farming production process, according to Gathak (1984), technology improvement in farming generally has two characteristics:

- to form a new production factor higher than a fixed amount input case.
- output in same amount can be obtained by combining input to alter the production cost.

1) Analysis frequency of plantation schedule for rice farming system

Supply of good irrigation and controlled will be increase frequency of plantation schedule so can be planting a whole year about twice or three times a year. Besides that, it can to confirm planting pattern according to needs and market demand to get more income.

Readiness of water very effect to planting pattern and frequency of plantation schedule rice farming system. With irrigation project, to expect frequency of plantation schedules increase from once a year for twice or three times a year.

Basically in location that farmer have frequency of plantation schedule twice a year to irrigated area by Local-Unggul, exactly in unirrigated area have once a year by Local. Mean frequency of plantation schedule in irrihated area 1.2753 and unirrigated area 1.0703. As there are more absentee area in irrigated area so utility area still to less. In irrigated area not 200% usefull area becaue trouble like amoun of water can't on time.

To know real different by significant level for frequency of plantation schedule irrigated and unirrigated area make t-test mean different like see Table 1 :

*Table 1.
Result of t-test Frequency of Plantation
Schedule 1998/1999*

Variable	Irrigated	Unirrigated
Mean	1.2753	1.0703
Deviation Standard	0.5173	0.3916
t-account	24.652	
t-table	2.358	
Significant level	99%	

Source : Result analysis data, 1999

From table 1 can that for significant level 99% get t-account (24.652) > t-table

(2.358) means frequency of plantation schedule irrigated higher than unirrigated area and significant (real different) so can accept for this analysis. Because in irrigated area farmer try to optimally planting rice or usually vast of area by rice farming system. Farmer unirrihated area can't usuallt area by maximal, can see from frequency of plantation schedule still lower because lack of water.

2) Analysis productivity of rice farming system.

Productivity of farming system is maximum capacity to produce with some input, so the effect of farming system can be counted from the level of productivity. Total productivity means that productivity of all input which accumulated from effect of all them (Widodo, 1986).

Productivity of area is compare of production or value production rice with vast of area per hectare. If productivity of area high so increases revenue and income rice farming system like seeing in Table 2:

*Table 2.
Result of Mean Productivity In Irrigated &
Unirrigated Area '98/'99*

Variable	Irrigated Area		Unirrigate Area	
	Kg/ha	Rp. /ha	Kg/ha	Rp. /ha
Mean 1 st plant session	3054.13	4,839,162	2.720	4,636,700
Mean 2 st plant session	1986.37	3,312,795	-	-
Mean a year	3006.83	4,815,069	2.720	4,636,700
Total a year	5040.50	8,151,957	2.720	4,636,700

Source : Result analysis data, 1999

To know real different by significant level productivity irrigated and unirrigated area make t-test mean different like see Table 3 :

Rice Farming System
(Siti Asmaul and Slamet)

Table 3.
Result of-test Productivity
1998/1999

Variable	Irrigated Area		Unirrigated Area	
	tons/ha	Rp/ha	tons/ha	Rp/ha
Mean	3.006	4,838,069	2.724	4,819,162
Deviation Standard	1.016	1,646,318	1.077	2,132,982
t-account	29.873	29.539	-	-
t-table	2.358	2.358	-	-
Significant level	99%	99%	-	-

Source : Result analysis data, 1999

From Table 2 can see that mean productivity in irrigated higher than unirrigated area. Mean productivity a year for irrigated 3.006 ton per hectare and 2.72 ton per hectare for unirrigated area. It happens because in irrihated area try to twice plantation pattern by Local ang Unggul more optimally than unirrigated area. Besides that, in irrigated area more absente area so and distrub other area and unirrigated area just plant Local that need a lot of time 8 months and 4 months again is bero (no activity to rice farming system).

From Table 3 can see that for significant level 99%, productivity of physic get t-account (29,873) > t-table (2.358) means productivity irrigated higher than unirrigated area and significant (real different) so can accept for this analysis. Also in value of productivity, get t-account (29.539) > t-table (2.358) means value of productivity irrigated higher than unirrigated area and significant (real different). Because in irrigated area farner optimally with twice a year planting rice or usually vast of area by rice farming system.

3) Analysis income of rice farming system.

Income of farming system in differences between value of production

with cost of farming system. Technically, it means result to decrease total revenue and cost for production process (Soeharjo, 1973).

Analysis income get from total revenue to less with production cost for a year, assumption it happen short time so not less by value depreciation for fixed production factor. For result can see in Table 4 :

Table 4.
Result of Mean Income
In Irrigated and Uniriigated Area '98/'99

Variable	Irrigated	Unirrigated
Mean 1 st plant session	1,649,887	1,554,911
Mean 2 nd plant session	928,943	-
Mean a year	1,730,091	1,554,911
Total a year	2,578,830	1,554,911

Source : Result analysis data, 1999

From Table 4 can see that mean income in irrigated bigger than unirrigated area. Mean income a year for irrigated Rp. 1,730,091 per hectare and Rp. 1,554,911 per hectare for unirrigated area. It means farmer in irrigated area have revenue bigger than unirrigated area, so usefull irrigation Riam Kanan try optimally.

To know real different by significant level for income of rice farming system irrigated and unirrigated area make t-test mean different can see in Table 5 :

Table 5.
Result of t-test Income of Rice Farming System
1998/1999

Variable	Irrigated	Unirrigated
Mean	2,922,293	2,125,071
Deviation Standard	2,408,784	3.093,591
t-account	12.253	-
t-table	2.358	-
Significant level	99%	

Source : Result analysis data, 1999

From table 5 can see that for significant level 99% get t-account (12.253) > t-table (2.358) means income of rice farming system irrigated bigger than unirrigated are and significant (real different) so can accept for this analysis.

CONCLUSION AND IMPLICATION

A. Conclusion

From research result can be conclude that :

1. Frequency of plantation schedule of rice farming system in irrigated higher than unirrigated area.
2. Productivity of rice farming system in irrigated higher than unirrigated area.
3. Income of rice farming system in irrigated bigger than unirrigated area.

B. Implication

1. Minimize absentee of area because can increase infection for other area so must decrease by rent to farmer.

2. Increase utility of water from Riam Kanan irrigation project because not optimally and different to rice farming system.

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