Risk Analysis of Harvest Faults Based on Enterprise Risk Management (ERM) Approach of Plantation in Wacopek, Kecamatan Bintan Timur

Dwi Septi Haryani[1*], **Risnawati**[2], **Nanda Kristia Santoso**[3], **Sri Kurnia**[4]

[1, 2, 3] *Management Department / Management,STIE Pembangunan, Tanjungpinang*
[4]*Accounting Department / Management,STIE Pembangunan, Tanjungpinang*

Author's email: dwiseptih@gmail.com; risna.nina1998@gmail.com; nandamasda@gmail.com; srikurnia@stie-pembangunan.ac.id
**Corresponding author: dwiseptih@gmail.com*

Abstract. *The purpose of the research is to analyze and identify the risk of the failed harvest of vegetable plantations, the impact, and the actions that need to be taken to prevent the dangers in the plantation business. This research belongs to a qualitative descriptive research approach. The research location is at Wacopek village, Kijang City of East Bintan District, Bintan Regency. The data collection techniques used in this study are interview and observation. The results show that several types of risks can cause failed crops in Wacopek Plantation obtained from risk identification. The level of risk experienced by Wacopek Plantation ranges from low to high severity. Therefore, to anticipate threats that can arise, the plantation requires proper risk mitigation adjusted to the priority by looking at the impact level.*

Keywords: *risk, plantation, harvest fault, Enterprise Risk Management*

1. INTRODUCTION

In the business world, especially the plantation business, some things are inevitable, namely uncertainty in its implementation. Of course, the uncertainty can be detrimental to the company. Plantation business has its uniqueness, where this business activity is very dependent on natural conditions, such as weather, soil quality, wind, and so on.

The plantation is named after Atan's boss due to founded by Atan. Wacopek's vegetable is a private business that produces various types of vegetables, such as cucumbers, spinach, lettuce, beans, and many more. This business has been established since 2010 with three employees. The vegetable plantation business founded by Atan is a profitable business considering that the plantation has many Tanjungpinang and Batam producers who buy vegetables from Wacopek. The seeds used in this plantation are supplied from the outside regions.

In running the vegetable plantation business, Atan does not always get optimum profit and faces risks on his plantation business. The vegetable plantation has experienced at least five crop failures a year due to erratic climate change, human error, unsuitable quality of seeds, pests, poultry, and floods. This situation is relevant to (Crane et al., 2013) which said that in the plantation sector, there are three primary sources of business risk, namely: (a) production or technical risk, (c) climate change risk, and (e) risk due to human error. These three sources of risk can have short-term and long-term effects on the plantation business.

According to (Tjakra & Sangari, 2011), failure to understand uncertain conditions can potentially lead to risks. This is also by the statement (Anggraini et al., 2006), which states that every business activity will face threats due to uncertain conditions in the future. According to (Haryani, 2019), with the many risks that often occur in a company or individual, it is necessary to manage and control risks to maintain and expand their business.

Moreover, according to (Haryani & Risnawati, 2018a), one of the essential things in managing all risks that can be ordered and minimized for the sake of achieving company goals by implementing Enterprise Risk Management (ERM), which is also essential in carrying out Enterprise Risk Management is because each -Each describes an approach to identify, analyze, respond to and monitor risks and opportunities, in an environment within the company and in an environment outside the company that must be faced by the company.

Many studies have examined risk management in various types of businesses, including research conducted by (Haryani et al., 2018), which examined the risk management of potato chips product failure at KUBE Widuri in Kijang, Bintan Island. The study focused on the risk of product failure, in contrast to the research the researchers conducted, which focused on plantation risk, which of course, the types of risks faced are very different and the management.

Furthermore, research from (Zirape & Warudkar, 2016) who research risk management on joint venture projects in the property business and by (Mustapha & Adnan, 2015) who research risk management at construction companies in malaysia which examines risk management in construction companies, which of course differs from the risk characteristics in the plantation. Where in construction companies, we have three types of risks, namely internal risks, project risks, and external threats. Of course, it will also be different in terms of risk mitigation.

Further research conducted by (Haryani & Risnawati, 2018b), they researched risk management in manufacturing companies engaged in textiles. The research examined operational risks in manufacturing companies engaged in textiles. Risks faced by manufacturing companies related to production processes, operator work procedures, production machinery and related employee productivity. Of course, it is very different from the risks of plantations that are being researched. Related to the risk management strategy is also different; of course, the focus of management on manufacturing is more focused on technical matters, while in the plantation business focuses on pure risk.

Based on the background above, the objectives of this study are: 1) to identify the risks faced in Atan's boss's plantation business; 2) to determine the impact of the risk of plantation failure on Atan's boss's plantation business; 3) to assess the risks faced in Atan's boss's plantation business, 4) Identify actions that need to be taken in prevention of the risks and impacts that occur.

2. LITERATURE REVIEW

2.1 Risk

Some risk definitions are based on probability, probability, expected value, unwanted events or hazards, and others on uncertainty (Crovini, 2019). Traditionally, risk has been viewed as negative consequences and unfavorable circumstances (Fadun, 2013) and refers to any uncertainty associated with organizational outcomes (Miller, 1992 in Luppino et al., 2014). Risk is defined by the Oxford English dictionary as "a condition engage exposure to a harmful event (Nikou & Selamat, 2013). The term risk from a broader perspective describes uncertain future events, and risks can be positive and negative (Brustbauer, 2016 in Temel & Durst, 2020).

Hardy (1931) considers risk as uncertainty related to cost, loss, or damage (Crovini, 2019). Furthermore, PMBOK (PMI, 2008) defines risk as an unpredictable condition, if it happens, affects at least one project objective (Porananond &

Thawesaengskulthai, 2014). It can be concluded that risk is an uncertainty that can cause possible losses.

According to (Mubarokah et al., 2017), the risk is the probability of an event resulting in losses when the incident occurs during a specific period. Moreover, According to (Rumimper et al., 2015) risk is an event that has the opportunity to affect the project as a result of uncertainty negatively and is associated with the possibility or probability of an event beyond what is expected.

2.2 Risk Management

(Perera et al., 2014) defines risk management as a systematic approach to the identification, assessment, and evaluation of related risks followed by the provision of resources necessary to monitor, control, and decrease events' disservice effect. (Miller, 1992; Brustbauer, 2014) Risk management could help SME managers identify significant risks that could jeopardize a company's success or existence in time to address them efficiently (Falkner & Hiebl, 2014). Misuses or failing to recognize risks can-in the worst cases-have catastrophic consequences, ranging from losing customers to destroy liability, environmental and any possible destruction, even bankruptcy (Hollman and Mohammad-Zadeh, 1984 in Falkner & Hiebl, 2014).

A committee that determines standards for managing risk in a company known as COSO, defines management of risk as a process, powered by the BOD of entities, management, and another department, executed in strategy and company-across settings, designed to identify potential events that could affect the entity and manage risk in its risk appetite, to offers reasonably assurance regarding the accomplishment of the objectives of the company (Mustapha & Adnan, 2015).

According to (Haryani, 2019), risk management always providing basis information about the concept of risk management in events detailed by the entity. Appearance of risk in agriculture has a significant impact on the decisions of farmers' production and investment; as a result, a good risk management concept is needed. According to (Hanafi, 2014), the risk management process consists of 1) risk identification, 2) risk evaluation and measurement, and 3) risk management (Haryani et al., 2018). One of the risk management at a known company is enterprise risk management.

2.3. Enterprise Risk Management

Lam (2000) defines ERM as an integrated framework for maintan credit risk, market risk, operational risk and capital risk to enlarge constant worth (Haryani et al., 2019). Based on the observations, research, interviews, and observations that have been conducted in the efforts to make known Mr. Ramidi and Mrs. Helis, that of the twelve relevant risks, three risks are classified as significant risks with very high severity, and nine risks classified as risks with moderate severity. These risks include human resource risks, productivity risks, process risks, external risks, reputational risks, and environmental risks.

According to Moeller (2009), there are the following ERM components (Sirait & Susanty, 2012): 1) The internal environment determines the color of an organization and service members for the perspective of the risks of each person in the organization; 2) Objective sefting, management must set the objectives of the organization to identify, access, and manage risks, 3) Identification of events (event identification), where this component identifies pontensial events both occurring in the internal and external environments of the organization that influence the strategy of the objectives of the organization; 4) Risk assessment, where the components assesses the extent to which the impact of the event can interfere with the achievement of the goal; 5) Risk response, an organization must be able to determine the attitude of the risk assessment results, 6) Control acivities, policies, and procedures are settled and executed to assist and to make sure the risk response runs effectively; 7) Information and communication, the

pertinent information is identified, caught, and presented in the form or time that enables each person to brought their responsibilities; 8) Monitoring, the entire ERM process is watched, and modification is carried out if necessary.

2.4. Plantation Risk

According to (Mubarokah et al., 2017), The risks of producing that disrupt the plantation business can be attributed to several factors including climate/weather change, disinfectant and disease, and the quality of the seed used, that can be described as follows:

a. Weather. Unfavorable weather or climate would cause disease attacks that would cause vegetable production to decline. Hot weather can cause vegetable production down because there is no water to watering plants. Vegetables would dry, and output would be inadequate.
b. Pest and disease attacks. A common disease in the vegetables on the farm is the pests that often appear during the rainy season. The vegetable becomes rotten. These pests are like caterpillars that regularly appear on leaves that damage the vegetable's leaves. The disease causes the leaves to have black spots, so it reduces production and quality.
c. Seed quality. One factor that contributes to the low production of vegetables is the quality of the seeds used. Quality seeds are more resistant to attacks by pests and disease.

Also, the plantation business is also faced with the risk of crop failure. According to (Alif, 2017), crop failure is the overall loss of plantation cultivation caused by climate, pests, and seed quality.

3. RESEARCH METHODS/METHODOLOGY

This research is a type of descriptive study with a qualitative approach. The data analysis technique is done through 3 stages according to Miles and Huberman namely data reduction, data presentation, and inferent withdrawal (Sangadji & Sopiah, 2010). The data source used is primary data, namely interviews and secondary data obtained from reference books and journals. The data techniques used were interviews, literature study, and documentation. This research object is the boss of the plantation in the Wacopek area, East Bintan, Riau Islands. The scope of this research is only on the variables related to the risk of product failure.

The population in this study were employees and owners of Wacopek plantations. Sample determination uses the purposive sampling technique, a sampling technique with specific considerations (Sugiyono, 2015). The care of the selected informant is an informant who understands the process of farming on this plantation. The author determines a sample of 2 people, including the owner of one person and employees of one person.

Data analysis techniques use the Enterprise Risk Management method, where the data obtained comes from interviews with businesses and observations conducted directly. The risk management process outlined in the ERM concept, according to Hanafi (2014) consists of 3 stages, including 1) risk identification, aiming to identify risks that may be faced by looking at the source of risk, 2) evaluation and measurement of risks, is the process of mapping risks into the likelihood-impact matrix, and 3) risk management or risk mitigation, is the process of providing recommendations to manage risk based on the priority of the results of risk mapping that has been done previously (Haryani & Risnawati, 2018a).

4. RESULTS AND DISCUSSION

Production Capacity and Planting Vegetable Process

The process of planting vegetable seedlings is uncertain, usually once a week after harvesting vegetables with a production capacity of about three hundred kilograms per harvest. The steps for the vegetable planting process are as follows:

a. F0 (crop management)
   This process requires a tool to loosen the soil for planting mustard greens, lettuce, kale, spinach, and other similar plants. Especially for cucumbers, long beans, and green beans, thick ropes are needed so that the plants spread. The soil that has been loosened is given para net and plastic mulch to maintain the ground, soil structure, minimize the attack of pests and plant diseases. After that, the soil is perforated with a small size to enter the seeds.
b. F1 (planting seeds)
   After cultivating the soil, the seeds are planted. Seedlings are placed in the soil hole. The soil hole that has been given the origins is covered again with dirt.
c. F2 (Watering)
   The planted seeds are given air (watering) so that they can grow and develop. Watering is carried out using pipes installed in each area. Watering is done twice a day (morning and evening).
d. F3 (Fertilization)
   After watering, the seeds are given fertilizer to add nutrients needed for optimal growth. The types of fertilizers used are organic fertilizers, namely organic fertilizers (compost and green) and inorganic fertilizers (urea, KCI, TSP). Fertilization is done once a week.
e. F4 (harvest)
   The harvesting process is carried out depending on the type of vegetable. Mustard greens, cucumbers, beans, and green beans are harvested every two weeks, while lettuce and spinach are harvested each month, kangkung is harvested every fourteen days.

Risk Identification

According to Hanafi (2014) in (Haryani et al., 2018) the identification process is carried out to identify all types of risks attached in any functional activity that could potentially endanger the firm. Many possibilities create risks during activities or the process of growing vegetables. These risks include:

1. Climate change. The unsupportive climate will cause pest attacks; it decreases vegetable production. The hot weather climate also makes vegetable production decrease due to the and dryness of the water. Continuous rain decreases the quality of soil moisture; it is unstable. And easy to be erosion. Furthermore, rainy weather can also cause flooding, which displaces the movement of vegetable seeds.
2. The quality of the seeds. Sometimes, not all of the vagetable seeds from producers are of good quality due to pests' presence and keep for too long storage.
3. Pests and Diseases. Diseases that occur of vegetables in the rainy season are a pest. These vegetables will become rotten. An example of a problem, such as a caterpillar that often appears on the leaves, can make vegetables have a black spot. The vegetables are infected with mold and which can reduce the quality of production.
4. *Human Error.* In doing the job at the plantation, sometimes farmers make several mistakes such as human error; the following human error will be explained as follows:
   a. Accidents in working. Sometimes, farmers do not use sandals and gloves, farmers can be hit by sharp objects, and it can hurt farmers, more than that, when the farmer dig the soil, without any protector, it can also be a dangerous thing to do.
   b. Delivery of vegetables. To Delivery vegetables to producers, Atan's boss uses transportation services. Sometimes the transportation exceeds the limit of delivering protocol; it will cause accidents.
   c. Planting schedules error. Sometimes, farmers make an error in planting seeds,

affecting vegetables' development and decreasing productivity.

d. Improper fertilization. Sometimes farmers are negligent in applying fertilizers that are not according to the predetermined dose.
e. Slow delivery. Slow delivery can happen because of slow packaging. Wacopek's plantation has producers in Tanjungpinang and Batam; in this case, the delivery of vegetables to Batam can take one day or more than one day because vegetable queued delivery up on the way to ship.

5. Damage of pump water. If the pump mechanism is not be repaired for a long time, the pump machine will be damaged. This damage also often occurs during dry weather because it tries hard to pump water.

The Impact of The Risks

1. The decrease of vegetable quality. Climate change can emerge pests. If the dry season comes, the plants can die and crop failure. Continuous rain can also make the quality of vegetables decrease due to unstable soil moisture and soil that has been loosened by erosion and flooding. Other risks include unqualified seedlings, wrong planting spacing, incapable fertilization composition, broken machines, and pipe leaks that can affect vegetables' quality.
2. Work accident. Negligence of farmers and delivery can cause work accidents. Farmers and couriers must focus on doing their work so that they can avoid accidents in working.

Risk Evaluation

The next step is Risk Evaluation and Measurement. The purpose of risk evaluation is to understand the characteristics of risk better. If we get a better understanding, then the risks will be easier to control. A more systematic evaluation is carried out to measure the risks. This risk assessment is carried out following the level of disaster around and the severity of the risk. At the level of probability, the author divides into five groups:

Table 1. Event frequency rate

Level	Frequency of Events
1	Never
2	Rare
3	Quite Rare
4	Often
5	Very Often

Sources: secondary data processing (2020)

Further categorization on the impacts caused, the author also divides into five levels of risk. From the results of interviews and observations, there are indicators of risk impact that are divided into five groups described in table 2 below:

Table 2. Impact level

Level	Risk Impact Indicators
1	Very Small
2	Small
3	Medium
4	Big
5	Very Big

Source: secondary data processing (2020)

The author conducts a frequency and impact level assessment for each identified risk in the risk measurement process before being included in the likelihood-impact matrix. The following table describes the results of a possible and impacts assessment of each event: The following is a table containing the identification of risks along with the frequency of their occurrence and the impact during the vegetable planting process:

Table 3. Risk Identification

No	Risk Identification	Frequency	Impact
R1	Climate Change	4	4
R2	Unqualified Seeds	2	1
R3	Pest and Deseas	3	4
R4	Human Error	3	2
R5	Broken Engine	1	1

Source: primary data processing (2020)

After the we knows the results of the identification of risks along with their impact frequency of occurrence, we can find out whether the risk is a risk with a low (low), medium (medium), and high (high) severity; the writer combines the frequency of occurrence and the risks and also the impacts of these risks in a matrix with the x and y axes. The risk matrix is carried out after a risk assessment to make it easier to know the most focused risks and must be prioritized by including each value of impact and the probability of each risk. In risk management is known as the likelihood-impact matrix.

Figure 1. Likelihood-Impact Matrix

F/I	1	2	3	4	5
5					
4				R1	
3		R4		R3	
2	R2				
1	R5				

Source: primary data process (2020)

Based on the above matrix, there are several explanations:

1. Each green box means that the risk is at a low severity level (low).
2. A yellow box means that the risk is at a moderate (medium) severity level.
3. The red box means that the risk is at a high severity level (high).

The Response to Risk

From the risk matrix, it can be known that from some of the risks in Wacopek plantation business, it is known that the risk according to the level is at both low, medium, and high levels. So the next step is to respond to whether the risk is acceptable, avoidable, reduced, or even shared with third parties.

1. **R1 (Climate Change)** has a significant impact considering its frequency. In this case, the weather significantly affects the quality of vegetables because a long dry season can cause drought, continuous rain also causes soil moisture condition, the emergence of pests and movement of seeds so that the spacing of the roots can even be a failure in the harvest of vegetables in the plantation of Wacopek. Coating the para net in two layers with plastic mulch and always checking the para net netting resistance in the process of loosening the soil can be the solution. you have to use a lot of soil to make it dense and make existing water channels in each land so that the rainwater is not exposed to seeds.
2. **R2 (seed quality decreases)** is a risk with low or low severity, which means that the frequency of occurrence is rare. The solution is putting the seeds in a room at room temperature. Furthermore, before using the seeds, they must be soaked in water for 15 minutes to open the layer of seeds.
3. **R3 (Pests and diseases)** is a risk with high or high severity, which means that the frequency level often occurs. It is capable of causing a tremendous impact. The solution is to cut dry leaves using scissors so that pests are reduced. Furthermore, the treatment that can be done is to provide pest fertilizer to vegetables affected by problems.

4. **R4 (Human Error)** is a risk with low or low severity, which means that the frequency level rarely occurs. Conduct training and checks on employees (farmers and couriers) can be the solution to this problem. When the workers and courier use work equipment and work by the procedures to reduce risks such as work accidents and other negligence.
5. **R5 (Water engine failure)** is a risk with low severity or rarely occurs. The workers should check the water machine periodically to get excellent pump power quality.

CONCLUSION

Based on the observations, research, interviews, and observations that have been conducted in the Wacopek plantation business, that of the five relevant risks, two risks are classified as significant risks with very high severity, and three risks classified as risks with low severity. These risks include the threat of climate change, un-qualified seeds, pests and diseases, human error, and engine damage.

The risk assessment is carried out in accordance with the severity of the risk at the level of possibility of occurring consists of very rare, rare, moderate, frequent and very frequent. The impact that appears consists of very small, medium, and large. Then this is where the risks are assessed and given a number that is then included in the likelihood-impact matrix. The risk matrix is carried out to make it easier to know the most focused risks and the possible impacts of each risk divided into low, medium and high levels. In Wacopek plantations, more impacts were found with low and high categories. Once the risk is determined according to its class, it responds to the threat by being accepted, avoided, or reduced, or even shared with third parties.

REFERENCES

Ahmed, I., & Manab, N. A. (2016). Influence of Enterprise Risk Management Success Factors on Firm Financial and Non-Financial Performance: A Proposed Model. *International Journal of Economics and Financial Issues*, *6*(3), 830–836.

Alif, S. M. (2017). *Kiat Sukses Budidaya Cabai Rawit*. Bio Genesis.

Anggraini, Y. F., Soewignjo, P., & Wiratno, S. E. (2006). Identifikasi dan Analisis Risiko Berdasarkan Konsep Risk Management di PT Perkebunan Nusantara X (Persero). *Prosiding Seminar Nasional Manajemen Teknologi IV*.

Crane, L., Gantz, G., Isaacs, S., Jose, D., & Sharp, R. (2013). *Introduction to Risk Management: Understanding Agricultural Risk* (2nd ed.). Extention Risk Managemen Education and Risk Management Agency. http://www.extensionrme.org/pubs/IntroductionToRiskManagement.pdf

Crovini, C. (2019). Risk Management In Small And Medium Enterprises. In G. Giappichelli (Ed.), *G. Giappichelli Editore*. Taylor & Francis Group.

Fadun, O. S. (2013). Risk management and risk management failure: Lessons for business enterprises. *International Journal of Academic Research in Business and Social Sciences*, *3*(2), 225–239.

Falkner, E. M., & Hiebl, M. R. W. (2014). Risk management in SMEs: a systematic review of available evidence. *The Journal of Risk Finance*, *16*(2), 122–144. https://doi.org/10.1108/JRF-06-2014-0079

Haryani, D. S. (2019). Analisis Risiko Kegagalan Budidaya Jamur Tiram Pada Bintan Cendawan. *Jurnal Ekonomi Dan Bisnis Indonesia*, *4*(1), 1–5.

Haryani, D. S., Ilyas, I., & Fauzar, S. (2018). The Analysis Of Potato Chips Product Damaged Risk In Widuri Joint Venture Group. *Proceeding International Seminar on Accounting for Society*, 48–56.

Haryani, D. S., & Risnawati. (2018). Analisis Risiko Operasional Berdasarkan Pendekatan Enterprise Risk Management (ERM) pada PT. Swakarya Indah Busana Tanjungpinang. *DIMENSI*, *7*(2), 357–367.

Haryani, D. S., Rizki, M., Abriyoso, O., & Saputra, E. K. (2019). Risk Management Analysis In Iman Santoso's Tax Consultant. *Advances in Social Science, Education and Humanities Research*, *377*, 112–116. https://doi.org/10.2991/icaess-19.2019.22

Luppino, R., Hosseini, M. R., & Rameezdeen, R. (2014). Risk management in research and development (R&D) projects: The case of South Australia. *Asian Academy of Management Journal*, *19*(2), 67–85.

Marcelino-sádaba, S., Pérez-ezcurdia, A., Echeverría, A. M., & Villanueva, P. (2013). Project risk management methodology for small firms. *International Journal of Project Management*, *32*(2), 327–340. https://doi.org/10.1016/j.ijproman.2013.05.009

Mubarokah, S. L., Nahraeni, W., Yusdiarti, A., & Rahayu, A. (2017). Analisis Risiko Produksi Sayuran Daun Indigenous di Kecamatan Kadudampit, Kabupaten Sukabumi, Jawa Barat. *Jurnal AgribiSains*, *3*(1), 45–54. https://doi.org/10.30997/jagi.v3i1.1029

Mustapha, M., & Adnan, A. (2015). A Case Study of Enterprise Risk Management Implementation in Malaysian Construction Companies. *International Journal of Economics and Financial Issues*, *5*(2), 70–76.

Nikou, S. H., & Selamat, H. (2013). Risk Management Capability within Malaysian Food Supply Chains. *International Journal of Agriculture and Economic Development*, *1*(1), 37–54.

Perera, B. A. K. S., Rameezdeen, R., & Chileshe, N. (2014). *International Journal of Construction Enhancing the effectiveness of risk management practices in Sri Lankan road construction projects : A Delphi approach*. *14*(1), 1–19. https://doi.org/10.1080/15623599.2013.875271

Porananond, D., & Thawesaengskulthai, N. (2014). Risk Management for New Product Development Projects in Food Industry. *Journal of Engineering, Project, and Production Management*, *4*(2), 99–113.

Rumimper, R. R., Sompie, B. F., & Sumajouw, M. D. J. (2015). Analisis Resiko Pada Proyek Konstruksi Perumahan Di Kabupaten Minahasa Utara. *Jurnal Ilmiah Media Engineering*, *5*(2), 381–389.

Sangadji, E. M., & Sopiah. (2010). *Metodologi Penelitian (Pendekatan Praktis dalam Penelitian)*. CV. Andi Offset.

Sirait, N. M., & Susanty, A. (2012). Analisis Risiko Operasional Berdasarkan Pendekatan Enterprise Risk Management (ERM) PAda Perusahaan Pembuatan Kardus Di CV. Mitra Dunia Palletindo. *Industrial Engineering Online Journal*, *5*(4), 1–10.

Sugiyono. (2015). *Metode Penelitian Manajemen* (4th ed.). Alfabeta.

Temel, S., & Durst, S. (2020). Knowledge risk prevention strategies for handling new technological innovations in small businesses. *VINE Journal of Information and Knowledge Management Systems*, *ahead-of-p*(ahead-of-print). https://doi.org/10.1108/VJIKMS-10-2019-0155

Tjakra, J., & Sangari, F. (2011). Analisis Resiko Pada Proyek Konstruksi Perumahan Di Kota Manado. *Jurnal Ilmiah Media Engineering*, *1*(1), 29–37.

Zirape, L. B., & Warudkar, A. A. (2016). Risk Management in Construction Joint Venture Projects in Real Estate. *International Journal of Engineering Science and Computing*, *6*(4), 4541–4544.