Entrepreneurial Activities And Performance Of Rice Farming In Bojongpicung Sub-District, Cianjur Regency

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ABSTRACT

Farming performance in BojongpicungCianjur is affected by several factors, including land area, types of seeds and the availability of workers, apart from farmers' tenacity in the program. Tenacity is a behavioral entrepreneur trait, which is influenced by business and individual farmers' characteristics, as well as the external environment. Entrepreneurial behavior depends on the farming business performance for the program to run and be successfully implemented. productivity can be increased by improving agricultural human resources quality. Descriptive statistical analysis for entrepreneurial activities was measured using the Entrepreneurial Behavior Index. The farming performance was analyzed based on the technical efficiency of farming. The results of this research are the majority of Rice Farming Entrepreneurial Activities in Bojongpicung Subdistrict are in a low category and Farming Technical Efficiency is influenced by Experience, Education, Capital, and Entrepreneurial Activities.

Keywords: farming performance, entrepreneurial activity, rice farming, technical efficiency

1. INTRODUCTION

Research Background

Indonesia's population has been increasing over time, reaching 265 million in 2018 (Bappenas, 2018). For this reason, the country is ranked third in rice consumption worldwide, consumed by at least 90% of its population daily. Due to the increasing demand, the government needs to invest more in rice production, which affects the quality of agricultural human resources. According to Dumasari, (2014), dominant pressure from economic factors that relates to limited production capital and low human resources quality lowers productivity. Additionally, farmers have relatively low formal education levels and minimal participation in extension activities, informal training, or demonstrations regarding ideas and agricultural technology innovations (Dumasari et al., 2007; Dumasari and Watemin, 2010).

Richards and Bulkley, (2007) and Goethner et al., (2012) reported that the key attribute to successful agricultural development is entrepreneurship. This is because entrepreneurship creates wealth through innovation, employment, economic growth, and wealth sharing based on hard work and risk-taking (Bygrave and Zacharakis 2010). Furthermore, its contribution to economic development is evident in different states worldwide. For economic development in a country, 2% of its population (PBB) should be entrepreneurs. According to recent studies, entrepreneurship is a key mechanism in creating wealth accumulation and savings. For

instance, Parker's (2003) stated that self-employed Britons enjoy above-average wealth in their old age. Entrepreneurship is a competitive behavior that creates new markets and innovations (Davidsson 2003; Kirzner 1973).

Problem Formulation

Concrete efforts are required to achieve the rice production target, which was fulfilled by 76.23 million tons in 2016. However, productivity can be increased by improving agricultural human resources quality.

Bojongpicung, a rice-producing village in Cianjur, located in Cihea irrigation areas in Indonesia. The region has the potential for high agricultural productivity because of a high-water capacity of 7,000 ltr/s, apart from being managed by the central government. A total of 3,292 and 2,192 ha of rice fields are irrigated from Cisuru/ Cisokan and Cirajang Dams.

Farming performance in BojongpicungCianjur is affected by several factors, including land area, types of seeds and the availability of workers, apart from farmers' tenacity in the program. Tenacity is a behavioral entrepreneur trait, which is influenced by business and individual farmers' characteristics, as well as the external environment. Entrepreneurial behavior depends on the farming business performance for the program to run and be successfully implemented.

Table 2

Rice Production Per Hectare of Each Village at Bojongpicung Subdistrict, Cianjur Regency in 2016-2019 (Ton / Ha)

Subdistrict	2016	2017	2018	2019
Sukarama	6,4	6,4	6,4	5,8
Sukajaya	6,2	6,2	6,2	6,2
Cikondang	6,4	6,4	6,4	6,5
Jatisari	6,6	6,6	6,6	6,8
Kemang	4,8	4,8	4,8	5,7
Cibarengkok	6,8	6,8	6,8	7
Jati	6,8	6,8	6,8	6,7
Bojongpicung	6,8	6,8	6,8	6,8
Sukaratu	7,1	7,1	7,1	6,8
Neglasari	7,3	7,3	7,3	7
Hegarmanah	7,3	7,3	7,3	6,8

Source: Cianjur Central Bureau of Statistics

Literature Review

According to Mangkunegara in Suparno Eko Widodo (2015: 131), performance is a function of work achievement. The term job or actual performance refers to the work quality and quantity achieved by an employee while completing assigned responsibilities. Generally, farm performance is measured by productivity, price, and income (Suratiyah 2011; Sadjudi 2009). Suratiyah (2011) stated that farmers use all resources, including manpower, capital, facilities, and infrastructure to improve production and generate more income.

Individual, governmental, and private farming is an agricultural development entity in Indonesia meant to increase growth and welfare. Performance is affected by various reasons, including land area, seed utilization, number of workers, and capital. Furthermore, innovation affects farm performance measurement models through the availability of farming technology, such as tools, or superior seeds. However, the model has not examined the labor element as in the Cobb Douglas theory, meaning that innovation focuses more on breaking down the A component in the theory.

Entrepreneurial ability comes from human capital leadership qualities or justification (Casson, 2003); Parker (2009); (van Praag, 2005); (Leibenstein, 1968); (Lucas 1978). According to Parker (2009), everyone has an innate ability describing how well they would

perform at entrepreneurship. Ability is measured as a one-dimensional quantity x, where the lowest in the population is x̲, while the highest is $\bar{x}$. Also, the relative and cumulative frequencies of individuals with entrepreneurial ability x are stated by f (x) and F (x), respectively.

Lucas (1978) assumed that x increases entrepreneurial output *q* to produce net income π (x) = xq - c, where c is the cost of using capital and labor. The output price is normalized to be one, though everyone is considered risk-neutral. This means that only individuals with x >x̃become entrepreneurs, where x̃is the identity of the "marginal entrepreneur", an indifferent person between two jobs. The property of the Lucas xq production function is that the demand for entrepreneurs for labor and capital is greater between individuals with a higher x. Therefore, an entrepreneur can run a larger company, regardless of whether the size is defined in terms of employment or capital assets. Capable people become better entrepreneurs because with more abilities, they manage larger businesses.

These theories and models help complete the analysis of factors affecting farm performance by considering their relationship to entrepreneurial aspects of farming actors. The research provides other factors outside production that can affect farm performance, including entrepreneurial aspects viewed in terms of individual, farming, or external factors.

2. RESEARCH METHODS

This research was conducted for 8 months (June - December 2019) at Bojongpicung Subdistrict, in Cianjur Regency, which consists of 11 villages. The research area was chosen deliberately based on the location in Cihea Irrigation. Moreover, the area is managed by the Central Government, there is relatively optimal irrigation, meaning improved farming performance can be achieved. The research sample consisted of 185 rice farmers in Bojongpicung Subdistrict, Cianjur Regency. Primary data were obtained directly from farmers using questionnaires. The proposed questionnaire was compiled and tested for validity and reliability based on predetermined variables. Secondary data was obtained from the Central Bureau of Statistics documentation, Cianjur Regency Government, the Ministry of Agriculture, and other relevant agencies and websites.

The farming performance was analyzed based on the technical efficiency of farming. These categories were divided into production, productivity, farming income, and farmer income. Production was measured by the total output in kilograms, while productivity was the farming land output (kg/ha). Farming income was the amount of revenue received by farmers after deducting costs (IDR / year) or (IDR / planting season). Contrastingly, farmers' income level was the total amount of income received by farmers from comprehensive sources. (IDR / year).

Entrepreneurship activities were analyzed by considering the Sense of Personal Control, Cooperative, Innovation, Growth-Oriented, Risk Taker, and Self Confidence aspects (Asmit and Koesrindartoto, 2015). Descriptive statistical analysis for entrepreneurial activities was measured using the Entrepreneurial Behavior Index (EBI) (Balasaravanan and Vijayadurai, 2012). According to Shyamalie et al. (2009), the EBI is an aggregate measure of the behavior quality on several components or attributes of entrepreneurship using the following formula.

$$EBI = \frac{\sum_{i=1}^{n} SEV_i}{\sum_{i=1}^{n} MSEV_i} \times 100$$

where:
SEV = score observed from the variable

MSEV = maximum score of variable I

i = 1 - n the number of question items in the variable.

Assessment criteria:

(a) very high, if the value is> 91%   (c) moderate if the value is 50-70%

(b) high, if the value is 71-91%   (d) is low, if the value is <50%

The empirical model used in this research is the Cobb-Douglas stochastic frontier production function model showed in the following equation.

$$Ln\ Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 \ldots + \beta_6 \ln X_6 + Vi - Ui$$

Where Y is rice production (kg/ha), and X1, X2, X3, X4, X5, X5 and X6 are the area of land (ha), the number of seeds, the amount of Urea fertilizer (kg/ha), NPK fertilizer (kg/ha), SP- 36 (kg/ha), workers (family / internal), and the number of non-family workers (external), respectively. Additionally, (Vi - Ui) is the component of the error term, where Vi and Ui are random variable assumed to have an iid N value (0, σv2) and non-negative random variables assumed to be the calculated inefficiency cost in production with a value of iid│N (0, σv2), β0 - β 6 = Estimated parameter.

Factors models that influence the efficiency include Experience, Education, Main Work, Owning Other Jobs, Capital, Counseling, Training, and Entrepreneurial Activities.

3. RESULTS AND DISCUSSION

Rice Farmer Entrepreneurship Activities in Bojongpicung Subdistrict, Cianjur

Table 3

Number of Farmers with the Maximum Value of Entrepreneurship Aspects

Entrepreneurial Aspects	Number of Farmers or Farming with the maximum value (%) N = 185	Maximum Category
Sense of Personal Control		
- Business Experience	11,9	> 45 years
- Education	7	Bachelor
- Membership of farmer groups / Indonesian Farmers Association / Cooperatives	96,2	Member of farmer groups (Poktan)
- Participation in counseling	34,1	Join counseling
- Participation in Training	8,6	Join Training
Cooperative		
- Involvement of Family Members	29,8	More than 4 people
- Total manpower	20,5	> 75 people
Innovation		
- Implementation of Planting Patterns	14,1	JajarLegowo
- Utilization of Superior Seeds	21,1	Superior Seeds
- Implementation of JajarLegowo Technique	7,0	Implement
Growth Oriented		
- Amount of Capital	4,3	> Rp 10juta
- Land area	6,5	> 1 ha
- Implementation of Healthy Plants	12,4	Implement
- Implementation of Effective Irrigation	60,5	Implement
- Pest Population Observations	16,8	Observe

- Implementation of Water Technique	68,6	Implement
- Implementation of Maintenance Activities	65,4	Implement
- Implementation of Pest Control	65,9	Implement
Risk Taker		
- Agricultural Insurance Participation	2,7	Follow
Self Confidence.		
- Land Status	93,5	One's own/ individual

Source: Primary Data Processed

Descriptive statistical analysis for entrepreneurial activities was measured using the Entrepreneurial Behavior Index (EBI). The basis for determining EBI was data on farmers' entrepreneurial activities, which included Sense of Personal Control, Cooperative, Innovation, Growth-Oriented, Risk Taker, and Self Confidence aspects. Table 4 shows the farmer groupings obtained using the EBI equation.

Table 4
Rice Farmers' Entrepreneurial Activity Levels in Bojongpicung Subdistrict, Cianjur

Criteria	Number of Farmers / Farming	Percentage
Low	109	58.60
Moderate	69	37.09
High	8	4.31
Very high	0	0

From the table, the majority of farmers or rice farming in Bojongpicung sub-district have low entrepreneurial activity.

Analysis of Rice Farming Production Functions in Bojongpicung Subdistrict, Cianjur

Table 5
Estimation Results for the Production Function Parameters of Rice Farming Frontier in Bojongpicung Subdistrict, Cianjur

Variable	Coefficient	Standard Errors	z value	P > |z|
Constant	7.914636	0.4432334	17.86	0.000
Land area	0.5266934	0.1077413	4.89	0.000
Seed	0.3456907	0.1090762	3.17	0.002
Urea	0.1276945	0.0766942	1.66	0.096
NPK	-0.1588025	0.3869951	-0.41	0.682
SP-36	0.0476731	0.0155356	3.07	0.002
Labor Inside	1.756515	1.658597	1.06	0.290
Labor Outside	-1.784257	1.294966	-1.38	0.168
Sigma Squared	0.5057687	0.2661278	1.90	0.057
Gamma γ	0.7610678	0.2735239	2.78	0.005

Source: Primary Data Processed

Table 5 shows that the estimation result of the Gamma parameter (γ) obtained a significant value of 0.76. This shows that the variation of random error is more dominant by 76% due to technical inefficiency. A γ value close to 1 showed that one-sided error U_i dominates the symmetrical error distribution of V_i. Consequently, there are more differences between actual farmer and possible maximum production due to variances in technical inefficiency and stochastic factors, such as climate, weather, pest attack disease, and modeling errors. Therefore, there are opportunities to achieve frontier production with managerial improvements in farming, which can be conducted through the use of labeled/certified

superior varieties, balanced fertilization (PUTS application), organic matter addition (manure), and timely harvesting.

Studies on the efficiency of rice farming using frontier stochastic analysis, obtained γ parameter values close to one. For instance, Okoruwa and Ogundele (2006) in a farmer's sample with local rice varieties and recommended improvements in Nigeria obtained γ values of 0.930 and 0.830, respectively. Abedullah et. al. (2007) in the technical efficiency of irrigated rice in Punjab obtained a γ value of 0.830. Minh and Long (2009), obtained a γ value of 0.880 for agricultural production efficiency in Vietnam.

Analysis of Rice Farming Technical Efficiency in Bojongpicung Subdistrict, Cianjur
Table 5 shows the technical efficiency distribution of the model used according to the efficiency level analysis, the average value of technical efficiency on the stochastic frontier production function is 0.92. Also, the lowest technical efficiency value was 0.04 while the highest was 0.99. Based on the average efficiency level value, the respondent farmers have the opportunity to obtain higher potential yields for maximum results. Suppose the average farmer in the sample can achieve the highest efficiency level, then the average save 7% of the costs (1 - 0.92 / 0.99). However, this is possible by applying the cultivation skills and techniques by the most efficient farmers. The same calculation for technically inefficient farmers shows a cost savings of 96% (1- 0.04 / 0.99).

Based on the distribution of technical efficiency levels, showed in Table 6, 85.41% of the research area rice farmers operate at an efficiency level above 0.90 and the remaining 20% at 0.89. This distribution indicates that irrigated lowland rice farming in the research location is technically efficient. Therefore, high output can be obtained from several inputs used.

Table 6.
Distribution of the technical efficiency level on rice farming at the Bojongpicung Subdistrict, Cianjur

Efficiency Level Distribution	Number of Farmers (people)		Percentage (%)
0,10 - 0,19	2		1,08
0,20 - 0,29			0,00
0,30 - 0,39	1		0,54
0,40 - 0,49	1		0,54
0,50 - 0,59	2		1,08
0,60 - 0,69	3		1,62
0,70 - 0,79	5		2,70
0,80 - 0,89	13		7,03
0,90 - 0,99	158		85,41
Average	0,92	Minimum	0,04
Standard Deviation	0,13	Maximum	0,99

Source: Primary Data Processed

Table 7
Estimation Results of Rice Farming Technical Efficiency Parameters in Bojongpicung Subdistrict, Cianjur

Variable	Coefficient	Standard Errors	z value	P > |z|
Constant	6,022289	7,031344	0,86	0,392
Age	0,0132323	0,0592732	0,22	0,823
Experience	-0,2145628	0,1421449	-1,51	0,131
Education	1,209676	0,7863478	1,54	0,124
The main job	1,204216	1,320676	0,91	0,362

Have Other Jobs	-0,4929496	1,260592	-0,39	0,696
Capital	0,4792639	0,3211176	1,49	0,136
Counseling	0,6255482	2,923819	0,21	0,831
Training	1,38006	3,874682	0,36	0,722
Entrepreneurial Activities	-0,2718217	0,1835841	-1,48	0,139

Source: Primary Data Processed

Table 7 shows the factors that influence rice farming technical efficiency. Farmers' experience is an exogenic factor that affects farming technical efficiency creation. Consequently, the longer the experience the farmer has, the more the technical efficiency is increased. Experience lengths give farmers more instincts in the use of production factors. Furthermore, the higher education level makes the farmers more informed about farm management. Better mastery of information and knowledge will encourage the creation of technical efficiency. The level of capital directly affected technical efficiency. Lastly, entrepreneurial activity had a significant effect on the achievement of rice farming technical efficiency in the Bojongpicung Subdistrict, Cianjur.

4. CONCLUSIONS AND SUGGESTIONS

This study concludes the following
1. The majority of Rice Farming Entrepreneurial Activities in Bojongpicung Subdistrict are in a low category.
2. Rice production is significantly influenced by land area, seeds, urea, SP-36, and labor outside the farmer household.
3. Farming Technical Efficiency is influenced by Experience, Education, Capital, and Entrepreneurial Activities.

Recommendations for future developments include
1. Farmers need to be promoted to improve entrepreneurial competence to increase farm performance.
2. Optimizing family members' involvement improve future farming sustainability and productivity.

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