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Application of Risk Management in Rice Milling Business in Karangwuluh Village

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Abstract

This study aims to analyze the implementation of risk management in rice milling businesses in Karangwuluh Village. The research focuses on three main aspects: risk identification, risk evaluation and measurement, and risk management. A quantitative descriptive method was employed using descriptive statistical analysis based on questionnaire data from four active rice mill owners. The findings reveal that the overall implementation of risk management is categorized as high to very high. The average score for risk identification (4.50) and risk evaluation and measurement (4.475) indicates that business owners have strong capabilities in recognizing and assessing potential risks. The average score for risk management (4.00) demonstrates that respondents have applied mitigation strategies such as regular machine maintenance, supplier diversification, and post-incident evaluation. However, aspects related to risk documentation and financial management need improvement, particularly in establishing reserve funds and utilizing business insurance. The results of this study are expected to enhance the awareness and capability of rice mill entrepreneurs in managing risks effectively and contribute to the academic development of risk management in rural agricultural sectors.

Keyword : Risk Management, Rice Milling Industry, Karangwuluh Village, Agribusiness.

INTRODUCTION

The agricultural sector plays an important role in the economy of communities in rural Indonesia. One of the subsectors that plays a big role in increasing the added value of agricultural products is rice milling, which functions to convert grain into rice that can be consumed and has high added value for farmers and the surrounding community. The existence of rice milling at the village level not only improves post-harvest efficiency, but also contributes to rural economic growth (Hutapea & Hermanto, 2018). In Karangwuuh Village, the rice milling business has a similar role, namely as a local economic center that supports the welfare of farmers and the surrounding community.

However, rice milling activities also have various business risks that can hinder operational sustainability. Risks can come from internal factors, such as machine failures, operational errors, and deterioration in rice quality, as well as external factors such as price fluctuations, and instability in the supply of raw materials to extreme weather changes that affect the drying and milling process so that it has an impact on the quality of milling products. Ullya et al. (2022), the rice supply chain in Indonesia faces interrelated risks ranging from the supply of raw loads to the milling process, so a thorough risk analysis is needed so as not to cause production disruptions. This was also stated by Kaleka et al. (2020), which explains that the high uncertainty of prices and production in the rice business is the main factor that affects the stability of the milling business at the level of farmers and local entrepreneurs. Therefore, the implementation of structured risk management is a strategic step so that rice milling business actors are able to identify, measure and control risks systematically and sustainably.

The application of risk management is one of the strategies that can be carried out to minimize potential losses and optimize the efficiency of the production process. In addition, risk management in the context of micro, small and medium enterprises (MSMEs), including the rice milling business, is one of the important sectors to maintain business stability and competitiveness.

Lawolo & Waruwu (2022) Explained that the application of risk analysis in the PAD business helps usha actors understand the possibility of risks and determine the right ways to overcome them. The risk management process that will be discussed includes three main stages, namely risk identification, risk evaluation and measurement, and risk management.

Although various studies have discussed risk management in small and medium business activities, studies that specifically examine its application to rice milling businesses at the village level are still limited. Widajatun et al. (2023) found that many MSME actors do not have a good understanding of risk identification and control, so actions are only taken after problems arise. A similar condition can be seen in rice milling business actors in rural areas, where risk management is still carried out based on personal experience without a systematic measurement approach.

Thus, this study aims to analyze the application of risk management in the rice milling business in Karangwuluh Village through the process of risk identification, risk evaluation and measurement, and risk management. The results of the research are expected to provide practical benefits for rice milling business actors in increasing their awareness and ability to anticipate risks that may occur, as well as academic contributions to the development of risk management science in the field of rural agriculture.

KAJIAN LITERATURE

Rice Milling Business as Part of the Agricultural and Agribusiness System

The rice milling business is one of the important components in the agricultural and agribusiness system because it functions to manage the grain harvested by farmers into rice that has added value and better quality. Rice milling is included in post-harvest processing activities, which is a series of processes carried out to maintain the quality of grain starting from the process of drying, peeling, separating husks, to turning it into rice that is ready for consumption. Palm (2023), the milling process contributes greatly to determining the economic value of rice through the stages of peeling, separating, and polishing which affect the yield and final quality of the product. In addition, Andriani et al. (2025) explained that important stages after harvest, such as drying and milling, are the main factors that affect the quality of rice and the potential for weight loss or yield quality in the rice production chain. Therefore, the rice milling business plays a strategic role not only as a place to process agricultural products, but also as a driver of the village economy and a link between farmers and the market, especially in rural areas such as Karangwuuh Village.

Risk Management Theory

Risk management is a process carried out to recognize, assess, and control various uncertainties that can cause losses to businesses. In the agribusiness sector, the implementation of risk management aims to maintain smooth production, business stability, and product quality. According to Humairoh et al. (2023), risk management in agribusiness is needed so that business actors can face production, price, weather, and financial risks through planned steps. The risk management process consists of three main stages, namely:

1. Identify Risks
   This stage is carried out to recognize all possible sources of risk, both from internal businesses such as machines and operators, and external ones such as prices and weather. Identification helps business actors understand what are potential obstacles to milling activities.
2. Risk Analysis and Evaluation
   Once identified, the next step is to assess the level of likelihood and impact of those risks. At this stage, it helps to determine which risk priorities should be addressed first.
3. Risk Control

The final stage is to establish a strategy to reduce the likelihood or impact of risk.

Risk Management for Rice Milling Business

The rice milling business faces various risks that can affect operational performance, product quality, and business sustainability. Therefore, the implementation of risk management is very important so that business actors can identify potential problems, evaluate impacts, and determine and design appropriate strategies to handle or reduce impacts.

1. Operational Risk

   These risks arise from internal process inefficiencies, such as machine failures, operator errors, and deterioration in rice quality. When the machine is not maintained or experiences wear, the yield of rice obtained can decrease, for example, more rice is broken or the yield is reduced. Setiadi et al. (2023) It shows that many milling machines are disrupted due to a lack of routine maintenance, so that the grinding process is not optimal. In addition, Maulani et al. (2025) Confirming that improper knife arrangement can cause damaged grain and milled yields to be of lower quality. Therefore, operational risks can be reduced if the machine is maintained regularly, the operator is trained and each mill follows the appropriate working steps.

2. Raw Material Supply Risks

   Supply risk occurs when the availability of grain is unstable due to seasonal, weather, and agricultural conditions. Rice mills in villages often lack grain because they are highly dependent on local farmers. Based on the analysis Purnomo & Risdianto (2025), rice mills face uncertainty of grain supply from farmers due to production factors and complex distribution chains. In addition, in the study *Risk Assessment of Rice Farming Businesses in Indonesia* by Kaleka et al. (2020) It shows that farmers' rice production can decrease due to natural conditions (weather) and limited capital, which will have a direct impact on the supply of grain to mills.

3. Price Risk

   Price risk arises when the price of grain or rice fluctuates so that it is difficult for the milling business to determine a definite profit. These price fluctuations can make mills suffer losses, especially if the price of grain rises while the selling price of rice does not increase. According to Ramadona et al. (2023), the ability of entrepreneurs to understand financial conditions is very influential in dealing with price changes, because if financial management is not good, the business will be more easily affected by the ups and downs of grain prices and other operational costs.

4. Environmental and Weather Risks

   Weather-dependent drying of grain makes rice milling businesses vulnerable to extreme conditions. Research Kaleka et al. (2020) It found that natural factors such as extreme weather are included in the risk of rice farming businesses, which can then impact the supply of grain raw materials to rice mills.

5. Financial Risk

   Financial risks in a rice milling business occur when income is not balanced with operational costs, or when the business does not have reserves of funds to face difficult times. Ramadona et al. (2023) explained that many rice mills face problems finance due to a lack of knowledge in managing money in and out. As a result, businesses become vulnerable when the cost of repairing machinery increases, when the supply of grain decreases, or when fuel and electricity rise. Good financial management is the key to keeping the business afloat in any condition.

RESEARCH METHODS

Types and Approaches to Research

This study uses a descriptive quantitative method. This method is used to describe the level of implementation of risk management in the rice milling business in Karangwuluh Village based on the results of measurements using questionnaire instruments. The data obtained is in the form of numbers (Likert scale) which is then analyzed statistically descriptively to find out the average value of each research variable.

Research Location

The research was conducted in Karangwuuh Village, Suraddi District, Tegal Regency. The research was conducted on four rice milling businesses that are still actively operating. The location was chosen because the village has several rice milling units that play an important role in the economic activities of the local community.

Population and Research Sample

The research population is all owners or managers of rice milling businesses in Karangwuuh Village. Meanwhile, the sample amounted to four respondents, which were all owners or managers of rice mills who were still active in the village. The technique used is total sampling, because the population is limited and all of them can be sampled. Thus the number of samples is equal to the population umlah.

Data Collection Techniques

1. Field Observation
   It is carried out to find out the operational conditions of rice milling, machinery and work processes.
2. Questionnaire Distribution
   The questionnaire was given directly to all respondents (four milling entrepreneurs). Respondents were asked according to their perception and business conditions.
3. Documentation
   Collection of notes, photographs, and supporting data to complete the researcher's information.

Data Analysis Techniques

The data analysis in this study uses a descriptive statistical model, which is a method that aims to describe data as it is based on measurement results without testing hypotheses.descriptive statistics is the basis of the development of modern statistical science and was first applied systematically by Sir John Graunt through his work entitled *Natural and Political Observations Made Upon the Bills of Mortality* in 1662 (Graunt, 1662). The work is considered an early milestone in the use of summary tables, mean calculations, and data analysis based on numerical observations. In this study, descriptive statistics were used to process and analyze Likert scale questionnaire data regarding the application of risk management in rice milling businesses. The stages of analysis are carried out as follows:

1. Calculates a score of 1-5 on each answer according to the Likert scale.
2. Calculate the average score for each research variable:
   a. Identify Risks
   b. Risk Evaluation and Measurement
   c. Risk Management
3. The interpretation of the average score in this study refers to the five-point Likert scale assessment category as explained by Sugiyono (2018) and (Riduwan, 2012). Vulnerable scores are used to determine the level of risk management implementation, namely:

Table.1
Interpretation of average values

Score Vulnerable	Category
1.00-1.79	Very Low
1.80-2.59	Low
2.60-3.39	Enough
3.40-4.19	Height
4.20-5.00	Very High

The results of this analysis were used to conclude the level of implementation of risk management in the rice milling business in Karangwuluh Village based on respondents' perceptions.

DISCUSSION

Based on the data processing of questionnaires that have been filled out by four rice milling business actors in Karangwuuh Village, an overview of the level of implementation of risk management is obtained which includes the process of risk identification, risk evaluation and measurement, and risk management in business operations. The analysis was carried out using a descriptive statistical approach to calculate the average value of each statement which was then summarized into the average score on each variable. The results are presented in the following average score table.

Table.2
Results of Risk Management Implementation

Variabel	Average	Category
Identify Risks	4.50	Very High
Risk Evaluation & Measurement	4.475	Very High
Risk Management	4.00	Height

In the identification of risks, an average score of 4.50 was obtained, which shows that rice milling business actors in Karangwuluh Village have a very high level of awareness in recognizing risks that can interfere with business operations. This shows that respondents consistently pay attention to potential risks such as weather, machine damage, grain supply, and changes in market conditions. This high value is in line with the opinion Lawolo & Waruwu (2022) which states that risk identification is an important stage that helps business actors understand potential disruptions from the initial stage. However, there are several statements that are still quite sufficient, especially related to recording risk events and monitoring the increase in operational costs. This shows that some respondents have not documented the risks systematically.

The evaluation and risk measurement obtained a score with an average of 4,475, which means that the milling business actors show excellent ability to assess and measure the level of risk. Respondents are able to understand the impact of risk on business, determine priorities, and have the habit of evaluating risks based on previous experience. However, there are still some

aspects that are still in the moderate category, such as in estimating how often a risk can occur and in conducting a reassessment when business conditions change. This shows that the risk evaluation process still needs to be improved, especially in terms of accurately estimating possible risks and conducting assessments consistently according to changing situations.

In risk management, an average score of 4.00 was obtained, which indicates that risk management is in the high category. This shows that respondents have implemented various mitigation measures such as performing routine machine maintenance, having more than one grain supplier, giving directions to workers, and conducting evaluations after losses occur. However, some aspects are still categorized as low, especially in the use of business insurance and the provision of financial reserves, which shows that some business actors still do not implement optimal financial protection against business risks.

CONCLUSION

The results of the study show that the application of risk management in the rice milling business in Karangwuluh Village is in the high to very high category in the three main variables. Business actors have been able to recognize various potential risks that come from technical, environmental, operational, and market factors. The ability to assess and measure risks is also very good, especially in understanding the impact and determining the priority of risks that need to be addressed. However, some aspects such as recording risk events, the ability to estimate the frequency of risks, and reassessment when business conditions change are still not optimal so they need to be improved in the future.

Meanwhile, risk management in general has been well implemented through machine maintenance, the use of more than one supplier, and evaluation after the occurrence of a disturbance. However, financial risk management is still a major weakness, as seen from the low provision of reserve funds and the lack of use of asset insurance funds. Thus, even though rice milling business actors have implemented risk management quite carefully, efforts are still needed, especially in administrative and financial aspects so that the sustainability of the rice milling business can be maintained optimally.

Based on the results of the research that has been obtained, there are several recommendations to improve the implementation of risk management in the rice milling business, which are as follows:

1. Rice milling business actors are advised to make regular records of incidents of operational disruptions, such as machine breakdowns or supply bottlenecks.
2. Business actors need to provide reserve funds and consider the use of insurance to protect business assets. This is important so that businesses are better prepared to face unexpected losses and can operate more stably.
3. Risk evaluation needs to be carried out consistently, especially when there are changes in weather conditions, grain prices, or raw material supply. Responsive assessments help business actors adjust strategies quickly and appropriately.
4. Support from the village government or related institutions is very necessary, especially in the form of training on financial planning, asset protection, and operational risk management.

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