The Strategy of guava agribusiness development in Kendal Regency using a business model canvas

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Abstract. Kendal is the area in Central Java with the most red guava fruit production, according to the Central Bureau of Statistics Republic of Indonesia. The production of red guava in Kendal Regency increased from 97,050 to 222,548 quintals between 2014 and 2016. In 2017, output fell to 137,671 quintals; however, in 2018, production rose to 159,079 quintals, still falling short of the previous year's total. This study used a business model canvas (BMC) methodology and SWOT analysis to map the existing red guava agribusiness business model and create a development plan for it. The interpretation of the SWOT diagram shows that guava farmers in four districts of Kendal Regency are in quadrant I, which indicates that they are in growth conditions with good opportunities and strengths to support the expansion of a red guava business. BMC demonstrates the need for additional consumer segments in order to reduce wholesaler dependence with several strategies.

1) Expansion of the trading network (2) Increasing key resources, (3) Adding key activity, such as regulating the harvest period for red guava and post-harvest processing. (4) Value proposition, by improving the quality of red guava.

1. Introduction

Indonesia as an agricultural country has abundant agricultural products which serve as a source of income for the Indonesian people. The plantation and agricultural industries provided a source of livelihood for many Indonesians. In addition, the agricultural and plantation sectors provide both markets and unprocessed materials for the industrial sector's output, as well as foreign exchange for development. [1]

According to the Central Statistics Agency (BPS), the agricultural sector contributed 13.41 percent of GDP on a constant 2010 basis in 2018, accounting for 31.86 percent of the 124.54 million national workforces. Agriculture, forestry, and fisheries are the second-largest contributors to GDP, with a total of 1,785,881 billion rupiah. Meanwhile, the manufacturing sector accounts for the first amount, which is about 2,739,415 billion rupiah. According to data from 2014 to 2017, Indonesia's agriculture, forestry, and fisheries sectors contributed more to the country's GDP. [2]

Bananas (7.16 million tons), mangoes (2.20 million tons), siam/tangerines (2.16 million tons), pineapples (1.79 million tons), and salak (0.95 million tons) are the top five annual fruit production commodities, according to 2017 statistical results. In addition to the five fruits listed above, guava has developed into an excellent commodity that is processed in large quantities. Guava production rose to 230,697 tons in 2018, up from 200,495 tons in 2017. [3]
With an output of 637,159 quintals, or 27.6% of national production, Central Java became the first province to contribute to national guava production in 2018. In Central Java, the Kendal Regency contributes the most to guava production. The production of guava in Kendal Regency increased from 97,050 quintals in 2014 to 222,548 quintals in 2016. In 2017, production fell to 137,671 quintals; however, in 2018, production rose to 159,079 quintals. [4]

The sustainability of the red guava agribusiness in Kendal district must be maintained and developed in order for farmers to reap the benefits of this agribusiness. Based on production fluctuations and previous studies, it appears that little has been done to improve the red guava agribusiness. The Business Model Canvas is one of the methods we can use to grow red guava agribusiness.

The Business Model Canvas is a strategic tool used to describe a business model and describe the procedure of how the organizations create, deliver, and capture value. The Business Model Canvas helps us to see more accurately the current or future business conditions. Changing a complex business concept to a simple one that is displayed on a single sheet of canvas containing nine key elements that are well integrated, which includes both internal and external strategic analysis. [5]

2. Methods

This study used a concurrent embedded design model that merged qualitative analysis methods as primary methods with quantitative methods to help and improve results.[6]. From June to July 2020, it was conducted in four districts: Patean, Pageruyung, Sukerejo, and Plantungan.

Interviews were used as the primary data in this analysis, with supporting data and a questionnaire serving as secondary data. Customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, and cost structure are the nine elements of the Business Model Canvas (BMC). Then, in every aspect, it was analyzed using a SWOT analysis. [7]

3. Results and discussion

Sukerejo, Pageruyung, Patean, and Plantungan Districts produce the most red guava in Kendal. This district is ideal for growing red guava because of its location. Pageruyung sub-district has a total area of 51.44 km², of which 82.07 percent is used for agricultural land (Ricefield land and dry land), while the remaining 17.93 percent is used for state forests and grounds, and the area of agricultural land used as a Red guava farm covering 16 ha with 10,000 red guava trees producing 9,500 quintals.

Pageruyung’s land elevation ranges from 250 to 600 meters above sea level. Sukerejo produces the most quintals, with 352 ha of red guava farming land and 220,000 trees producing 187,000 quintals. Patean has a total of 19,778 red guava trees on 25 hectares of red guava farming land, with a production yield of 24,401 quintals. Meanwhile, the Plantungan has 23.5 hectares of red guava trees, growing 20,860 quintals of red guava on 13.7 hectares of red guava agricultural property.

3.1 Current Business Model Condition

The state of the red guava agribusiness Business Model Canvas in terms of the identification of the nine blocks is as can be seen in Figure 1, based on the results of interviews with both the Regional Government Department of Agriculture and Farmers:

| Key Partners | Key Activities | Value Propositions | Customer Relationships | Customer Segment |
|--------------|----------------|-------------------|------------------------|------------------|
| 1. Wholesalers | 1. Plantation | 1. Quantity | 1. Kinship | 1. Personal |
| 2. Plant seeds supplier | 2. Fertilization | 2. Quality | 2. Adjust price (cheaper) | 2. Collector |
| 3. Fertilizer supplier | 3. Plant Pest Controlling | 3. Adjust price | 3. Guarantee | 3. Wholesalers |
| 4. Workers | 4. Covering | | | |
| 5. Land owner | 5. Harvesting | | | |

| Key Resources | Channels |
|---------------|---------|
| 1. Land | 1. Direct selling |
| 2. Good Seed | 2. Partner up |
3. Human resources
4. Finance

| Cost Structure       | Revenue Streams |
|----------------------|-----------------|
| 1. Workers salary    | 1. Selling      |
| 2. Fertilizer cost   |                 |
| 3. Covering cost     |                 |
| 4. Land rent cost    |                 |

3.1. Identification of the BMC Red Guava Farmers

3.1.1 Internal factors identification

1. Strength
   a. Availability of agricultural infrastructure
   b. The large production of quantity
   c. Well-built customer relationships
   d. Potential of natural resources owned
   e. Market segmentation which is specified
   f. The ease of plant care

2. Weakness
   a. Dependence with wholesalers
   b. Farmers’ human resources need to be upgraded, both in cultivation and mastery of information technology
   c. Farm equipment is outdated
   d. The Prices fall during the main harvest
   e. Limited capital
   f. Limited coaching

The following Table 1 is the outcome of the IFAS matrix recapitulation after determining the strengths and weaknesses of guava farmers.

| Internal Strategy Key Factors                      | Value | Rating | Total  |
|----------------------------------------------------|-------|--------|--------|
| **STRENGTH**                                       |       |        |        |
| The large production of quantity                   | 0.17  | 3.5    | 0.595  |
| Availability of agricultural infrastructure        | 0.18  | 3.6    | 0.648  |
| Well-built customer relationships                  | 0.16  | 3.4    | 0.544  |
| Potential of natural resources                     | 0.15  | 3.4    | 0.510  |
| The ease of plant care                             | 0.15  | 3.4    | 0.510  |
| Specified market segmentation                      | 0.19  | 3.8    | 0.722  |
| **Sum** 1.00                                       |       |        | 3.529  |

| **WEAKNESSES**                                     |       |        |        |
| Out dated farmers resources                        | 0.18  | 2.6    | 0.468  |
| Dependence with wholesalers                        | 0.21  | 2.8    | 0.588  |
| Fall prices during the main harvest                | 0.12  | 2.4    | 0.288  |
| Limited capital                                    | 0.14  | 2.5    | 0.350  |
| Out dated equipment                                | 0.18  | 2.4    | 0.432  |
| Limited coaching                                   | 0.17  | 2.6    | 0.442  |
| **Sum** 1.00                                       |       |        | 2.568  |
3.1.2 External factors identification

A. Opportunity

1. The harvest period management
2. Classification of quality red guava
3. Expanding the market
4. Increasing access to capital
5. Guava processed products is small
6. Availability of large vacant land
7. Utilization of information technology

B. Threat

1. The price is played by wholesaler
2. Plant pests and diseases
3. Consumers can turn away
4. Limited of supporting institutions for farming
5. No regeneration of guava farmers
6. Failed to harvest
7. Similar harvest period with other fruit (mango)

Following Table 2 is the outcome of the EFAS matrix recapitulation after determining the strengths and weaknesses of guava farmers.

| Internal Strategy Key Factors | Value | Rating | Total  |
|-------------------------------|-------|--------|--------|
| OPPORTUNITY                   |       |        |        |
| The harvest period management | 0,17  | 3,8    | 0,646  |
| Classification of quality red guava | 0,13 | 3,4    | 0,442  |
| Expanding the market          | 0,14  | 3,6    | 0,504  |
| Increasing access to capital  | 0,15  | 3,8    | 0,570  |
| Guava processed products is small | 0,14 | 3,8    | 0,532  |
| Availability of large vacant land | 0,12 | 3,6    | 0,432  |
| Utilization of information technology | 0,15 | 3,8    | 0,570  |
| Sum                           | 1,00  |        | 3,696  |

| THREAT                        |       |        |        |
| The price is played by wholesaler | 0,15 | 2,8    | 0,420  |
| Plant pests and diseases      | 0,12  | 2,0    | 0,240  |
| Similar harvest period with other fruits | 0,17 | 2,8    | 0,476  |
| Harvest failed                | 0,13  | 2,2    | 0,286  |
| No regeneration of guava farmers | 0,14 | 2,4    | 0,336  |
| Limited of supporting institutions | 0,15 | 2,6    | 0,390  |
| Consumers can turn away       | 0,14  | 2,6    | 0,364  |
| Sum                           | 1,00  |        | 2,512  |

Based on the results obtained from the results of the internal and external analysis in the table above, it requires confirmation of the position in the Cartesian diagram, between strengths and weaknesses, as well as opportunities and challenges which are all depicted in positive and negative lines. In terms of coordinate equations, it can be done based on the following calculations:

1. Internal coordinate analysis, the total strength-weakness score divided by 2 then \( \frac{3,529-2,568}{2} = 0,48 \)
2. External coordinate analysis, the total opportunity score divided by 2 then \( \frac{3,696-2,512}{2} = 0,59 \)

Based on the results above, it can be determined the coordinate point is located at 0.48 : 0.59
According to the diagram above, guava farmers in four sub-districts are in quadrant I, which indicates that they have a good understanding of growth conditions, as well as good opportunities and strengths to support the production of an increasingly red guava market.

### 3.2 SWOT Identification on the BMC Block

Furthermore, mapping the strengths, weaknesses, threats, and opportunities of the BMC block was used to determine the current state of the BMC block. The results of SWOT identification on the BMC block are as follows, based on the results of interviews and questionnaires.

#### IFAS

**Strength (S)**

1. The availability of agricultural infrastructure (KR)
2. High amount of production (VP)
3. Good relationship with partner and consumers (KP)
4. Natural resources owned (KR)
5. Specified market segmentation (CS)
6. Ease of plant care (KA)

**Weakness (W)**

1. Dependence with wholesalers (CS)
2. Farmers’ human resources need to be upgraded both in cultivation and mastery of information technology (KR)
3. Farm equipment is still simple (KA)
4. Prices fall during harvest season (CS)
5. Limited capital (CoS)
6. Limited coaching access to farmers (CR)

#### EFAS

**Opportunity (O)**

1. Monthly harvest (KA)
2. Classifying red guava quality (VP)
3. Expanding market (CS)

**Strategi SO**

1. Improving the IT infrastructure (S1,S4,O7)

**Strategi WO**

1. Creative marketing using social media (W1,O3)
2. Improving human resources of farmers in the cultivation

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**Figure 2.** SWOT Diagram of Red Guava farmers
4. Improving capital access (CoS)
5. Processed red guava product is still limited (VP)
6. Availability of large vacant land (KR)
7. IT utilization (KR)

| Threat (T) | Strategi ST | Strategi WT |
|------------|-------------|-------------|
| 1. Price depended on wholesalers (CR) | improving the infrastructure and maintaining the quality of red guava (S1,S2,S4,S6,T2,T6,T7) | 1. Establishing farmer group and IT Marketing mastery (W1,W2,W4,T1,T3,T5) |
| 2. Plant pest and disease (KA) | Increasing good relationship with partners and consumers (S3,T3) | 2. Giving acces to the farmers for coaching clinic i (W6,T4) |
| 3. Consumer can turn away (RS) | Expanding new market segment besides wholesalers (S5,T1) | 3. Expanding the capital to maintain and increasing the amount of processed product (W3,W5,T2,T6,T7) |
| 4. Limited supporting institution (C) | Establishing farmer groups for coaching and guidance. (S3,T4) | |
| 5. No regeneration of farmers (KA) | | |
| 6. Failed Harvest (KA) | | |
| 7. Similar harvest period with other comodity (KA) | | |

Note:
CS=Customer Segment  CR=Customer Relationship  KA=Key Activities
VP=Value Propositions  RS=Revenue Streams  KP=Key Partnerships
C=Channel  KR=Key Resources  CoS= Cost Structure

Figure 3. The Matrix SWOT of Alternative Strategy Formula

3.3 The Alternative Strategy on the Business Model Canvas of Red Guava Farmers

The next step after the SWOT analysis produces an alternative strategy is the implementation of the resulting strategy in designing a new business model canvas. This stage involves implementing the SO, WO, ST and WT strategies in improving and evaluating the business model canvas as follows:

3.3.1 Customer Segments

Farmers must use the SO-3, ST-3 strategy in this element to overcome the problem of a limited customer segment, namely by evaluating segmentation in order to add new market segments for the growth of this guava sector. Farmers have only sold to collectors and wholesalers so far. Wholesalers, fruit-processed beverage firms, pharmaceutical companies, and modern markets were among the recipients.

Farmers in this element may also use the WO-1, WO-2, and WT-1 strategies to improve consumer segments by optimizing marketing activities with online media and having farmer groups that control product processing and marketing. This strategy is used to address the weaknesses of farmers who are having trouble finding new buyers. This occurs as a result of insufficient human capital and infrastructure to sustain marketing activities. As a consequence, in the future, they will need to update human resources and infrastructure in order to better assist the operational marketing of guava production results.

3.3.2 Value Propositions

The quality of red guava is not classified by farmers at the time of sale or it is commonly called wholesale. Farmers are reluctant to improve quality and will result in low prices. In this condition farmers can apply the SO-2, SO-3, WO-3 strategy, classifying quality into two types, namely super quality or grade A to target wholesale and modern markets as well as standard quality or grade B to be sold to collectors and middlemen as well as made processed red guava products.
3.3.3 Channels
Weaknesses in the channel aspect continue to focus on direct sale and one-to-one communication, as well as less-than-optimal social media marketing. In order to have a successful sales life, farmers should use the SO-4 strategy by maintaining harmony with partners and customers. They can also use the WO-1 and WO-2 strategies, which include optimizing the use of technology and information in marketing activities in order to see potential markets, especially through online media with supporting human resources and technology. As a result, sales using IT through online media and salespeople managed by marketing staff are alternatives to keeping sales flowing smoothly.

3.3.4 Customer Relationship
This block's weaknesses include reliance on wholesalers and dropping prices during harvest. Implementing the alternative SO-4 strategy, where farmers continue to establish and improve harmony with partners and consumers, both with kinship and others for business continuity is one of the alternative strategies. Furthermore, the ST-4, WO-2, and WT-1, where farmers add human resources, particularly in the field of marketing, to carry out tasks that are more focused on sales, both with kinship and others are also among alternative strategies.

3.3.5 Revenue Streams
In order to maximize benefit, red guava must be graded by the farmer at the time of sale. Farmers can use the SO-2, SO-3, WO-3 strategy, which divides quality into two categories: super quality (grade A) for wholesale and modern markets, and standard quality (grade B) for collectors and middlemen, as well as manufactured goods. guava (red).

3.3.6 Key Resources
Natural resources, human resources, and financial resources are all at a minimum in this block. In terms of natural resources, it has a lot of potential but is still underutilized, so a SO-2 strategy is needed to maximize the land and increase red guava farming production. In terms of human resources, they continue to depend on farmer families and farmer neighbors, especially in terms of red guava production and harvest, resulting in human resources that are inadequate for marketing. A WO-2 strategy is needed to supplement these human resources. Meanwhile, farmers' capital is severely limited due to their reliance on income and bank borrowing. Farmers may use an alternate WT-1 approach in this situation, namely the inclusion of capital assistance from both the government and corporate CSR.

3.3.7 Key Activities
The absence of guava farmer regeneration is a weakness of the key activity factor. In this situation, farmers may use WO-2, ST-4, and WT-2 alternative strategies, such as human resource addition and fulfillment. This strategy is intended to ensure the long-term sustainability of farmers' businesses by providing sufficient human resources via farmer groups as an organization that shelters farmers and collaborates with many schools/universities to meet these needs.

3.3.8 Key Partnership
In this key partnership element, describing how the relationship between farmers and partners is very important to keep the business model running well and smooth. Farmers can apply alternative strategies to maintain the relationship between farmers and partners that have existed so far, so the implementation of an alternative strategy of SO-4, namely maintaining harmonization of partners and consumers, is done to avoid competitors that will hinder farmers' businesses.

Therefore, farmers must employ the ST-4 strategy, which focuses on improving harmonious relationships with partners and customers. The business continuity can run smoothly if there is constant harmonization and strengthening of relationships, and there is also the possibility of finding a new segment for this guava product (SO-3).
3.3.9 Cost Structure
There is no new funding for this aspect, but the demand will grow as farmers increase their operation and management to increase production, pest control, irrigation systems, and regulating the harvest season and processing of red guava.

3.4. The projection of BMC
Alternative strategy mapping implemented on the new Business Model Canvas for Red Guava farmer can be seen in Figure 4.

| Key Partners          | Key Activities                      | Value Propositions | Customer Relationships | Customer Segment                      |
|-----------------------|-------------------------------------|--------------------|------------------------|---------------------------------------|
| 1. Wholesalers        | 1. Plantation                       | 1. Quality         | 1. Kinship             | 1. Personal                           |
| 2. Seed plants supplier | 2. Fertilization                   | 2. Quantity        | 2. Good price          | 2. Collectors                         |
| 3. Fertilizer supplier | 3. Plant Pest                       | 3. Cheaper price   | 3. Guarantee           | 3. Wholesalers,                       |
| 4. Workers            | 4. Covering the guava               | 4. The availability of guava products even in out of harvest period | 4. Startup capital                | Modern market                         |
| 5. Land Owners        | 5. Harvesting                       |                    | 5. Good relationship between partners and consument. | 4. Company of processed guava/ pharmacy |
| 6. Farmer group       | 6. Cutting plant (to manage the harvest period) |                    |                        |                                       |
| 7. The Government     | 7. Classifying the product quality  |                    |                        |                                       |
| 8. Modern Market      | 8. Packaging                       |                    |                        |                                       |
| 9. Capital Supplier   |                                     |                    |                        |                                       |

| Key Resources         | Channels                             |                      | Relevance Streams     |
|-----------------------|-------------------------------------|----------------------|-----------------------|
| 1. Land               | 1. Direct selling                   | 1. Selling Super Quality /A |
| 2. Good Seed Plants   | 2. Partner up                       | 2. Selling quality B  |
| 3. Human Resources    | 3. Marketing resources              | 3. Selling the processed producs of red guava |
| 4. Finance            | 4. IT utilization                   |                      |
| 5. Improvement of Agricultural Infrastructure | | |
| 6. Irrigation         |                                     |                      |
| 7. Land Expansion     |                                     |                      |
| 8. Marketing Human resources | | |
| 9. Capital Assistance |                                     |                      |

| Cost Struktur         | Revenue Streams                     |
|-----------------------|-------------------------------------|
| 1. Workers salary     | 1. Selling Super Quality /A         |
| 2. Fertilizers cost   | 2. Selling quality B                |
| 3. Covering cost      | 3. Selling the processed producs of red guava |
| 4. Land rent cost     |                                     |
| 5. Packaging          |                                     |
| 6. Red Guava processed product | | |
| 7. Direct selling transportaion | | |

**Figure 4.** The Alternative Strategy BMC of Red Guava Cultivation

4. Conclusion
The results of the BMC with SWOT indicate that farmer groups should be established, that farmer human resources should be improved in both cultivation and information and processing technology, that market segments should be expanded, that guava quality should be classified, and that capital should be strengthened. Farmers also require guidance and training in guava cultivation, especially in terms of regulating the harvest period.
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