

Analysis of Factors Influencing the Success of Rice Seed Breeders in Banten Province

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Received May 24, 2023; Revised November 21, 2023; Accepted December 14, 2023

Cite This Paper in the Following Citation Styles

(a): [1] Khaerul Saleh , "Analysis of Factors Influencing the Success of Rice Seed Breeders in Banten Province," *Universal Journal of Agricultural Research*, Vol. 11, No. 6, pp. 1148 - 1155, 2023. DOI: 10.13189/ujar.2023.110622.

(b): Khaerul Saleh (2023). *Analysis of Factors Influencing the Success of Rice Seed Breeders in Banten Province*. *Universal Journal of Agricultural Research*, 11(6), 1148 - 1155. DOI: 10.13189/ujar.2023.110622.

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Abstract Improving superior-quality rice seed production is essential in preparing for sustainable food security. One of the challenges farmers encounter in utilizing good and superior-quality rice seeds is the limited stock in the market, and even when available, they are often relatively expensive. Consequently, farmers tend to rely on self-produced seeds. The present study aimed to assess the readiness of rice farmers to become rice seed breeders and identify the factors that influenced their success. Several selected factors, namely (1) self-capability, (2) education, (3) experience, (4) income, (5) technology, (6) marketing, (7) government role, (8) extension worker role, and (9) facilities and infrastructure, were evaluated for their dominant influence on the success of rice seed breeders in the Banten Province. The research was conducted from October 2022 to December 2022 in Serang and Pandeglang regencies, Banten Province, Indonesia. A quantitative descriptive method was employed, and data were collected through observations, questionnaires, and interviews. The research findings indicated a high success rate of rice seed breeders in both locations, reaching 86.1%. Simultaneous regression analysis revealed a significant influence of dominant factors on farmers' success in rice seed breeding, accounting for 70% of the variance. It was found that three dominant factors, namely self-capability, government role, and extension worker role, did not significantly influence the success of rice seed breeding among farmers, although their direction was positive. On the other hand, education, experience, income, marketing, technology, and facilities and infrastructure significantly and positively influenced the success of rice seed breeders in Banten Province, as indicated by a p-value of less than 0.05.

Keywords Superior Rice Seed, Seed Breeder, Seed Grower, Successful Farmer

1. Introduction

The increase in rice productivity is closely related to the crucial role of technology in rice cultivation. One technology that significantly enhances production is the use of improved rice varieties. Several related studies have shown that adopting new superior rice varieties (SRVs) could contribute up to 56.1 percent [1]. Furthermore, with good planting techniques such as water management, fertilization, and soil management, productivity could be increased by up to 75 percent [2].

In Indonesia, the demand for superior rice seeds in 2021 amounted to 10.61 million hectares of cultivated land, requiring 265.25 tons of seeds for that planting season. However, only 78 percent of the total requirement was fulfilled [3]. Since 2015, the Ministry of Agriculture, through the Agricultural Research and Development Agency, has released over 400 SRVs. Additionally, the Superior Seed Assistance Program has been implemented annually by the Ministry of Agriculture through the Regional Agriculture Offices, aiming to ensure food security and sufficient calories, carbohydrates, and protein to address stunting. Some varieties disseminated to the community included *Inpari*, *IR46*, *Nutri Zinc*, *Ciherang*, and *Makongga*, intending to optimize the improvement of planting indices with *IP 300* and *IP 400* through the use of short-duration rice varieties [3, 4].

Government efforts to achieve food self-sufficiency require community support, quality seed supply, and agricultural infrastructure. One factor in crop cultivation is the availability of high-quality seeds. Access to quality seeds is intrinsically linked to community involvement in seed multiplication. In this regard, using a cluster approach, socioeconomic diversity is vital in seed availability for food crops. The Ministry of Agriculture cites the Food and Agriculture Organization's statement that in developing countries, farmers store seeds, while commercial seeds involve seed breeders and the seed industry.

The involvement of farmers and farmer groups is crucial in supporting the establishment of seed regions [5]. The availability of certified quality seeds has not yet increased optimally in meeting the demand for quality, accuracy, quantity, timing, location, and price. Hence, the role of seed breeders or seed breeder groups in providing certified superior varieties is essential. However, it is also associated with various limitations, such as capital, human resources, facilities, and infrastructure [6]. Many farmers have been involved in starting certified seed breeding, but they have encountered several challenges, including limited land and equipment. The production of rice seeds requires drying equipment, cleaning equipment, drying areas, and storage facilities. Additionally, seed breeders often face difficulties marketing their seeds, resulting in selling prices that do not cover the production costs. The availability of superior seeds at the farmer level is not only about the quantity and quality of the seeds themselves but also the major constraint for breeders is the price level they receive, leading many farmers to be less interested in breeding seeds and prefer growing rice solely for consumption [7].

Serang and Pandeglang regencies are among the most crucial rice production centers in Banten Province, based on the extensive paddy field potential in 2022, covering an area of 48,831 hectares, consisting of 39,075 hectares of wetland rice and 9,756 hectares of upland rice [3]. Banten Province requires approximately 4,635 tons of rice seeds annually in these rice-growing areas, according to the annual report of the Ministry of Agriculture, Food Security, and Fisheries. One of the efforts to meet this demand is the establishment of seed breeding groups among farmers. The high demand for rice seeds each season presents a promising business opportunity for seed breeders. Moreover, the risk is relatively low for farmers engaged in seed breeding because unsuccessful seed sales can still be used as rice for consumption or milled into grain. However, they might face challenges in maintaining and selecting common varieties [8].

The decision for a farmer to breed rice seeds is challenging, as many factors influence it. Considering the characteristics of farmers who prefer a safe zone, avoid risks, and think rationally is reasonable because superior seed production promises higher prices and income. One of the major obstacles is the limited knowledge of rice seed breeding management. The government's efforts, particularly the Regional Seed Certification Agency

(*BSBD*), should take massive steps in socialization and innovation objectives to ensure that farmers can easily obtain seeds within certain limitations [9].

On the other hand, the use of superior rice seed varieties (SRVs) by farmers still varies significantly due to several factors, including 1) the availability of SRVs, which is not only relatively expensive but also difficult to obtain; 2) farmers' habit of using market-available seeds or those obtained from previous harvests; and 3) the socioeconomic conditions of the community (farmers), both internally and externally, particularly in the context of risk and resource scarcity. Based on the factors above, this research aimed to determine the success rate of rice seed breeders and identify the role of factors such as self-capability, education, experience, income, technology, marketing, government role, extension worker role, and facilities and infrastructure in the successful rice seed breeding in Serang and Pandeglang regencies, Banten Province. The hypothesis proposed was that the success rate of rice seed breeders in Serang and Pandeglang Regencies, Banten Province, was believed to be low. It was due to factors including capability, education, experience, income, technology, marketing, government role, extension worker role, and facilities and infrastructure in the success rate of rice seed breeders in Serang and Pandeglang regencies, Banten Province.

2. Materials and Methods

The research stages were conducted from October 2022 to December 2022, involving a population of rice seed breeders in Serang and Pandeglang regencies, Banten Province. The implementation procedures consisted of steps to identify the challenges encountered by rice seed breeders in Banten Province. A preliminary survey was also completed at the research locations to formulate the problems, develop hypotheses, and establish an appropriate methodology to address the issues.

The present study employed a quantitative descriptive research design, aiming to collect data by preparing a questionnaire administered to 50 respondents who were rice seed breeders in Serang and Pandeglang regencies. The approach applied by researchers focused on collecting quantitative data in the form of numerical figures, which were subsequently analyzed using quantitative analysis tools such as statistical analysis and mathematical calculations processed in *SPSS version 21.00*.

Data collection techniques included observation, questionnaires, and interviews, with the questionnaire's validity and reliability tested beforehand. In this context, validity refers to the degree of accuracy calculated using the Pearson product-moment correlation formula, while reliability indicates the consistency of measurement results when measuring the same phenomenon multiple times using the same instrument. The Cronbach's Alpha formula was used to test reliability. To assess the level of success in

rice seed breeding, the following formula was applied:

$$N = \frac{\text{Achieved Score}}{\text{Maximum Score}} \times 100 \% \quad (1)$$

The criteria are as follows:

- 1 0% - 20% = Very low level of success
- 2 21% - 40% = Low level of success
- 3 41% - 60% = Moderate level of success
- 4 61% - 80% = High level of success
- 5 81% - 100% = Very high level of success

To determine the factors influencing the success of rice seed breeders, multiple regression analysis was employed using the following formula:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 \quad (2)$$

Notes:

- Y = Success of farmers in rice seed breeding
 α = Constant term
 $\beta_1 - \beta_9$ = Regression coefficients
 X_1 = Self-capability variable
 X_2 = Education variable
 X_3 = Experience variable
 X_4 = Income variable
 X_5 = Marketing variable
 X_6 = Technology variable
 X_7 = Government role variable
 X_8 = Extension worker role variable
 X_9 = Facilities and infrastructure variable

3. Results and Discussion

3.1. Respondents' Characteristics

The general characteristics of the respondents are presented in Table 1. It reveals that most respondents belonged to the 41-51 age group, accounting for 18 individuals (36%). The 52-62 age group followed closely behind with 15 individuals (30%). Additionally, there were 5 respondents (10%) in the age group ≤ 63 and 12 respondents (24%) in the age group ≥ 40 . Hence, the interest of young farmers in rice seed breeding was found to be relatively low, as observed in Table 1.

Based on Table 1, the respondents generally completed formal education for 9 years, accounting for 29 individuals (58%), and more than 9 years, consisting of 17 individuals (34%), while only 8% did not complete elementary school. Regarding land ownership for farming, most respondents (52%) engaged in rice seed breeding on their own land, while the rest had a sharecropping or rental status, as shown in Table 1.

Table 1. Respondents' characteristics

No	Variable	Indicator	Total	Percentage
1	Age	≥ 40 years old	12	24
		41-51 years old	18	36
		52-62 years old	15	30
		≤ 63 years old	5	10
2	Formal Education	≥ 6 years	4	8
		6-9 years	29	58
		≤ 9 years	17	34
3	Land Ownership Status	Rented	9	18
		Self-owned	26	52
		Sharecropping	15	30

3.2. Success Rate of Rice Seed Breeders

The success rate of rice seed breeders in Banten Province could be considered successful based on the calculation in Equation 1, which is 86.1%. It was attributed to the increasing awareness among farmers to explore more profitable opportunities as seed breeders rather than cultivating rice for consumption.

3.3. Factors Influencing the Success of Rice Seed Breeders

The dominant factors influencing the success of rice seed breeders in Banten Province included several variables such as self-capability (X_1), education (X_2), experience (X_3), income (X_4), marketing (X_5), technology (X_6), government role (X_7), extension worker role (X_8), facilities and infrastructure (X_9), and the farmer's success (Y). The multiple regression analysis results yield the following mathematical equation:

$$Y = 14.298 + 0.273X_1 - 0.310X_2 - 0.241X_3 + 0.321X_4 + 0.349X_5 + 0.321X_6 - 0.175X_7 + 0.134X_8 + 0.560X_9$$

To assess the extent of the influence generated by the independent variables (X) on the dependent variable (Y), refer to Table 2.

Table 2. Influence of the Independent Variables on the Dependent Variable Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.837a	.700	.633	1.809

a. Predictors: (Constant), Facilities and Infrastructure (X_9), Education (X_2), Government Role (X_7), Experience (X_3), Income (X_4), Technology (X_6), Marketing (X_5), Extension Worker Role (X_8), Self-Capability (X_1)

Based on Table 2, the value of R square (R^2) is 0.700. It indicates that the independent variables ($X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8$, and X_9) collectively accounted for 70% of the influence on the dependent variable (Y). In other words, the significant factors influencing the success of rice seed

breeders in Banten Province were the independent variables ($X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8,$ and X_9), which contributed to 70% of the variation, while other factors influenced the remaining 30%.

In summary, the success of rice seed breeders in Banten Province (Y) was simultaneously influenced by the variables of self-capability (X_1), education (X_2), experience (X_3), income (X_4), marketing (X_5), technology (X_6), government role (X_7), extension worker role (X_8), and facilities and infrastructure (X_9), accounting for 70% of the variation. Other variables outside the model influenced the remaining 30%.

3.4. Simultaneous Effect Test (F-test)

To determine the simultaneous influence of the independent variables (X) on the dependent variable (Y), the F-score was compared with the F-table. From the analysis results shown in Table 3, the F-score is greater than the F-table. Specifically, the F-score is 10.374, while the F-table is 2.14. Therefore, H_0 was rejected, and H_1 was accepted. In other words, there was a linear relationship between the success of rice seed breeders (Y) and the variables of self-capability (X_1), education (X_2), experience (X_3), income (X_4), marketing (X_5), technology (X_6), government role (X_7), extension worker role (X_8), and facilities and infrastructure (X_9), as depicted in Table 3.

Table 3. Simultaneous Effect Test (F-test)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	305.583	9	33.954	10.374	.000 ^b
Residual	130.917	40	3.273		
Total	436.500	49			

a. Dependent Variable: Success (Y)

b. Predictors: (Constant), Facilities and Infrastructure (X_9), Education (X_2), Government Role (X_7), Experience (X_3), Income (X_4), Technology (X_6), Marketing (X_5), Extension Worker Role (X_8), Self-Capability (X_1)

3.5. Partial Effect Test (T-test)

To examine how each variable X influenced the variable Y, the t-test or regression coefficient test was employed. The test results demonstrated that the independent variables (X) positively influenced the dependent variable (Y). Based on the t-test results in Table 4, the t-score is 4.789, while the t-table is 2.021. It indicates that the t-score is greater than the t-table, suggesting that the independent variables (X) positively influenced the dependent variable (Y).

The detailed partial effects of each variable are as follows:

- 1 The t-score of variable X_1 resulted in 1.567, while the t-table is 2.021. Since the t-score is less than the t-table (t-score < t, 0.05), variable X_1 did not significantly influence variable Y. The standardized coefficient beta for X_1 is 0.303, indicating that the influence of X_1 on Y is 30.3%.
- 2 The analysis shows that the t-score for variable X_2 is -2.547, and the t-table is 2.021. Since the t-score is greater than the t-table (t-score > t, 0.05), variable X_2 had a significant but inverse influence on the dependent variable Y. The standardized coefficient beta for X_2 is -0.395, indicating that X_2 significantly influenced Y, accounting for 39.5%.
- 3 The t-score for variable X_3 is -2.456, and the t-table is 2.021. Since the t-score is greater than the t-table (t-score > t, 0.05), variable X_3 significantly negatively influenced the variable Y. The standardized coefficient beta for X_3 is 0.350, indicating that X_3 contributed to Y by 35%.
- 4 The t-score for variable X_4 is 2.649, and the t-table is 2.021. Since the t-score is greater than the t-table (t-score > t, 0.05), variable X_4 significantly positively influenced the dependent variable Y. The standardized coefficient beta for X_4 is 0.452, indicating that X_4 contributed to Y by 45.2%.
- 5 The t-score for variable X_5 is 2.665, and the t-table is 2.021. Since the t-score is greater than the t-table (t-score > t, 0.05), variable X_5 significantly influenced the dependent variable Y. The standardized coefficient beta for X_5 is 0.454, indicating that X_5 contributed to Y by 45.4%.
- 6 The t-score for variable X_6 is 2.335, and the t-table is 2.021. Since the t-score is greater than the t-table (t-score > t, 0.05), variable X_6 significantly positively influenced the dependent variable Y. The standardized coefficient beta for X_6 is 0.397, indicating that X_6 influenced Y by 39.7%.
- 7 The t-score for variable X_7 is -1.609, and the t-table is 2.021. Since the t-score is less than the t-table (t-score < t, 0.05), variable X_7 did not significantly influence variable Y. The standardized coefficient beta for X_7 is -0.256, indicating that X_7 contributed to Y by 25.6%.
- 8 The t-score for variable X_8 is 1.264, and the t-table is 2.021. Since the t-score is less than the t-table (t-score < t, 0.05), variable X_8 did not significantly influence variable Y. The standardized coefficient beta for X_8 is 0.301, indicating that X_8 influenced Y by 30.1%.
- 9 The t-score for variable X_9 is 4.476, and the t-table is 2.021. Since the t-score is greater than the t-table (t-score > t, 0.05), variable X_9 significantly influenced the dependent variable Y. The standardized coefficient beta for X_9 is 0.716, indicating that X_9 contributed to Y by 71.6%.

Table 4. Partial Effect Test (T-test)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.298	2.986		4.789	.000
	Self-Capability (X ₁)	.273	.174	.303	1.567	.125
	Education (X ₂)	-.310	.122	-.395	-2.547	.015
	Experience (X ₃)	-.241	.099	-.350	-2.456	.018
	Income (X ₄)	.321	.121	.452	2.649	.012
	Marketing (X ₅)	.349	.134	.454	2.665	.011
	Technology (X ₆)	.321	.138	.397	2.335	.025
	Government Role (X ₇)	-.175	.109	-.256	-1.609	.115
	Extension Worker Role (X ₈)	.134	.126	.301	1.264	.152
	Facilities and Infrastructure (X ₉)	.560	.125	.716	4.476	.000

Dependent Variable: Success (Y)

Self-Capability (X₁)

The regression analysis yielded a beta coefficient value of 0.303 for the Self-Capability variable (X₁), indicating that farmers' self-capability did not have a positive and significant influence on the success of rice seed breeding. Self-capability refers to an individual's belief in their ability to perform actions that control their reactions or the events in their environment. It can affect a person's ability to express certain behaviors or beliefs that lead to success, supported by interconnected behaviors. Conversely, Hardjana [10] and Indraningsih [11] demonstrated that success in managing rice seed breeding was directly related to farmers' ability to implement innovation and technology. Their analysis revealed a significant correlation between farmers' self-capability in managing rice seed breeding and their success. This connection was closely related to farmers' capacity to utilize innovation and technology, although it was not optimal. Farmers' desires predominantly drove the management of rice seed breeding, as they recognized the economic benefits of breeding activities.

Education (X₂)

The variable of education of rice seed breeders indicated an inverse relationship with the level of farmer success, accounting for 39.5%. It was evident that higher education among farmers did not necessarily contribute to their success as rice seed breeders. It aligned with the viewpoint expressed by Ginting [12], stating that formal education did not significantly influence agricultural success. Generally, it serves as a measure of an individual's abilities and qualities. Farmers with higher education should ideally be more innovative than those with lower education, especially in accessing the latest information from

electronic media and other sources.

In this regard, the level of education possessed by rice seed breeders serves as an indicator of human resource capacity, as it influences farmers' mindsets and facilitates the adoption of technology, innovations, and access to information. Likewise, higher education is expected to positively influence their mindset, leading to improved rice seed breeding practices and subsequently increasing their yields and income.

Experience (X₃)

The experience variable (X₃) had an inverse effect on farmer success, contributing to a negative correlation of 35%. Experience represents the accumulated time an individual (the farmer) spends executing and managing their agricultural activities. It indicates how well farmers can carry out their farming practices. Generally, as they gain more experience managing their agricultural activities, their knowledge and insights in farming also increase. It was in line with the findings of the Indonesian Ministry of Agriculture [4], Jufri et al. [13], and Narso et al. [14], which suggested that experienced farmers could effectively and efficiently manage their agriculture. The data confirmed that most farmers had a relatively long duration of experience cultivating rice fields, with an average of 7.5 years. Thus, the success in managing seed breeding has been established since they began their rice farming activities.

Income (X₄)

Income refers to the revenue farmers obtain in their agricultural activities, reflecting their well-being. In this study, the income variable had a significant and positive influence on the success of rice seed breeders, with a score

of 45.2%. It indicated that higher income levels for farmers were associated with greater success in their farming practices.

The increase in farmers' income is aligned with the growth in production and consumption. Hence, income generated from agricultural activities is a measure of farmers' success in their farming endeavors. Some researchers, including Susanti et al. [15], Sundari et al. [16], and Saleh [17] argued that income was one of the indicators of agricultural success, in addition to productivity. Furthermore, household income is the total income of a household minus its total expenditures from agricultural and non-agricultural activities over a specific period. In this context, the income of rice seed breeders in Banten Province was classified into the very high category, with a score of 86.1%.

Marketing (X₅)

There is generally a significant demand for quality rice seeds, as almost all farmers require them. Therefore, the market opportunities related to seed production are extensive. In this regard, the present research findings indicated that the marketing variable (X₅) contributed 45.4% towards the dependent variable (Y), and the direction of influence was positive. It suggested that rice seed breeders had considerably succeeded in developing their farming practices. However, several challenges were commonly encountered in marketing, such as the fluctuation of rice seed prices. To address this issue, it is necessary to establish a specific Cost of Production (COP). Narso et al. [14] and Mulyanti [18] mentioned that the uncertainty of rice seed prices could hinder farmers' interest in seed breeding activities. Nevertheless, a decrease in the price of rice seeds led to a decline in farmers' income, as more resources were allocated to seed breeding than rice farming.

Technology (X₆)

The analysis results indicated that the technology variable (X₆) positively influenced the dependent variable (Y), with a significant score of 0.397 or 39.7%, as shown in Table 4. Technology was measured through the use of seeds, fertilizers, pesticides, agricultural equipment, and seed management practices. In general, rice seed breeders understand how to manage seed breeding activities, and their understanding of technology utilization aligns with their capacity to comprehend the relevant Standard Operating Procedures (SOPs).

An essential component in selecting rice seeds is not only the innovative technology utilized but also the farmers' ability to determine the radius of the seed source area. Hence, human resource capacity is a crucial component in seed breeding management. As stated by Herawati [19] and Saleh [20], the capability of rice farmers to utilize technology facilitated its application in rice seed breeding. Innovative technology utilization is also obtained from acquiring knowledge through institutions or groups with shared objectives. Moreover, Saleh et al. [21]

discovered that the success of rice seed breeding was a combination of beliefs, norms, and intergroup networks.

Government Role (X₇)

The regression analysis revealed a beta coefficient value of -0.256 (25.6%), indicating that the correlation or loading between the government role variable (X₇) and the success of rice seed breeders (Y) was negative. It suggested a contrary or inverse relationship. However, government efforts to promote the growth and development of more efficient rice seed breeders are crucial. The availability of superior rice seeds significantly contributes to the productivity of subsequent rice farming. In this regard, specific policies related to the seed sector, such as labeling, supervision, and seed distribution, should become government priorities in safeguarding the existence of rice seed breeders, as highlighted by Saleh et al. [5]. The government plays a vital role in the capacity development of rice seed breeders, particularly in facilitating the necessary resources and infrastructure for farmers and finding solutions to their challenges, such as funding and marketing issues.

Extension Worker Role (X₈)

The regression analysis results demonstrated a beta coefficient value of 0.301, indicating that the loading factor of the extension worker role variable (X₈) was 30.1% towards the success of rice seed breeders, closely linked to the role of extension workers as guides, organizers, technicians, and consultants, as mentioned by Sundari et al. [16]. Likewise, Sofia et al. [22] revealed that agricultural extension workers played a significant role in disseminating information about innovations to farmers and had a tangible impact on empowering rice farmer groups. In this regard, they could act as consultants, facilitators, and mediators for farmers, which could be considered a "back to basics" approach.

The capability development of rice seed breeders is empowering farmers, as mandated by Law No. 16/2006 [23]. Therefore, the role of extension workers is not limited to developing productive activities for income enhancement but also involves policy advocacy, legitimizing technological innovations or ideas for change, and developing farmer organizations to foster agribusiness development through extension activities [22].

Facilities and Infrastructure (X₉)

Supportive facilities and infrastructure, such as location support, plant maintenance, morphological selection, certification, and packaging, are essential in preparing superior rice seeds. In this context, the facilities and infrastructure variable (X₉) significantly contributed to the success of farmers, with a beta coefficient of 0.716, indicating a loading factor of 71.6% between facility support and the success of rice seed breeding.

Efforts towards farmer empowerment, as initiated by the government through the concept of "*Konstratani*," involve

synergy between the government, specifically the agricultural extension worker, and farmers in the development of assistance, including rice planting equipment (transplanters), grain threshers (paddy threshers), and packaging labeling.

Farmers' Success (Y)

In several studies, success is defined as an individual or group's ability to carry out an activity. Primiana (2009), as cited in Mashuri [24], defines business success as the fulfillment of capital, productive distribution, and the achievement of organizational goals. In other words, it is the feedback resulting from implemented plans.

Changes in income levels indicate the success of rice seed breeders. The income farmers obtained in the present research was influenced by various factors, including the scale of their operations, capital availability, new technology adoption, input prices, family labor availability, knowledge and skills, marketing systems, and government policies. On the other hand, factors such as prices and productivity posed uncertainties. Therefore, farmers' income would also change if prices and production changed.

4. Conclusions

Based on the analysis results, the level of success of rice seed breeders in Banten Province was 86.1%, indicating a very high level of success. Correspondingly, facilities and infrastructure were significant factors influencing farmers' success. It suggests that the more facilities and infrastructure farmers had, the more successful they would be. The analysis also revealed that the facilities and infrastructure variables had a 71.6% impact on farmers' success, positively influencing their overall success.

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