Mapping of business potentials of Maha orange plantation using the Business Model Canvas and BCG matrix

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Abstract. This study aims to find out the business model that has been used by Maha Plantation and the business model that will be used to be able to implement strategies using what aspects need to be addressed by the internal business of Maha Plantation. The type of research used by researchers in this study is descriptive with a qualitative approach. The results of the identification of Business Model Canvas can provide the best strategy implementation according to respondents for business in each element contained in BMC. Based on the results of interviews with internal respondents and the overall respondents, the BMC that has been determined by the researchers to establish a strategy is quite good, but improvements are still needed in the future.

1. Introduction
Yields from plantations are producers of export in Indonesia. At present the plantation business in Indonesia is a challenge in the massive era of citrus fruit products in Indonesian plantation commodities, it is known that the challenges ahead are becoming increasingly complex as the quality of the plantation industry decreases.

One of the plantation centers in Indonesia, including the Karo Regency in Berastagi city with its citrus commodities, an area of 1,893 hectares of citrus plantations in the Karo Land experienced post-eruption damage and eruption of Mount Sinabung in succession, and the possibility of damage to the orange plant it will still increase because it is recorded in the five closest sub-districts of Mount Sinabung.

![Figure 1. Tangerine fruit production in North Sumatra.](image)

Based on known data, the area of orange plantations in Karo is around 14,483 hectares. The damage to the orange plantations has reduced the production of citrus fruits and is expected to continue until the
time cannot be determined, estimating the impact of the new eruption in the next harvest. Of the many citrus plantations in the city of Berastagi, one of them is a plantation called Maha.

![Figure 2. Maha plantation sales data 2011–2017.](image)

From figure 2 above, it can be seen that in the 6th year citrus plantations did not result in the sale of oranges caused by pests and diseases as a result of Mount Sinabung. The owners also do other ideas to be used as funding support to cover the maintenance of the citrus garden itself, which is 2009 until 2017, the plantation area around Karo district is still not good due to the Mount Sinabung natural disaster that is still active up to now.

The disaster caused by Mount Sinabung had an impact on Berastagi citrus plantations and would be very difficult to survive, therefore agro-tourism became one of the potentials that were expected to be able to assist plantations in their business continuity and become a supporting business in the survival of endangered Berastagi oranges in Sumatra North. Agro-tourism is expected to be able to help farmers and surrounding communities who lose their livelihoods and are able to impact the economic improvement of the area and its surroundings. Based on the background that the author has described, the authors formulate the problem, namely, how to analyze the plantations using BCG Matrix and implementing strategies using Business Model Canvas.

2. Methodology

The method used in this study is qualitative Business Research. According to [1] Moleong, 2007 qualitative data is data that is not expressed in the form of numbers or numbers. This study distributes questionnaires to respondents who are experts with an expert judgment approach, and according to interviews with company leaders 45 respondents can be obtained consisting of internal business, community, media, agents/consumers. The object of the research is in the form of variables contained in the validation of Business Model Canvas. Operational variables that are on the Business Model Canvas with measurements of 9 elements.

According to [2] Rufaidah 2014, strategic management is a series of managerial decisions and actions in improving the company's performance for a long time. This study uses BCG Matrix analysis and the development of mapping potential using Business Model Canvas. The stages of BCG matrix analysis can be described as follows.

1. Select the unit or product you want to analyze, BCG Matrix Analysis can be used to analyze products and even the company itself. The first step is to determine which unit to analyze.
2. Determine Market, Determining the Market is the most important thing in conducting the analysis. Errors in determining the market will cause an incorrect classification.
3. Calculating Market Share, Market Share can be calculated using income. How to analyze market share competition per year using income data is the company's revenue divided by total.
Market Share = \frac{Annual Income}{Total} \quad (1)

4. Knowing the market growth rate, the growth rate can be known from income in two years. The market growth rate is measured by percentage (%).

Growth = \frac{Year (n) - Year (n - 1)}{Year (n - 1)} \quad (2)

5. Drawing the Cycle in the BCG Matrix, after calculating each measurement variable, describe the position of your brand or product into the matrix. In this study, researchers used Microsoft Excel in determining growth rates, market share and BCG Matrix charts.

According to Osterwalder & Pigneur (2010) that business models explain rational approaches and how a business can create, deliver, and capture something that has value. According to Osterwalder & Pigneur 2015 [3] states that "A business model describes the rationale for how organizations create, deliver, and capture value.

3. Result and discussion

3.1. BCG matrix analysis

In analyzing the focus on Maha Plantation, researchers used the BCG Matrix analysis method, the method was used in order to find out the competition of the Plantation Maha quadrant in Lingga Village.

| No. | Perkebunan             | (Sales) Rp. 2016 | (Sales) Rp. 2017 | Growth 2016 | Market Share 2016 | Growth 2017 | Market Share 2017 |
|-----|------------------------|------------------|------------------|-------------|------------------|-------------|------------------|
| 1.  | Maha plantation        | 28.761.750       | 23.626.300       | -18%        | 29%              | 18%         |
| 2.  | Geser Sinuraya plantation | 35.500.000       | 59.220.700       | 158%        | 36%              | 44%         |
| 3.  | Siregar plantation     | 2.990.000        | 7.910.000        | 170%        | 3%               | 6%          |
| 4.  | Matatari Ginting plantation | 4.499.833       | 5.500.000        | 22%         | 5%               | 4%          |
| 5.  | Purba plantation       | 2.196.833        | 2.320.000        | 6%          | 2%               | 2%          |
| 6.  | Brahmana plantation    | 19.500.000       | 29.447.760       | 51%         | 20%              | 22%         |
| 7.  | Agus plantation        | 3.820.700        | 3.160.200        | -17%        | 4%               | 2%          |
| 8.  | Yoga Sembiring plantation | 1.700.000       | 2.100.000        | 24%         | 2%               | 2%          |

| Total | 98.909.117 | 133.285.460 |

Figure 3. BCG Matrix Plantation in Lingga Village.
Mapping is done using BCG Matrix, the BCG Matrix above uses Market Share and Growth. In the Matrix above, the company is in the "Dogs" quadrant. This happened because Maha Plantation was a producer of Berastagi citrus fruit, the impact caused by Mount Sinabung was bacteria and pests on citrus fruits and also the inhibition of the growth of citrus fruits which resulted in not achieving appropriate demand by agents and markets. The issue of rare and extinction of Berastagi oranges in 2030 has reduced the interest of oranges farmers in Berastagi to gardening again. Therefore from the results obtained from the BCG Matrix above, Plantation Maha experienced a decrease of -18% from the previous year (2016).

3.2. Development Business Model Canvas (BMC)

From the results of the BCG Matrix analysis above the strategy that will be used in the implementation of BMC is "Related Diversification", by adding new products or services but still related to the Maha Plantation business in general.

| Key Partners | Key Activities | Value Proposition | Customer Relationships | Customer Segments |
|--------------|----------------|-------------------|------------------------|-------------------|
| • Farmers and Drug Stores | • Selection of seeds and fertilizers that are suitable for citrus trees | • The best quality of local oranges in Indonesia | • Education about citrus fruits and their benefits | • All ages |
| • Citrus Plantation Community | • Sorting the orange seeds | • Product quality is maintained | • Educating healthy lifestyles and their benefits | • Male/Woman |
| • Media publications | • Cultivation of Berastagi oranges | • Target the market accordingly | • Member application | • Personal & Group |
| • Farmers | • Care of trees and citrus fruits | • • | • Member point discount | • Family |
| • Consumers | • Postharvest handling according to standard (manual/mechanical) | • • | • | • Tourism |
| • Online partnership | • Sorting (separating fruit by class/grade) | • | • | • Vegetarian |

| Key Resources | Key Activities | Value Proposition | Customer Relationships | Customer Segments |
|---------------|----------------|-------------------|------------------------|-------------------|
| • Training | • Fertilizer and medicine | • The best quality of local oranges in Indonesia | • Education about citrus fruits and their benefits | • All ages |
| • Trimmers | • Plantation | • Product quality is maintained | • Educating healthy lifestyles and their benefits | • Male/Woman |
| • Farming HR | • Access | • Target the market accordingly | • Member application | • Personal & Group |
| • Tools and raw materials | • Souvenir raw materials | • • | • Member point discount | • Family |
| • Seeds | • Pancake raw material | • • | • | • Tourism |
| • Transportation in plantations | • Natural resources | • • | • | • Vegetarian |

| Cost Structure | Revenue Streams |
|----------------|-----------------|
| • Tax on plantation land | • Direct sales of citrus fruits |
| • Employee salary | • Get profits from third parties |
| • Production cost | • Announced from Key Activities, Value and Channels |
| • Raw material costs | • Technology |
| • Transportation | • Local communities |
| • Technology | • Consumers |

**Figure 4. Alternative BMC – Development Market.**

Researchers found Natural Resources (SDA) owned by Maha Plantation which did not become plantations, in the form of waterfalls and springs that had not been touched and known by local residents due to the closed land of plantation owners, and also empty land that could be utilized by plantations. By using Business Model Canvas, Maha Plantation can add new products or services but is still related to the previous business.
### Key Partners
- Furniture and Drug Stores
- Balitjestro
- Citrus Plantation Community
- Online media
- Local communities
- Consumers
- Government
- Tour & travel
- Organizer Event

### Key Activities

#### Short Term
- Selection of drugs and fertilizers that are suitable for citrus oranges
- Sort out the orange seeds
- Cultivation of Berastagi oranges
- Care of trees and citrus fruits
- Produce handling according to standard (manual / mechanical)
- Sorting (separating fruit by class / grade)
- Product innovation
- Cleasning the fruit
- Storage of fruit with a suitable standard (temperature / transport / laying)
- Sales of oranges through markets and Fruit-trucks
- Online websites and applications
- Compost fertilizer from livestock
- Sales of citrus seeds
- Sales of compost fertilizer

#### Mid Term
- Make use of abandoned vehicles
- Vehicle design
- Sales in the city
- Partners of fruit shops and supermarkets
- Place and positioning Fruit-truck near resident’s area
- Delivery services in the city
- Direct sales
- Product education and advise
- Lounge
- Online partnership
- Delivery of products to customers
- Gain member points
- Sales of orange juice

#### Long Term
- Orange plantation agribusiness
- Sales of orange juice
- Consumer education
- Picking up accompanied
- Food sales (Pancakes)
- Extensive parking
- Historical education
- Unique restaurant
- Bird tourism cage
- Rabbit world
- Children's playgrounds
- Play ground
- Onbound
- Dairy milk
- Natural tourism
- Delivery transportation
- Market culture
- Hotels, Villa Riverside, Hobbit Villa and Camping area
- Ancient tourist attractions
- Karenese and Batakinese culture
- Flower garden
- Sang with the dream of Karenese culture and artificial lakes
- Tourist souvenirs
- Hibiscus picnic area
- Horse riding in tourist attractions
- Track bicycles
- Wedding and special events
- Artificial pine forest
- Mountain View
- Center for souvenirs
- Fashion outlets

### Value Proposition
- The best quality of local oranges in Indonesia
- Product quality is maintained
- Target the market accordingly
- Culture tour
- Instagrammable
- Nature and plantation tourism
- Suitable for families
- Traditional restaurants and Hill restaurants
- Cool atmosphere
- Bird tours
- Sang with Karen culture design
- Easy access and communication

### Customer Relationships
- Educations about citrus fruits and their benefits
- Educating healthy lifestyles and their benefits
- Educational history of citrus fruits
- Citrus plantation community
- Member application
- Member point discounts
- Panorama
- Family gathering
- Student tours
- Products regarding health benefits
- School tourism
- Become an area icon

### Customer Segments
- All ages
- Man Woman
- Personal & Group
- Family
- Fruitarian (Vegetarian) Consumers
- Domestic and international tourists
- Event Organizer
- Community
- Tour & travel companies
- Short stay people & long stay
- Camping tourism
- Nature tourists
- Community of nature lovers

### Key Resources
- Training
- Trainer
- Farmer HR
- Tools and raw materials
- Seeds
- Transportation in plantations
- Fertilizer and medicine
- Plantation
- Access
- Sourcens raw materials
- Pancake raw materials
- Natural resources
- HR who know citrus fruits

### Value Channels
- Local community
- Hydroelectric power plant
- Technology
- Animals
- Online media
- HR who knows citrus fruits
- Agent
- Market
- Social media
- Online sales application
- Local communities
- Consumers
- Tour & Travel
- Event Organizer
- Plantation farmers
- Government
- Citrus community
- Media TV

### Cost Structure
- Tax on plantation land
- Employee salary
- Production cost
- Raw material costs
- Transportation
- Technology
- Animal Care
- Animal food
- Care of a tourist park
- Maintenance of hotel buildings, villas, and camp areas
- Technology care
- Transportation Care

### Revenue Streams
- Direct and indirect sales of citrus fruits
- Training
- Agrotourism
- Merchandise
- Tickets

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**Figure 5.** Alternative BMC – Agrotourism.
Figure 6. BMC evaluation of respondents.

The use of scatter plots using the results of respondents aims to sharpen the analysis so that the plantations can see the position of the variables and the direction of the development of the BMC variables. The alternative strategies chosen based on the highest weighting must be prioritized by the company. However, the development of BMC variables that have not been maximized to the nine Business Model Canvas blocks that will be applied to the Maha Plantation as below:

1. Channel (8.92, 9.61) is the highest rating of respondents in all variables, plantations can increase distribution and sales networks so that consumers can recognize and evaluate the value proposition of the company's services or products.

2. Key resource (7.61, 9.11) is the lowest in the results of the overall questionnaire of respondents, indicating that having as much resources as related to plantations such as Farmers' HR, seeds and pancake raw materials in agrotourism cannot be maximally used due to natural disasters repeat within one week and cannot be known the time period.

3. Revenue streams (7.61, 9.14) are the lowest rating in the results of the questionnaire, because the resources for plantations do not provide the maximum, the business unit of agro-tourism is not fully maximized and the agro-tourism business is only a support for plantations to survive. However, the plantation business is expected to provide maximum results if natural disasters have been completed. One of the targets of the plantation is plantation expansion and is expected to be a supply for the next BMC. The development stage after the plantation is able to provide maximum results is the stage of processing plantation products using a factory business.

3.3. Business model development strategy

Business is a process, indirect and takes time, the plantation will carry out stages in the process of developing a micro business that will become a macro scale business that can survive in the future. The following can be explained the stages of the plantation in the process of implementing the alternative Business Model Canvas.
3.3.1. **Short term.** In the starting stage, the plantation will maximize the yield of the plantation itself, using existing technology and innovation to produce quality products. The plantations will also reduce costs for their needs by making compost and nurseries independently, so that the needs of the plantations will be fulfilled.

3.3.2. **Mid-term.** At the time of the start of development, the plantations will develop the market, will maximize resources so that they can meet directly with customers so that relationships with customers are created and able to reduce prices due to scarcity of fruit.

3.3.3. **Long term.** In this stage the business is expected to be able to maximize the overall business unit with related business diversification, which is to transform the main business into agro-tourism in order to help cultivate oranges to survive and be able to provide long business continuity, in the future after the plantations have not suffered losses from natural disasters, plantations will expand plantation production areas.

4. **Conclusion**

Maha's Plantation is in the "Dogs" quadrant because of experiencing declining growth, it can be seen that businesses experience financial problems where income is low because of low market share and also low growth rates, but Maha Plantation will use other alternative strategies namely diversification strategies using Diversification Related, by adding new products or services but still related to the Maha Plantation business in general.

Based on the results of the study, the channel variable becomes the best variable on the plantation in determining the potential of development markets and agro-tourism. However, natural disasters have an adverse effect on both variables, namely key resource and revenue streams due to the relationship between plantation resources that are not optimal and affect the source of income of the plantation itself.

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