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COMPARATIVE ANALYSIS OF THE INCOME OF RICE SEED BREEDERS AND CONSUMPTION RICE FARMERS IN BANJAR DISTRICT OF KALIMANTAN SELATAN PROVINCE, INDONESIA

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ABSTRACT

The number of seed-breeding farmer groups in Banjar Regency is still not sufficient to meet the needs. The problem that occurs is the lack of interest of the seed breeders in Banjar Regency due to the increase in production costs incurred by the seed breeders which do not increase the income received by the seed farmers. This study aims to analyze the difference in income between seed-breeding and consumption-rice farming and the problems and solutions faced by rice-seed-seeding farmers and consumption-rice farmers in Banjar Regency. The results of the analysis show that the results of the t test (independent sample t-test), there is a difference in income between seed-breeding rice farming and consumption rice farming. The income of rice seed breeders farming is greater than that of consumption rice farmers. The problems faced by rice seed breeders are: (a) the breeding business has not given hope of better profits; (b) the competent authorities have not implemented better captive management and technology development; and (c) lack of captive business capital. The problems faced by consumption rice farmers are pest disturbances in the form of rats, leafhoppers and stink bugs.

KEY WORDS

Comparative analysis, seed breeders, rice farmers.

Efforts to increase rice production to maintain rice self-sufficiency face various obstacles. These problems are in the form of physical, biological and socio-economic constraints. To overcome these problems, the government needs to adopt policies in rice development in order to achieve better results (Prasekti, 2015).

Paddy production in South Kalimantan Province experienced a fairly fluctuating increase from 2018 to 2020. In 2019, there was an increase in production of 15,369.41 tons. On the other hand, in 2020 there was a decrease in production of 208,411.61 tons (BPS Kalimantan Selatan, 2021). The decline in production was due to reduced harvested area, damage to the planting area. Damage to rice planting areas can be caused by drought and attacks by pests and plant diseases or plant-disturbing organisms (OPT).

Banjar Regency is one of the main rice-producing regions in South Kalimantan, with rice production in 2020 ranking second after Barito Kuala Regency (167,690.91 tonnes). However, compared to the previous year, when rice production was 77,504.66 tonnes, rice production in 2020 will be lower (BPS Kalimantan Selatan, 2021).

Seed is one of the production inputs that greatly influence the final yield. The existence of a seed breeder or rice seed business is very important, especially to meet the limited demand for seeds in Banjar Regency. The availability and demand for seeds by farmers in Banjar Regency does not only come from the government, but also from the areas cultivated by farmers. This is a solution for farmers who cannot get seeds from the government because their stocks are insufficient or have run out.

The number of seed-breeding farmer groups in Banjar Regency is still not sufficient to meet the needs. The problem that occurs is the lack of interest of the seed breeders in Banjar Regency due to the increase in production costs incurred by the seed breeders which do not increase the income received by the seed farmers.

The purpose of this research: analyzing the difference in income between rice seed farming and consumption rice farming in Banjar Regency; analyzing the problems and



solutions faced by rice seed breeders and consumption rice farmers in Banjar Regency.

METHODS OF RESEARCH

This research was conducted in Banjar Regency, South Kalimantan Province. This research was conducted from March to November 2022.

In this study the data used were primary data obtained by direct interviews with rice seed growers and consumption rice farmers as research respondents. In addition, secondary data is needed to support primary data obtained from literature studies, related institutions or agencies.

Analyzing the difference in income between rice seed farming and consumption rice farming, with several stages of analysis:

$$TC_i = TC_{ei} + TC_{ii}$$

Where:

- TC: total cost of farming (IDR);
 - TC_{ei} : total explicit cost (IDR);
 - TC_{ii} : total implicit cost (IDR);
 - i: 1. Farmers cultivating rice seeds; 2. consumption of rice farmers.
- Tool shrinkage:

$$D_i = \frac{N_{ai} - N_{si}}{Up_i}$$

Where:

- D: depreciation value of fixed capital goods (IDR/year);
 - N_a : the initial value of fixed capital goods equal to the purchase price (IDR);
 - N_s^* : residual value of fixed capital goods (IDR);
 - UP: age of use of fixed capital goods (years);
 - i: 1. Farmers cultivating rice seeds; 2. consumption of rice farmers.
- Farming revenue:

$$TR_i = Q_i \times P_i$$

Where:

- TR: farming revenue (IDR);
- P : production price (IDR /kg);
- Q: production yield (kg);
- i: 1. Farmers cultivating rice seeds; 2. consumption of rice farmers.

Farm income hypothesis:

- $H_0: I_{pb} = I_{pk}$;
- $H_1: I_{pb} > I_{pk}$.

t-test (*independent sample t-test*):

$$t_{statistics} = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

Where:

- \bar{x}_1 : average income of rice seed-breeding farmers;
- \bar{x}_2 : average income of consumption rice farmers;
- s_1^2 : variance of rice seed farmers;
- s_2^2 : variance of consumption rice farmers;
- n_1 : number of farmers cultivating rice seeds;



- n_2 : number of consumption rice farmers.
- Decision criteria:
- H_0 is accepted, if the sig. from thit $\geq \alpha_{0,05}$;
 - H_0 is rejected, if the sig. of thit $< \alpha_{0,05}$.

Analyzing the problems and solutions faced by rice seed breeders and consumption rice farmers in Banjar Regency using descriptive analysis methods. The method of descriptive analysis is to describe the problems and solutions that have been put forward by rice seed breeders and consumption rice farmers in the implementation of rice farming.

RESULTS AND DISCUSSION

Farming costs are costs incurred by farmers in carrying out their farming. The costs of farming rice seedling farmers and consumption rice farmers consist of implicit costs and explicit costs.

Table 1 – Average total cost per hectare

Description	Rice seed growers (Rp)	Consumable rice farmers (Rp)
Implicit costs		
Land	2.479.124	2.083.707
Labor in the family	3.098.296	2.441.033
Own capital interest	319.792	251.468
Explicit costs		
Seed	360.803	256.095
Fertilizer	1.048.539	1.076.531
Drugs	2.271.759	882.427
Tool depreciation	565.098	417.523
Labels and packaging	298.491	0
Family labor	2.749.848	2.651.075
Labor tools and agricultural machinery	3.117.651	2.764.990
Total cost	16.309.400	12.824.848

Source: Primary data processing, 2022.

Based on Tables 1, the costs incurred in the farming of rice seed breeders calculated per farm are greater than those of consumption rice farmers. The average total cost of farming for seed-bearing farmers is IDR 16,309,400/ha, consisting of implicit costs of IDR 5,897,212/ha and explicit costs of IDR 10,412,188/ha, while the total cost per ha of consumption rice farmers is Rp. 12,824,848/ha. ha consists of an implicit cost of IDR 4,776,208/ha and an explicit cost of IDR 8,048,640/ha.

The farming land of rice seed breeders and consumption rice farmers that are worked on by farmers is their own. Even though the arable land is self-owned, the cost of the land is still calculated. Based on Tables 1, the average cost of land incurred by farmers in implementing rice seed-breeding farming is greater than for consumption rice farmers if calculated per farm or per hectare. The cost of land for farmers raising rice seeds is IDR 2,479,124/ha, while for consumption rice farmers are IDR 2,083,707/ha. The average area of land cultivated by rice seed growers is 1.26 ha (44.23 wholesale), while consumption rice farmers are 1.27 ha (44.55 wholesale).

Labor in the family in the management of consumption rice farming includes the activities of seeding, planting, maintenance (weeding, fertilizing and pest control), harvesting (grinding), transportation and drying. While the activities in carrying out the farming of rice seed breeders are the same as those of consumption rice farmers, however there are several additional activities, namely selection (roguing) and packaging. Based on Tables 1, the cost of labor in the family for farming rice seed-raising farmers is greater than for consumption rice farmers if calculated per farm or per hectare. The average labor force in the family of rice seed cultivators is 31.52 HKO/ha, so the average labor cost is IDR 3,098,296/ha. While the average use of labor in consumption rice farming families is 25.23 HKO/ha, so the average labor cost incurred is IDR 2,441,033/ha.

The capital issued by the farmers in managing the farming of rice seed-breeding farmers and consumption rice farmers is their own. Even though the capital used is self-owned, the amount of interest costs on their own capital is still taken into account by farmers



for the implementation of lowland rice farming in this study. Based on Tables 1, the interest cost of self-owned capital incurred by farmers raising rice seeds is greater than that of consumption rice farmers when calculated per farm or per hectare. The average cost of interest on self-owned capital for rice seed-breeding farmers is IDR 319,792/ha, while for consumption rice farmers is IDR 251,468/ha.

The cost of seeds incurred by rice seed breeders is relatively higher than the cost of seeds for consumption rice farmers if calculated per farm or per hectare. The average seed used by rice seed breeders is 45.10/ha at a price of IDR 8,000/kg, so the average seed cost is IDR 360,803/ha. Meanwhile, rice farmers use an average seed consumption of 31.73 kg/ha at a price of IDR 8,000/kg, so the average seed cost is IDR 256,095/ha.

The types of fertilizers used by rice seed breeders and consumption rice farmers in the implementation of rice farming are Petroganik, Urea and Phonska fertilizers. Fertilizer costs incurred by rice seed growers are relatively smaller than the cost of fertilizer used by consumption rice farmers if calculated per farm or per hectare. The average cost of fertilizer for farmers raising rice seeds is 701 kg/ha, so the average cost of fertilizer is IDR 1,048,539/ha. Meanwhile, the cost of fertilizer consumed by rice farmers is 738 kg/ha, so that the average cost of fertilizer is IDR 1,076,531/ha.

The use of drugs used by rice seed growers and rice consumption farmers are herbicides (Suprimo, Basmilang, Paratop and Gramoxone), insecticides (Spontan, Regent, Matador, Alika and Sidatan) and fungicides (Fujiwan, Dennis, Sidabin, Tyopsin and score). The cost of medicines incurred by farmers raising rice seeds is relatively higher than the cost of medicines used by rice farmers for consumption if calculated per farm or per hectare. The average use of medicines by rice seed growers is 16.84 L/ha, so the average cost of medicines is IDR 2,271,759/ha. Meanwhile, the consumption of rice farmers is 5.83 L/ha, so the average cost of medicines is IDR 882,427/ha.

The cost of depreciation of tools is calculated from the depreciation value of the tools used by rice seed breeders and consumption rice farmers, where the tools used include machetes, hoes, rakes, sickles, sacks, tarpaulins, lanjung, mats, gumbaam and handsprayer. The cost of depreciation of tools incurred by rice seed growers is relatively greater than the cost of depreciation of tools used by consumption rice farmers if calculated per farm or per hectare. The average cost of depreciation for rice seed growers is IDR 565,098/ha, while for consumption rice farmers it is IDR 417,523/ha.

Labels and packaging are needed by rice seed breeders to be sold and distributed to farmers who need rice seeds for conducting rice farming. On average, rice seed growers make labels of 426 fruit/ha at a price of IDR 250/fruit, so the cost of labeling is IDR 106,604/ha. While the average use of packaging by rice seed growers is 426 pieces/ha at a price of IDR 450/fruit, so the labeling fee is IDR 191,887/ha. The total cost of labeling and packaging incurred by farmers raising rice seeds is IDR 298,491/ha.

The activities of labor outside the family in carrying out the farming of rice seed breeders are the same as those of consumption rice farmers including planting and harvesting (harvesting rice). Based on Tables 1 and 2, the cost of labor outside the family incurred by rice seed breeders is relatively higher than that of consumption rice farmers if calculated per farm or per hectare. The average labor outside the family of rice seed cultivators is 28.64 HKO/ha, so the average labor cost incurred is IDR 2,749,848/ha. Meanwhile, the average use of labor outside the family of consumption rice farmers is 27.62 HKO/ha, so the average labor cost incurred is Rp. 2,651. 075/ha.

The labor activities of agricultural tools and machines in the operation of rice seed-breeding farmers are the same as for consumption rice farmers, including land processing using a handtractor and harvesting (threshing rice using a power thresher and combine harvester). Based on Tables, the labor costs for agricultural tools and machinery incurred by rice seed breeders are relatively higher than those for consumption rice farmers if calculated per farm or per hectare. The average labor force for agricultural tools and machinery for rice seed breeders is 7.49 HKO/ha, so the average labor cost for agricultural tools and machinery incurred is IDR 3,117,651/ha. While the average use of agricultural equipment and machinery for consumption rice farmers is 8.15 HKO/ha, so the average labor cost for agricultural tools and machinery incurred is IDR 2,764,990/ha.



The acceptance value obtained by rice seed growers is the value of the calculation of the seeds produced by the respondent farmers multiplied by the selling price of the seeds. The acceptance value obtained by consumption rice farmers is the value of the calculation of the yield from the respondent farmers multiplied by the price of grain.

Table 2 – The distribution of the technical efficiency index of respondent farmers in the superior rice farming method is Tablea

Description	Rice seed growers (Rp)	Consumable rice farmers (Rp)
Productivity (kw/ha)	42,89	38,50
Production (kg)	4.266,77	3.845,13
Selling price (IDR)	8.000	5.943
Revenue (IDR)	34.134.145	22.708.484

Source: Primary data processing, 2022.

Based on Tables 2, the income generated by rice seed breeders is higher than consumption rice farmers. The average income for rice seed growers is IDR 34,134,145/ha, while for consumption rice farmers it is IDR 22,708,484/ha. The reason is that as a result of the production/productivity of the farming business of rice seed breeders produced is higher than that of consumption rice farmers. This is because the ability to cultivate land with mechanization is able to further increase high production, and mechanized harvesting can minimize crop loss.

Income is the value of the difference between income and costs of rice farming. Income is one indicator of the success of farming activities. Farming income can also provide an overview of the benefits of farming activities.

Table 3 – Average farmer income per hectare

Description	Rice seed growers (Rp)	Consumable rice farmers (Rp)
Revenue	34.134.145	22.708.484
Explicit cost	10.412.188	8.048.640
Income	23.721.956	14.659.843

Source: Primary data processing, 2022.

Based on Table 3, the income generated by rice seed breeders is higher than that of consumer rice farmers. This is shown based on the calculation analysis that the average income of rice seed growers is Rp. 29,980,903/farm business or Rp. 23,721,956/ha, while for consumption rice farmers it is Rp. 18,660,127/farm business or Rp. 14,659,843/ha. The reason is that as a result of the production/productivity and income of rice seed-breeding farmers, the resulting farming is higher than that of consumption rice farmers.

To analyze the difference in income between rice seed raising farming and consumption rice farming using the t test (independent sample t-test). Based on the test, the difference in income between seed raising farming and consumption rice farming shows that the F-hit value (11.868) with a probability value (sig.) of 0.034 is smaller than the level value of $\alpha = 0.05$. So the decision taken is to reject H0 and accept H1, with the conclusion that the farming income of rice seed breeders is significantly greater than the income of consumption rice farmers.

The test uses the t-test, based on the results of the analysis of differences in income between seed-breeding rice farming and consumption rice farming, it shows that the t-hit value (14.269) with a probability value (sig.) of 0.000 is smaller than the level value $\alpha = 0.05$. So the decision taken is to reject H0 and accept H1, with the conclusion that the farming income of rice seed breeders is significantly greater than the farming income of consumption rice farmers.

There are many technical and non-technical problems encountered in the rice seed breeding business. Non-technical problems include the environmental conditions of the community and unsupportive seeding policies. Technical problems are generally found in maintenance, harvest and postharvest factors. In plant maintenance, it is generally constrained by limited fertilizers and excess or lack of water. Meanwhile, in terms of harvest and postharvest, it is often constrained by limited harvesting equipment and seed



processing. Sometimes it is also constrained by rain which suddenly falls when the seeds are dry in the field or even when they are drying. This case can actually be overcome by using a seed dryer.

In addition, other problems and solutions faced by rice seed breeders:

1. The captive breeding business has not given hope of a better profit:
 - There is no market guarantee from the Government/Private that will accommodate the production of breeders. The solution to this problem is that there is a market guarantee by the government/private sector that will buy or there needs to be free competition between traders (no monopoly);
 - The high price of production facilities and the high wages in captive breeding. The solution to this problem is cheap and in line with the price of production facilities and the efficiency of the implementation of captive breeding.
2. Better captive management and technology development has not been implemented by authorized officers:
 - Insufficient or slow transfer of technology information to supervisory officers as a result of a lack of skills training on seed technology, and the lack of fluency in information about superior varieties that have been released for development. The solution to this problem is accelerating the transfer of technology to supervisory officers, increasing opportunities for skills training on seed technology and facilitating information on superior varieties that have been released for development;
 - Lack of opportunities for officers to carry out coaching as a result of the lack of staff facilities and overlapping tasks that must be carried out by an officer. The solution to this problem is to increase the opportunities for officers to carry out captive breeding in the following ways: provide adequate staff facilities and try not to overlap the workloads that must be carried out by an officer.
3. Lack of captive business capital. Any farming carried out by farmers, such as breeding seeds, of course, leads to the problem of availability of funds. Even though there are opportunities for farmers to take advantage of banking services, farmers are often worried that they cannot return them due to the lack of market guarantees for the seeds they produce. The solution to this problem is that for this it is hoped that there will be easy banking services or private funders that are not ensnared. For this, of course, good business management is needed.

The problems faced by consumption rice farmers are pest disturbances in the form of rats, leafhoppers and stink bugs. The pest walang sangit (*Leptocoris oratorius*) attacks paddy rice plants by sucking the liquid from the flower stalks and grains of rice during the grain filling and grain cooking phases so that the filling of the rice grains is not perfect, and often results in empty rice grains. The existence of this pest attack can lead to a decrease in lowland rice production and reduce grain quality. Farmers control this pest attack by chemical means, which is done by spraying insecticides. The planthopper pest begins to attack paddy rice plants aged 15 days after planting and the attack symptoms will appear after planting 20-40 days after planting. This pest not only sucks the liquid from the stems of paddy rice plants, but can transmit the virus through infected plants and spreads to other plants. Farmers control these planthopper pests by chemical means, namely the use of systemic and contact pesticides.

CONCLUSION

Based on the results and discussion that has been described regarding the comparative analysis of the income of rice seed breeders and consumption rice farmers in Banjar Regency, South Kalimantan Province, several conclusions are obtained, namely:

- Based on the results of the t test (independent sample t-test), there is a difference in income between seed-breeding rice farming and consumption rice farming. The income of rice seed breeders farming is greater than that of consumption rice farmers;
- Other problems and solutions faced by rice seed breeders are: (a) captive breeding



does not yet provide hope of better profits; (b) the competent authorities have not implemented better captive management and technology development; and (c) lack of captive business capital. The problems faced by consumption rice farmers are pest disturbances in the form of rats, leafhoppers and stink bugs.

Recommendations:

- Local extension workers hold outreach to consumption farming farmers about the difference in income between rice seed breeding and consumption rice farmers so that consumption farmers are interested in breeding rice seeds;
- There needs to be regular training from the government for rice seed breeders, especially in Banjar Regency, to increase the ability of farmers in rice cultivation and increase rice productivity, so that the need for certified rice seeds can be met for consumption rice farmers;
- For rice seed breeders to further increase their knowledge through various training activities and exchange of information between fellow rice seed breeders to add information, insight and skills that can be applied in running rice seed breeding farming and in making decisions;
- The need for prevention of pests and diseases carried out by farmers cultivating consumption rice seeds in a preventive and integrated manner. Farmers sprayed pesticides, even though there was no attack. Farmers carry out physical and organic pest control. Physically, namely by catching or baiting. Organically, namely by using animal or vegetable pesticides that are made alone or made in groups;
- It is expected that rice seed breeders will pay more attention to the number of workers starting from land preparation activities to harvesting production because most of the income is obtained by deducting wages for labor which is quite large compared to other costs. This is done so that rice seed breeders can survive to carry out rice seed breeding farming.

REFERENCES

1. Abdi, A. M. 2019. Faktor-Faktor yang Mempengaruhi Keputusan Petani Untuk Memproduksi Benih Padi di Kabupaten Deli Serdang. [Tesis]. Program Studi Magister Agribisnis, Fakultas Pertanian, Universitas Sumatera Utara.
2. Akbar, F.M. 2011. Analisis Faktor-Faktor Produksi dan Pendapatan Petani Penangkar Benih Padi (Kasus Kemitraan Petani Penangkar PT. Sang Hyang Seri). Institut Pertanian Bogor. Bogor.
3. Badan Pusat Statistik. 2021. Provinsi Kalimantan Selatan Dalam Angka. BPS. Banjarbaru.
4. Prasekti, Y.H. 2015. Analisa Ekonomi Usaha Penangkar Benih Padi Cihelang (di Kelurahan Tamanan Kec. Tulungagung Kab. Tulungagung). Jurnal Agribisnis Fakultas Pertanian Unita. Vol. 11(13). Tulungagung.
5. Hutapea, Y., Suparwoto dan Waluyo. 2018. Analisis Perbandingan Pendapatan Penangkaran Benih Padi Pada Tiga Agroekosistem di Sumatera Selatan. Jurnal Pengkajian dan Pengembangan Teknologi Pertanian. Balai Pengkajian Teknologi Pertanian Sumatera Selatan. Vol. 21, No. 1, hlmn 49-61.
6. Ishaq, I. 2009. Petunjuk Teknis Penangkaran Benih Padi. BPTP Jawa Barat. Bandung.
7. Kusnadi, D., D. H. Sudjaya., Z. Normansyah. 2015. Analisis Usahatani Penangkaran Benih Padi (*Oryza sativa* L.) Varietas Cihelang (Studi Kasus pada Seorang Penangkar Benih di Desa Purwajaya Kecamatan Purwadadi Kabupaten Ciamis). Jurnal Ilmiah Agroinfo Galuh. Vol.1(2). Ciamis.
8. Nursyamsiah, D. 2013. Analisis Usaha Tani Penangkaran Benih dan Padi Konsumsi (Studi Kasus di Desa Gunung Sari, Kecamatan Pamijahan Kabupaten Bogor). Insitut Pertanian Bogor. Bogor.