

MARKET FAILURE FACTORS AND RISK MANAGEMENT OF HYDROPONIC MELONS AT MANTRI MELON FARM

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ABSTRACT

This study aims to analyze the factor that cause market failure at Mantri Melon Farm Agritourism and identify effective market risk management efforts. Mantri Melon Farm, as an agritourism destination that relies on hydroponic melon production, faces significant challenges in maintaining its market share. Through a qualitative approach, data was collected from interviews with the owner Mantri Melon, farmers and Mantri Melon employees. This research was conducted in May-June at Mantri Melon Farm Agrotourism. The results show that the main factor of market failure is asymmetric information. Efforts to overcome this are suggested with empowerment through education and increased literacy to have more equal access to information related to relevant issues, so that they are better able to make the right decisions, improve product quality, and maintain good relations with the market. The implementation of these strategies is expected to minimize market risk and ensure the sustainability of Mantri Melon Farm's business.

KEYWORDS

Market Failure, Market Risk, Hydroponic Melon, Agritourism, Mantri Melon Farm



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INTRODUCTION

Hydroponics is a method of cultivating plants without the use of soil, instead utilizing water that has been enriched with essential nutrients. This method is considered more efficient in terms of land and water usage, and is able to increase crop productivity with better quality. In the midst of increasing market demand for organic and environmentally friendly agricultural products, hydroponics is one of the potential solutions that can meet these needs. One of the commodities that has the prospect of being developed with a hydroponic system is horticultural crops. One commodity that has the prospect of being developed with a hydroponic system is horticultural crops. Melon is one of the fruit horticulture crops that has the potential to be developed. The agricultural sector still faces many risks and uncertainties. There are many risks in the cultivation process,

from planting to harvesting. This also happens at Mantri Melon Farm Agritourism. Starting from production risk, market risk, financial risk, and policy risk. In terms of market risk, this risk arises one of them because of the uncertainty in the process of selling production. In addition, intensifying competition with other melon producers, both using conventional and hydroponic methods, adds pressure for Mantri Melon Farm to remain relevant in the market. Risk management in the context of agriculture and agritourism businesses covers various aspects, including product diversification, improving operational efficiency, and strengthening marketing strategies. Product diversification, for example, can be done by introducing new melon varieties that have competitive advantages in the market. On the other hand, digital marketing optimization is becoming increasingly relevant, especially in today's digital era where consumers access more information and make purchases through online platforms. The purpose of this study is to analyze the failure factors of the melon market and the appropriate efforts for handling the risks of the hydroponic melon market to improve the sustainability of its business. The approach used was qualitative analysis, with data obtained through in-depth interviews with agritourism owners, farmers and Mantri Melon employees.

Table 1.1 Melon Production in Sukoharjo District 2019-2022

No	Year	Production Output (Quintal)
1	2019	7.404
2	2020	6.252
3	2021	6.092
4	2022	12.257

Based on the data BPS (2023), it explains that melon production in Sukoharjo Regency in the last 4 years has fluctuated. Melon plants are plants that are classified as difficult to develop, so it is necessary to cultivate plants with the right techniques. Farmers who will do hydroponic melon cultivation business can calculate in advance in order to know the amount of costs used for farming and the benefits to be obtained, and can minimize the risks that will come. Risks in agribusiness activities are difficult to control by business actors. Starting from production risk, market risk, financial risk, and policy risk (Amruddin et al., 2021). In terms of market risk, this risk arises one of them because of the uncertainty in the process of selling production products which results in products that cannot be sold all and rot. The company's concern about the risks involved in agribusiness is due to a lack of knowledge about risk management itself. The implementation of risk management will provide benefits to the company, one of which is to provide an overview of the possibility of future losses.

Along with the times, the concept of agritourism began to emerge as a strategy to combine agriculture with the tourism sector. Agritourism not only serves as a means of education for the community, but also a source of additional income for farmers through the management of agricultural land as a tourist destination. Mantri Melon Farm is one example of agritourism that emphasizes hydroponic melon cultivation as the main attraction. Strategy by offering a hands-on experience for visitors to learn and be involved in the process of planting to harvesting "picking melons". Mantri Melon Farm is located in Plemburan Village RT 03 RW 03, Ngemplak, Kartasura District, Sukoharjo Regency. Mantri Melon Farm is managed by an individual, with a land area of 2,500 m². Nowadays, tourism is not only about fun but also about knowledge. Educational tourism is the right type of tourism to be able to get new knowledge directly (Saputra & Idajati, 2024).

Based on existing objectives, it is expected to provide information on a deeper understanding of the causes of failure and appropriate efforts. The results of this study are expected to be a reference for Mantri Melon Farm to be able to improve its position in the market, increase competitiveness, and realize its vision as a sustainable agro-tourism destination. This research is also expected to contribute to the development of science in the field of agritourism and agricultural risk management, and become a reference for other agritourism managers who face similar challenges. Thus, the results of this study are not only relevant for Mantri Melon Farm, but also for practitioners and academics interested in the development of the agritourism sector.

RESEARCH METHOD

This research uses primary data and secondary data. Primary data was obtained through interviews with the owner and staff employees of Mantri Melon Farm. Primary data was obtained through other sources such as BPS data, and other sources such as books and journals that explain market failure factors and market risk handling efforts. Determination of the research location was done purposively, with the consideration that Mantri Melon Farm is a relatively new agritourism. The research method carried out by this study uses descriptive methods carried out by interviewing the owner and staff of the Mantri Melon Farm agro-tourism.

RESULT AND DISCUSSION

1. Market Failure Factors of Hydroponic Melon at Mantri Melon Farm

Market failure is a condition where the market is unable to fulfill market needs efficiently, or there is an imbalance between producers and consumers. In this case, an inefficient market mechanism will result in too much market demand being generated or vice versa. Hydroponic melons are one of the commodities that attract attention in the modern agricultural sector, especially in the concept of agritourism. However, it is not uncommon for the hydroponic melon market to experience constraints or failures. Hydroponic melon production requires strict control over various factors such as nutrients, temperature, and humidity. Minor disruptions in these systems can lead to a decrease in product quality and quantity. If the agritourism does not have enough resources or knowledge to effectively manage production, this can lead to supply instability, which will affect product availability in the market.

Based on this description, a business needs to know and calculate the size of the costs used. In addition, a business will also be faced with various risks, one of which is market risk. A risk if it cannot be handled properly will result in market failure, because market risk is one of the main factors that can cause market failure. If the risk is not managed properly, the company can experience a decline in sales which has an impact on financial losses and ultimately experience market failure. This phenomenon is certainly avoided by Mantri Melon Farm. According to Kadariah *et al.*, (2022), there are 4 factors that cause market failure, namely:

- a. Asymmetric information, asymmetric information is a situation where one party to a transaction has better information than the other party so that the party can take advantage of the other party. Parties who have information use the information for personal gain, and can harm parties who do not have information.

- b. Externalities, externalities are costs or benefits that are inflicted or given to an individual or group that is outside a transaction (an unattached third person).
- c. Efficiency and Public Goods, in economics, public goods are goods that cannot be limited by those who use them and if possible even arranged so that no one incurs costs to obtain them. Public goods can lead to the disappearance of a market associated with these goods and services.
- d. Market Imperfections or market distortions are imbalances in market performance, where the market does not operate in accordance with the market forces of demand and supply. Examples of imperfect market competition are monopoly, oligopoly, and natural monopoly.

Based on this description, it is necessary to analyze what are the factors of hydroponic melon market failure at Mantri Melon Farm agrotourism. The results showed that the factors of hydroponic melon market failure in Mantri Melon Farm agrotourism were caused by climatic or weather factors and pests that attacked plants during the cultivation process. These factors are included in the phenomenon of market failure stemming from asymmetric information or information imperfections. Information imperfections can cause the cultivation process to be ineffective, increase production costs, and decrease profitability. The use of drugs that are excessive or do not meet the needs of plants can result in plant death and waste of resources. The process of horticultural cultivation, especially melons, requires precise and appropriate information to achieve optimal results. The main problem faced in the cultivation process at Mantri Melon Farm is related to asymmetric information. This refers to the imbalance of information between various parties, where one party has more accurate and complete information than the other. Farmers do not have equal access to the latest information on fertilization, agricultural technology, or pest control. This phenomenon is in line with Kadariah et al., (2022) research, which explains that input providers have more complete information about the products they sell. Other external factors include:

1) Climate or Weather Factors

Climate change is one of the factors inhibiting the decline in productivity and quality of crops, resulting in market failure in hydroponic melons, one of which is at Mantri Melon Farm Agrotourism. The optimal temperature for growing melons is 25-30°C, but melons do not grow well if the temperature is below 18 °C. Melon plants require 10-12 hours of sunlight every day. The appropriate humidity level for melon plants is around 70-80%. Excessive humidity (>80%) can affect plant growth, such as fruit quality, and plant susceptibility to disease. In humid climatic conditions can result in inhibition of melon growth, this will cause rupture of the fruit, as a result of erratic changes in climatic conditions resulting in rupture of the fruit (Supriyanta et al., 2021). The condition of fruit rupture experienced by Mantri Melon Farm has an impact on production that is not maximized. One of the factors considered by consumers of hydroponic melons at Mantri Melon Farm is the quality of the fruit, it is unlikely that consumers will pick defective or damaged fruit. If the quality of the fruit is good, the price will be high, but if the quality of the fruit is not good, the price of melons will definitely decrease. This will affect the risk of financial loss and decrease consumer interest in the hydroponic melon market at Mantri Melon Farm.

2) Pest and Fungal Factors

Based on the results of the study, there are several failure factors that often occur in melon plants at Mantri Melon Farm, namely attacked by Cucumber Mosaic Virus (CMV), Powdery Fungus, and whitefly.

a) Cucumber Mosaic Virus (CMV).

This virus causes a lot of yield losses due to its wide host range and the diversity of its biological and molecular characteristics. CMV virus is also known to infect seeds, so the virus can also be spread through seeds. Symptoms of CMV virus attack are white spots scattered on the leaf surface and some are accompanied by small bumps. The result of this virus attack is the inhibition of plant growth as well as flowers that fall and are indicated by the presence of spots (Supriyanta et al., 2021). This leads to a decrease in the marketability of the fruit.

b) Powdery Mildew

Powdery mildew attacks can not only derail the harvest, but also result in a risk of loss for farmers. This disease can reduce plant growth as well as reduce yields such as reduced size, and quality of the melon fruit. Powdery mildew usually grows on the leaves, which makes the leaves wither and die. Symptoms of leaves affected by powdery mildew are the appearance of small grayish powdery patches on the underside of the leaves. Both sides of the leaf appear to be covered with a powder-like coating. Fruit affected by powdery mildew usually cannot develop fully and can become rotten. This can cause potential losses as not all crops grow optimally, and result in some crops being unmarketable.

c) Whitefly (*Bemisia tabaci*)

Melon plants attacked by whitefly in Mantri Melon Farm also have characteristics such as leaves turning yellow, curling the shape of the leaves, and wilting. Pests and diseases are very fast growing and difficult to control, so not all can be eradicated quickly. The way whitefly works is by sucking the liquid of the leaves or stems of the plant, thus inhibiting the photosynthesis process of the plant. The attack of this disease will make fruit development slow, so that the fruit produced is not optimal, and affects the taste and shape of the fruit. Whitefly can also transmit dangerous viruses, such as the mosaic virus, which can cause severe damage to the plant and even cause the plant to die.

Based on the results of the study, pest eradication is carried out by always maintaining the cleanliness of the environment around the plant and observing pest attacks and plant diseases as early as possible. Pest control is carried out manually when the plants are still low, namely by taking pests by hand and then killing them and then spraying them using the drugs needed by the plants.

2. Efforts to Handle Hydroponic Melon Market Risk at Mantri Melon Farm Agrotourism

The model used by this study to analyze efforts to handle market risk is to analyze the behavior of business owners when facing market risk. The results of the analysis are then used as a reference to analyze the behavior of farmers in facing market risk. The existence of risk and the behavior of business owners towards risk will affect the decision to allocate inputs to their agricultural businesses, which in turn will affect the effectiveness achieved. Developing a sustainable business is not easy. Entrepreneurs will be faced with various internal and external constraints. Understanding the sources of risk and risk preferences can be used to develop appropriate measures to minimize risk. In addition, effective risk

management and appropriate behavior in decision making are the keys to success in maintaining the sustainability of the hydroponic melon market in agritourism.

Entrepreneurial behavior can be interpreted as an activity or action where business actors do everything of their own accord, motivate themselves, and make decisions in entrepreneurship. Entrepreneurial behavior can also be interpreted as an entrepreneurial ability to take opportunities. An entrepreneur has the following characteristics (Muadin *et al.*, 2021):

- a. Have a passion or motivation to learn.
- b. Have a sense of responsibility and high work ethic.
- c. Committed and risk-taking.
- d. Have a leadership spirit.
- e. Always looking for opportunities and have managerial skills.

Suryana (2021) explained that almost 80% of companies fail in their first year, this is due to obstacles that are often faced by entrepreneurs including human resources, legal aspects, weather climate, infrastructure, and market access. Entrepreneurial behavior will greatly affect the success of their business performance. Entrepreneurial skills are an important and valuable resource for a company, because competence refers to the quality of actions performed by entrepreneurs, therefore entrepreneurial behavior will be related to the success of their business.

Based on the results of the research, the efforts made by the owner of Mantri Melon Farm to deal with market risk at this time:

- a. Want to focus more on maintaining and developing their business by improving product quality to stay afloat.
- b. Maintaining good relations with the market. This is done because they are worried about consumer demand, which tends to fluctuate and is difficult to predict. In addition to focusing on maintaining and improving product quality, efforts have been made to overcome market risks related to market failure by the owner of Mantri Melon Farm.
- c. Strive to market their products online. Through Instagram, WhatsApp, and Tiktok media, it is hoped that hydroponic melon enthusiasts in Soloraya can visit to travel and buy melon products from Mantri Melon Farm. This is expected to facilitate marketing activities and the harvest can be picked immediately and not rotten on the tree. This behavior is in accordance with some of the characteristics of entrepreneurs who have been described by Muadin *et al.*, (2021) as having a motivational spirit to learn, creativity, innovation, courage to take risks, and always looking for opportunities.

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- a. Has a Motivational Spirit to Learn

Based on the research results, the owner of Mantri Melon Farm does not have a background in agriculture, but has an interest in hydroponics. The owner of Mantri Melon Farm believes that his interest in hydroponics, especially melons, will have a positive impact on the agricultural sector. The owner of Mantri Melon Farm has the willingness to learn and seek information related to how to cultivate melons

well, he believes that with intention and effort will provide maximum results at Mantri Melon Farm Agritourism.

b. Creativity and Innovation

Based on the research results, there is an innovation process related to the application of new techniques in production activities that use certain technologies. Hydroponics with drip irrigation system used by Mantri Melon Farm. As well as innovative product marketing activities, using the role of social media which is considered more effective because it has become something that is very closely related to the community. As for the creative characteristics possessed by the owner of Mantri Melon Farm, which initially only offered cultivation activities, then over time it developed into a melon picking agritourism.

c. Courage to Take Risks

As an entrepreneur, the owner of Mantri Melon Farm has developed a strategy to overcome existing risks, especially during the harvest season or melon picking. The efforts made are if during the specified time span for picking the harvest has not run out, then to maintain the quality of the melons so that they do not rot on the tree, promotions through social media and discounts are held. This is in line with the research which explains that it is necessary to have a good and correct entrepreneurial attitude in order to manage the business well (Syarifudin, 2020).

d. Always Looking for Opportunities

An entrepreneur has many characteristics and ways of developing his business, among others, by looking for opportunities and creating products based on experience. Based on the results of the research, the owner of Mantri Melon Farm sees the prospect of hydroponic melons in the future is good for young people who want to develop. In addition, with a land area of 2,500 m², the owner of Mantri Melon Farm utilizes it as an opportunity for cultivation and agro-tourism activities in the midst of land conversion as lodging and housing. An entrepreneur must also be able to see opportunities and maintain the business he runs well. An entrepreneur must also be able to manage his business, funds, and resources well.

CONCLUSION

The hydroponic melon market in the context of agritourism faces various challenges that can lead to failure, such as asymmetric information. Imperfect information can make farming activities inefficient, increasing production costs and decreasing profits, which can lead to market failure. To overcome this market risk, business owners need to take steps to identify and manage risks. Business owners' flexible and adaptive behavior in decision-making, as well as innovativeness, is essential in dealing with market changes. In addition, mental preparation before starting and already running a business is also very necessary to be ready to accept and handle all risks or conditions beyond prediction, and increasing knowledge through continuing education is also a strategy in maintaining the sustainability and success of the hydroponic melon business in agritourism.

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