COSTS AND REVENUE OF IRRIGED AND RAINFED RICE FARMING IN KLATEN DISTRICT

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ABSTRACT
Population growth and continuous economic growth increase the demand for food, water and energy. Food security is a condition where food needs are met both for households, such as quality, safety, nutrition, equitable distribution, and affordable. Food security is an important thing in food self-sufficiency. The purpose of this study was to analyze the cost of income and efficiency in irrigated and rainfed rice fields in Klaten district. The method used in determining the sample is done by purposive sampling. Data analysis uses farming analysis such as cost, income and efficiency analysis. The results show that rainfed and irrigated rice fields in Klaten Regency are profitable and efficient in terms of efficiency. The income from irrigation rice farming obtained by farmers is 22,344,090.67/ha and Rainfed is 15,037,684.32/ha and the efficiency of Irrigated lowland rice farming is Rp. 2.11 and Rainfed is Rp. 1.46.

KEYWORDS Cost, Revenue, Efficiency, Rice Farming

INTRODUCTION

Indonesia is still an agricultural country, meaning that agriculture plays an important role in the overall national economy. Rice is the main food crop. Since the birth of human civilization, agriculture has played a role as an activity that is very essential in sustaining life and human life. This sector is the only sector that is highly dependent on land, water, climate and surrounding ecosystem resources. Given the different climatic conditions, soil and water structures in each area, the types of rice plants in each area are generally different. These differences generally lie in the age of the plant, the number of yields of rice quality, and resistance to pests and diseases (Suryana, 2004).

Population growth and continuous economic growth increase the demand for food, water and energy. Food security is a condition where food needs are met both for households, such as quality, safety, nutrition, equitable distribution, and affordable. Food security is an important thing in food self-sufficiency. In Indonesia, the production of food commodities is rice, namely West Java, Central Java and East Java. According to the Central Statistics Agency (2020) the three provinces with the highest rice production

(GKG) in 2018 and 2019 were Central Java, East Java, and West Java. However, in 2019 there was a decline in production in the three provinces compared to 2018 production.

Limited land and other productive sources have the potential to make farmers only become wage laborers in the system there, which leads to structural poverty. When food prices are high, low-wage farmers are no longer able to meet their food needs. This has led to an increase in the number of malnutrition in Indonesia. In the end, it is predictable that poverty and hunger are big problems (Puspadi, 2005).

Rural Agribusiness Development is one of the programs aimed at reducing poverty. The basic problem faced by farmers is the lack of access to sources of capital, markets and technology, as well as weak farmer organizations. For this reason, farmers should have the ability to cultivate farming properly to reduce poverty. The right way is by planning for farming, participating in counseling and discussions between farmer groups.

Klaten Regency became the research site because Klaten Regency is an area of Central Java which according to the Central Statistics Agency is the highest rice production province (GKG) in 2018 and 2019 in Indonesia. The Klaten area also has rainfed and irrigated rice fields. Therefore, the researcher wants to examine the cost, income and efficiency of irrigated and rainfed rice cultivation in Klaten district.

Table 1 Rice Production Harvest Area Klaten Regency

No	Season (Year)	Harvest Area
1	2012	63.195
2	2013	61.358
3	2014	63.751
4	2015	66.546
5	2016	70.603

Source: Badan Pusat Statistik Klaten 2017 Year

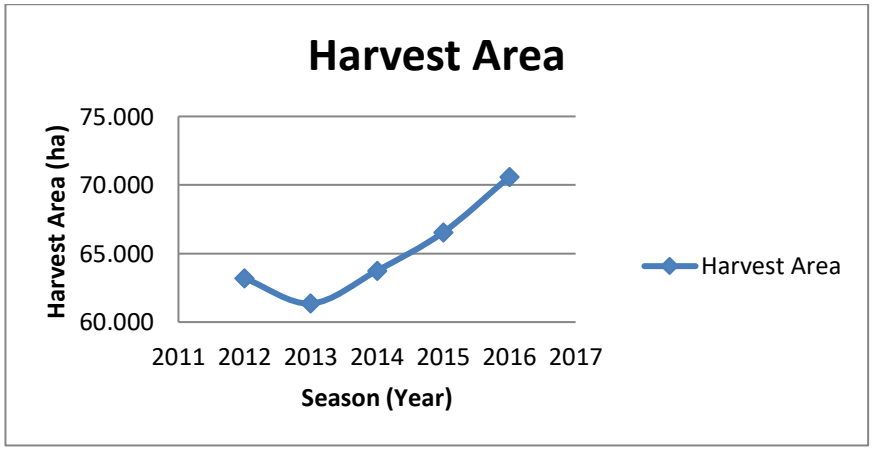

Figure 1. Harvest Area

Harvested area in Klaten from 2012 to 2016 tends to increase. There was a decrease in harvested area in 2013 and the rest always increased. This harvested area occurs in Klaten because land that was not previously planted with rice to eliminate leafhoppers is now being reused so as to increase the harvested area in Klaten. The increase also occurred because of the Klaten program and targets to meet rice production for Klaten as well as for the nation.

RESEARCH METHOD

The choice of research location was carried out by purposive method or intentionally based on certain considerations. According to Singarimbun and Efendi (2008), purposive is the selection of research locations based on certain considerations based on previously known characteristics or traits in accordance with the interests of the researcher.

a. Determination of District Sampling

The determination of the sub-district sample area was carried out intentionally by considering the sub-district criteria based on the harvested area in the sub-district and the largest harvested area for rainfed rice in the sub-district in Klaten. The harvested area and production level of lowland rice for each sub-district in Klaten Regency are both rainfed and irrigated.

b. Sample Farmer Selection Method

Singarimbun and Efendi (2008) state that if the data is analyzed by parametric statistics, the number of samples must be large so that it can follow a normal distribution. Samples that are normally distributed are samples whose number is 30.

The determination of the sample villages was carried out intentionally, namely by considering the largest number of farmers from villages in the sub-districts of Cawas, Bayat, Karangdowo, Wonosari. Based on the consideration of the widest production area, Karangasem village (cawas), ngerangan village (bayat), pile village (karangdowo) and present village (wonosari) were chosen.

Determination of the number of sample farmers from each village was carried out by the proportional random sampling method, namely taking the number of samples following the proportion of the number of farmers in the sample villages. The number of samples taken in this study were 40 lowland rice farmers, 20 rain-fed farmers and 20 irrigated rice farmers in the four villages selected as sample farmers. (Nazir, 1988)

Data analysis method

1. Cost, Revenue and Revenue Analysis

a. Cost Analysis

The concept of cost in this study is the cost of undertaking. Operating costs are costs that are actually paid during the production process by farmers in one growing season which consist of costs for production facilities which include costs for seeds or seeds, fertilizers, chemical drugs, external labor costs, internal labor costs and other costs. which includes the cost of salvage, land tax, depreciation and transportation costs. Formulated as follows:

TC = cost of production facilities (purchase cost of seeds/seeds + purchase cost of fertilizer + cost of purchasing chemical drugs + cost of external labor + cost of internal labor + other costs (cost of safety + transportation + depreciation cost + land tax)

Information :

TC = Cost of operating (Rp)

b. Acceptance Analysis

Revenue is the multiplication between the results of the paddy rice products sold and the price of the paddy paddy which is formulated as follows:

TR = Q x P

Information :

TR = Total Revenue / Total rice paddy receipts (Rp)

Q = Quantity of Lowland Rice Production (kg)

P = Price / Price of paddy rice products (Rp/kg)

c. Income Analysis

Lowland rice farming income is the difference between total revenue and total farming costs, formulated as follows

Pd = TR – TC
Information:
Pd = Income / Rice Farming Income (Rp)
TC = Total Cost / Cost of cultivating lowland rice (Rp)
TR = Total Revenue / Total rice paddy receipts (Rp)
2. Farming efficiency

Efficiency analysis of lowland rice farming using Revenue Cost Ratio. The R/C Ratio is known as the ratio (ratio) between farm revenues and farm costs. Mathematically it can be written as follows:

Efficiency of lowland rice farming (R/C Ratio) =
Information :
TR = Total Revenue / Receipt of paddy rice farming (Rp)
TC = Total Cost / cost of cultivating in lowland rice farming (Rp)
From the formula listed above, the following criteria are obtained:
R/C > 1, it means that lowland rice farming is efficient
R/C = 1, it means that paddy rice farming is in a break even point condition
R/C < 1, it means that lowland rice farming is not efficient

RESULT AND DISCUSSION

Rice farming revenue is obtained from the results of rice production multiplied by the selling price of rice. Production, price and revenue in rice farming can be seen in table 2.

Table 2. Average Production, Price and Revenue of Irrigated and Rainfed Rice Farming in Klaten Regency Planting Time I in 2021

No	Description	Average Production, Price and Revenue	
		Ha/Irriged	Ha/Rainfed
1	Production (Kg)	4.857,41	3.269,06
2	Price (Rp/Kg)	Rp 4.600,00	Rp 4.600,00
3	Revenue (Rp)	Rp 22.344.090,67	Rp 15.037.684,32

Source: Primary Data Analysis

The production of irrigated paddy in farming is on average 4.857.41 kg/ha. The selling price of dry grain harvested by farmers' rice farming is Rp. 4.600.00/kg. The average income of irrigated rice farmers is Rp. 22,344,090.67/ha. Meanwhile, the production of rainfed lowland rice in farming is an average of 3,269.06 kg/ha. The selling price of dry grain harvested by farmers' rice farming is Rp. 4.600.00/kg. The average income of rainfed rice farmers is Rp. 22,344,090.67/ha.

Average income and efficiency of rice farming. The average income of irrigated and rain-fed rice farming can be calculated by subtracting the income from the cost of farming that has been incurred by the farmer. Efficiency is obtained by using the formula for total revenue divided by total operating costs. The results of these calculations can be seen in Table 3 below.

Tabel 3. Average Net Income and Efficiency of Irrigated and Rainfed Rice Fields in Klaten Planting Time I Regency in 2021 (Rp)

No	Description	Net Income	
		Ha/Irriged	Ha/Rainfed
1.	Revenue	22.344.090,67	15.037.684,32
2.	Cost	11.075.277,69	10.492.417,37
3.	Revenue	11.268.812,98	4.545.266,95
4.	Efficiency	2,11	1,46

Source: Primary Data Analysis

The average income earned by irrigation farmers is Rp. 11,268,812.98/ha and Rainfed Rp 4,545,266.95/ha . Farming costs obtained by rice farmers Irrigation of Rp. 11,075,277.69/ha and Rainfed 10,492,417.37/ha. The income from Irrigated rice farming obtained by farmers is 22,344,090.67/ha and Rainfed is 15,037,684.32/ha. Irrigation rice farming efficiency is Rp. 2.11 and Rainfed is Rp. 1.46. From the explanation above, it can be concluded that irrigation and rainfed lowland rice farming is feasible for farmers but irrigation farming is more profitable than rainfed. This is because the R/C is more than 1 so that both Irrigation and Rainfed farming have been efficient or feasible.

CONCLUSION

Based on the results of research on Irrigated Lowland Rice and Rainfed Rice Farming in Klaten Regency, conclusions can be drawn, including:

1. The average income earned by irrigation farmers is Rp. 11,268,812.98/ha and Rainfed Rp 4,545,266.95/ha . Farming costs obtained by rice farmers Irrigation of Rp. 11,075,277.69/ha and Rainfed 10,492,417.37. The income from Irrigated rice farming obtained by farmers is 22,344,090.67/ha and Rainfed is 15,037,684.32/ha.
2. Irrigation rice farming efficiency is Rp. 2.11 and Rainfed is Rp. 1.46. From the explanation above, it can be concluded that irrigation and rainfed lowland rice farming is feasible for farmers but irrigation farming is more profitable than rainfed. This is because the R/C is more than 1 so that both Irrigation and Rainfed farming have been efficient or feasible.

REFERENCES

BPS (2020). Harvest Area, Production and Productivity of Rice by Province. Central Java : Central Bureau of Statistics. https://www.bps.go.id/.

BPS (2017). Harvest area, production and productivity of rice in Klaten district. Klaten Regency : Central Bureau of Statistics. https://klatenkab.bps.go.id/.

Majka, L.B,. R. Kala, and K. Maciejewski, 2011. Productivity and Efficiency of Large and Small Field Crop Farms and Mixed Farms of the Old and New EU Regions, 58(2): 61-71

Singarimbun, M dan Sofian Effendi. (2008). Survey Research Methods. Jakarta: PT Pustaka LP3ES Indonesia.

Suryana. (2004). Food Independence Towards Sustainable Food Security. Jakarta: Publisher of the Indonesian Institute of Information and Development Studies (LISPI).