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Operational Risk Identification and Mitigation Strategies in Rizky Strawberry Agrotourism

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Abstract:

Operational risk management is essential for ensuring the sustainability of newly established agrotourism enterprises operating under high uncertainty. This study examines operational risks in Rizky Strawberry Agrotourism, Sukabumi, and aims to identify, assess, and prioritize risks while formulating appropriate mitigation strategies. A case study approach was employed using in-depth interviews with five key internal stakeholders. The findings reveal ten operational risks categorized into human resource, system and regulatory, facilities and infrastructure, environmental, and external risks. Three risks were classified as very high and two as high, primarily related to employee competency gaps, safety management weaknesses, and infrastructure limitations. These risks indicate that early-stage agrotourism enterprises are highly vulnerable to internal managerial inefficiencies. The study confirms that operational sustainability in emerging agrotourism depends not only on resource potential but also on structured risk-based management. This research provides an applicable operational risk prioritization framework tailored to newly established agrotourism businesses. Unlike prior studies that examine tourism risk in general contexts, this research focuses specifically on operational risk structures in early-stage agrotourism enterprises and integrates risk measurement, prioritization, and mapping into a practical decision-support framework.

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Introduction

West Java Province represents one of Indonesia's main agricultural hubs, ranking third nationally with 3,224,000 agricultural businesses and second in the number of legally incorporated agricultural enterprises (BPS, 2023). This strong agrarian structure

provides a foundation for the rapid growth of agro-based tourism. Table 1 shows the distribution of agricultural business units in 2023, indicating substantial potential for integrating agriculture and tourism activities. This information can be seen in Table 1.

Table 1 Number of agricultural businesses in West Java 2023

Type	Number of Agricultural Business Households (RTUP)	Number of Individual Agricultural Businesses (UTI
Food Crops	2,210,536	2,221,502
Horticulture	1,281,005	1,287,788
Plantation	556,753	558,942
Ranch	1,061,094	1,065,093
Forestry	251,353	252,317
Fishing	589,182	590,816
Agricultural Services	55,064	55,351

Source: Jabarprov (2023)

At the regional level, Sukabumi Regency ranks second after Bogor Regency in the number of legal-entity agricultural companies (BPS, 2023). With a total area of 4,145.7 km²—47% allocated to agriculture and 32% forested—the region possesses significant natural and productive resources. The Sukabumi Regency Agriculture Office (2020) highlights that agricultural development in this region holds strong potential to enhance community welfare, particularly among farmers. These conditions make Sukabumi a strategic location for agrotourism expansion.

Despite this potential, the sustainability of agrotourism businesses depends on effective operational management. Nugroho (2013) explains that tourism performance is influenced by internal factors such as service quality, infrastructure readiness, sanitation, safety, human resources, and promotion, as well as external factors including regulations, economic conditions, political stability, supporting industries, and environmental disturbances. These factors inherently generate operational risks. Risk, defined as potential events that hinder organizational objectives (Abdurrahman et al., 2018), cannot be eliminated but must be systematically managed. Risk management aims to minimize uncertainty and potential losses through structured strategies such as avoidance, reduction, diversification, and risk control (Susiloningtyas Riyanti et al., 2021; Sudarmanto et al., 2021).

However, existing studies generally discuss tourism risk in a broad context and rarely focus on operational risk management in newly established agrotourism enterprises. In the case of Rizky Strawberry Agrotourism, the absence of structured risk planning has led to vulnerabilities, including infrastructure limitations, workforce competency gaps, weak promotional strategies, environmental concerns, and unpreparedness in managing visitor fluctuations. These conditions increase operational uncertainty and threaten long-term sustainability.

Therefore, this study aims to systematically identify and assess operational risks and formulate prioritized mitigation strategies in Rizky Strawberry Agrotourism to strengthen managerial resilience and support sustainable agrotourism development.

Methods

This study was conducted at Rizky Strawberry Agrotourism, located in the Cinumpang Tourist Area, Sukabumi Regency, West Java. The location was selected purposively, considering its characteristics as a strawberry-based self-picking agrotourism enterprise. The research was carried out from July 31, 2023, to January 13, 2024.

This study used primary and secondary data. Primary data were collected through in-depth

interviews with five key internal stakeholders: the owner, general manager, treasurer, marketing division, and production division. The selection of respondents followed a purposive approach, referring to Yin (2018), who states that a limited number of key informants in case study research can provide comprehensive organizational insights. Secondary data were obtained from internal company documents.

Data were analyzed using descriptive statistics and a Likert scale (1–5) to assess the probability and impact of identified risks (Budiaji, 2013). The aggregation of respondents' assessments applied the geometric mean method (Saaty & Vargas, 2006). Risk levels were calculated using the formula R = P × I, as proposed by Godfrey (1996), and mapped into a 5×5 risk matrix to determine priority levels. Risk treatment strategies referred to Flanagan and Norman (1993).

$$GM = \sqrt[n]{(x_1)(x_2)\dots(x_n)}$$

Description:

GM = Measured average (geometric average)

n = large number of samples

X = Measurement data

Godfrey (1996) defined the level of risk as the result of the multiplication of the probability score and the impact score that had been collected from the previous respondents. The risk value is then calculated by multiplying the probability score and the impact score. The formulas used to measure risk are:

R = P x I

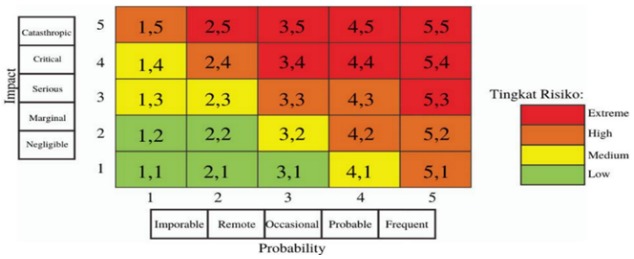
Description:

R = Risk Level

P = Probability *of* risks that occur

I = Impact if the risk really occurs

Godfrey's Risk Map



aims to make it usually depicted This mapping prioritize risks based on their significance for the company (Pangestuti, 2019). To easier to understand, the risk map is visually as shown in Figure 3.1. In the figure, the Y axis represents the probability level of the occurrence of the risk, while the X axis represents the impact if the risk occurs. Once the level of risk is known, the information can then be represented in the form of a risk map. Godfrey's Risk Map is usually illustrated in the form of a matrix with 5 columns and 5 rows, as illustrated below.

Figure 1 Godfrey's risk map
Source: Godfrey (1996)

Results

Rizky Strawberry Agrotourism is a company engaged in the tourism sector, with a special focus on self-picking tourism. Located on Jl. Situ Gunung Kadudampit, Sukamaju Village, Kadudampit District, Sukabumi Regency, West Java, this company was established in 2019. The main activities at Rizky Strawberry Agrotourism include land preparation, fertilization, nurseries, plant maintenance, harvesting, and post-harvest management. This place offers a cool and natural natural atmosphere with stunning views, attracting tourists from different regions to enjoy the tranquil rural atmosphere. Tourists can experience gardening and picking fresh fruit directly from the trees, which is an activity that visitors enjoy very much.

According to SNI, ISO 31000:2018 defines risk identification as the process of identifying, classifying, and explaining risks that can affect or hinder the achievement of organizational goals. The risk identification process in Rizky Strawberry Agrotourism refers to the methodology introduced by Godfrey (1996). Based on the results of a comprehensive literature study and primary analysis that has been carried out, operational risks at Rizky Strawberry Agrotourism can be grouped into five main categories, namely: Human Resources Risk, System and Regulatory Risk, Facilities and Infrastructure Risk, Environmental Risk, and External Risk. The results of this risk identification and analysis can be found in Table 2.

Table 2 Results of Identification of Rizky Strawberry Agrotourism Operational Risks from Internal Respondents

Operational Risk Factors in General	**Operational Risk Factors of Rizky Strawberry Agrotourism**
Human Resource Risk a. Human resource competence b. Employee relationships c. Service d. Internal control of the organization	Human Resource Risk a. Human resource competence b. Employee relationships c. Service d. Internal control of the organization
System/Regulatory Risks e. Security Issues f. Strawberry food safety g. Vendor cooperation h. SOP Implementation	System/Regulatory Risks e. Security Issues
Facilities and Infrastructure Risks f. Environmental Safety g. Road access to between tourist attractions is lacking or difficult to reach	Facilities and Infrastructure Risks f. Management of tourist facilities g. Management of public facilities h. Lack of compatibility with technology

	h. Management of tourist facilities i. Maintenance of lodging facilities j. Management of public facilities k. Lack of compatibility with technology	
Environmental Risks		Environmental Risks
	l. Employes Turnover m. Environmental Pollution	n. Environmental Pollution
External Risks		External Risks
	o. Natural disasters p. Server/internet connection disruption	q. Natural disasters

Source: Data processed (2024)

Based on observation data and in-depth interviews with 5 internal respondents, in Table 6 as the risk of Rizky Strawberry Agrotourism.

1. Human Resource Risk

a) Human Resource Competencies

Human resources (HR) is a very important and inseparable aspect in an organization, including institutions and companies. Human resources are also a determining factor for the company's development. Mangkunegara (2012) defines human resource competence as a qualification that includes knowledge, skills, abilities, and personality characteristics that directly affect the performance of the individual. Employees in Agrotourism are divided into two, namely permanent employees and freelance employees with a total number of employees of 30 people. The average competency of employees who work is elementary school graduates with a percentage of 38%, junior high school 27%, high school 31% and most of them do not have special skills/knowledge in the field of tourism before. Despite the recruitment process being carried out, the company accepts employees from various backgrounds without imposing any special requirements regarding knowledge in the tourism industry or other related fields. This policy increases the risk of placing employees who may not have sufficient skills or knowledge for their jobs.

b) Employee Relations

The respondents listed in appendix 1 determined that the relationship between Rizky Strawberry Agrotourism employees has the highest level of operational risk reaching 100%. This is supported by the statement of Gibson and Ivancevich (2010) that the relationship between employees has several factors, including communication. Communication refers to the way individuals interact to build harmonious relationships both within their own group and with other groups. Communication refers to the way individuals use interaction strategies and patterns to reinforce balanced and mutually supportive relationships, both within the group they are in and in interacting with other groups around them. This includes the application of various communication techniques, such as adaptation of speaking styles, active listening skills, and awareness of applicable social norms, with the ultimate goal of creating a supportive environment and harmonious relationships between group members and other parties. However, challenges in building relationships always exist, especially in the work environment of Rizky Strawberry Agrotourism employees. Conflicts can arise both from personal

problems and caused by a lack of firmness in implementing work discipline in the workplace, which can result in employees tending to be absent without explanation, neglecting time in the office, and so on.

c) Service

The absence of strawberry productivity at Rizky Strawberry Agrotourism can be an indication of unsatisfactory service for visitors. When visitors come in the hope of enjoying the strawberry picking experience in person, only to find that fruit production is inadequate or even unavailable, this can disappoint them. The lack of productivity of strawberries can reduce the added value of a visit to the place, resulting in visitors feeling dissatisfied and reducing their likelihood of returning or recommending the place to others. It is important for Rizky Strawberry Agrotourism to ensure that the services provided are in accordance with the expectations of visitors, including by maintaining the productivity and quality of the strawberries available for picking.

d) Internal Organizational Controls

One of the internal risks of organizational control that arises at Rizky Strawberry Agrotourism is the weakness in the recording and reporting system which can result in difficulties in tracking finances and overall performance. If the record-keeping procedures are inadequate, there is a risk of losing important data or confusion in managing information, which can interfere with effective and accurate decision-making.

2. System/Regulatory Risks

a) Security Issues

The safety explained includes aspects of occupational safety for employees as well as safety for visitor or guest activities. This concept demands that these conditions must be free from all forms of threat of danger that can interfere with activities and cause injury, disease, property damage, and disturbance to the environment. Given the vastness of the tourist environment and its open nature, there are several areas where visitors need to be warned about the possible dangers they may face if they are not careful. In the midst of conditions like this, the tourism environment still has a shortage in marking or providing information evenly to visitors through directional signs or warnings placed in the right location. There are risks that may arise if visitors are not adequately informed and take actions that are not recommended, which can cause accidents for them such as roads that are not allowed to be crossed, slippery roads so that visitors can slip and fall, and play in areas prone to landslides.

3. Facilities and Infrastructure Risks

Management of Tourism Facilities

In relation to the control of tourist facilities in open land, there is a higher risk of damage, especially because some facilities that cannot be repaired or reused are often left abandoned. This can result in a decrease in the attractiveness of these tourist facilities, as well as have a negative impact on the visitor experience.

a) Management of public facilities

When the management of public facilities at Rizky Strawberry Agrotourism is not done properly, various risks can arise that have the potential to disrupt the visitor experience and overall operations. One of them is the deterioration in service quality, where facilities such as public toilets that are not properly treated cause inconvenience to

visitors.

b) Lack of adaptation to technology

The lack of interactive information that includes a complete list of activities and facilities available at tourist attractions may result in a reduction in the quality of services and facilities provided. This can have an impact on the level of visitor satisfaction and affect their perception of the experience at Rizky Strawberry Agrotourism. It is important for companies to continuously update and improve their interactive information systems in order to provide a more engaging and informative experience for visitors. Thus, adapting to technology is not only key to improving operational efficiency and expanding marketing reach, but also to improve the overall experience of visitors at Rizky Strawberry Agrotourism.

4. Environmental Risks

a) Environmental Pollution

The irregular distribution of waste by some visitors, who ignore compliance with environmental norms, has become a source of pollution in the Rizky Strawberry Agrotourism environment. This condition not only disrupts the natural aesthetics and cleanliness of the area, but also increases the risk to public health and damage to the ecosystem that is the main attraction of agro-tourism. There needs to be awareness and joint efforts to overcome this problem, through law enforcement, education, and the development of an effective waste management system.

5. External Risks

a) Natural Disasters

Highland areas prone to natural disasters include threats from extreme weather such as landslides, climate change or storms that can disrupt operations and cause damage to facilities and crops.

Likelihood and Impact of Risk

By grouping risks into different levels, tourism managers can take proactive steps to reduce these risks to the smallest possible extent (Pamungkas *et al.* 2019). Assessing the probability and impact of risks is important as a guide and consideration for Rizky Strawberry Agrotourism in planning and executing business strategies in the future. Evaluation of the likelihood of risk occurrence was carried out for 10 risks in Rizky Strawberry Agrotourism, with the results shown in the calculation data in Figure 2

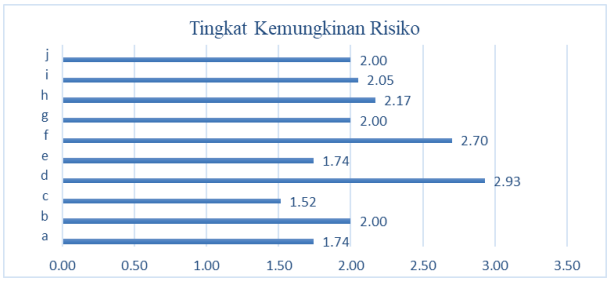


Figure 2 Possible risk level of Rizky Strawberry Agrotourism

Source: Data processed (2024)

Based on the evaluation of the possibility of operational risks in Rizky Strawberry Agrotourism, the average probability of reaching a frequency value of 2.08 or 2 with the

classification of possible risks is rare *(remote)*. However, when a more in-depth analysis of each factor is carried out, the highest value of the possibility of risk occurring is found in the internal control of the organization (d) with a value of 2.93, which is included in the category of occasional risk because it has a value above 2.5. Meanwhile, the lowest possible risk value is found in natural disasters, which is 2.00, which is categorized as an improbable risk.

Internal control risks of the organization (d) have a higher probability value than other risks. The causes of problems in the internal control of the organization at Rizky Strawberry Agrotourism can vary. One of the main causes is a lack of understanding or awareness of the importance of internal control among staff and management. In addition, there is a weakness in the recording and reporting system which can result in difficulties in tracking finances and overall performance. So that internal control problems may not be detected or resolved in a timely manner.

The value of the possibility of natural disaster risk (j) in Rizky Strawberry Agrotourism has the lowest value because the average respondent considers that the event is very rare. The location of Rizky Strawberry Agrotourism may have certain geographical or environmental factors that make it relatively safe from natural disasters such as flooded land. Due to this geographical factor, visitors and staff may feel safer and more comfortable in exploring and managing the agro-tourism. However, it is still important to remain alert and have a good emergency plan, as well as carry out regular maintenance of facilities to remain prepared for the possibility of natural disasters that are rare but still possible. Wasisto (2013) revealed that although some risks are easy to measure, predicting the probability of rare events is very difficult.

Risk Impact Level

Based on the evaluation of the impact of operational risks at Rizky Strawberry Agrotourism, it was found that the highest impact value was found in several risks, namely natural disasters (j) with a frequency value of 5 (five) or categorized as very large *(catastrophic)*. In addition, risks related to internal control of the organization (d), management of tourist facilities (f), lack of conformity to technology (h) and environmental pollution (i) have a frequency value of 4 *(four),* which indicates the magnitude of the impact is large (critical). Meanwhile, risks related to services (c) and management of public facilities (g) are included in the category of frequency values 3 (three), indicating a moderate *(serious)* level of impact. Meanwhile, the lowest impact value is found in risks related to human resource competence (a), relationships between employees (b) and safety issues (e) which are included in the frequency category of 2 (two) or small *(marginal)*.

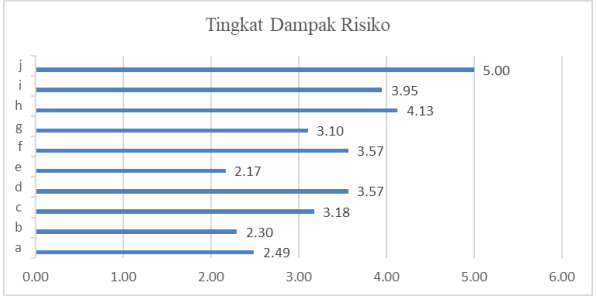


Figure 3 Risk impact level of Rizky Strawberry Agrotourism
Source: Data processed (2024)

Risks related to natural disasters (j) have a very significant impact and have the potential to harm the company substantially. Given the environmental conditions of the company, which mostly consists of the outdoors, the existence of agro-tourism is very vulnerable to various types of natural disasters. Potential losses that may arise due to natural disasters include a drastic decrease in the number of visitors coming, given the unsafe or impossible conditions to receive tourist visits. Natural disasters that often occur in the region generally include storms, climate change and landslides that can cause very serious disruptions to the operations and business continuity of Rizky Strawberry Agrotourism. Protection and risk mitigation against natural disasters is an important priority for companies to ensure operational continuity and business sustainability.

Risk Maps and Mapping

A risk map is a tool that combines the estimation of the likelihood and impact of risk into a single unit, so that it can describe the risk category on each factor analyzed. Information related to the level of operational risk in Rizky Strawberry Agrotourism is available in Table 3.

Table 3 Operational risk level of Rizky Strawberry Agrotourism

Code	Operational risks	K[a]	P	I	P,I	Risk level*
a	Human resource competence	HRM	1,74	2,49	2,2	*Low*
b	Employee relationships	HRM	2,00	2,30	2,2	*Low*
c	Service	HRM	1,52	3,18	2,3	*Medium*
d	Internal control of the organization	HRM	2,93	3,57	3.4	*Extreme*
e	Security issues	SI	1,74	2,17	2,2	*Low*
f	Management of tourist facilities	S&P	2,70	3,57	3,4	*Extreme*
g	Management of public facilities	S&P	2,00	3,10	2,3	*Medium*
h	Lack of compatibility with technology	S&P	2,17	4,13	2,4	*High*
i	Environmental pollution	LNK	2,05	3,95	2,4	*High*
j	Natural disasters	EKS	2,00	5,00	2,5	*Extreme*

Source: Data processed (2024)

By using the risk map, Rizky Strawberry Agrotourism can be more effective in managing operational risks and ensuring sustainability and safety in daily operations as shown in Figure 4.

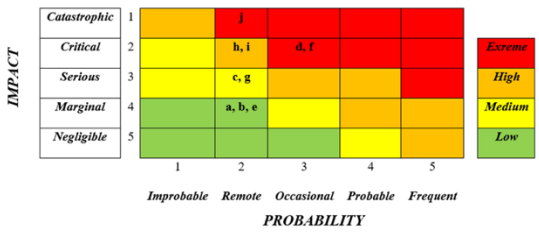


Figure 4 Rizky Strawberry Agrotourism operational risk map
Source: Data processed (2024)

The figure above is the result of mapping the operational risks faced by Rizky Strawberry Agrotourism. Risks a, b, and e that have a low risk level are placed on the map according to the probability (p) and impact (i) values listed in Figure 8, marked in green. The risks c and g, which have a moderate risk level , are placed on the map with

yellow markings. Risks h and i, which have a high level of risk, are marked in orange on the map. Meanwhile, the risks of d, f and j, which have a very high *level of risk (extreme),* are marked in red on the map.

Each risk that has been leveled based on its likelihood and impact will determine the steps that the company needs to take to deal with it. Low risk is negligible because the impact is considered insignificant and will not affect or harm the company as a whole. For medium risks*,* companies can accept that these risks may occur, but do not need to take too serious measures. It is enough to apply simple initial steps to reduce or control the risk so that it does not develop into a bigger problem.

Risk evaluation, as described in the SNI ISO 31000:2018 standard, aims to support decision-making related to risk management. The evaluation process is carried out by mapping the possibilities and impacts of risks to determine the level of risk. After mapping the operational risks that occur at Rizky Strawberry Agrotourism, the next step is to measure the level of risk acceptance.

According to Godfrey (1996), risk can be divided into four risk categories. For risks that fall into the unacceptable category, companies such as Rizky Strawberry Agrotourism must do their best to avoid these risks, because the impact can be very detrimental and difficult to repair. In the case of risks that fall into the undesirable category, Rizky Strawberry Agrotourism needs to make a transfer response, namely transferring the risk to an outside party, such as through insurance or a contract with a third party, so that the risk that must be borne by the company becomes smaller. For risks that fall into the acceptable category*,* companies must take actions known as *reduction responses*. This means reducing the potential for risks through various prevention and mitigation measures. As for risks that are classified as *negligible,* companies can accept the risks that occur without the need to take special measures, because the impact is considered insignificant. In this case, the company *responds acceptably,* which means that the risk can be accepted and ignored without causing significant losses. By referring to the principles put forward by Flanagan and Norman (1993), the level of acceptance and response to risk can be identified in more detail through the application of Table 4 previously described regarding the level of risk acceptance.

The level of acceptance and appropriate response to risks in the Company can be seen in Table 8, showing that the internal risks of organizational control (d), management of tourist facilities (f) and natural disasters (j) are included in the category of unacceptable acceptance. Furthermore, the lack of conformity with technology (h), and environmental pollution (i) are classified in the category of undesirable revenues. Risks related to services (c) and management of public facilities (g) are included in the category of *acceptable acceptance*. Meanwhile, human resource competence (a), relationships between employees (b), and safety issues (e) are included in the category of *negligible acceptance*.

Table 4 Acceptance rate of operational risk of Rizky Strawberry Agrotourism

Code	Operational Risk	K[a]	Risk level*	Risk level
a	Human resource competence	SDM	*Low*	*Negligible*
b	Employee relationships	SDM	*Low*	*Negligible*
c	Service	SDM	*Medium*	*Acceptable*
d	Internal control of the organizatio	SDM	*Extreme*	*Unacceptable*
e	Security issues	SI	*Low*	*Negligible*

Code	Operational Risk	K[a]	Risk level*	Risk level
f	Management of tourist facilities	S&P	*Extreme*	*Unacceptable*
g	Management of public facilities	S&P	*Medium*	*Acceptable*
h	Lack of compatibility with technology	S&P	*High*	*Undesirable*
i	Environmental pollution	LNK	*High*	*Undesirable*
j	Natural disasters	EKS	*Extreme*	*Unacceptable*

Source: Data processed (2024)

Risk treatment is the stage taken after establishing the risk acceptance level. Risk response analysis helps companies find effective solutions to address emerging risks. The results of the risk response analysis according to Flanagan and Norman (1993) can be seen in Table 5.

Table 5 Risk response in Rizky Strawberry Agrotourism

Code	Operational Risk	K[a]	Risk level*	Risk acceptanc
a	Human resource competence	SDM	*Negligible*	*Retention*
b	Employee relationships	SDM	*Negligible*	*Retention*
c	Service	SDM	*Acceptable*	*Reduction*
d	Internal control organization	SDM	*Unacceptable*	*Avoidance*
e	Security issues	SI	*Negligible*	*Retention*
f	Management of tourist facilities	S&P	*Unacceptable*	*Avoidance*
g	Management of public facilities	S&P	*Acceptable*	*Reduction*
h	Lack of compatibility with technology	S&P	*Undesirable*	*Transfer*
i	Environmental pollution	LNK	*Undesirable*	*Transfer*
j	Natural disasters	EKS	*Unacceptable*	*Avoidance*

Source: Data processed (2024)

To improve the effectiveness of the risk management process, it is important to formulate risk treatment efforts based on the level of each risk. According to Pangestuti (2019), companies do not need to worry about all types of risks equally. Rizky Strawberry agrotourism must carry out risk treatment efforts that are focused on high *and extreme risks*. Internal control of the organization (d), management of tourist facilities (f) and natural disasters (j) as very high risk *(extreme)* require additional treatment by risk *avoidance*. For high level risks, such as lack of conformity with technology (h), and environmental pollution (i), the appropriate treatment is risk transfer (*risk transfer)*. This study applies *risk transfer* and *risk reduction* strategies to minimize the possibility of risk. For extreme risks, risk avoidance efforts are carried out *supported by theories from Flanagan and Norman (1993), risk* treatment actions for two high levels and one very high risk are as follows:

Sub 1 Lack of Compatibility with Technology *(High)*

The risk of conformity to technology in developing agrotourism includes several important aspects that need to be considered. One of the problems that Agrotourism often faces in the operation of technology is the tendency to post and mix personal life content with corporate activities.

When employees or management do not clearly separate personal and professional content on social media platforms or other communication channels, this

can pose a number of risks. For example, company information that should be internal may be accidentally exposed, or the image of agrotourism professionals may be tainted by inappropriate personal content. To mitigate this risk, it is important for agrotourism to establish clear social media policies and provide training to staff on the importance of separating personal and professional content. This not only protects the integrity and reputation of the company, but also ensures that the technology is used in a way that supports business and operational goals. Efforts that need to be made to overcome these problems:

1. Establishing clear social media policies and providing training to staff on the importance of separating personal and professional content is a crucial step to maintaining the integrity and reputation of the company. This policy should include detailed guidelines on what can and cannot be shared on social media accounts associated with the company.
2. Conduct comprehensive training should be provided to all staff to ensure they understand the consequences of mixing personal content with professional content and how to keep company information secure. Thus, companies can avoid the potential risk of information leakage and maintain a professional image in the eyes of the public.

Sub 2 Environmental Pollution *(High)*

The risk of environmental pollution at Rizky Strawberry Agrotourism is relatively high because many visitors throw garbage carelessly. This condition can cause damage to the ecosystem and reduce the quality of the tourist experience. In addition to having a negative impact on the beauty and cleanliness of the environment, the pollution also has the potential to cause health problems for visitors and staff. The suggestions or efforts that need to be made by the company to manage risks are as follows:

1. Increasing the awareness of visitors and Rizky Strawberry Agrotourism staff about the importance of maintaining environmental cleanliness by providing sufficient garbage cans and providing education on the correct way to dispose of waste.
2. Conducting strict supervision of visitor behavior so as not to litter by making rules for tourists. Regular environmental cleaning and maintenance efforts are also needed to prevent ecosystem damage and maintain the quality of the tourism experience.
3. Cooperation with relevant parties such as local governments, especially or the environment and forestry service and environmental organizations can also help in dealing with environmental pollution problems and increase awareness of the surrounding community about the importance of maintaining environmental cleanliness.

Sub 3 Internal Organizational Controls *(Extreme)*

The internal control of the organization is at a very high level due to weaknesses in the recording and reporting system. A common mistake in Rizky Strawberry Agrotourism is not recording expenses and income with low values, which causes data inaccuracy. Internal control is a process designed to provide assurance related to the achievement of objectives related to operations, reporting, and compliance (COSO, 2013). To reduce the risk impact of an organization's internal controls, several steps can be taken:

1. Strengthening the Recording and Reporting System: improving the recording and reporting system to make financial information and company performance more

accurate and reliable.

2. Training and Awareness-raising: providing training to staff and management on the importance of internal controls and raising awareness of existing procedures.
3. These efforts are expected to reduce risks by reducing the factors that cause risks through the implementation of proactive measures designed to identify, address, and manage potential sources of risk, thereby effectively reducing the probability of risks occurring in the company's operational environment.

Sub 4 Management of Tourism Facilities (Extreme)

Risks in the management of tourist facilities have a very high level and a significant impact on agro-tourism activities. Tourist facilities, including objects that attract visitors, are vulnerable to damage if not properly maintained. Lack of maintenance is the main factor that causes tourist facilities to become damaged and abandoned. The gazebo is one of the first buildings that visitors see when entering the Rizky Strawberry Agrotourism area. This gazebo is often used for various activities such as picnics, group meetings, and educational activities. Good gazebo conditions ensure the smooth and comfortable operation of these activities. A well-maintained gazebo reflects attention to detail and concern for the comfort of visitors, which in turn can improve the reputation of agrotourism and encourage visitors to return and recommend the place to others. The first impression of visitors is greatly influenced by the condition of the facilities in the area they first enter.

However, currently many facilities at Rizky Strawberry Agrotourism are no longer suitable for use and seem unmanaged. For example, stair handrails made of already fragile bamboo can cause visitors to fall and suffer serious injuries. This situation will certainly reduce the level of visitor satisfaction. The advice or efforts that need to be made by the company to manage the risk are as follows:

1. Identify facilities that are not feasible and those that are still fit to use. Repair the damage or, if the facility is no longer in use and will not be replaced with a new one, immediately clean it up to ensure that the comfort of visitors is not disturbed.
2. Carry out clear quality control of facilities that are still suitable for use by considering the safety of visitors. The specifications of tourist attractions need to be established to determine the type of maintenance required, including consideration of suitable locations to place the tourist attraction.
3. These efforts aim to reduce risks by minimizing factors that can cause the negative impact of such risks.

Sub 5 Natural Disasters *(Extreme)*

At the stage of problem identification, the risk of human resource competence showed the highest value, reaching 100%, while after data analysis, natural disasters were ranked very high risk. This happens due to the unavoidable, yet predictable nature of disasters. On the other hand, human resource competencies can be predicted, prevented, and overcome through planned efforts, such as internal company training. By conducting this training, companies can reduce the risks associated with human resource competencies, and effectively mitigate their potential negative impacts.

Rizky Strawberry agrotourism are located in mountainous areas that are often hit by high rainfall, increasing the potential for natural disasters including storms, climate change and landslides that are common in mountainous environments. The condition of

the trees around this area that are old increases the risk of fallen trees, threatens the safety of people and property and has the potential to damage vehicles and endanger lives. The results of the risk analysis confirm that the level of natural disaster risk in this region is very high *(extreme),* which encourages the need for mitigation efforts to reduce the possible impact that it can cause. In accordance with the General Guidelines for Disaster Mitigation of the Minister of Home Affairs Regulation No. 33 of 2006, disaster mitigation efforts aim to identify potential disasters and take necessary preventive measures. It is recommended that companies implement special measures to reduce risks related to natural disasters in the area. Steps that can be taken:

1. Preparing for a natural disaster in an area can include actions such as preparing evacuation signs, such as hazard warnings, gathering points, evacuation routes, and announcements of evacuation procedures for visitors. Cooperation with the Regional Disaster Management Agency (BPBD) can support the implementation of these preparatory measures.
2. Cooperation between agro-tourism and local hospitals and local fire departments is needed to ensure a quick and effective response in handling natural disaster situations in agro-tourism. With this collaboration, agro-tourism can provide timely medical assistance and evacuation to visitors or affected employees.
3. Working with fire departments can help in fire suppression and risk management associated with natural disasters such as wildfires. This cooperation also allows for the exchange of information and coordination between related parties to ensure the safety and well-being of all parties involved.

The implementation of the risk management strategy described above aims to reduce the losses experienced by Rizky Strawberry Agrotourism due to various operational risks that may occur. These risks arise from the company's day-to-day business activities and are the main focus in risk management. The implementation of appropriate risk management strategies is essential to effectively handle and mitigate the impact of these risks. A thorough risk management process, which includes detailed assessments and the implementation of appropriate mitigation strategies, is expected to provide a better understanding of the company's operational risk map. With this understanding, companies can be more proactive in identifying and addressing potential threats, reducing the negative impact that may occur. Figure 5 visually illustrates the operational risk map, providing guidance on areas that require special attention and steps that can be taken to mitigate potential losses.

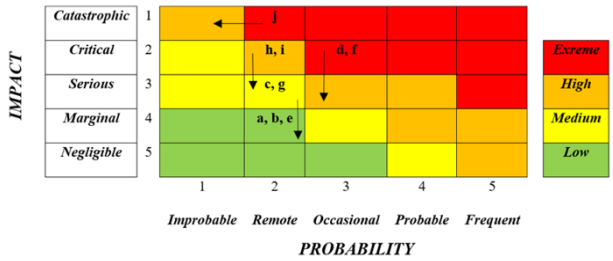


Figure 5 Projection of risk map after the implementation of risk treatment
Source: Data processed (2024)

Risk mitigation efforts with the implementation of preventive strategies are prioritized

for high-level and extreme risks, because risks at this level are beyond the company's control. The implementation of preventive strategies is expected to reduce the possibility of risks and their impacts. In Figure 9, it can be seen that the implementation of risk mitigation is expected to reduce the possibility of internal risks of organizational control (d), management of tourist facilities (f) and natural disasters (j). Risk mitigation is also expected to be able to reduce the possibility and impact of lack of conformity to technology (h) and environmental pollution (i). It is important for Rizky Strawberry Agrotourism to implement a risk mitigation strategy to reduce the level of likelihood and impact of risks faced by the company.

Conclusion

This study identifies that operational risk in Rizky Strawberry Agrotourism is primarily driven by internal managerial weaknesses, particularly in human resource capacity, safety management, infrastructure readiness, and environmental control. The dominance of extreme and high-level risks indicates that newly established agrotourism enterprises are structurally vulnerable during their early operational phase. The findings demonstrate that systematic risk identification, probability–impact assessment, and risk mapping are essential to determine priority risks and support evidence-based managerial decision-making.

Theoretically, this study underscores the importance of structured operational risk management in strengthening business sustainability within emerging agrotourism enterprises. Managerially, the results highlight the need to enhance employee competencies, standardize safety and internal control systems, improve facility maintenance, and reinforce environmental management. Overall, a risk-based management approach is critical for building organizational resilience and ensuring long-term sustainability in early-stage agrotourism businesses.

Suggestion

To address the identified risks in Rizky Strawberry Agrotourism, several strategies can be implemented. Establishing and enforcing clear social media policies, combined with staff training on the importance of separating personal and professional content, is crucial for maintaining the integrity of the company. Efforts to enhance environmental cleanliness should include providing sufficient garbage bins, educating visitors on proper waste disposal, and strictly monitoring visitor behavior to prevent ecosystem damage. Collaboration with local governments and environmental organizations can also help tackle pollution and raise awareness of hygiene. Furthermore, strengthening the accuracy of financial and performance reporting through improved recording systems and internal control training is essential. Regular facility inspections and timely repairs will ensure visitor comfort and safety, supported by quality control measures. Additionally, preparation for natural disasters should involve installing evacuation signs and coordinating with BPBD, hospitals, and fire departments to ensure a quick and effective response during emergencies. These integrated approaches will effectively mitigate operational risks and promote sustainability in Rizky Strawberry Agrotourism.

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