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RESEARCH ARTICLE

The Case Study Examines the Efficiency Analysis of a Mobile Rice Milling Business in Pinrang District, Specifically in Marannu Village, Mattirobulu District, Indonesia

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ABSTRACT

Social changes are occurring in the milling industry, where customers used to come to the mill to use their services. Now, with advancements in technology, rice milling tools can be transported to the location of the customer who wants to use the service. This led to the creation of mobile rice mill services to help farmers process their agricultural products more easily. The objective of this study is to describe the mobile rice mill business and analyze its efficiency level. The study was conducted in Marannu Village, Mattirobulu District, Pinrang Regency, which is a rice production center in Pinrang Regency. The population studied included mobile rice milling businesses and farmers who used mobile rice milling services in Marannu Village. The study involved UD. Resky and 30 households/farmers who used mobile rice mill services. The research showed that "UD Resky" is a mobile rice mill service business that processes paddy/unhulled rice into rice. It was established in 2010, with an initial investment of IDR 85,000,000 from personal savings and a bank loan of IDR 120,000,000. The investment was used to purchase two cars and two rice mill machines, as well as other materials. On average, the business mills 3,567 liters of rice per month, generating average revenue of IDR 21,402,000 per month, with an average total cost of IDR 15,234,583 per month. This results in a monthly net income of IDR 6,167,417. The Net Present Value (NPV) was IDR 211,507,842, the Internal Rate of Return (IRR) was 70.32%, and the Break Even Point (BEP) occurred in the fourth year of operation.

INTRODUCTION AND BACKGROUND

The Indonesian economy greatly benefits from the agricultural sector, which serves as the main source of livelihood for the majority of the country's population. This sector holds immense potential to increase the income of farming communities by producing various commodities. Among these commodities, rice has become a focal point in the food crop sector. Rice plays a crucial role in various aspects of Indonesian society, including cultural, social, economic, and political. Production, processing, and distribution of rice provide significant employment opportunities and generate income in the Indonesian economy. While some farmers use rice as a staple food to meet their family's needs, others sell it through collectors

and wholesalers. These intermediaries then sell the rice to factories or rice refineries. Subsequently, the paddy undergoes processing into rice, and the factory managers may sell some of it to the local community or market it to other regions (Oktaviani, 2004).

Losses in harvest and post-harvest results occur due to various factors, including how farmers handle and use their harvesting tools. Ahmad et al. (2011) reported that using conventional tools, such as sickles for harvesting, gebot for threshing, drying paddy on the floor in the sun, and milling grain with conventional tools, resulted in a yield loss of 21.09%. However, modifying the harvest and post-harvest handling process, such as using a reaper instead of a sickle, a power thresher instead of gebot for threshing, a flatbed dryer instead of drying paddy on the floor, and a husker for milling grain, can reduce yield losses to 13%. The highest yield losses occurred during harvesting (9.52%) using a sickle, followed by threshing (4.79%), drying (2.13%), and milling (2.19%) stages. When translated to national rice production, which is around 54.34 million tons, this loss is equivalent to more than Rp.15 trillion. Reducing yield losses will have a direct impact on increasing final production. Milling rice into rice is a crucial post-harvest activity, particularly because rice is a staple food for the Indonesian people. The journey towards rice self-sufficiency in Indonesia was challenging, but the country achieved this goal in 1984 and needs to maintain it until now (Ilsan, 2022; Simatupang and Gratitude, 2002).

Rice milling is a crucial aspect of rice postharvest handling, as it influences both the quality and quantity of the final product. Utilizing a good rice grinding machine can improve the yield and quality of milled rice compared to the traditional pounding method. According to the Central Bureau of Statistics (2012), small-scale rice milling businesses still dominate the Indonesian rice milling industry, accounting for 94.13 percent of the industry. Medium and large-scale rice milling businesses make up only 4.74 percent and 1.14 percent of the industry, respectively. Small-scale rice mill business units were established as investments during the 1960s to early 1980s (Sawit, 2011).

The introduction of mobile rice milling services represents a form of social change. Previously, customers had to visit rice milling facilities, but with the mobile rice mill service, farmers can process their agricultural products more conveniently (BPS, 2018). The service targets the lower middle class, who seek to reduce production expenditure costs to meet other necessities of life (Kusumah, 2011; Mahajan-Tatpate et al., 2022).

A mobile rice mill is a rice mill that is capable of moving from one place to another and is powered by a motor that uses either gasoline or diesel fuel. These mobile rice mills emerged in the 1980s and are still in operation in rural areas. However, due to the lack of a business license, their scope is limited, and they are difficult to move from one location to another during operation. The emergence of these mobile rice mills has generated mixed reactions from rural communities due to concerns about pollution from exhaust fumes and the careless disposal of grain husks, noise disturbance, the loss of rice during the milling process, and the addition of weight during the weighing process to achieve more profit.

Private entrepreneurs, particularly small-scale entrepreneurs, conduct most of the rice milling businesses, while Village Unit Cooperatives (KUDs) as community group business units have not developed much in this area. Rent payments for rice mills are calculated based on the yield of milled rice, but there is no uniform standard for the cost of renting a rice mill in different locations. Although there are many rice milling businesses, their distribution and feasibility have not been optimal. This situation requires evaluation and analysis to assess the optimum level of demand so that the businesses can operate profitably (Patiwiri, 2006).

Mobile rice milling services are popular due to their practicality, efficiency, and affordability, which save time and effort. However, the quality of the milled rice produced by mobile rice mills is often low due to broken rice grains, leading to a drastic drop in market price. In contrast, the rice produced by resident rice milling services, which have a business license and are located in one place, is of higher quality and can be sold at a better price. Despite this, many people still use mobile rice milling services, possibly due to a lack of knowledge about other options or because mobile rice milling services are a trend in their community (Indriani, 2013). The reasons why people choose to use mobile rice milling services

need further exploration to reveal the community's perspective on the matter. Phenomena like this are frequently encountered in people's lives, where the advantages and disadvantages of a certain service must be considered. Those who use Mobile Rice Milling Services are typically familiar with the positive and negative aspects of the process, having subscribed to the service from one harvest to the next. In fact, many who previously used Permanent Rice Milling Services are now switching to the mobile option, which has become quite popular in Marannu Village, Mattirobulu District, Pinrang Regency, where there are numerous customers. Mobile rice milling service providers can be easily contacted via SMS or telephone, and some even offer on-site service at the customer's location or rice drying place. This convenience has led many customers to become regular subscribers. Furthermore, many of the mobile rice milling services in the area are utilized not only by residents of the local community but also by farmers from neighboring villages who travel from hamlet to hamlet or from one subdistrict to another (Sabir, 2018).

The popularity of mobile rice mills has caused many static rice mills in the area to cease operation, as farmers and households in Marannu Village now prefer the convenience of the mobile option. With this service, they no longer need to transport their paddy to the rice mill; rather, the mobile rice mill will come to their home upon request. Another advantage of the mobile rice mill is that the bran leftover from the milling process belongs to the customer, who only needs to pay the service provider 10% of the rice as compensation. However, as with any business operation, it is important to conduct a financial analysis to avoid over-investing in unprofitable activities (Suwarsono, 2013).

Research objectives

The objectives of this study are threefold: first, to provide an overview of the mobile rice milling businesses in Marannu Village, Mattirobulu District, Pinrang Regency; second, to analyze the efficiency level of these businesses; and third, to describe the reasons why farmers in the area choose to use mobile rice milling services.

METHODS AND RESEARCH

Site and location

The study was carried out in Marannu Village, Mattirobulu District, Pinrang Regency, which was selected because it is a prominent area for rice production in the region.

Target population

The target population consisted of mobile rice milling businesses and farmers who utilize mobile rice milling services in the village. The research included two mobile rice mill businesses, namely UD. Resky, and 30 households/farmers who utilize the services in the village.

Descriptive research

We utilized a variety of techniques, such as field surveys, in-depth interviews, and using documentation, to conduct descriptive research.

Interview and observation

Supplementary to the observations, interviews were executed, which entailed posing questions and documenting both verbal and non-verbal responses. To acquire a more thorough comprehension of the viewpoints and experiences of particular individuals or sources, in-depth interviews were conducted. The interview method adopted in this investigation was adaptable, unstructured, and open-ended, and the sampling method was selective in order to identify the most well-informed informants and the fitting representative locations. The informants were chosen from the surrounding community, although the selection of informants may be adjusted based on the researcher's data requirements and stability.

Data types

The overall objective of the study was to assess the cost and efficiency of mobile rice milling businesses and identify strategies to prevent financial losses. Primary data was collected through observations of the milling process and interviews with mobile rice mill business owners and farmers who use the service, while secondary data was obtained by the research team.

Data analysis

The research data focused on analyzing the equipment and financial resources of a mobile rice mill service

and evaluating its business efficiency. The tables are likely presenting specific data points related to the equipment and financial resources, such as the number and types of equipment owned and the amount of funding available. The discussion of NPV, IRR, and BEP suggests that the research is also examining the financial viability of the mobile rice mill service. NPV is a financial metric used to calculate the present value of future cash flows, IRR is used to calculate the profitability of an investment, and BEP is used to determine the level of sales needed to cover all expenses and start generating a profit. The use of tables and financial metrics provide a clear picture of the service's equipment and financial resources, as well as its business efficiency.

RESULTS AND DISCUSSION

Description of mobile rice milling business

In 2010, "UD. Resky" was established in Marannu Village to convert paddy/unhulled rice into rice for farmers at an affordable cost and established the business model as in Figure 1. Mr. Umar, the founder, invested IDR 85,000,000 from his personal savings to purchase a car (IDR 60,000,000), a rice milling machine (IDR 23,000,000), 5 jerry cans (20 liters each) costing Rp.30,000 each, 10 sacks of 100 kg rice costing Rp.3,000 each, and other materials for Rp.1,820,000. Prior to this venture, Mr. Umar was a rice farmer and identified a business opportunity in Marannu Village, where he began renting out his mobile rice mill services under the business name "UD. Resky". The farming community in Marannu Village and neighboring areas such as Bunga Village and Padakkalawa Village highly demand the services of this mobile rice mill business. A year later, "UD. Resky" secured a loan of Rp. 120,000,000 from a bank to purchase a new car (Rp. 90,000,000) and a milling machine (Rp. 30,000,000) to expand their mobile rice milling services beyond Marannu Village, and they continue to receive a growing number of subscribers from neighboring villages.

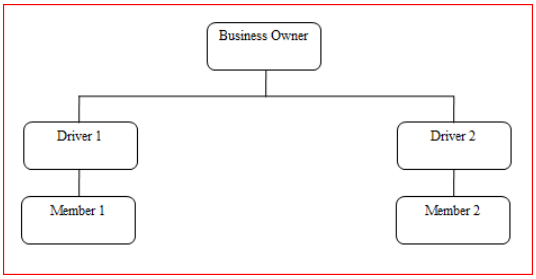

Figure 1: Organizational Structure of Mobile Rice Milling Business, "UD. Resky" 2017

Equipment resources

The mobile rice mill service business "UD. Resky" owns four types of equipment with an initial value of IDR 203,180,000, which have now depreciated to a final value of IDR 20,303,300, with a total depreciation value of IDR 13,814,250. The equipment includes a car (Table 1) purchased by Mr. Umar in 2010 for IDR 60,000,000, a rice mill machine also purchased by Mr. Umar in the same year for IDR 23,000,000, 5 jerry cans of 20 liters each purchased for a total of IDR 150,000, and 10 sacks of 100 kg rice purchased for IDR 30,000. In 2011, Mr. Umar bought another car (2) for IDR 90,000,000 and a rice mill machine for IDR 30,000,000.

Table 1: Equipment Resources Owned by Mobile Rice Mill Service Business "UD. Resky"

No	Tool Type	Amount	Initial Value (IDR)	Final Score (IDR)	Economical Age (Years)	Depreciation Value (IDR)
1	Car (1)	1 units	60,000,000	6,000,000	15	3,600,000
2	Cars (2)	1 units	90,000,000	9,000,000	15	5,400,000
3	Rice Milling Machine (1)	1 units	23,000,000	2,300,000	10	2,070,000
4	Rice Milling Machine (2)	1 units	30,000,000	3,000,000	10	2,700,000
5	Jergen 20 L (Rp.30.000)	5 Pieces	150,000	3,000	5	29,400
6	Sacks of Rice 100 Kg (Rp.3.000)	10 lb	30,000	300	2	14,850
	Amount		203,180,000	20,303,300		13,814,250

Financial resource

The mobile rice mill service business "UD. Resky" has total assets amounting to Rp. 287,428,800. This includes current assets of Rp. 273,614,550, which consists of cash. The fixed assets, on the other hand, amount to Rp. 13,814,250 and are

in the form of equipment costs. As for the total liabilities, they amount to Rp. 287,428,800, which includes total liabilities of Rp. 84,248,800. This liability covers fuel costs of Rp. 24,248,800 and labor salaries of Rp. 60,000,000. The remaining amount of Rp. 203,180,000 represents the capital.Top of Form Bottom of Form, as discussed in (Table 2).

Table 2: Business Financial Resource Use of Mobile Rice Mill Service Balance "UD. Resky"

ASSETS		PASSIVE	
Current asset		Obligation	
Cash	273,614,550	Fuel	24,248,800
Account receivable	-	Gas	13,964,250
Final Inventory	-	Solar	10,284,550
Total Current Assets	273,614,550	Employee salary	60,000,000
Fixed assets		Total Liabilities	84,248,800
Building	-		
Land	-	Capital	203,180,000
Equipment	13,814,250		
Total Fixed Assets	13,814,250		
Total Assets	287,428,800	Passive amount	287,428,800

Mobile rice mill business efficiency level

The mobile rice mill business named "UD. Resky" appears to be efficient with a R/C (revenue to cost) ratio of 1.40. This ratio is calculated by dividing the average yearly income of Rp.256,824,000 (which is derived from monthly income of Rp.21,402,000 x 12 months) by the total costs incurred during the year of Rp.182,814,996. The total costs include fixed costs of Rp.13,213,850 multiplied by 12 months, as well as variable costs of Rp.2,020,733 multiplied by 12 months. The income of Rp.74,009,004 shows that the business generates more revenue than the costs incurred, indicating its efficiency.

NPV, IRR and BEP analysis

*Net Present Value (NPV):*The calculation of NPV involves subtracting the present value of costs (expenses) incurred throughout the project's lifespan from the present value of benefits (revenue) expected to be received. After performing the calculations using a Discount Factor (df) of 12 percent for a period of five years (2012-2017), it was found that the NPV value for rice milling is IDR 211,529,270. This indicates that the project is highly profitable.

*Internal Rate of Return (IRR):*The IRR is the discount rate or interest rate that equates the present value of benefits with the present value of total costs. The calculation results for a five-year period indicate that the IRR value for the rice mill operated by UD. Resky is 70.32%. This suggests that the rate of return on the investment is good, as the IRR value exceeds the prevailing bank interest rate of 12% per year. Since IRR is greater than 12%, which is the bank interest rate, it can be concluded that UD. Resky's mobile rice milling business is viable in the study area.

*Break Event Points (BEP):*BEP refers to the point in time when the present value of benefits equals the present value of costs, also known as the Return on Point. The calculations conducted at a discount factor of 12% over a period of five years indicate that the BEP for the rice mill operated by UD. Resky occurs during the fourth year. Therefore, it can be concluded that the investment in the rice mill is already profitable.

Farmers use the mobile rice milling service

The table 3 describes the reasons why farmers use the mobile rice milling service "UD Resky." The reasons given by farmers include easy accessibility, practicality, efficiency, effectiveness, and ease of contact with the service providers. These factors may influence the farmers' decision-making process when choosing a mobile rice milling service. Overall, the table highlights the importance of convenience, efficiency, and practicality for farmers when choosing a service.

Table 3: Reasons for Farmers to Use Mobile Rice Milling Service "UD Resky"

No	Reason	Amount	Percentage(%)
1	Easy to find on the streets	3	10.00
2	Practical	7	23,33
3	Efficient	9	30.00
4	Effective	6	20.00
5	Easy to contact	5	16,67
	Amount	30	100

The amount of grain milled by respondent farmers users of mobile rice milling business services "UD. Resky"

On average, the highest number of respondents who use the services of a mobile rice mill called "UD. Resky" produce 300 kg of dry unhusked rice per month, which is 11 respondents (36.67%) (Table 4). This is followed by an average of 400 kg of dry unhusked rice per month, which is 9 respondents (30.00%), and the smallest group produces an average of 200 kg of dry unhusked rice per month, which is 3 respondents (10.00%). The milling process takes place 2-3 times a month, and as a result, 200 kg of dry unhusked rice is converted to 150 kg of milled rice, which incurs a milling fee of 15 liters. Alternatively, a fee of 1 liter of rice is charged for every 10 kg of milled rice.

Table 4: Amount of Grain Milled by Respondent Farmers Users of Mobile Rice Milling Business Services "UD. Resky"

No	Amount of Grain Milled (Kg) into Rice (Kg) / Month	Number of Respondents	Percentage (%)
1	200 kg of grain = 150 kg of rice	3	10.00
2	250 kg of grain = 188 kg of rice	7	23,33
3	300 kg of grain = 225 kg of rice	11	36,67
4	400 kg of grain = 300 kg of rice	9	30.00
	Amount	30	100.00

CONCLUSION AND RECOMMENDATIONS

The mobile rice milling service business known as "UD Resky" processes unhusked rice into rice and was established in 2010. The owner invested IDR 85,000,000 of personal funds and took a bank loan of IDR 120,000,000 to purchase two cars worth IDR 60,000,000 and IDR 90,000,000, respectively, and two rice mill machines worth IDR 23,000,000 and IDR 30,000,000, respectively. Additionally, they purchased five 20-liter jerry cans at IDR 30,000 each, 10 sacks of 100 kg rice at IDR 3,000 each, and other materials for IDR 1,820,000.

On average, the mobile rice mill service business "UD Resky" generates 3,567 liters or IDR 21,402,000 per month in receipts from milling operations, and incurs average total costs of IDR 15,234,583. This results in a monthly net income of IDR 6,167,417. The business has a NPV of IDR 211,529,270, an IRR of 70.32% which is greater than 12.00%, and a BEP at the beginning of the 4th year of operation.

Suggestions

The expansion of the mobile rice milling business service in Marannu Village, Mattirobulu District, Pinrang Regency, and beyond is anticipated as it is expected to assist farmers in reducing their agricultural expenses. Furthermore, the establishment of regulations to govern the operations of mobile rice milling business services is highly recommended.

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