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Local Wisdom in Floating Seeding-Based Rice Farming in Non-Tidal Swamp Land and Its Impact on Income in Pematang Bungur Village, Ogan Ilir

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ABSTRACT: Non tidal swamp land is a sub-optimal type of land that contributes to rice production in South Sumatra. Local wisdom is the culture of the community that is applied according to regional conditions, one of which is floating nurseries. The objectives of this study; (1) identifying local wisdom in non tidal swamp land rice farming based on floating seeding in Pematang Bungur Village, South Pemouthan District, Ogan Ilir Regency; (2) calculating the amount of income from non tidal swamp land rice farming based on floating seeding; and (3) analyze the influence of local wisdom on floating seeding and factors that affect the income of rice farming in non tidal swamp land based on floating seeding. This research was carried out in November 2024 with a survey method and a simple random sample withdrawal method. Interviews, observations and filling out questionnaires were carried out to collect data. Data management was analyzed descriptively and regression analysis with a cobb douglas function. The results of the study show that there are several local wisdom that are still applied in farming management including land preparation, seed procurement, planting and post-harvest, while in the process of maintaining and managing

crop yields there is no local wisdom that is still applied. It is also known that the total income of non tidal swamp land rice farming is an average income of IDR 10,875,925/lg/year. This revenue is significantly influenced by the determinants of production costs, production output, and selling prices. Meanwhile, the variation in land area and floating seeding dummies did not significantly affect farming income.

Keywords: *local wisdom, rice, income, floating seeding, non-tidal swamp land.*

1. INTRODUCTION

South Sumatra Province is one of the producers of rice plants in Indonesia. Some of these food crops are planted in the non-tidal swamp land agroecosystem. non tidal swamp land is a place in a basin that has been submerged in water for a while, The selection of swamp in agricultural cultivation is often based on the extent of the typology of the land that has not been widely used, so that it has the potential to develop agricultural production, especially rice plants (Pujiharti, 2017; Saidi et al, 2021).

Ogan Ilir is one of the districts in South Sumatra Province. This area has a swampland production capacity of 61,940 hectares, with a yield range of 2-4 tons of rice per hectare. The total swampland that has been developed reaches 33,986 hectares, while the undeveloped area is 27,954 hectares (Adistya *et al*, 2023; Kasih *et al*., 2020). Based on this data, there is potential for the use of land that has not been converted into food land to help this country produce food, especially rice.

Based on data from Ogan Ilir Regency in the Central District Statistics Agency in 2021, South Pumulutan District is one of the areas with a fairly large rice commodity harvest area, reaching 3,899 hectares and a volume of rice crop production of 17,755 tons compared to other districts. Pematang Bungur Village is one of the areas in South Pemouthan District that has a large area of swamp land which is also empowered for swamp rice cultivation business. Considering that Pematang Bungur Village has a fairly large swampland, the majority of the population works as farmers.

In agriculture, income, i.e. receipts, minus all expenses during the production process. The area of cultivated land, the selling price of agricultural products, production costs, and production are some of the variables that can affect farmers' income (Yunus, 2019; Mohsinah and Arisinta, 2024). As a commodity with wide prospects, rice plants contribute significantly to increasing farmers' income. This encourages farmers to continue to increase their production in the hope of obtaining large yields. In order to be able to make decisions that can affect their farm income, farmers must also be careful when checking market prices (Roidah, 2015).

The management of farming is carried out by the community in which there is a traditional agricultural system. Farmers use this agricultural system that has been inherited from generation to generation as a local wisdom in farming and utilizing natural resources. This local knowledge system then provides an overview of local wisdom, which is a type of original information that is still used and preserved in society because it comes from the noble values of local culture. Because each community group has different natural difficulties and life demands, different knowledge systems are created, both environmental and social, so that local wisdom also varies depending on location, time, and ethnicity (Yanubi *et al.*, 2022; Yadi, 2022).

South Pemouthan District, Ogan Ilir Regency where one of the areas is Pematang Bungur Village. There are some people in Pematang Bungur Village who still apply traditional farming methods, because it is a legacy from their ancestors, rice cultivation with a floating system in the nursery is an interesting thing to research. By using various basic materials to make rafts and as a planting medium for wild plants, the floating nursery system is one of the agricultural cultivation techniques carried out on the surface of the water. Farmers benefit from floating nursery systems that use wild plants because there is no longer a need to water plants because plants can easily absorb a sufficient amount of water from the surrounding environment and maximize the spread of plant roots which is believed to support optimal plant growth (Siaga and Lakitan, 2021).

Based on the previous description, it can be stated that the objectives of this study are (1) to identify local wisdom in non-tidal swamp land rice farming based on floating

seeding in Pematang Bungur Village, South Pemouthan District, Ogan Ilir Regency; (2) calculating the amount of income from non-tidal swamp land rice farming based on floating seeding; and (3) analyze the influence of local wisdom on floating seeding and factors that affect the income of non-tidal swamp land rice farming based on floating seeding.

2. RESEARCH METHODS

The study was conducted in Pematang Bungur Village, South Pemouthan District, Ogan Ilir, South Sumatra. The research area was determined purposively (deliberately) by considering that Pematang Bungur Village has a fairly large potential for swamp land and most of the people work as rice farmers. Data was collected in November 2024. The survey method used in this study.

In this study, samples were taken using *the Simple Random Sampling method* on the population of swamp rice farmers in Pematang Bungur Village. The population of swamp rice farmers in Pematang Bungur Village is 320 farmers. Furthermore, to determine the number of samples, it was calculated using the slovin formula (Wibowo, 2022; Madjina et al, 2024). Here is the notation of the slovin formula:

$$n= N/(1+〖Ne〗^2)$$

Information:

n = Number of Samples

N = Total Population

e = Batas Tolerance Who alahan (error tolerance)

Thus, the calculation of the number of samples taken in this study with a margin of error of 15% is as follows:

$$n= 320/(1+(320 x 〖0.15〗^2))= 320/(1+(320 x 0.0225))= 39.02$$

From the calculation of the formula above, the number of example farmers to be taken is 40 farmers.

The first objective related to the identification of local wisdom applied by farmers in the management of non-tidal swamp land rice farming in Pematang Bungur Village was analyzed using descriptive analysis. In addition, a calculation was also carried out on the percentage of local wisdom that is still applied in the management of swamp land in rice farming activities. As for the calculation of the percentage of local wisdom, it is obtained by using the following equation.

$$\%KL=PMKL/TPR \times 100\%$$

Information:

%KL = Percentage of Local Wisdom

PMKL = Farmers who practice local wisdom

TPR = Total Respondent Farmers

The data analysis used to answer the objective, which is to calculate how much income of non-tidal swamp land rice farming based on floating seeding, by calculating the total amount of revenue minus the total production cost (fixed and variable) using the formula below.

$$TC=TFC+TVC$$

Information:

TC = Total Production Cost (IDR/yr)

TFC = Fixed Cost (IDR/yr)

TVC = Variable Cost (IDR/yr)

To calculate the revenue of non-tidal swamp land rice farming, the following formula can be used.

$$TR=Q \times P$$

Information:

TR = Receipts (IDR/yr)

Q = Production Yield (kg)

P= Price (IDR/kg)

To calculate the income of non-tidal swamp land rice farming, the following formula can be used.

$$PUPRL=TR- TC$$

Information:

PUPRL = Income of Non tidal swamp land Rice Farming (Income) (IDR/yr)

TR = Total Revenue (IDR/yr)

TC = Total Production Cost (IDR/yr)

The third goal is to find out the correlation between local wisdom and income using a Cobb-Douglas type regression analysis. Here are the equations used in the Cobb-Douglas function:

$$Y = b0 + b1X1 + b2X2 + b3X3 + b4X4 + b5D1 + m$$

For the estimation of the regression coefficient, it is transformed into a linear form using a natural logarithm (Ln) to calculate the elasticity value of each independent variable to the bound variable into the model so that the following equation is obtained:

$$Ln\ Y = Ln\ \beta0 + \beta1\ Ln\ X1 + \beta2\ Ln\ X2 + \beta3\ Ln\ X3 + \beta4\ Ln\ X4 + \beta5D1 + \mu$$

Information:

Y = Income (IDR/lg/yr)

X1 = Land Area (ha)

X2 = Production Cost (IDR/lg/yr)

X3 = Production yield (Kg/lg)

X4 = Selling Price (IDR8/Kg)

D1 = Dummy of local wisdom floating seeding

(1 = doing local wisdom)

(0 = not doing local wisdom)

3. RESULTS AND DISCUSSION

3.1. Local Wisdom in the Management of Non tidal swamp land Rice Farming

Farmers in Pematang Bungur Village only plant rice during the planting season, namely during drought or when the water conditions recede so that the land is not flooded. The growing season lasts for three to four months, and farmers usually start production activities in April or May. Although rice farming activities in Pematang Bungur Village have begun to be carried out in a modern way at several stages, a number of farmers in several other stages still maintain local knowledge or adaptive understanding since long ago and have been inherited from generation to generation. The potential of local wisdom in organizing swamp rice farming activities in Pematang Bungur Village can be seen in Table 1.

Table 1. Local Wisdom in Rice Farming Management in Non tidal swamp land

Stages/Process	Local Wisdom (Any/Nothing)	Limitations of Local Wisdom	Percentage (%)
Land Preparation	Exist	Cultivate land using traditional tools in the form of hoes, machetes, and sickles in cooperation	55
Seed procurement	Exist	Utilizing previously harvested seeds as seeds to be planted	100
Seeding	Exist	Using floating seeding called *ambuan* and sowing seeds directly (tabela).	100
Planting	Exist	The plant transplant system is carried out using traditional tools in the form of *tunjam*	100
Maintenance	None	Using traditional tools to clean weeds and making scarecrows to repel pests	0
Harvest	None	Harvesting with traditional tools in cooperation	0
Post-Harvest	Exist	Selling the harvest directly to middlemen in the form of GKP.	100

3.2. Analysis of the Income of Rice Farming in Non tidal swamp land

3.2.1. Non tidal swamp land Rice Production

The production of rice farming in non-tidal swamp land is mostly in the form of Harvested Dry Grain (GKP). The average rice production of non-tidal swamp land is 2,670 kg per cultivated area or 2,472 kg per hectare. After harvesting, the harvest is directly sold to the middleman, and a small part is stored for consumption and as rice seeds for the next planting season.

3.2.2. The Cost of Maintaining a Healthy Diet

These fixed costs are often related to the use of assets required to carry out production activities such as hoes, sickles, machetes, tuning and *hansprayer* machines. The amount of fixed costs in research on swamp rice farming is explained and can be seen in Table 2. From Table 2, it can be seen that the cost of subsidizing in swamp rice farming; ebak of IDR 124,575/lg/yr.

Table 2. The Cost of Farming in non-tidal swamp land

No.	Component	Total Cost (IDR/lg/yr)	Depreciation (IDR/lg/yr)	Average (IDR/lg/yr)	
1.	Parang	2.350.000	480.000	12.000	
2.	Hoe	1.870.000	374.000	9.350	
3.	Arts	2.475.000	495.000	12.450	
4.	Tuna	2.205.000	441.000	11.025	
5.	*Handsprayer*	15.950.000	3.190.000	79.750	
		24.900.000	4.980.000	124.575	

3.2.3. Variable Cost of Rice Farming in Non tidal swamp land

Variable costs are a type of expenditure whose amount fluctuates depending on the level of production or agricultural activities. This cost tends to increase along with the increase in production volume and the area of land cultivated and vice versa can decrease if production decreases. The total variable costs in the study on rice farming in Non tidal swamp land are shown and explained in Table 3.

Table 3. Total Variable Costs of Non tidal swamp land Rice Farming

No.	Cost Component	Total Cost (IDR/lg/yr)	Average (IDR/lg/yr)	
1.	Mesin *Combine Harvester*	64.740.000	1.618.500	
2.	Mesin *JhonDeer Tractor*	20.430.000	510.750	
3.	Workforce	12.100.000	302.500	
4.	Pesticides	5.125.000	128.125	
5.	Pupuk	4.650.000	116.250	
		107.045.000	2.676.125	

From table 3, it can be seen that the average variable cost is IDR 2,676,125/lg/year. The farming equipment that is the largest fixed cost component is the *combine harvester* machine with an average cost of IDR 1,618,500/lg/year. Meanwhile, the smallest fixed cost component is fertilizer with a depreciation cost of IDR 116,250/lg/year.

3.2.4. Production Costs of Rice Farming in Non tidal swamp land

All costs incurred by farmers when doing agricultural business, especially in the rice cultivation sector in swampy areas, are considered production costs, starting from land preparation to harvesting and marketing of crops. This production cost is an important aspect in calculating business efficiency because it is the basis for determining the amount of profit obtained by farmers. The amount of fixed costs and variable costs can be used to calculate the cost of production. Table 4 shows the total cost of production for growing rice in swampy areas. The average production cost incurred by farmers is IDR 2,800,700/lg/year.

Table 4. Total Production Costs of Non tidal swamp land Rice Farming

No.	Cost Component	Total Cost (IDR/lg/yr)	Average (IDR/lg/yr)	
1.	Fixed Fees	4.980.000	124.575	
2.	Variable Costs	107.045.000	2.676.125	
		112.028.000	2.800.700	

3.2.5. Income and Income of Non tidal swamp land Rice Farming

When calculating agricultural output, revenue and profit or income is interrelated. Without taking into account costs, revenue is the total amount of money that goes to farmers from the sale of agricultural products. The amount of production sold multiplied by the selling price per unit can be used to calculate farm profits or income. Then to calculate revenue, it is necessary to reduce the total cost of production from the total receipt.

The calculation of the income of non-tidal swamp land rice farming in Pematang Bungur Village is not illustrated by the total production multiplied by the selling price, but some of the harvest is allocated for other non-commercial purposes, such as storage to meet the daily needs of the farmer's family and also as seeds for the next planting season so that not all crops are sold. The calculation of total production and crop storage allocation is shown in Table 5.

Table 5. Storage and Sales Allocation of Production Products

No	Information	Total (kg)	Average (kg)
1.	Total Production	106.800	2.670,5
2.	Storage	12.100	302,5
	Sales	94.700	2.367,5

The allocation to storage and sales by farmers is shown in Table 10. namely the respondent farmers in Pematang Bungur Village received a total rice farming production of 106,800 kg with an average production of 2,670.5 kg. Then from the production results, part of it is allocated for daily needs and the preparation of seeds for the next planting season reaches 12,100 kg, so that the total production sold reaches 94,700 kg with an average of 2,367.5 kg.

Table 6. Acceptance of Non tidal swamp land Rice Farming

No.	Information	Total	Average
1.	Sales (kg/yr)	94.700	2.367,5
2.	Price (IDR)	5.753,08	5.753,08
	Revenue (IDR/yr)	547.065.000	13.676.625

After observing the calculations in Table 11. showed the results that the income range of non-tidal swamp land rice farmers in Pematang Bungur Village was 2,367.5/kg/year with an average selling price of IDR 5,753.08/kg. This shows that from rice farming, it is known that the average value of rice farming revenue is IDR13,676,625/lg/yr. In addition, Table 7 also explains the calculation of revenue from rice farming in the non-tidal swamp land below.

Table 7. Income of Rice Farming Non tidal swamp land

No.	Information	Total	Average
1.	Total Receipts	547.065.000	13.676.625
2.	Total Production Cost	112.028.000	2.800.700
	Income	435.037.000	10.875.925

Calculations in Table 4.16. shows that the total income of Non tidal swamp land rice farmers is calculated by the amount of revenue, which is IDR 547,065,000 minus the total production cost of IDR 112,028,000 so that the total income of Non tidal swamp land rice farmers is IDR 435,037,000/lg/year. Meanwhile, average income is calculated from average sales minus average production costs to get an average income of IDR 10,875,925/lg/year.

3.3. Factors Affecting Rice Farming Income in Non tidal swamp land

The results of the analysis of factors that affect the income of non-tidal swamp land rice farming can be seen in Table 13. The following are the variables that have a significant effect on the income of non-tidal swamp land rice farming, namely:

1. Production Cost Variable (X3)

The value of the conjecture parameter obtained is -0.453 indicating that if there is a 1% increase in production costs, it will reduce farmers' income by 0.453%. This is in accordance with theory and facts in the field, if the amount of production costs used, the higher the value, the lower the farmer's income, which is the result of accumulated income minus the total production cost of agricultural activities. Therefore, production costs are one of the variables that have a significant impact on

the income of rice farmers. This is in line with the results of research from Darna (2022) and Nugroho and Maria (2021).

Table 8. Analysis Results Factors affecting Revenue

Coefficient						
Model		Unstandardized Coeficients		Standardized Coeficients		
		B	Std. Error	Beta	t	Itself
1	(Constant)	2,646	4,352		,608	,547
	Land	,095	,154	,117	,614	,543
	Production Costs	-,453	,099	-,785	-4,560	,000
	Production Results	1,214	,167	1,428	7,256	,000
	Selling Price	1,235	,398	,231	3,104	,004
	Floating Seeding Dummy	-,014	,056	-,018	-,251	,803

2. Production Output Variables

The value of the alleged parameter obtained is 1.214 indicating that if there is a 1% increase in production output, it will increase farmers' income by 1.214. This is in accordance with the fact that as a result of the accumulation of production and the selling price of grain obtained by farmers, their farming income will increase in proportion to the level of their production. Thus, one of the factors that greatly affects income in rice farming is production.

3. Selling Price Variable (X4)

The value of the conjecture parameter obtained is 1.235 indicating that if there is an increase of 1%, the variable will increase farmers' income by 1.235. This is in accordance with the reality on the ground, that is, if the production is the same but the selling price is better, then the farming business will be more profitable, which will ultimately increase the total income of farmers. Therefore, one of the factors that

has a significant influence on farming income is the selling price. The results of the analysis are in line with the results of Sihite's (2024) research.

4. CONCLUSION

From the results of the research, it can be seen that local wisdom that is still applied and inherited from generation to generation in Pematang Bungur Village in the management of non tidal swamp land rice farming includes the stages of land preparation, pengadaan_benih, planting, and post-harvest. The average income of non tidal swamp land rice farming is IDR 10,875,925/lg/year. The factors that faktor_yang significantly affect the income of non tidal swamp land rice farming are production costs, production yields, and selling prices.

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