



UDC 332; DOI 10.18551/rjoas.2022-11.16

STRATEGIES FOR DEVELOPING CERTIFIED SUPERIOR RICE SEEDS THROUGH BREEDING BUSINESS IN BALANGAN REGENCY OF SOUTH KALIMANTAN, INDONESIA

Diniati Dewi*, Hamdani, Ikhsan Sadik

Master's Study Program of Agricultural Economics, Faculty of Agriculture,
University of Lambung Mangkurat, South Kalimantan, Indonesia

*E-mail: dewidiniati@gmail.com

ABSTRACT

The role of agriculture, especially in South Kalimantan, is very dominant, seen in the vast agricultural sector in South Kalimantan Province. Various efforts of the South Kalimantan provincial government in increasing superior rice production are carried out in various ways the government supports through several program activities. The government's policy is for farmers to use certified (quality) superior seeds as an important element to increase production, in line with the increasing number of Indonesians whose traditional staple food is rice. The government through the Ministry of Agriculture issued a policy to develop seeding activities by both the government and the private sector which encourages the development of rice seed breeding activities that produce superior seeds. The study was conducted to analyze the income and profits of the breeding business of superior rice seeds, prioritize the breeding business, and analyze the strategy for developing superior seeds through captive breeding in Balangan Regency. The research was carried out from March 2022 to June 2022 using secondary data and primary data from all measuring farmers in Balangan Regency. Data analysis uses explicit and implicit costs, Revenue Cost Ratio analysis, and SWOT analysis. Based on the analysis, the income of superior seed breeding business in Balangan Regency is on average Rp. 17,905,452, - with an average profit of Rp. 12,370,690,-. The breeding business of superior seeds carried out in Balangan Regency has an RCR value of 2.05 which means that this captive business is feasible. SWOT matrix analysis obtains a certified superior seed development strategy, namely: SO (Strength-Opportunities) by expanding market reach by increasing the amount of production; WO (Weakness-Opportunity) by making a proposal for a farm business road to the local government, increasing capital by submitting a bank credit application; ST (Strength-Threats) with the formation of a captive corporation to jointly deal with threats in the captive business; WT (Weakness-Threats) by maximizing the potential of natural resources and human resources.

KEY WORDS

Development strategy, SWOT, superior seeds, rice.

Until now, the agricultural sector still has a strategic role in national development, both for economic growth and equitable development. The strategic role of the agricultural sector for economic growth is shown, among others, by the position of the agricultural sector as an important contribution in: (1) the formation of Gross Domestic Product, based on statistics in 2020 the agricultural sector contributes 13.28% to Indonesia's total GDP (BPS, 2020); (2) the provision and increase of foreign exchange through the export of agricultural products; and (3) supply of industrial raw materials. One of the technological innovations adopted by farmers today is breeding superior rice seeds with the technology of using superior rice varieties followed by proper fertilization and irrigation that can contribute to increasing rice productivity. This has become one of the goals in order to increase the income of rice farmers. By producing rice for seed means that the selling price received by farmers is higher when compared to rice for consumption. The prospect of breeding superior rice seeds is quite promising, considering the high price difference between rice for seeds and rice for consumption and the large demand for seeds at this time. The great need for



superior rice seeds is related to the increasing awareness of farmers to use certified seeds, and the government's policy of distributing seeds to farmers for free through various programs from the government.

In the Balangan Regency area, the use of superior seeds from year to year continues to increase, along with the increasing awareness of farmers to use superior rice seeds which are proven to be able to increase rice productivity, also driven by the high demand for non-local varieties of rice, as a result of the composition of the population of Balangan Regency which consists of multi-ethnic. In addition, there are many migrants from outside the island who work in companies in the Balangan district. The types of superior rice varieties developed for captive breeding in Balangan Regency are Inpari 9, Inpari 30, Mekongga, Situ Patenggang, IR 42 and Ciherang varieties.

The government's policy for farmers to use certified (quality) superior seeds as an important element to increase production is in line with the rate of population growth in Indonesia, where one of the traditional staple foods is rice. The government through the Ministry of Agriculture issued a policy to develop seed activities by both the government and the private sector to encourage the development of rice seed breeding activities that are oriented to producing high quality seeds.

The increase in demand for superior rice seeds has triggered an increase in the number of captive farmers and the area of captivity every year. This also encourages the Balangan Regency government to support the development of certified superior rice seed breeding. With a total planting area of 37,769 ha in Balangan Regency, the need for seeds from captive breeding is not sufficient to be reallocated in the district itself, because with a total planting area of 15,530 ha of superior rice seeds, 388,250 tons of certified seeds are needed while production from captivity is only 274.63 tons, so that the need for seeds for seeds is still not enough to be allocated in Balangan Regency itself, so to cover the shortage of seeds taken from neighboring districts. With the lack of procurement of certified superior rice seeds in Balangan Regency, it is necessary to have an appropriate strategy to increase the production of superior rice seed breeders, to meet the needs of rice seeds for farmers and support rice self-sufficiency and food security programs. The increase in production also certainly has an impact on increasing Regional Original Income (PAD) in Balangan Regency. For this reason, it is necessary to increase production through improving the quality of rice plants, such as developing varieties and using certified rice seeds.

This research aims to analyze:

- Profit which the farmer get from superior seed breeding business;
- Feasibility of breeding superior seeds in Balangan Regency;
- Development strategy of breeding superior seeds in Balangan Regency.

The merits of this research are:

- As an information to breeders in running their business especially breeding certified superior seeds;
- As an input or suggestion to government in order to make a policy about developing certified superior seeds through breeding;
- As a comparison reference for someone who are interested to continue this research on the same field.

METHODS OF RESEARCH

This research was carried out in Balangan Regency, from March 2022 to June 2022, starting from collecting secondary data and other supporting data in the Food Crops Sector and Technical Implementation Unit (UPT) Seed Center of the Food Security Agency of Agriculture and Fisheries of Balangan Regency and Balai Seed Supervision and Certification (BPSB) of South Kalimantan Province.

The data used in this study consisted of primary data and secondary data. Primary data were obtained from interviews and direct field observations using questionnaires.



Respondents consist of breeder respondents. Respondents of breeders were used as respondents using the criteria (Sarpintini, 2013):

- Having many experiences which appropriate with the field of research;
- Having a reputation and position in competence which appropriate with the field of research;
- Having a high credibility, willing and availing in the place which this research held.

Secondary data used is general data that supports research related to agribusiness development of superior rice seeds through captivity in Balangan Regency such as reports from the Balangan Regency Agriculture Office, Seed Monitoring and Certificate Center (BPSB) of South Kalimantan Province.

In order to analyze the income of farmers from breeding superior rice seeds as the first goal of this research, it is done by calculating the difference or the result of the reduction between the amount of revenue and the real (explicit) costs incurred. How to calculate income is:

$$I = TR - TCe$$

Where: $I = \text{Income}$; $TR = \text{Total Revenue}$; $TCe = \text{Explicit Cost}$.

Explicit costs are all costs that are actually incurred by farmers in carrying out farming activities. To calculate explicit costs can use the formula:

$$TCe = \sum_{i=1}^n X_{e_i} \cdot P_i$$

Where: $TCe = \text{Explicit costs total}$; $X_{e_i} = \text{The amount of input which make explicit costs to-}i$; $P_i = \text{Input costs to-}i$; $i = 1,2,3,4,\dots,n$.

Implicit costs are costs that are only calculated as costs; do not actually get the actual expenses paid by farmers. To calculate implicit costs, you can use the formula:

$$TCi = \sum_{i=1}^n X_{i_i} \cdot P_i$$

Where: $TCi = \text{Implicit costs total}$; $X_{i_i} = \text{The amount of input which make explicit costs to-}i$; $P_i = \text{Input costs to-}i$; $i = 1,2,3,4,\dots,n$.

Farming revenue is the product of the number of outputs or physical production results obtained during the production period and the price. To calculate revenue can use the following formula:

$$TR = Q \cdot P$$

Where: $TR = \text{Total Revenue}$; $Q = \text{Quantity (Production)}$; $P = \text{Price of seeds per kilogram}$.

Likewise, to find out farmers' profits by calculating the difference between the values of all revenues obtained and all costs (explicit costs and implicit costs) that have been incurred in carrying out production activities. Profits are calculated using the following formula:

$$\Pi = TR - TC$$

Where: $\Pi = \text{Profit}$; $TR = \text{Total Revenue}$; $TC = \text{Total Cost}$.

To achieve the goal of analyzing the feasibility of breeding superior rice seeds, an analysis of the Revenue Cost Ratio (RCR) was carried out. This is a comparison (ratio) between total revenue and total cost. Theoretically a business is said to be feasible if the RCR value > 1 . Mathematically the RCR is formulated as follows:



$$RCR = \frac{TR}{TC} = \frac{TR}{TC_e + TC_i}$$

Where: RCR = *Revenue Cost Ratio* (Comparison between total revenue and total cost); TR = *Total Revenue*; TC = *Total Cost*; TC_e = Total cost explicit; TC_i = Total cost implicit.

To achieve the third objective, namely to analyze the strategy of developing superior rice seed breeding farming in Balangan Regency, a SWOT analysis was used. SWOT analysis is used based on the assumption that an effective strategy is to maximize strengths and opportunities and minimize weaknesses and threats. The SWOT matrix consists of four strategic factors (Strengths, Weaknesses, Opportunities, and Treats) and four combined strategies (SO strategy, WO strategy, ST strategy and WT strategy). This matrix is used to clearly describe how the opportunities and threats faced can be adjusted to their strengths and weaknesses.

RESULTS AND DISCUSSION

Farming land used for breeding these superior rice seeds includes several types of farming land, namely: rainfed rice fields, tertiary technical irrigation land and swamp land. The land area used varies from 0.5 ha to 6 ha with a total area of 90.5 ha in captivity, so the average land area per farm is 1.8 ha. Production facilities used by farmers in Balangan Regency include seeds, NPK fertilizers, organic fertilizers, while pesticides used by farmers include herbicides, insecticides, and rodenticides. The results of the research carried out in Balangan Regency are known with a captive area of 90.5 ha so that an average land area per farm is 1.8 ha, with an average production per farm of 6,211 kg/farm, so the average per hectare owned by the breeder farmers is 3,450.5 kg/ha. The average total cost of rice breeding business in Balangan Regency can be seen in Table 1.

Tabel 1 – Total Explicit Cost

No.	Detail of cost explicit	Total Cost	
		Per Unit (Rp)	Per ha (Rp)
1.	Production Facilities	4,328,030	2,404,004
2.	Depreciation value of agricultural equipment	214,432	119,405
3.	Labor cost outside family	6.837.588	3.724.999
TOTAL		11,380,050	6,248,408

Source: *Primary Data Analysis, 2022.*

The result of primary data processing is known that the explicit cost which includes the average total cost of production facilities per hectare is Rp. 2,404,004, - while the total depreciation value for agricultural equipment is Rp. 119,405, - and the cost of family labour is Rp. 3,724,999, - so the total amount is Rp. the explicit cost of the rice breeding business in Balangan Regency is Rp. 6,248,408,-.

Table 2 – Total Cost Implicit

No.	Detail of cost explicit	Total Cost	
		Per Unit (Rp)	Per ha (Rp)
1.	Renting Land	5,323,529	2,957,516
2.	Labor inside family	4,497,745	2,493,868
TOTAL		9,821,274	5,451,384

Source: *Primary Data Analysis, 2022.*

The results of primary data processing are known that the implicit cost which includes the average rental cost of own land per hectare is Rp. 2,957,516, - while the average amount of labour costs in the family is Rp. 2,493,868, - then the total explicit cost of breeding seed business rice in Balangan Regency is Rp. 5,451,384,-.



Table 3 – Total Cost of Business

No.	Detail of cost explicit	Total Cost	
		Per Unit (Rp)	Per ha (Rp)
1.	Explicit Cost	11,380,050	6,331,426
2.	Implicit Cost	9,821,274	5,451,384
TOTAL		21,201,324	11,782,810

Source: Primary Data Analysis, 2022.

The results of primary data processing show that the total explicit cost per ha is IDR 6,331,426, while the total implicit cost per ha is IDR 5,451,384, which is incurred by the breeder farmers in the rice breeding business in Balangan Regency for each production time. cost per ha Rp 11,782,810, -.

Table 4 – Revenue

Cost (Rp)	Production		Revenue	
	Per Unit (Kg)	Per ha (Kg)	Per Unit (Kg)	Per ha (Kg)
7.000	6.211	3.450,5	43.475.490	24.153.500

Source: Primary Data Analysis, 2022.

The results of primary data processing can be seen that the average selling price of dry milled unhulled rice (GKG) for breeder farmers is Rp. 7,000, - with an average production per ha of 3,450.5 kg, so the average income of breeder farmers per farm is Rp. 43,475.490,- and Rp.24,153,500,- per ha.

Table 5 – Income

No.	Description	Total Cost	
		Per Unit (Rp)	Per ha (Rp)
1.	Revenue	43.475.490	24.153.500
2.	Total Cost explicit	11.380.050	6.248.048
3.	Income	32.095.440	17.905.452

Source: Primary Data Analysis, 2022.

The results of primary data processing are known that the average income of farmers is Rp. 24,153,500, - with an average total explicit cost of Rp. 6,248,048, - then the average income of captive farmers is Rp. 17,905,452, - for each time of production.

Table 6 – Profit

No.	Description	Total Cost	
		Per Unit (Rp)	Per ha (Rp)
1.	Revenue	43.475.490	24.153.500
2.	Total Cost	21.201.324	11.782.810
3.	Profit	22.274.166	12.370.690

Source: Primary Data Analysis, 2022.

Table 7 – Revenue Cost Ratio (RCR)

No.	Description	Total Cost	
		Per Unit (Rp)	Per ha (Rp)
1.	Revenue	43.475.490	24.153.500
2.	Total Cost	21.201.324	11.782.810
3.	RCR	2,05	2,05

Source: Primary Data Analysis, 2022.

The results of primary data processing are known that the average farmer income is Rp. 24,153,500, - with an average total explicit and implicit cost of Rp. 11,782,810, the



average profit obtained by breeder farmers per farm is Rp. 22,274,166, - and per ha of Rp 12,370,690,-.

The result of primary data processing is known that the business feasibility value per ha is 2.05 so that the RCR value is above 1, so the rice breeding business in Balangan Regency is very feasible to be cultivated.

Analyzing Factor Strategies:

- **Internal Factors.** The internal factor of this research comes from the existing breeder farmers in Balangan Regency. Strength factors include: (a) Availability of seed raw materials; (b) Experience of Breeder Farmers; (c) strategic area location; (d) Breeder's motivation; and (e) the captive system according to the guidelines. Weakness factors include: (a) Transportation access is still difficult; (b) limited working capital; (c) inadequate facilities and infrastructure and (d) the selling price has not been determined by the breeder; and (e) machine technology is still little used;
- **External Factors.** External factors of this study were sourced from BPSB and the Department of Food Security, Agriculture and Fisheries, Balangan Regency. Opportunity factors include: (a) Government support; (b) active extension workers (c) routine supervision from BPSB; and (d) high demand. Threat factors include: (a) Climate and weather changes; (b) The presence of competitors; (c) Captive corporations; and (d) Irrigation does not yet exist.

The weight calculation is carried out using a formula and the total of the weights should not exceed one, while the rating starts from numbers 1 to 4, giving this rating is determined by the researcher. The score is obtained from the result of multiplying the weight and rating that has been given.

Table 8 – Preparation of the internal strategy factor matrix

Internal Factor Strategies	Quality	Rating	Score
Strenght			
Availability of Seed Raw Material	0,104	4	0,416
Breeder Experience	0,114	4	0,456
Strategic Area	0,103	3	0,309
Breeder Motivation	0,092	3	0,276
Suitable Breeding System	0,093	3	0,280
Weakness			
Difficult Transportation Access	0,079	-3	-0,237
Limited Working Capital	0,103	-3	-0,301
Unsuitable Facilities	0,097	-3	-0,290
Undetermined Selling Prices	0,104	-4	-0,416
Lack of using Technology	0,112	-4	-0,448
TOTAL	1,000		0,045

Source: *Primary Data Analysis, 2022.*

The results of the assessment of the internal factors of the development of certified superior seeds in Balangan Regency with a total rating of 1 to 4 obtained an average total score of 0.045 which indicates that the business is in an average or moderate internal business condition. So that farmers must be able to take advantage of the strengths they have as well as possible and overcome the weaknesses they have in breeding certified superior seeds. The main strengths of the breeder farmers are the experience of the breeder farmers with a score of 0.456 and the availability of raw materials with a score of 0.416 while the weakness of the highest score is that machine technology is still little used with a score of -0.448.

Giving weights and ratings to determine the external strategic factors for the development of high-quality seeds. The score results from the weighting and rating can be seen in table 9.

The results of the external factor matrix strategy (EFAS) for the development of high-quality seeds obtained a total score of 0.302. Based on this total, it shows that the external



strategic factor (EFAS) for developing superior seeds is in an average or moderate external condition. So that breeder farmers must take advantage of existing opportunities and overcome existing threats to develop certified superior seeds, while the highest threat is in captivity corporations with a score of -0.600.

Table 9 – Compilation of the matrix of external strategic factors

External Strategic Factors	Quality	Rating	Score
Chance			
Government Support	0,188	4	0,752
Active Influencer	0,150	3	0,450
Control Routine	0,166	3	0,498
High Offer	0,147	2	0,294
Threat			
Changeable Climate	0,120	-3	-0,360
Competitor	0,128	-3	-0,384
Captive Corporation	0,150	-4	-0,600
No Irrigation	0,116	-3	-0,348
TOTAL	1,000		0,302

Source: Primary Data Analysis, 2022.

Matrix of SWOT Analysis. Based on the results of the calculation of the IFAS score of 0.045 and EFAS of 0.302, then an integration of internal and external factors will be carried out including strengths, weaknesses, opportunities and threats using the SWOT matrix. The aim is to determine alternative strategies to be chosen in the development of certified superior seeds in Balangan Regency.

Table 10 – Matrix of SWOT

EFAS	IFAS	Strength (S) Availability of seed raw materials Breeder farmer experience Strategic area location Breeder's motivation Captive system according to guidelines	Weakness(W) Transportation access is still difficult Limited working capital Inadequate facilities and infrastructure The selling price has not been determined by the breeder Machine technology is still little used
	Opportunity (O) Government Support Active instructor Routine supervision High demand	Expanding a wider market reach by increasing the amount of production	Make a proposal for the future business to the local government, increase capital by trying to apply for a bank loan
Threat(T) Climate change and weather competitors Captive corporation No irrigation yet	Establishment of a captive corporation to jointly deal with threats in captivity	Maximizing the potential of natural resources and human resources	

After identifying internal and external factors that become strengths and weaknesses as well as opportunities and threats in improving, several alternative strategies can be considered, including:

SO Strategy. Where the strategy is generated from the strengths and opportunities possessed by certified superior rice seed breeders. The alternative strategy is to expand the reach of a wider market by increasing the amount of production.

Seeing the strength factor of seed raw materials that are always available and a strategic location with opportunities for high demand for seeds and government support, it will be very suitable for its development by expanding the market for selling certified superior seeds. With the expansion of the market, the production of certified superior seeds must of course be increased; this will automatically increase the income of breeder farmers.

WO Strategy. This strategy is resulted from the weaknesses and opportunities in the breeding business of certified superior seeds in Balangan Regency. The alternative strategy



is to make a proposal for a farm road to the local government, increase capital by trying to apply for a bank loan.

In the IFAS matrix, the highest weakness is that capital is still limited to self-help capital, there has been no additional touch of capital from banks and infrastructure that is still not good, namely access roads to agricultural land. Seeing from the opportunities that exist, the breeder farmers can make a proposal to the local government and try to go to the bank to apply for business credit so that there is additional capital for breeding certified superior seeds.

ST Strategy. This strategy is resulted from the strengths and threats of breeding certified superior seeds in Balangan Regency. The alternative strategy is the formation of a captive corporation to jointly deal with threats in the captive business.

Considering the many threats, both climate change and weather, it would be better to form a certified breeding corporation for superior seeds in Balangan Regency as soon as possible. This corporation will benefit greatly in the future how to deal with all these threats and can be solved together by breeder farmers.

WT Strategy. This strategy resulted from the weaknesses and threats of breeding certified superior seeds in Balangan Regency. The alternative strategies are as follows:

- Maximize the potential of natural resources and human resources;
- Minimizing weaknesses and avoiding threats can be done by maximizing human resources who are experienced in the field of certified rice seed breeding, the location of a supportive area as a good natural resource to be able to develop a large breeding business area which will later be able to develop this breeding business.

CONCLUSION

The income of superior rice seed breeding business in Balangan Regency is on average Rp. 17,905,452, - with an average profit of Rp. 12,370,690,- per hectare.

The breeding business for superior rice seeds carried out in Balangan Regency has an RCR value of 2.05 which means that this breeding business is feasible to cultivate.

Based on the SWOT matrix analysis, the strategy for developing certified superior rice seeds is obtained, namely:

- SO (Strength-Opportunities): Expanding market through increasing the number of production;
- WO (Weakness-Opportunities): Creating proposal to local government in order to raising capital in taking bank loan;
- ST (Strength-Threats): Making relation or corporation in order to void together numerous treats in whole business;
- WT (Weakness-Threats): Maximize all natural resources and human resources potency.

There are several suggestions that we would like to convey to rice breeders in Indonesia, especially rice breeders in Balangan Regency including:

- The selling price that follows the purchase of large-scale harvested grain that has not been packaged by the packaging party, so there needs to be an institution that manages it;
- Capital is limited to own capital without credit from banks or people's business credit so that farmers are only able to plant captive seeds according to the capital they have, therefore researchers suggest that it should be provided in the form of savings and loan cooperatives that make it easier for farmers to do farming.

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