Socio-Economic Analysis of Hybrid Rice Variety "OPTIMA" Farming in District of Banyuwangi to Increase Income, Indonesia

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Abstract: *In general, hybrid rice has a significant advantage over inbred rice, such as higher yields, more competitive harvesting, wider, shorter plant life, wider photosynthetic area, lower respiratory intensity and higher assimilation translocation . Although in Indonesia hybrid rice has been popularized since 1983, but the empirical facts show that few farmers are adopting new technology in this field of seed, although the price of production is more expensive than the price of the rice product inbrid. Therefore, this paper explains the following matters: 1) Socio-economic factors that influence farmers' decision to plant hybrid rice OPTIMA, 2) Level of profit of hybrid rice farming OPTIMA, and 3) Cost efficiency level of rice farming hybrid OPTIMA. The research method used is descriptive method of quantitative and qualitative techniques where census data information collected includes primary data and secondary data. The population in this research is farmers of hybrid rice varieties of OPTIMA in Banyuwangi. Data analysis techniques used are probability probability analysis of probit model function, cost efficiency analysis, and profit. Simultaneously there are several factors that are expected to significantly influence farmers' decision to plant hybrid rice optima at a 1% significance level. But partially only factor of production amount which have no significant effect to dependent variable (Farmer's Decision, while variable of output price and farmer perception about hybrid varieties of Optima hybrid is significant effect) Farm profit rate during second rainy season and drought in year 2013/2014 reach IDR 9.61.992,06 per hectare with average production of 5,9 tons and the farming efficiency level reached 1,5 or has reached the point of technical efficiency.*

Keyword: *determinant factors; efficiency; profit; OPTIMA hybrid rice*

I.   Introduction

In general, hybrid rice has significant advantages over inbred rice, such as higher yields, better Vigor making it more competitive against weeds; advantages of rooting activity aspects of physiology as a broader, wider area of photosynthesis, respiration intensity lower and higher assimilate translocation; superiority on some morphological characteristics such as root system stronger, more tillers, number of grains per panicle more, and weight of 1000 filled grains more higther. But hybrid rice on the other hand has a weakness, some of them very fundamental problem, namely: rice production will only increase if the role of farmers in the production process is optimized, farmers must buy new seeds every planting, because of previous seed crop can not be used for the next planting. Because hybrid seed (F1) will produce seeds (F2) that can not be reused as seed for the next planting season, meaning

farmers will always depend on the manufacturer of hybrid seeds. To achieve yield potential, hybrid rice production facilities require particularly fertilizer application and supporting infrastructure (irrigation) are adequate, the price of seed is expensive; not any strains or varieties can be used as a parent of hybrid rice. For the male elders confined to the strains or varieties which have Rf genes or that include restorer alone; seed production complex and require the planting area with a particular growing conditions (Satoto dan Suprihatno, 2008).

Several other socio-economic factors that influence the optima hybrid rice cultivation is the aspect of the role of extension workers, farmers, farmers' perceptions of hybrid rice varieties, irrigation systems applicable, supporting institutions, capital resources of farmers, production and marketing of others. Although the popularization of hybrid rice has been going on since 1983 in Indonesia, but the fact showed that only a few farmers who adopt new technology in the field of this seed. Though countries china, india and vietnam already to generalized and effective in order to support the availability of food in the country. Along with the dense capital needs to be allocated, as well as hybrid rice requires intensive management, while on the other side of the peasant culture in Indonesian rice farming intensification process tends to be weak, so the phenomenon shown by the farmers in Banyuwangi.

Marketing a true hybrid rice production price of the product is more expensive than the price of rice products inbrid, was in fact relatively the same. Traders do not care about the cost of hybrid rice production tends to be higher, because of their economic logic is always oriented towards profit maximization. Similarly, the local government's good will in this case still seem hesitant to convincing the farmer groups and other farmers based on past experience or due to synergy between the stakeholders and the government has not been able to awaken synergistically effective and has not been supported by adequate college. Only advanced farmers who would dare to try to manage his farm with veritas optima hybrid rice farming.

Furthermore, as a comparison that results of research on analysis of the benefits and risks of hybrid rice by the research team Faculty of Agriculture UGM (2007) concluded that hybrid rice Arize, SL8SHS, and Intani 2 gives yields higher and higher profits compared with the IR 64, and among the three hybrid Intani 2 is the best varieties. The advantages of the hybrid situational third because of the risk that belongs to the hybrid rice is higher than the IR 64. Benefit-cost and revenue-cost ratio for hybrid rice is lower than 64. According Khazanani (2011), factors that affect the production of chili farming influenced significantly by land, seed, labor and fertilizer. From the results of these studies found that the cost of farm production chili is efficient, because the value of R/C is greater than one. Meanwhile in a study conducted by Cahyono (2010) concluded that the factors that affect the rice farming advantages include cost of land, cost of seed, fertilizer costs, the cost of pesticide and labor costs have a significant effect on the profitability of rice farming. This is indicated by the results of paddy rice farm income by an average of IDR 8.911.338,24 per hectare.

Based on the above description, it is a problem in this study can be formulated as follows: what are the socio-economic factors are the factors that influence farmers to decide optima hybrid rice farming in Banyuwangi?; What degree gains optima hybrid rice farming in Banyuwangi?, What is the level of efficiency and cost optima hybrid rice farming in Banyuwangi?. Therefore, the purpose of this study is: To analyze the socio-economic aspects of the factors that influence farmers' decisions optima hybrid rice farming in Banyuwangi, Knowing the rate of profit optima hybrid rice farming in Banyuwangi; Analyzing the level of efficiency and cost optima hybrid rice farming in Banyuwangi.

II. Methodology

2.1 Research Area

This study was conducted in nine sub-districts Kalibaru, Genteng, Gambiran, Singojuruh, Sempu, Glagah, Muncar, Giri and Banyuwangi. Determination of the location of this research was determined by purposive sampling on the consideration that the existence of hybrid rice varieties farmers optima in Banyuwangi start in 2012 until today is contained in the sub-district.

2.2 Sampling Techniques and Data Collection

This research is a descriptive study, the research aims to describe the events systematically, factual and accurate information on the facts, properties and relationships between phenomena that occur in the present. Meanwhile, the method used in this study is the method in which this method of determining Census sample is taken of the entire population. The data collection techniques with interviews conducted with respondents through depth interview and FGD techniques or other techniques that are easy and practical to use.

2.3 Data Analysis

The analysis technique used in this study is the multiple linear regression model to determine the socio-economic factors that influence farmers' decisions to plant hybrid rice varieties optima in Banyuwangi. In addition, a mathematical analysis to determine the level of farm profit optima hybrid rice varieties, Revenue Cost Ratio Analysis is used to analyze the level of cost efficiency and descriptive analysis was also used to describe the profile of the respondents. The answer to the third goal of the level of efficiency of use of farm production costs optima hybrid rice varieties to used the approach of R/C ratio.

III. Discussion

3.1 Profile of Respondents

The average age of respondents optima for rice farmers in the dry season 2014 in the area of the sample was 45,90 years with a range between the ages of 34-64 years which means that all respondents were in the productive age (15-64 years). The average level of formal education the respondent farmers is known to work only 13,10 in or have graduated from high school. It is the opinion of Soekartawi (2003) that the level of formal education is one of the factors that affect a person's thinking toward a better and rational. Meanwhile, the average length of experience of trying to trade the location of the respondent farmers in the study is still ongoing in the period of 2,2 years with a range between 1-5 years. Furthermore, the average scale farming of hybrid rice is only reached 0,25 optima hectares with a range between 0,02 sd. 1 hectare. This does not mean they are classified as small farmers, but only to prove over the perception that these types of varieties according to their beliefs, so do not dare to plant more.

3.2 Economic Analysis of Social Factors Influencing Farmers' Decisions to Grow Optima Hybrid Rice

To examine whether socioeconomic factors that influence farmers' decisions to plant hybrid rice varieties optima, then it can be used multiple regression analysis models (Gujarati, 1995). The following Table 1 presents the regression results of the condition

Table 1. Results of Multiple Linear Regression Analysis Of Socio-Economic Factors Influencing the Decision Optima Hybrid Rice Farmers Planting Banyuwangi Regency in 2014

Variabel Independent	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1,033	2,180		-0,474^{ns}	0,642
Product Price	0,083	0,196	0,392	0,589**	0,059
Quantity of Produt	0,051	0,063	0,149	0,316^{ns}	0,356
Farmer's Perception	0,679	0,161	0,748	4,219***	0,001

Specification:
Dependent Variable: Decision optima hybrid Farmers plant rice; F-hit (α1%) = 9,106
R Square = 0,731; 'Adjusted R Square = 0,661; NS = Non Sicnificant
A *** = significant at 1% and ** = Significant at the 5% significance level α
Source: Primary Data Processed in 2014

Simultaneous independent variables supposed to influence the decision of farmers to plant hybrid rice optima significant at significance level α1%. That is the hypothesis that some socio-economic factors are the factors that influence farmers' decisions to seek land optima hybrid rice is accepted or received Hi, this is indicated by the F-hit (9,12)> F-table (3,89). The level of determination that is free of degrees or Adjusted R Square is equal to 0,661. Conditions suggests that 66,1% of the farmer's decision to plant rice Banyuwangi Regency optima hybrid produced by PT. Longping High Technology Indonesia is influenced by the price of the product (input), the price of production (output) and the perception of farmers on hybrid rice optima, and the rest is influenced by other variables outside the model.

To test the significance of the test circuitry followed by partial t-test where the only independent variable that does not affect the amount of production (non-significant) effect on the dependent variable, but theoretically the phenomenon according to the socio-economic rationale. Although some farmers are not too sure on the increase in the number of this type of production, but because it is based on the desire to try new technology, then the variable is not too be a factor on the decision of farmers to plant hybrid rice optima. Variable optima hybrid rice product prices affect the decision of farmers to plant hybrid rice optima significantly at 5% significance level α. Coefficient values as in Table 3.1 above shows that the higher the price of this type of product, then the stronger farmers compelled to decide optima hybrid rice planting for the next season assuming cateris paribus, because farmers believe high productivity will increase. The variables most strongly influence the farmer's decision to plant hybrid rice optima for the upcoming growing season is the perception of farmers about new varieties of rice seeds. Some of the information that can be received through a variety of opportunities and the momentum of the strengths and weaknesses of the new rice varieties turns implications for the perception of farmers.

3.3 Profitability Analysis Optima Hybrid Rice Farming

In Table 2 below shows that the rate of profit optima hybrid rice farming in Banyuwangi in the rainy dry season II of year 2013/2014 reached IDR 9.619.992,06 per hectare. When compared with a profit-making inbrid rice farming in the same area, then mathematical optima hybrid rice farming profits higher. Despite this difference was not significant when viewed from a character of this type of hybrid rice itself which incidentally has a superior physiological characteristics compared to other types inbrid. Conditions relarif low levels of profit optima hybrid rice farming in Banyuwangi on the growing season is caused by several factors, namely: 1) optima hybrid rice varieties suitable only in the dry season and the rainy season is less suitable, so the amount of production is relatively low; 2) the technology has not been applied in accordance with the recommendations of the optima hybrid rice producers; 3) the experience of farmers to cultivate rice varieties are still relatively new, and 4) the use of variable inputs, especially fertilizers and medicines amounts far above recommen-dation besides the price is relatively high, and 5) the average price of the product is not different from the price of production inbrid other types of rice, even some optima hybrid paddy farmers who receive no lower product prices.

Table 2. Results Analysis of the Optima Hybrid Rice Farming Gains per hectare in Banyuwangi in 2014

Number	Description	Total	Cost Structure (%)
1	Quantity (Ku)	59,46	
2	Output's Price (IDR/Ku)	386.562,50	
3	Total Cost of Production:	13.366.246,79	
	a. Variable Cost (IDR)	9.731.423,08	72,81
	b. Fixed Costs (IDR)	3.634.823,72	27,19
4	Revenue (IDR)	22.986.238,86	
5	Profit (IDR)	9.619.992,06	

Source: Primary Data Processed

Optima hybrid rice production can be harvested only from 40% of respondents farmers with an average of 5,9 tonnes per hectare of all respondents, while the remaining crop failure even to move plants from the age of 1 – 1,5 months already many Xanthomonas disease. This means that the rate of profit optima hybrid rice system in this analysis was obtained from only 40% of respondents, while the remaining giving not only provide profit contribution and accumulation of total production costs. The next result is high production reduces total revenue value is relatively low. If profits optima hybrid rice farming is only analyzed the revenue and the total cost value of 40% of respondents farmers, then the advantage grew to more than IDR 20.000.000,- per hectare. For some farmers respondents obtain production of more than 10 tons and even 12 tons hectare.

3.4 Efficiency Analysis Optima Hybrid Rice Farming

In any form of economic activity, including the production of farm economic activities, it is necessary to measure the level of efficiency of use of inputs. Various measuring devices that can be used to determine or find out if the use of production inputs is already relatively efficient or inefficient. Similarly for optima hybrid rice farming activities in Banyuwangi, also keep in mind the level of efficiency that in the future farmers can allocate

their resources appropriately so as to encourage the achievement of maximum profit level. It is based on the findings in the field, that the production cost seems too high. In order to determine the level of efficiency optima hybrid rice farming in the study location, the measured simply by using an analysis tool R / C ratio as the results are presented in Table 3.

This is consistent with the results of research Satoto and Suprihatno (2008) of hybrid rice on the Development of Hybrid Rice in Indonesia which concluded that Since 1998 the research further intensified by the establishment of elders hybrid rice originating from germplasm itself with a goal of achieving rice hybrid adaptive in the neighborhood Indonesia and potentially result 15-20% higher than the best inbred varieties. Since 2001, hybrid rice research involve more researchers from different disciplines with the aim of increasing the stability of heterosis and obtain appropriate cultivation techniques for a hybrid rice.

Table 3. Farming Efficiency Analysis Results Optima Hybrid Rice per Hectare in Banyuwangi in 2014

No	Discriptions	Total (Rp)	R / C Ratio and π / C Ratio
1	Total Cost of Production (IDR)	15.338.641,62	
2	Revenue (IDR)	22.986.238,86	1,50
3	Profit (IDR)	9.619.992,06	0,63

Source: Primary Data Processed

In Table 3 above shows that the efficiency of hybrid rice farming in Banyuwangi optima of 1.5 which means that each expenditure costs USD 1, -, it will gain acceptance of USD 1.5, -. Meanwhile, in terms of the ratio of profits to the costs incurred, it is known to reach the value of 0,63. This means that any production expenses as much as USD 1, -, it will make a profit of IDR 0,63. Hypothesis which states that the level of cost efficiency optima hybrid rice farming in the study area is in a position not efficient, it was not proven. However, this condition is also worrying in terms of macro-economic perspective, that if the total cost of production adapted to the prevailing interest rates. This means that if the interest rate component included as a divisor of the calculation formula of R/C ratio, the lower the level of efficiency it can even happen anymore inefficient. There are two main factors, namely the use of the input exceeds the recommendations by the relatively expensive price, and 2) the amount of production that is not too high relative to the price of production is equal to the price of rice production inbrid types. This condition is consistent with the results of research on the analysis of the revenue-cost ratio (R/C ratio) for hybrid rice is lower than that in fact the IR 64 rice types inbrid.

IV. Conclusion

Simultaneously independent variables are supposed to influence the decision of farmers to plant hybrid rice optima significant at significance level α1%, where it is indicated by the F-hit (9,12) > F-table (3,89). The level of determination that is free of degrees or Adjusted-R-Square is equal to 0,661. Partially the result of t-test revealed that the only independent variable amount of production that do not significantly affect the dependent variable, but

theoretically the phenomenon according to the rational of socioeconomic. While the independent variable output prices and the perception of farmers about the kinds of optima hybrid rice significantly affect the farmer's decision to plant rice varieties respectively at significance level of 5% and 1%. That the rate of profit optima hybrid rice farming in Banyuwangi on the second rainy season and drought year 2013/2014 reached IDR 9.619.992,06 per hectare. Average production is as much produced 5.9 tons, with an average production price of IDR 38.656,- per kg and the average cost of production as much as IDR 13.366.246,79 per hectare. The efficiency of hybrid rice farming in Banyuwangi optima of 1,5 or have reached the point of efficiency, so that the hypothesis that the level of cost efficiency optima hybrid rice farming in the study area is in a position not efficient, it was not proven. However, if the total cost of production adapted to the prevailing interest rate and included as a divisor of the calculation formula of R/C ratio, the lower the level of efficiency even more inefficient.

Optima hybrid rice is a type and variety of rice that can increase the productivity of land and become one of the drivers of the realization of national food sovereignty. Therefore, in this paper the following recommen-dations are proposed: 1) The Government and other stake holders should appreciate the presence of hybrid rice optima by synergizing the food programs in the region to spur food security and further improve the welfare of farmers and their families. If deemed necessary, the program is budgeted into the APBD in a sustainable manner with clear, systematic and targeted phasing and measurable targets; 2) The use of production input, especially the cost of drugs and fertilizers should be reduced by identifying farming. Preferably planting hybrid rice variar optima planted in the dry season because genetically engineered specifically destined for tropical regions during the dry season; and 3) Eradication of pests and diseases should be done organically, in addition to aims to further eficiency of farming, as well as for the process of rehabilitation or restoration of degraded land and food sovereignty.

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