International Journal of Technology and Education Research

https://e-journal.citakonsultindo.or.id/index.php/IJETER

E-ISSN: 2986-0733

The Role of Brown Rice in Farmers' Income and Consumption in North Kulisusu Subdistrict, North Buton Regency

Novita Rahmadani Azhar[1] , Samsul Alam Fyka[2] , Hadi Sudarmo[3]

[1] Alumnus of Agribusiness, Faculty of Agriculture, Halu Oleo University, Kendari City, Indonesia
[2] Lecturer, Faculty of Agriculture, Halu Oleo University, Kendari City, Indonesia

Corresponding Author; nvtrhmdni@gmail.com

Abstract

This study analyzes the role of brown rice on the income and consumption of farming households in North Kulisusu District, North Buton Regency. The research sample included all 44 brown rice farmers, with data collection through observation, interviews, and documentation. The research area consists of lowlands to hills, partly coastal, with a tropical climate, and the majority of the population earns a living as farmers. Farming is carried out traditionally starting from land preparation, planting with a spacing of 30 × 30 cm, maintenance, until harvesting 1–2 weeks after being ready. Respondents are of productive age, mostly elementary school graduates, have more than 10 years of farming experience, and manage 0–1 hectare of land. The results show an average production cost of IDR 1,097,245 per year with a net income of IDR 4,855,028 per year, indicating a significant contribution of brown rice to farmer income. Of the average production of 220.5 kg per year, 9.81% is consumed by households and the remainder is marketed. Brown rice serves as a source of income and food. Improved efficiency of farming practices, land diversification, and support from the government and relevant institutions are recommended to increase yields, incomes, and local food consumption. This study confirms the economic and health potential of red rice cultivation in the region

Keywords: ***Brown Rice, Farmer Income, Food Consumption, Farming, North Kulisusu District***

INTRODUCTION

Brown rice (*Oryza nivara*) is a food commodity commonly cultivated on dryland or in fields and holds significant economic potential. In recent years, public interest in consuming brown rice has shown an upward trend, in line with growing public awareness of the importance

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

of a healthy lifestyle. Brown rice is known as a functional food because it has better nutritional content compared to white rice, such as higher levels of fiber, vitamin B, and minerals, as well as relatively lower calorie content. These characteristics give brown rice a higher market value, thereby potentially increasing farmers' income (Saidah et al., 2015).

Nevertheless, according to data from the Central Statistics Agency (BPS) for 2021–2022, red rice remains relatively unpopular among the majority of the Indonesian population. Consumption preferences are still dominated by white rice, particularly among groups with lower to middle levels of education. Conversely, individuals with higher levels of education tend to prefer red rice due to a better understanding of its long-term health benefits. Data from shows that 50% of highly educated consumers choose brown rice, while consumers with lower and middle levels of education prefer white rice at 55% and 25%, respectively. This indicates that socioeconomic factors, particularly educational level, significantly influence rice consumption patterns.

In terms of nutritional content, brown rice has a significant advantage over white rice. Brown rice contains 3.5 grams of fiber, which is higher than white rice, which contains only 1.5 grams. Additionally, brown rice has higher levels of vitamin B and minerals, as well as fewer calories. These advantages make red rice a healthy food alternative that is increasingly in demand by the public, especially among those with a high awareness of health.

The Kulisusu Utara Subdistrict in North Buton Regency is one of the areas with great potential for brown rice development. This region is dominated by dry land suitable for upland rice cultivation, including brown rice. Most residents work as farmers, making the agricultural sector the backbone of the local economy. Production data for 2024 indicates that Kulisusu Utara Subdistrict has a planted area of 10 hectares with a production of 11.52 tons, ranking third in North Buton Regency. Interestingly, the farming practices employed by farmers are still largely natural, with minimal use of pesticides and chemical fertilizers, resulting in relatively low production costs and the potential to increase farmers' net income.

However, the utilization of red rice by farmers in this region remains suboptimal, both as a primary income source and for household consumption. Most farmers still treat red rice as a supplementary commodity, so its contribution to farmers' well-being remains unclear. This situation indicates a gap between the economic potential of red rice and its actual utilization at the farmer level.

A number of previous studies have examined the economic aspects of various business sectors, including agriculture. Research by Silvian and Hekmahtiar (2024) indicates that organic red rice farming is economically viable, with a favorable R/C ratio. Devita et al. (2023) found that

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

fishermen's income exceeds the County Minimum Wage (UMK), indicating a decent standard of living. Dahlianawati et al. (2020) also demonstrated that red onion farming has a B/C ratio of 1.44, signifying the viability of the enterprise. Another study by Kumalasari et al. (2019) confirms that partnerships can increase sugarcane farmers' income, while Damayanti et al. (2021) show that poultry slaughterhouse businesses generate income far above the UMK.

Although these various studies have addressed income and business viability aspects, most still focus on general economic analysis and have not specifically examined the relationship between red rice as a commodity and both farmers' household income and consumption patterns, particularly in dryland areas such as North Kulisusu Subdistrict. Furthermore, existing research on red rice generally emphasizes production and business viability; few studies have integrated economic and consumption aspects into a comprehensive analysis. Given these conditions, this study is crucial to understand the extent to which red rice contributes to increasing farmers' income and improving household consumption patterns, thereby supporting sustainable food security and farmers' well-being. Furthermore, this research is relevant for supporting the development of locally-based food systems utilizing regional resources.

Thus, this study is expected to provide a comprehensive overview of red rice's contribution to farmers' well-being—both economically and in terms of consumption—and to serve as a foundation for formulating sustainable agricultural development policies.

METHOD

This study was conducted in North Kulisusu Subdistrict, North Buton Regency, from November to December 2025, using a survey method and purposive sampling because the area is one of the major red rice production centers. The study population consisted of all red rice field farmers in four villages—Lelamo, Waodeburi, Petetea, and Pebaoa—totaling 44 farmers, all of whom were selected as the sample through a census method. The data used consisted of primary and secondary data, where primary data was obtained directly from respondents through field observations, structured interviews using questionnaires, and record-keeping, while secondary data was obtained from literature reviews, documentation, and relevant agencies to support the analysis. Data collection techniques included observation, interviews, and systematic recording, which were subsequently analyzed to determine the role of red rice in farmers' household income and food consumption.

The data analysis used to support the role of red rice in the income and food consumption of red rice field farmers in Kulisusu Utara sub-district, Buton Utara regency, is quantitative descriptive data analysis, specifically the " " method, which calculates the difference between

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

income from red rice field cultivation and the total costs associated with production. Soekarwati (2003) argues that farm income is the difference between revenue and all expenses incurred, using the formula:

$$\pi = TR - TC$$

$$TR = Y \cdot PY$$

$$TC = FC + VC$$

Explanation:

π = TR – TC

TR = Y × PY

TC = FC + VC

π = Farm income (Rp/Year)

TR = Total *Revenue* (Rp/Year)

TC = Total costs (Rp/Year)

Y = Total production (kg/year)

Py = Price (Rp/Year)

FC = *Fixed cost* (Rp/Year)

VC = Variable cost (Rp/Year)

Criteria:

> UMK (County/City Minimum Wage) = Prosperous

< UMK (County/City Minimum Wage) = Not yet prosperous

Calculating the consumption percentage according to (Rahim and Hastuti, 2008) for red rice field crops using the formula:

$$PK = \frac{KB}{TP} \times 100\%$$

Notes:

PK = Percentage of brown rice consumption (%)

KB = Amount of brown rice consumed (kg/year)

TP = Total production or availability of brown rice (kg/year)

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Technology and Education Research

https://e-journal.citakonsultindo.or.id/index.php/IJETER

E-ISSN: 2986-0733

RESULTS AND DISCUSSION

The income conditions of red rice farmers in North Kulisusu Subdistrict illustrate the important role of this commodity in the economic and social lives of red rice field farmers. Red rice is not only cultivated as a source of household food but also as an economically valuable commodity that contributes to farmers' income. The income of red rice farmers is based on production costs, revenue, and net income. For further details, please refer to the tables below.

Table 1 Average Production Costs of Red Rice Field Farmers in North Kulisusu Subdistrict, North Buton Regency, 2025

No	Description	Cost (Rp/Year)
1	Fixed Costs	
a	Depreciation Cost	
	Senso	230,325
	Parang	95,319
	Tembilang	62,427
	Knife	3,966
	Scissors	7,273
	Axe	909
	Tarpaulin	14,905
	Fence netting	100,189
	Total Fixed Costs	515,313
2	Variable Costs	
a	Labor Costs	
	Tree Felling	305,114
	Clearing of Burn Residue	201,023
	Weed Removal	52,272
	Seeds	14,432
b	Output Costs	
	Plastic bags	9,091
	Total Variable Costs	581,932
3	Total Costs (Fixed + Variable)	1,097,245

Source: Processed Primary Data, 2025

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

Fixed costs (FC) in this study are costs that are not consumed in a single production process but instead depreciate over time and function as investments to support the sustainability of red rice field farming. Fixed cost components include various tools used by farmers, with the highest depreciation cost being for the senso tool at Rp 230,325, while the lowest is for the axe at Rp 909. The depreciation costs for other equipment are as follows: machete (Rp 95,319), hoe (Rp 62,427), knife (Rp 3,967), scissors (Rp 7,273), tarp (Rp 14,905), and fence netting (Rp 100,189). The significant variation in fixed costs among respondents is influenced by the number of tools owned, the price of the equipment, and the economic lifespan of the tools. Overall, the average total fixed costs incurred by respondents amount to Rp 515,313 per year.

Meanwhile, variable costs (VC) are costs that are consumed in a single production process and vary depending on the scale of production. Variable costs in this study include labor costs and output costs, such as land clearing activities (tree felling, clearing of burn residues, and weed removal), seeds, and plastic bags. The highest variable cost was labor for tree felling at Rp 305,114, while the lowest was the cost of seeds at Rp 9,091. Other costs include clearing of burn residues at Rp 201,023, weed control at Rp 52,272, and plastic bags at Rp 14,432. The average total variable costs incurred by respondents amount to Rp 581,932 per year and are generally incurred once per growing season. Thus, the total cost (TC) in red rice field farming is the sum of fixed and variable costs, amounting to Rp 1,097,245 per year, reflecting the farmers' total expenditures over a single production season.

Table 2 Average Income of Red Rice Field Respondents in North Kulisusu Subdistrict, North Buton Regency, in 2025

No	Description	Unit	Value
1	Price	Rp/kg	27,000
2	Production	kg/year	220.5
3	Revenue	Rp/Year	5,952,273

Source: Processed Primary Data, 2025

In Table 2, the price in this study represents the total exchange value in rupiah units derived from the sale of red rice. The selling price of red rice is Rp27,000 per kilogram, with an average annual production of 220.5 kilograms per farmer. Multiplying this price by the production volume yields an average annual income for farmers of Rp5,952,273. This income reflects the total gross revenue received by farmers before production costs are deducted, and

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

thus serves as a basis for analyzing the contribution of red rice to the income of red rice field farmers in Kulisusu Utara Subdistrict, Buton Utara Regency .

Table 3. Average Income of Red Rice Field Respondents in North Kulisusu Subdistrict, North Buton Regency, in 2025

No	Description	Unit	Value
1	Variable Cost (VC)	Rp/Year	581,932
2	Fixed Costs (FC)	IDR/Year	515,313
3	Production Cost (TC)	IDR/Year	1,097,245
4	Price	IDR/kg	27,000
5	Production	kg/year	220.5
6	Total Revenue (TR)	Rp/Year	5,952,273
7	Revenue	IDR/Year	4,855,028

Source: Processed Primary Data, 2025

Table 3 shows the average income from red rice field cultivation in North Kulisusu Subdistrict, North Buton Regency, with an average annual production of 220.5 kg per farmer and a selling price of Rp 27,000 per kg, resulting in an average total *revenue* of Rp 5,952,273 per year. This total revenue is the result of multiplying the production volume by the selling price, reflecting the farming operation's ability to generate gross income. On the cost side, the total production costs (Total *Cost*) incurred by farmers consist of fixed costs (*Fixed Cost*) of Rp 515,313 and variable costs (*Variable Cost*) of Rp 581,932, resulting in total costs incurred by farmers over one year of production amounting to Rp 1,097,245.

Based on the income calculation, the average annual income for red rice field farmers is Rp4,855,028. If the average sales revenue of the respondents is divided by 12 months, the respondents earn a monthly income from red rice field sales of Rp404,586/ha/month. This monthly income is very small compared to the Regency Minimum Wage (UMK) of North Buton, Southeast Sulawesi, in 2025, which is Rp3,073,551 per month. This is because the annual income of red rice field farmers cannot meet their families' living expenses for 12 months, so red rice can only be harvested once a year; additionally, production is not maximized due to weather factors. Consequently, red rice field farmers not only cultivate red rice on their land but also grow seasonal crops such as corn, chili peppers, vegetables, and tubers, or rely on other income sources outside of farming.

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Technology and Education Research

https://e-journal.citakonsultindo.or.id/index.php/IJETER

E-ISSN: 2986-0733

The Role of Red Rice in Rice Consumption

Broadly speaking, consumption refers to household spending to meet basic needs, particularly food needs, which reflects the level of well-being and lifestyle of the community, and is influenced by income level, family size, and the habits or preferences of each household. In the context of red rice-farming households in North Kulisusu Subdistrict, food consumption patterns are influenced not only by income levels but also by the availability of food produced from their own farming activities. Red rice, as the primary agricultural product, serves a dual role: as an economically valuable commodity and as a household food source that can reduce expenditures on purchasing rice from external sources. The percentage of red rice consumption relative to red rice production is shown in Table 4

Table 4. Percentage of Red Rice Consumption Relative to Total Production by Red Rice Field Farmers in North Kulisusu Subdistrict, North Buton Regency, in 2025

No	Description	Average (kg/year)	Percentage of Consumption Relative to Production (%)
1.	Brown Rice Production	220.5	9.81
2.	Brown Rice Consumption	22.65	

Table 4 shows that the average red rice production of upland rice farmers is 220.5 kg per year, while the average household consumption of red rice by farmers' households is only 22.65 kg per year. Based on this comparison, the percentage of consumption relative to total production is 9.81%, meaning that only a small portion of the red rice production is utilized for farmers' household consumption. This situation indicates that the majority of red rice production is not consumed by the farmers themselves but is allocated for sale as a source of income. Farmers tend to view red rice as a high-value commodity, so they prioritize selling it to meet cash income needs and consume cheaper or more readily available food for daily needs (Sulaeman, 2018). The contribution of red rice to rice consumption is shown in Table 5.

Table 5. Percentage Contribution of Red Rice to Rice Consumption Among Red Rice Field Farmers in North Kulisusu Subdistrict, North Buton Regency, in 2025.

Description	Average (kg/year)	Percentage of Consumption of Total Production (%)
Brown Rice Consumption	22.65	8
White Rice Consumption	259	91.9

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

Total	281.75	100

Source: Processed Primary Data, 2025

Table 5 shows that the total household rice consumption of upland rice farmers is 281.75 kg per year, consisting of 22.65 kg of red rice (8%) and 259 kg of regular or white rice (91.9%). This indicates that the contribution of red rice to household rice consumption among farmers remains very low, while white rice consumption still dominates dietary patterns. This situation suggests that although farmers produce red rice, it has not yet become the primary staple food in farming households, and its role in food consumption remains limited.

One of the main factors behind this phenomenon is the age profile of farmers, who are on average between 33 and 72 years old. In this age group, most farmers tend to have consumption patterns that have been established for a long time and are difficult to change, especially since they have long been accustomed to consuming white rice as their staple food. This habit has become a dominant, passed-down tradition compared to having to shift consumption patterns toward red rice. Additionally, white rice is considered more practical to prepare because it has a softer texture and a more familiar taste for farmers and their families, in contrast to brown rice, which requires a longer cooking time and has a harder texture, making it less preferred—especially by family members accustomed to white rice.

Furthermore, farmers' understanding of the nutritional content and benefits of brown rice remains relatively low, as evidenced by the educational background of brown rice farmers in North Kulisusu Subdistrict, where the majority have only completed elementary school (SD), and some have not even finished school. This low level of education limits farmers' ability to receive, understand, and access information, particularly regarding nutrition and health. Many farmers are unaware that brown rice contains higher levels of fiber, vitamins, and antioxidants compared to white rice, and that it offers health benefits such as helping to control blood sugar levels and boost the immune system.

CONCLUSION

The conclusion of this study indicates that red rice serves as a source of additional income for farmers in North Kulisusu Subdistrict, with an average annual income of Rp 4,855,028 or Rp 404,586 per month, however, this remains below the Regency Minimum Wage (UMK) and is therefore not yet suitable as a primary income source, although it continues to contribute to supporting farmers' household economies and has the potential to be enhanced through increased productivity and policy support. Furthermore, the role of red rice in farmers'

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

household food consumption remains relatively low because the majority of the production is prioritized for sale, while daily consumption is still dominated by white rice, even though red rice has a higher nutritional content.

Based on the research findings regarding the role of red rice in farmers' income and consumption in Kulisusu Utara Subdistrict, North Buton Regency, it is recommended that farmers enhance red rice cultivation by adopting better and sustainable agricultural techniques to improve productivity and product quality. Local governments are encouraged to provide support through extension services, the provision of infrastructure and facilities, and the expansion of market access to increase the market value of red rice. Additionally, efforts are needed to develop markets and promote " " red rice as a healthy food to drive increased demand. For future researchers, it is recommended to further examine aspects of post-harvest processing and the red rice marketing chain so that the economic and nutritional benefits obtained by farmers can be optimized.

REFERENCE

Badan Pusat Statistik. (2011). Survei Angkatan Kerja Nasional. Yogyakarta: Badan Pusat Statistik.

Badan Kependudukan dan Keluarga Berencana Nasional, (2011). "Batasan dan Pengertian MDK,"

Badan Pusat Statistik (BPS). (2022). Survei Sosial Ekonomi Nasional (SUSENAS) 2022. Jakarta: Badan Pusat Statistik

BPS (2023). Statistik Konsumsi Beras Di Indonesia. Badan Pusat Statistik.

Dahlianawati, D., Sofyan, S., & Jakfar, F. (2020). Analisis Pendapatan Usahatani

Devita, D., Meilani, E. H., & Astutiningsih, E. T. (2023). Analisis pendapatan masyarakat nelayan di Desa Cikahuripan Kabupaten Sukabumi. *Jurnal Ilmiah Mahasiswa AGROINFO GALUH*, *10*(2), 1196-1205.

Kumalasari, A. D., Budiraharjo, K., & Setiadi, A. (2019). Komparasi produksi dan pendapatan petani tebu mitra dan non mitra pabrik gula Rendeng di Kabupaten Kudus. *Agrisocionomics: Jurnal Sosial Ekonomi Pertanian*, *3*(1), 28-38.

Rahim, A dan Hastuti. 2008. Ekonomi Pertanian. Penebar Swadaya. Jakarta Rachmat, M., Suprianti, D., Hidayat, dan Situmorang, J.2000. *Perumusan*

Saidah, S., & Pangestuti, R. (2015). Daya hasil padi sawah varietas Inpari 24 di beberapa lokasi SL-PTT di Sulawesi Tengah. *Pros Sem Nas Masy Biodiv Indon*, *7*, 1147-1150.

Silvian, T., & Hekmahtiar, Y. (2024). Alih Fungsi Lahan dan Pengaruhnya terhadap Pendapatan serta Pola Konsumsi Rumah Tangga Petani di Desa Muktijaya Kabupaten Ogan Komering Ilir (Land Use Conversion and Its Impact on Income and Consumption Patterns of Farming

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

Households in Muktijaya Village, Ogan Komering Ilir Regency). *JURNAL PANGAN*, *33*(2), 127- 136.

Soekarwati, 2003. Teori Ekonomi Produksi. Jakarta: Rajawali Pers

Sulaeman, M. (2018). Guyub Ekonomi Desa: Kajian Kewirausahaan Untuk Desa Mandiri Dan Sejahtera.

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.