

Business Feasibility Study on Hydroponic Vegetable Business in Ciawi Bogor Area (Bogor Veggies Case Study)

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ABSTRACT

Hydroponic vegetables are vegetables that grow with the help of liquids that contain nutrients needed by vegetables to grow. Hydroponics uses water that is more efficient, so it is suitable to be applied in areas that have a limited water supply. The water used to grow these vegetables can also be recycled. Plants like this, healthier than using fertilizers, because without chemicals. Hydroponic vegetable plants, many people like to understand health, because it is considered healthier when compared to vegetable crop grown using fertilizer. The purpose of this study is to determine and analyze the feasibility of hydroponic vegetable business in the Ciawi Bogor region (Bogor Veggies Study Case) seen from non-financial aspects, namely market aspects, legal aspects, technical aspects and management aspects and financial aspects. So that the capital that has been invested in this business can be more effective and implementation and the output produced will be maximized. The data used in this study are primary data and secondary data. Data The primary is obtained by direct observation of only one business actor hydroponic vegetables in the Ciawi Bogor region (Bogor Veggies Case Study) the business actor has fulfilled the criteria determined as a business actor hydroponic vegetables in Bogor Regency. Secondary data obtained from financial reports and sales reports and literature relevant to research in the form of books, results of previous studies, and internet publications. Qualitative analysis is used to analyze the feasibility of non-financial aspects such as market aspects, legal aspects, technical aspects and management aspects. Quantitative Analysis used to analyze eligibility based on investment criteria. Financial aspects in Bogor Veggies business shows that the payback period is 1 years 4 months 1 days, NPV is Rp 126.869.865, IRR is 49 percent, and profitability index is 3,504 percent. The results of this feasibility analysis indicate that the hydroponic vegetable business in the Ciawi Bogor region is feasible based on market aspects, legal aspects, technical aspects, management aspects and financial aspects.

1. INTRODUCTION

The phenomenon of a healthy lifestyle in Indonesia today is starting to be alarming, the lack of public awareness in implementing a healthy lifestyle is one of the major threats to the survival of a country, where the strength of a country can be judged from all the activities of its people. This certainly requires a healthy body condition in order to carry out all activities, and how to get it is by living a healthy lifestyle.

Ministry of Health data shows an increase in obesity in adults since 2007. In addition to obesity, low consumption of vegetables is also thought to be the main cause of health problems ranging from cancer, stroke, chronic kidney disease, diabetes mellitus to hypertension. Indonesian people's consumption of fruits and vegetables refers to the 2016 BPS data which reached 173 grams per day, which is less than the World Health Organization (WHO) nutritional adequacy rate of 400 grams per day. The government also responded to this through Presidential Regulation No.42 of 2013 concerning the National Movement for Nutrition Improvement. This Presidential Regulation shows that the priority of health is to overcome community nutrition problems through awareness of consuming fruits and vegetables. (www.suara.com)

Table 1. Proportion of Recommended Fruits and Vegetables in Indonesia

| No | Year | Proportion of Fruits and Vegetables |
|----|------|-------------------------------------|
| 1 | 2012 | 45% |
| 2 | 2013 | 43% |
| 3 | 2014 | 46% |
| 4 | 2015 | 46% |
| 5 | 2016 | 43% |

Source: BPS Susenas, 2017

It can be seen from Figure 1 above that in 2016, the consumption of fruits and vegetables in Indonesia is less than consumption that does not consume. Consumption of fruit is less than consumption of vegetables, namely, 67 grams, while vegetables are 107 grams per capita per day. Whereas in Table 1 the low consumption of vegetables and fruit has contributed to the low number of Expected Food Figures (PPH) which has tended to decline since 2010-2013, namely, 85.7 (2010), 85.6 (2011), 83.5 (2012) and 81.4 (2013) . However, in the 2015-2019 National Medium Term Development Plan (RPJMN), the Indonesian government has made improving nutrition one of the key targets. The government is targeting to improve the PPH figure to reach 92.5 in 2019.

Limited land is one of the causes of low vegetable productivity, in addition to environmental factors such as soil fertility, low irrigation channels and unstable weather factors that make the quality of vegetables decrease. Hydroponics is the answer to land problems, both land narrowing and marginal problems that have not been managed properly. Hydroponic systems can be cultivated with simple equipment. For example, the use of PVC pipes or gutters as a place for hydroponic cultivation and the use of used water bottles as a container for planting media. Distribution of nutrients to plants can be provided via a drip or flow system. This indicates that the hydroponic system can be applied using any media. (Hendra and Andoko, 2014: 3)

The hydroponic business opportunity is still wide open. Moreover, there are quite a lot of local target markets, such as restaurants, hospitals, hotels, cafes, supermarkets, and various supermarkets. In addition to direct marketing channels, hydroponic commodity producers can sell to third parties who usually sell hydroponics by giving certain labels or brands. (Arifin, 2016: 2).

In addition to business opportunities that are still wide open, of course there are many weaknesses in the hydroponic vegetable cultivation business that must be considered first, including a large amount of capital required, if you intend to carry out large-scale cultivation. On the other hand, farmers must master the knowledge about how to care for plants, from how to sow seeds, provide nutrition, to control the acidity level of the pH of the water in plants.

Mr. Akmal is a hydroponic vegetable farmer located in the Ciawi area, Bogor Regency. He first started doing hydroponics in 2015 and only as a hobby. Only in 2016, Pak Akmal and his wife started to develop a hobby of cultivating hydroponics into a business that could generate profits for them.

The demand for vegetables is quite a lot and of various types, making Pak Akmal not only cultivate hydroponic vegetables, but Pak Akmal to expand his business by looking for hydroponic farmers to be able to meet his market needs. Armed with social media and relations from other hydroponic friends, Pak Akmal managed to get a supply of healthy vegetables from the Cipanas and

Bandung areas with a total shipment of an average of 150 kg per day with an average turnover of 50 to 70 million per month.

The description above is the background of the author's interest in conducting research with the title Hydroponic Vegetable Business Feasibility Study in the Ciawi Bogor Region (Bogor Veggies Case Study). Some of the problems that arise can be identified by the authors as follows:

1. Lack of sufficient knowledge in providing nutrition which results in not optimal yields so that the quality of vegetables is not maintained.
2. The improper process of seeding will have a negative impact on the development of vegetable life.
3. High market needs are not met due to lack of production.
4. Lack of information regarding the location of hydroponic growers makes it difficult for new markets to get hydroponic vegetables.
5. The majority of Indonesians have not opened their eyes regarding hydroponic vegetable business opportunities and many of them do not even know about farming using a hydroponic system.
6. The unstable price of seeds accompanied by other staples, such as rockwool and scarce nutrients, makes it difficult for hydroponic farmers to develop hydroponic vegetable cultivation.

Based on the phenomenon and problem identification, this study has several objectives, which the authors can convey as follows:

1. To analyze the feasibility of the hydroponic vegetable Bogor Veggies business
2. To analyze the feasibility of the hydroponic vegetable Bogor Veggies based on non-financial aspects, such as market aspects, legal aspects, technical aspects, and management aspects?
3. To analyze the feasibility of hydroponic vegetables Bogor Veggies based on financial aspects based on investment criteria such as Net Present Value (NPV), Profitability Index (PI), Internal Rate of Return (IRR), and Payback Period (PP)

Business Feasibility Study

A business feasibility study is a study involving various aspects, be it market and marketing aspects, technical and technological aspects, financial aspects, social and cultural economic aspects, management aspects, all of which can be used for decision making whether a business or business is feasible or not (Sakka, 2013: 1). Another opinion states that a business feasibility study is an activity that studies deeply which data and information will be thoroughly researched, then measured, calculated, and analyzed the results of research conducted on the business to be carried out with a certain size, so that it is obtained. maximum results from the research (Jumingan, 2009).

According to Kasmir and Jakfar (2016: 12), a business feasibility study has five objectives why before a business is run it is necessary to conduct a feasibility study, namely:

- a. Avoid the Risk of Loss
- b. Avoid the Risk of Loss
- c. Make Planning Easy
- d. Facilitate Work Execution
- e. Simplify Supervision
- f. Simplify Control

The stages in carrying out a common feasibility study are as follows:

1. Data and Information Collection
2. Perform Data Processing
3. Make a decision
4. Give Recommendations

Business Feasibility Study Aspects

In analyzing, there is a relationship between one aspect and another so that the results of the analysis of each aspect occur in an integrated manner. The sequence of assessing which aspects should take precedence depends on the readiness of the assessor and the completeness of the existing data. Of

course, in this case, considering which priorities should come first and which will be next.

1. Market and Marketing Aspect

The market can also be interpreted as a mechanism that occurs between buyers and sellers or a meeting place between the forces of demand and supply (Kasmir and Jakfar, 2016: 43). What is needed in the market and marketing aspect is which market the company will enter, how big the market it wants to enter or which is available in the future. To find out that, it is necessary to measure the demand which is measured based on current and future demand. To market a product, marketers need to plan marketing activities and form a fully integrated marketing program to create, communicate, and deliver value to customers.

Companies must determine the target market by segmenting the market because the market is basically heterogeneous. Market segmentation produces segments that are relatively homogeneous. After the market becomes homogeneous, companies should choose clearer goals. Next is to formulate a marketing strategy called STP (Segmenting, Targetting, Positioning). The meaning of the STP marketing strategy is a process of categorizing, targeting the desired market and then positioning the company's marketing compared to competitors.

2. Operation and Technology Aspect

Operational management is a set of management functions or activities that include planning, organization, staffing, coordination, direction and supervision of the company. There are 3 main problems faced by the company, namely determining the company's position, design problems, and operational problems. Group of company side problems, the main issues are the selection of company strategy, product selection and planning, and quality planning. While the design problem group, the main problem is the choice of technology, planning the capacity of the service production process, planning business layout.

Operational problem groups include production quantity planning, inventory management, and product quality control. Engineering and technology aspects include:

1. Determination of Production Strategy
2. Quality Planning
3. Technology Selection
4. Production Capacity Plan
5. Factory Layout Planning
6. Layout Planning (layout)
7. Production Amount Planning
8. Inventory Management
9. Product Quality Control.

3. Management Aspect

Management is a process of planning, organizing, coordinating and controlling resources to achieve goals effectively and efficiently. Effective means that goals can be achieved according to planning, while efficiency means that existing tasks are carried out correctly, organized, and on schedule, in various fields such as industry, education, health, business, finance and so on. In other words, effective regarding goals and efficient regarding the way and length of a process to achieve these goals.

4. Human Resources Aspect

Human resources are a very important organizational asset, therefore their existence in the organization or company cannot be replaced by other resources, the problem that arises is how to get human resources who have the capabilities needed by the company and how to reposition the role of human resources in facing global challenges. The stages of the human resource process include:

1. Recruitment (procurement)
2. Maintenance (maintenance)

3. Development (development).

5. Law and Legality

In this aspect, what will be discussed is the problem of completeness and validity of company documents, starting from the form of a business entity to the permits it owns. Completeness and validity of documents is very important, because this is a legal basis that must be adhered to if problems arise in the future.

1. Several factors are used as the basis for the feasibility assessment, namely:
2. What legal entity is most suitable for the formal form of the business entity to be established.
3. Business commodities include types of merchandise (commodities) that are allowed which are permitted or prohibited by law.
4. How to do business violates religious law or not.
5. Operational technical get permission from related agency / department / service or not Operational technical get permit from related agency / department / service or not.

6. Financial Aspect

Realizing a business project certainly requires investment funds. Funds are classified based on tangible fixed assets, such as land, buildings, factories and machinery as well as intangible assets such as patents, licenses, upfront costs and pre-operation costs. After the amount of funds required is known, the next step is to determine in what form the funds will be obtained.

A feasibility study from a financial aspect needs to analyze cash flow forecasts. In general, there are four methods commonly considered for assessing the cash flow of an investment, namely the payback period method, net present value, internal rate of return and profitability index, and break even point. (Umar. 256: 2005)

Table 2. Previous Research

| Research Researcher | Title | Results |
|----------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Darman(2015) | Feasibility Study on the Establishment of a Small Fish Feed Industry in Cilingcing - Cianjur | NPV IDR 452,852,260,073 at a discount rate of 14% per year (feasible). Nett B / C at a discount rate of 14% per annum 1.4 (feasible) |
| Wahyuningtyas (2014) | Business Feasibility Study Analysis of the Salon and Spa House of Khadijah (PT Sharika Solusi Internasional) | NPV IDR (88,586,046) is not feasible. Nett B / C -1.4 times (not feasible) |

Theoretical Framework

Analysis of the feasibility of business development will analyze the feasibility of the business when viewed from various aspects qualitatively and quantitatively. Qualitative analysis is carried out on non-financial aspects such as market, legal, technical and environmental aspects. Meanwhile, quantitative analysis is carried out on the financial aspect using the payback period (PBP) analysis tool, net present value (NPV), internal rate of return (IRR), and profitability index (PI). From the results of this analysis, recommendations will be given whether the development of the hydroponic vegetable business in Bogor Veggies is feasible to run. Below is an overview of the framework used in this study

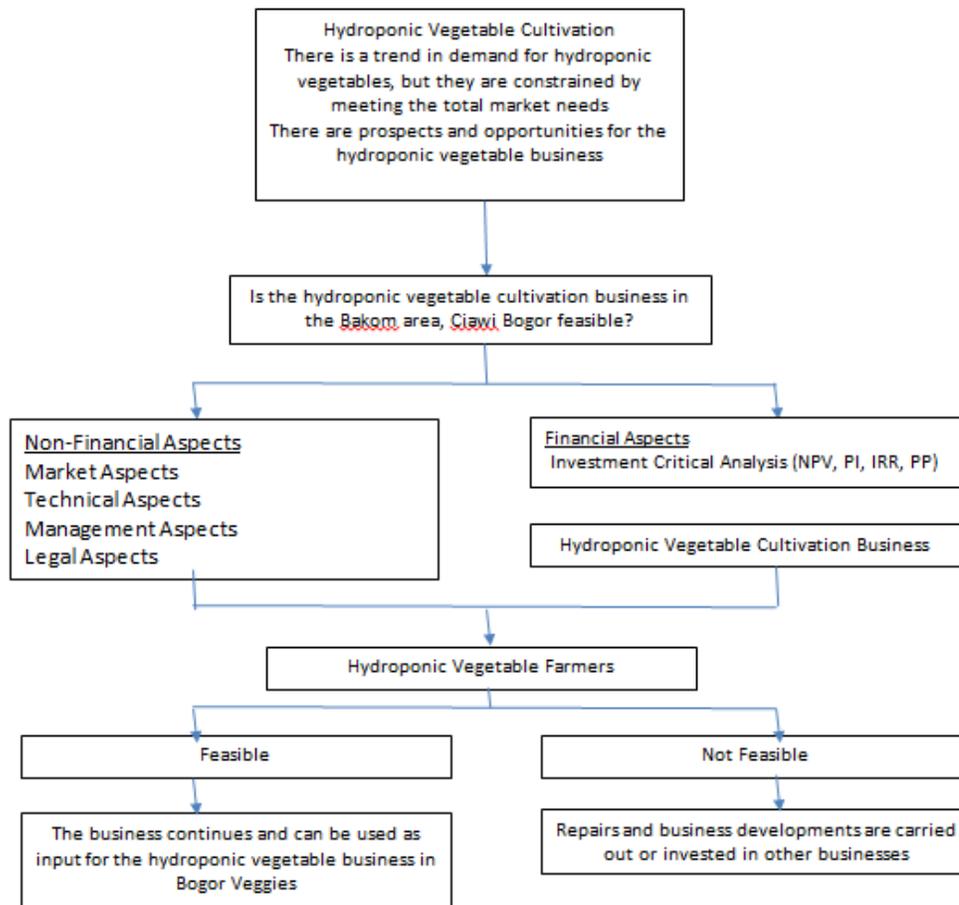


Figure 1 Research Framework

2. Method

This research is an exploratory research. The data used in this study consisted of primary and secondary data. Primary data were obtained from the owner of the hydroponic vegetable business, Bogor Veggies, using in-depth interviews and direct observation at the place of business. Meanwhile, secondary data is obtained from financial reports and sales reports as well as literature relevant to the research in the form of books, previous research results, and electronic publications (internet).

This research was conducted at Mr. Akmal's residence which is located on Jalan Raya Sukabumi, Gang Bakom Pesantren No. 53 Ciawi Bogor. The research was conducted deliberately with the approval of the owner of the Bogor Veggies vegetable business from March 2019 to August 2019.

The data collection technique in this research is by using in-depth interview method and direct observation to the place of business. While the analytical tools used in this study to assess non-financial aspects are market aspects, legal aspects, technical aspects, and management aspects and the financial aspects are payback period (PP), net present value (NPV), internal rate of return (IRR), and profitability index (PI).

3. Result and Discussions

Result

This business is managed by Darmal Ali and his wife. Initially they marketed hydroponic vegetables which they cultivated themselves by marketing them to houses and restaurants in the Ciawi area, Bogor Regency. However, the results were not satisfactory.

Then they began to use Instagram social media as a means to introduce their hydroponic vegetables widely. Bogor Veggies is the name chosen by the owner's wife to make it easier for consumers to buy hydroponic vegetables from them because the name veggies is taken from English which means people who like vegetables.

To develop its hydroponic vegetable business, Bogor Veggies has started to hold exhibitions in major malls in the City of Bogor and Jakarta. From the results of the exhibition, there were several restaurant owners who were interested and asked to cooperate with Bogor Veggies in order to fulfill the vegetable needs of their restaurant.

Bogor Veggies cannot meet the demand for many and various types of vegetables. Because of that, they started to gather hydroponic farmers to meet market demand, where Bogor Veggies acted as a distributor. Until now, Bogor Veggies has been actively developing hydroponic farmer groups that can produce superior quality vegetables so that they can compete with other hydroponic vegetable farmers and get high selling prices.

Marketing Aspect Analysis

Before running a business, the most important thing to pay attention to is knowing the market potential that the resulting product will enter. Therefore, it is necessary to analyze the market and marketing aspects of the business to be run. There are three elements of a marketing strategy, namely, segmentation, targetting, and positioning.

Segmenting

The potential segments that can be targeted based on geography, of course, are consumers who are in the Bogor Regency area (around the location of the garden) in particular and consumers who are in the Bogor City area in general. If determined based on demographics, this business segment will include age group, income, lifestyle.

Table 3. Demographic and Psychographic Segmentation

| Age (years) | Gender | | Occupation | Lifestyle |
|-------------|---------|---------|-------------------|-----------------------------|
| | Male | Female | | |
| 5-19 | 137,149 | 132,807 | Students | rarely eat outside the home |
| 20-34 | 139,399 | 133,630 | Students, workers | often eat outside the home |
| 35-49 | 123,259 | 118,683 | Entrepreneurs,IRT | Balanced |
| 50-64 | 71,318 | 67,560 | Retirees | rarely eat outside the home |

Source: BPS Kota Bogor, 2016

Table 4. Number of Restaurants / Restaurants by Regency / Cities in West Java Province 2013 - 2016

| Regencies / Cities | 2013 | 2014 | 2015 | 2016 |
|--------------------|------|------|------|-------|
| Regency | | | | |
| 1. Bogor | 86 | 86 | 86 | 162 |
| 2. Sukabumi | 63 | 63 | 63 | 63 |
| 3. Cianjur | 193 | 193 | 193 | 193 |
| 4. Bandung | 467 | 467 | 467 | 467 |
| 5. Garut | 85 | 85 | 85 | 85 85 |
| 6. Tasikmalaya | 28 | 28 | 28 | 25 |
| 7. Ciamis | 109 | 109 | 109 | 149 |
| 8. Brass | 60 | 60 | 60 | 60 |
| 9. Cirebon | 21 | 21 | 21 | 21 |
| 10. Majalengka | 65 | 65 | 65 | 67 |

| | | | | |
|------------------|-------------|-------|-------|-------|
| 11. Sumedang | 105 105 105 | | | 105 |
| 12. Indramayu | 77 | 77 | 77 | 77 |
| 13. Subang | 151 151 151 | | | 151 |
| 14. Purwakarta | 66 | 46 | 46 | 65 |
| 15. Karawang | 90 | 90 | 90 | 90 |
| 16. Bekasi | 28 | 28 | 28 | 28 |
| 17. Bandung West | 128 | 128 | 128 | 128 |
| City | | | | |
| 1. Bogor | 130 | 130 | 130 | 162 |
| 2. Sukabumi | 72 | 65 | 65 | 65 |
| 3. Bandung | 291 291 291 | | | 291 |
| 4. Cirebon | 52 | 52 | 52 | 52 |
| 5. Bekasi | 143 143 143 | | | 143 |
| 6. Depok | 107 107 107 | | | 107 |
| 7. Cimahi | 31 | 31 | 31 | 31 |
| 8. Tasikmalaya | 30 | 30 | 30 | 30 |
| 9. Banjar | 36 | 36 | 36 | 36 |
| West Java | 2,714 | 2,687 | 2,687 | 2,853 |

Source: Department of Tourism and Kebudayaan West Java province, 2017

Targeting

From the segmentation above, Bogor Veggies is targeting the market in Bogor Regency. Apart from geographical proximity, it is also from the potential for developing a population that continues to grow. Based on the results of the population census in 2010, BPS Bogor Regency predicts the population data in 2017 of 5,715,009 people consisting of 40 Districts. From this number, it is known that there is an increase 2.28 percent per year.

The restaurant is the main target for the hydroponic vegetable business in Bogor Veggies. From the results of the West Java Province BPS census which came from the West Java Province Tourism and Culture Office in 2016 there were 162 restaurants in Bogor Regency and 162 restaurants in Bogor City, from these data it was found that the results for restaurants in the Bogor area totaled 324 restaurants. .

Meanwhile, for psychographics, Bogor Veggies targets groups of vegetable lovers who care about health.

Positioning

As a business actor targeting groups with specific lifestyles, the Bogor Veggies hydroponic vegetable business is a solution for all hydroponic vegetable needs. As a producer, Bogor Veggies strives to meet consumer needs, from supply to distribution. As a distributor, Bogor Veggies accommodates farmers' production and distributes it to consumers. Likewise for people who want to cultivate hydroponic vegetables, Bogor Veggies sells hydroponic installation services along with guidelines on how to cultivate hydroponic vegetables, both on a hobby and business scale.

Marketing mix

Marketing management is broken down into several marketing policies called the marketing mix. This marketing mix provides an overview of the activities carried out by a business entity. The marketing mix of a product consists of product components, price, distribution (place), and promotion (promotion).

Product

The vegetable products that Bogor Veggies cultivates on its own land are pakcoy, kale, and romen lettuce. The harvest period for pakcoy is 40 days, 30 days for romen lettuce and 45 days for kale. With a hydroponic garden that has 2,700 planting holes, Bogor Veggies can harvest hydroponic vegetables twice a month with a total weight of 30 to 50 kilograms in one harvest for the three types of vegetables.



Figure 2 Label and Packaging of Bogor Veggies' Vegetables

1) Price

Price is a very important factor for the sustainability of a business in creating offers to consumers, so that consumers can be interested in buying the products offered. In the current competitive situation and conditions, the role of prices tends to increase, this is due to business competition in the same field. Little or much information obtained by consumers can affect the occurrence of a sale and purchase transaction because consumers have references and information to compare prices.

Bogor Veggies sets various prices for each type of vegetable it sells, variations in selling prices are based on many factors ranging from seed prices, harvest time, weather factors, to prices purchased from vegetable farmers, both hydroponic and conventional, prices range between Rp. 10,000 to Rp 35,000 per kilo. Can be seen in the following price table.

Tabel 5 Price List of Vegetables in Bogor Veggies

| Hydroponic Vegetables | | Conventional Vegetables | |
|-----------------------|---------------|-------------------------|---------------|
| Name | Price (Rp)/Kg | Name | Price (Rp)/Kg |
| Pakcoy | 35.000 | Beets | 12.000 |
| Kale | 35.000 | Cabbages | 15.000 |
| Lettuce Romen | 20.000 | | |
| Spinach | 15.000 | | |
| Pasley | 20.000 | | |
| Kailan | 10.000 | | |

2) Place

For the location of the hydroponic vegetable business, Bogor Veggies is of course very strategic, because it is located in a village area that is a little far from residential areas and there are not many vehicles passing by so that it will maintain environmental quality which will have an impact on the freshness of the vegetables. Access to the Bogor Veggies hydroponic garden is also very easy, where four-wheeled vehicles can pass through the road. This will make it easier to distribute harvested products. For the distribution route itself, Bogor Veggies chooses to deliver it directly to its customers so that the costs incurred can be reduced so that the benefits can be maximized.



Figure 3 Distribution Channels for Hydroponic Vegetables from Bogor Veggies Cultivation

Apart from being a producer of Bogor Veggies, it also acts as a distributor for hydroponic products from farmers who are members of the Prosperous Hydroponic Farmers Cooperative / Kotahira. For this purpose, Bogor Veggies asks farmers to send their vegetables in the afternoon after they are harvested, this is done to keep the vegetables from wilting easily, so in the morning Bogor Veggies will immediately deliver them to their regular customers..

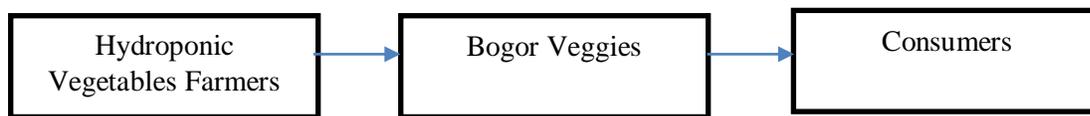


Figure 4 Distribution Channels for Hydroponic Vegetables from Outside Farmers

3) Promotion

Promotion is one of the most important activities in marketing activities in a business. Without promotion, the target market will not know which product to buy. In a marketing strategy it is known as the promotion mix which includes, advertising (advertising), personal selling (direct offering), publicity (social media), sales promotion (sales promotion) direct marketing (direct marketing). The promotional strategy carried out by Bogor Veggies is by utilizing social media Instagram (publicity) to be able to reach markets that want hydroponic vegetables, the second way is by holding hydroponic exhibitions in large malls in Bogor City and its surroundings, thus encouraging people's interest in consuming hydroponic vegetables which in turn expands the market potential for Bogor Veggies products.

Law and Legality Aspects Analysis

In this aspect, what will be discussed is the problem of completeness and legality of company documents, starting from the form of a business entity to the permits it owns. Completeness and validity of documents are very important because, this is a legal basis that must be adhered to if problems arise.

Based on the legal aspect, the required business permits are SKDU (Business Domicile Certificate) and SIUP UMKM. For the hydroponic vegetable business of Bogor Veggies, the owner of Bogor Veggies is in the process of licensing the SKDU and is in the process of making it by the Ciawi District.

Production and Technical Aspects Analysis

Location Determination

To carry out a business activity, a place of business known as the location is required. This location is important both as a place to carry out activities that serve consumers (customers / customers, production activities, storage activities, or to control the activities of the company as a whole.

The location chosen by Bogor Veggies is to use the area of the Bogor Veggies business owner's home page so that it is easy to control and access is more convenient. To get to the location of the hydroponic vegetable business, Bogor Veggies, the road access is very convenient, located in a corner of residential areas that can be passed by four-wheeled vehicles, and a short distance from Jalan Raya Sukabumi makes it easy to send and receive goods.

Production Area

Production area can be defined as the amount and variety of products produced for a certain period. Production area is also defined as the capacity used (capacity used) by the company in a certain period. The amount of production area can vary from period to period.

The area of the Bogor Veggies hydroponic vegetable business has 2,700 planting holes that produce 90 kilograms of vegetables per month. With 2700 planting holes, according to the owner of Bogor Veggies that have not reached economies of scale, a minimum of 5000-12000 planting holes is needed for economies of scale so that vegetable harvesting can be done every day with a weight of up to 30 to 50 kilograms / day. To cover this production shortage, Bogor Veggies has chosen to buy vegetables from farmers to achieve economies of scale.

Layout

Layout is one of the operational strategic decisions that also determines the efficiency of the company's operations in the long term. The correct layout shows the characteristics of the adjustment of the operational facility layout with the product or type of service produced and the conversion process. Bogor Veggies manages the layout of the hydroponic vegetable business as comfortably as possible, making it easy to run business activities, besides that a gazebo made of bamboo is also made as a training ground for people who want to learn about how to grow crops with a hydroponic system.



Figure 5. Hydroponic Garden of Bogor Veggies

Management Aspects Analysis

1. Planning

Planning is a process carried out by an organization to determine a strategy or direction and make decisions to allocate resources (including capital and human resources) to achieve this strategy. Based on the results of the analysis on the previous aspect, Bogor Veggies plans to develop a business in the hydroponic vegetable sector which is not focused on cultivating vegetables only but becomes a supplier of hydroponic vegetables.

2. Organizing

Management structure of the Bogor Veggies hydroponic vegetable business

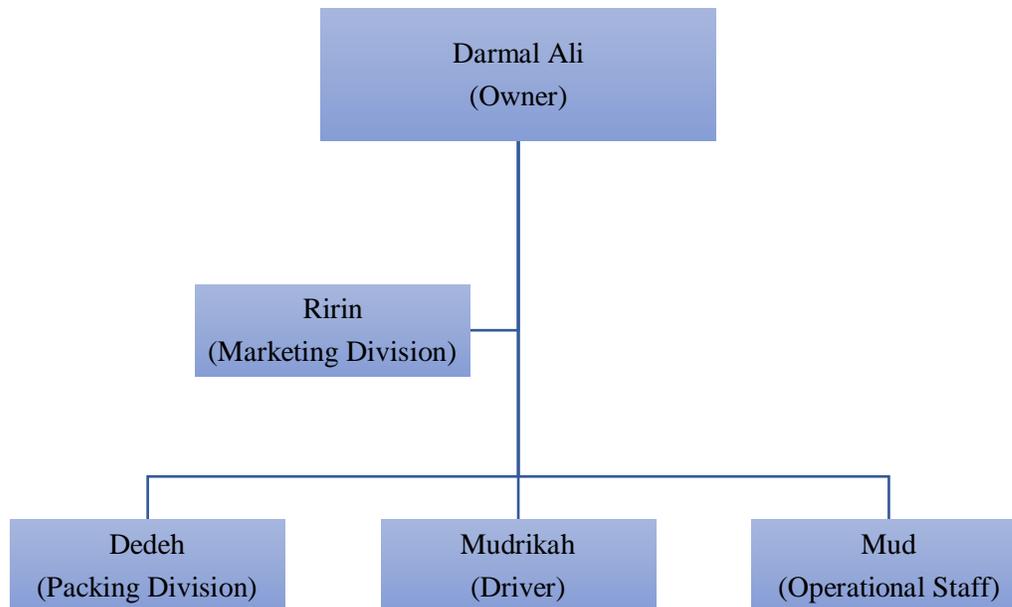


Figure 6. Organizational Structure of Bogor Veggies

The owner is responsible for monitoring the smooth running of the Bogor Veggies vegetable business, starting from building working relationships, maintaining relationships with customers, giving directions to suppliers so that the vegetables produced are of superior quality, to making new breakthroughs so that the Bogor Veggies vegetable business remains in demand by consumers.

Marketing is responsible for promoting vegetables both through social media, and through exhibitions. As well as arranging a delivery schedule so that requests can be fulfilled.

The packer is responsible for sorting the vegetables according to the type and quality of the vegetables as well as tidying up the packaging in accordance with applicable regulations. The driver is responsible for delivering the vegetables and accompanying the Bogor Veggies business. Meanwhile, the executor is responsible for taking care of the Bogor Veggies hydroponic garden from the seeding to harvesting. The executor also acts as a hydroponic garden maker to meet customer demands.

3. *Actuating*

Actuating (direction), namely the union of people with organizations to obtain their cooperation in achieving goals. It also means instructing, guiding, and inspiring people in the organization to achieve goals. Bogor Veggies applies a family system in establishing work relationships, where the owner plays an active role in maintaining working relationships, being open to each other with his employees.

4. *Controlling*

Control is the discovery and application of methods and tools to ensure that the implementation has been carried out in accordance with a predetermined plan. Supervision is often interpreted as control, namely the process of determining what is to be achieved, what is being done, assessing the implementation and if necessary making improvements so that the implementation is in accordance with the plan in line with the standard. In Bogor Veggies, control is carried out by providing work directions in accordance with the respective duties and obligations carried out by the owner of Bogor Veggies, so that performance is more focused and can run according to its function.

5. *Monitoring and Evaluation*

In this process, new things can be found and new strategies to achieve success in a business. Seeing this situation, the owner of Bogor Veggies monitors his business by being a driving force for all of Bogor Veggies' business activities which include cultivating hydroponic vegetables, receiving hydroponic

installation services, to collecting hydroponic vegetables from outside farmers, so that evaluation can be monitored regularly to obtain more satisfying results.

Financial Aspects Analysis

The financial aspect in this study is one of the important goals to determine the feasibility of this business in the financial aspect. This study uses several basic assumptions that can be used to analyze financial aspects. The following are the assumptions:

1. This study is analyzed for projections over a 3 year period.
2. The depreciation value for each investment is calculated using the straight-line method with no residual value.
3. The research was conducted at the hydroponic vegetable business location, Bogor Veggies
4. The desired discount rate is 10%.
5. The Bogor Veggies hydroponic vegetable business capital is the result of your own savings without a bank loan.
6. Harvesting period for hydroponic vegetable production in one year, namely, 24 periods or 2 times a month for a year.
7. The hydroponic vegetables that are sold are vegetables that are ready to be consumed.
8. The average productivity of hydroponic vegetables is 60 kg in a month.

Investment Cost

Investment costs are often referred to as company costs, which are costs incurred at the start of the business and at a certain time to obtain benefits. Investment cost expenditures are generally made one or more times before the business begins production and only produces benefits a few years later. Investment costs can also be incurred within a few years after the business is running, for example, to replace investment equipment whose life has expired but business operations are still running, the investment costs incurred are reinvestment costs. A description of the investment costs of the Bogor Veggies hydroponic vegetable business can be seen in the following table.

Table 6. Investment Costs for Bogor Veggies

| Description | Unit | Economic Age | Total | Unit Price (Rp) | Value (Rp) |
|---------------------------------|-------|--------------|-------|-----------------|----------------------------------|
| Installation Hydroponic Gardens | Set | 3 year | 5 | 8,500,000 | 42.5 million |
| Netpot | Kodi | 3 years | 135 | 12,000 | 1.62 million |
| water pump machine300D | Fruit | 3 year | 5 | 200,000 | 1,000,000 |
| 1050 liter water Toren | Fruit | 3 year | 2 | 1,600,000 | 3,200,000 |
| Irrigation hose | Sets | 3 years | 10 | 30,000 | 300,000 |
| Taps | Fruit | 3 years | 6 | 8,000 | 48,000 |
| Hygrometers | Fruit | 3 years | 1 | 250,000 | 250,000 |
| Thermometers | Fruit | 3 years | 1 | 250,000 | 250,000 |
| Green house seedlings | Set | 3 years | 1 | 1,000,000 | 1,000. 000 |
| DigitalScales | Fruit | 3 years | 1 | 450,000 | 450,000 |
| Total | | | | | 50,618,0007.V ariable |

Source: Bogor Veggies, 2019

The purchase of investment equipment was made at the beginning of Bogor Veggies, which started to establish a hydroponic vegetable business, namely in early 2016. Therefore, calculations began in early 2017 when the business started. The total investment amount is IDR 50,618,000.

Fixed Operational Cost

Operational costs are costs needed to support operational activities in processing raw materials into products that are ready for sale. Operational costs include variable costs and fixed costs. Variable costs are costs that are in proportion to the development of production or sales each year. The amount of operational costs when Bogor Veggies operates in the first year can be seen from the Table 7 below

Table 7 Fixed Costs of Bogor Veggies

| No | Operational | Costs Costs per year (Rp) | |
|--------------------------|----------------------|---------------------------|-------------|
| | | 2017 | 2018 |
| Variable Costs | | | |
| 1 | Raw materials | 2,280,000 | 2,280. 000 |
| 2 | Meals | 17,280,000 | 17,280,000 |
| 3 | Employee cigarettes | 10,000,000 | 10,000,000 |
| 4 | Finished goods costs | 639,000,000 | 639,000,000 |
| 5 | Transportation | 54,000,000 | 54,000,000 |
| feesTotal Variable Costs | | 723,100,000 | 723,100,000 |
| Fixed Costs | | | |
| 1 | Employee salary | 216,000,000 | 216,000,000 |
| 2 | Electricity costs | 9,600,000 | 9,600,000 |
| 3 | Promotion costs | 10,000,000 | 10,000,000 |
| 4 | Rent a place | 10,000,000 | 10,000,000 |
| Total fixed costs | | 245,600,000 | 245,600,000 |

Source: Bogor Veggies, 2019

The total operational cost incurred by Bogor Veggies in the first year is IDR 968,700,000. The total production is shown in Table 8 below.

Table 8. Total Production

| No | Year | Number of Month | Total |
|--------------|------|-----------------|----------------------|
| 1 | 2016 | 12 months | 977,400,000 |
| 2 | 2017 | 12 months | 1,026,270,000 |
| 3 | 2018 | 12 months | 1,075,140,000 |
| Total | | | 3,078,810,000 |

Source: Bogor Veggies, 2019

Investment Criteria Analysis

The investment criteria analysis is an assessment of the feasibility of developing the Bogor Veggies business, whether the business development is feasible to run. Analysis of investment criteria takes into account the time value of money (time value of money) while the criteria used as an assessment of the feasibility of developing this business are Payback Period, Net Present Value, Internal Rate of Return and Profitability Index.

The results of the calculations from the investment criteria analysis can be seen in Table 9 below.

Table 9. Values of Bogor Veggies Vegetable Business

| Investment Criteria | Measurement Results | Information | Status |
|---------------------|-------------------------|---------------------|----------|
| Payback Period | 1 years 4 months 2 days | Faster than 3 years | Eligible |
| Net Present Value | IDR 126,869,865 | Positive NPV | Eligible |
| Internal Rate of | 49% | Greater than df 10% | Eligible |

| | | | |
|---------------------|-------|----------------|----------|
| Return | | | |
| Profitability Index | 3,504 | Greater than 1 | Eligible |

Source: Bogor Veggies, 2019

Depreciation Cost of Bogor Veggies

$$\text{Depreciation} = \frac{\text{Investment}}{\text{Economics Age}}$$

= Rp 50,618,000

3 Tahun

= Rp 16,873,000

Depreciation = Rp16,873,000/Tahun

Tabel 10 CashFlow Over Economics Age

| Year | EAT | Depreciation | Net Cash | Df 10% | Net Cash PV |
|--------------|-------------|--------------|---------------------|--------|--------------------|
| 2016 | 8.700.000 | 16.873.000 | 25.573.000 | 0,909 | 23.245.857 |
| 2017 | 57.570.000 | 16.873.000 | 74.443.000 | 0,826 | 61.489.918 |
| 2018 | 106.440.000 | 16.873.000 | 123.313.000 | 0,751 | 92.608.063 |
| Total | | | 223. 329.000 | | 177.343.838 |

A. PaybackPeriod

Payback period is a period required to cover the return of investment expenses (initial cash investment) using cash flow. In other words, PP measures how quickly the invested investment can return.

Investment = Rp. 50.618.000

Net Cash 1st Year = Rp.25.573.000-

Rp 25.045.000 1 Year

Rp 25.045.000 x 12 months = 4,037 4 Months

Rp 74.443.000

0,037 x 30 days.....=1,11 hari

It can be seen from the processing results show that PP on the development of the Bogor Veggies business for 1 year 4 months 2 days. The faster the return, the more feasible the business is to run. This shows that business development is feasible because PP is smaller than the maximum period.

B. Net PresentValue

Net Present Value or net present value is the difference between the present value of an investment and the present value of net cash receipts (operating cash flows and terminal cash flows) in the future.

$NPV = \text{Net Cash 1} + \text{Net Cash 2} + \dots + \text{Net Cash N} - \text{investment} (1+r) (1+r)^2 (1+r)^n$

$NPV = \text{Rp 25.573.000} + \text{Rp 74.443.000} + \text{Rp 123.313.000} - \text{Rp 50.618.000} (1+0,10) (1,10)^2 (1,10)^3$

$$= \text{Rp } 23.248.182 + \text{Rp } 61.523.141 + \text{Rp } 92.716.542 - \text{Rp } 50.618.000$$

$$= \text{Rp } 126.869.865$$

A positive NPV result means the business is feasible to run.

C. Internal Rate of Return

The internal rate of return is the rate of return of the business against invested capital.

$$\text{IRR} = i_1 + \frac{\text{NPV}_1 - \text{PV Investasi}}{\text{NPV}_1 - \text{NPV}_2} (i_2 - i_1)$$

$$\text{IRR} = 15\% + \frac{159.602.931 - 50.618.000}{159.602.931 - 156.379.160} (16\% - 15\%)$$

$$= 15\% + \frac{108.984.931}{3.223.771} \times 1\%$$

$$= 15\% + 33,807 \times 1\%$$

$$= 15\% + 0,338$$

$$\text{IRR} = 15\% + 0,338$$

$$\text{IRR} = 15\% + 0,338$$

$$\text{IRR} = 15\% + 0,338$$

The IRR value in the development of the Bogor Veggies vegetable business is 49% feasible to run.

D. Profitability Index

This analysis is carried out to see the ratio of activity from the total present value of net income to the present value of investment expenditures over the life of the investment

$$\text{PI} = \frac{\sum \text{PV Kas Bersih}}{\sum \text{PV Investasi}} \times 100\%$$

$$\text{PI} = \frac{\text{Rp } 177.343.838}{\text{Rp } 50.618.000} \times 100\%$$

$$= \text{Rp } 3,504 \times 100\%$$

$$\text{PI} = \text{Rp } 3,504 \times 100\%$$

$$= \text{Rp } 3,504\%$$

The profitability index value of the Bogor Veggies business is 3.504%, the value of each profitability index is more than one, so the Bogor Veggies business is feasible to run.

4. CONCLUSION

Based on the analysis and evaluation of data that have been carried out on non-financial and financial aspects in this study, some conclusions and suggestions can be taken as follows:

The results of the analysis that has been carried out on the hydroponic vegetable business of Bogor Veggies from the financial and non-financial aspects, several conclusions can be drawn.

1. Based on the analysis of non-financial aspects, such as market aspects, legal aspects, technical aspects, and management aspects, the hydroponic vegetable business of Bogor Veggies is feasible to run.
2. Based on the results of the analysis on the financial aspect, namely, payback period = 1 year, 4 months 2 days, net present value = IDR 126,869,865, internal rate of return = 49% and profitability

index = 3.504%. So the Bogor Veggies hydroponic vegetable business is feasible to run.

Based on the results of the research above, the authors can provide some suggestions as follows:

1. Increase revenue and profits by developing a business by adding new hydroponic gardens
2. Increasingly expanding production networks with hydroponic farmers to meet market demand.
3. Increasing promotion through social media.
4. Need to be more active in participating in hydroponic events and exhibitions.
5. Make business financial reports in order to exercise control over the business, know business conditions, and be able to make the right decisions in developing the business.

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