The Feasibility of Gedong Gincu Mango (Mangifera indica L) Agribusiness by Using Off-Season Technology

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Abstract. Gedong Gincu mango is a local commodities in Majalengka. The limited supply of Gedong Gincu mango as the leading local commodity in Majalengka Regency in off season has influence on demand and income of the farmers. Research to assess the feasibility of the gedong gincu mango agribusiness was conducted using quantitative descriptive methods. The data was collected through a survey using a questionnaire and involved 31 respondents. The observed variables were income and farm analysis with R/C ratio for one season. The results showed that the agribusiness gedong gincu mango in the off season was able to provide an income of Rp. 13.405.860, (-100% higher than high season) with an R/C ratio of 1.30. This finding confirms that the off-season Gedong Gincu mango agribusiness could increase farmers’ incomes significantly.

1. Introduction
Gedong Gincu Mango (hereinafter called GGM) is one of the leading local commodities in West Java. The central areas of GGM are Majalengka, Cirebon, Indramayu, Sumedang, and Kuningan. Majalengka Regency is the highest producing area of GGM when compared to other districts in West Java Province [1]. This indicates that GGM is one of the commodities that have a comparative advantage in Majalengka Regency.

Mango is a profitable horticultural commodity to be cultivated [2]. GGM, in particular, has a higher selling value compared to other variety of mangoes because it has a quite high market demand that cannot be fulfilled due to the limited amount of production and complicated harvesting patterns [3]. Consumers from all levels are drawn to GGM for its distinctive and attractive shapes, flavors, and colors. Even in recent years, it has successfully penetrated the export market (Directorate General of Horticulture) with target countries including Singapore, Malaysia, Taiwan, Hong Kong to Saudi Arabia and the United Emirates Arab.

Consumer demand for GGM commodities tends to increase every year but it is not counterbalanced by an increase in the amount of production and good quality due to the low adoption of technology of GGM farmers [4]. The gap between demand and technology innovation can be influenced the trade of GGM on the market [5]. If such a condition is left unchecked, it is feared to affect consumer interest in GGM. In addition, the competitiveness of GGM in the international market will be outdone by other mango commodities from India, Bangladesh, Thailand, Japan, etc. Therefore, the government through the two in one program provides assistance in the form of capital strengthening and technological incentives for farmers through farmer groups [6] Though the government plays a very small role on providing information or influencing of technology [4] but it is expected in the future the government
can helped farmers to overcome all the problems in GGM farming so as to increase the production and quality [7]. Through off-season technology, GGM farmers can start off-season farming activities. The existence of off-season technology, in essence, makes the GGM commodity can be enjoyed throughout the year at a much higher price than during the major harvest season. The major harvest of GGM which usually takes place in October to December results in a fall of its price. In addition, off-season technology is also expected to improve the standard of living of farmers. Along with that, the application of an appropriate SOP is also expected to improve the quality of GGM flesh.

Research by Mukti [8] states that approximately 15 percent of GGM farmers in Majalengka Regency run their businesses with income-oriented and business development, while the rest are income-oriented only. It means the entrepreneurial spirit of GGM farmers needs to be increased in order to gain high competitiveness. Meanwhile, according to Sulistiyowati [9], GGM management is influenced by age, a number of mango trees cultivated, and access to information and markets. For this reason, off-season technology innovation with a drip irrigation system needs to be carried out to support the development of GGM agribusiness [10]. The results of the innovation show that the average production per tree is 38 kg with an average weight of > 250 grams.

Research on the feasibility of mango business has been widely carried out, one of which is the one conducted by Nirmal [2] stating that mango agribusiness is one of the profitable businesses. Likewise, research by Rahman, et al. [11] shows that mango agribusiness is worth the effort because the level of return on capital is very high for about 80.07%. Even for sub-tropical regions, mango is a plant with a profit of 20 times more than citrus agribusiness [12] and more profitable than red onion farming [13].

Research by Suhaeni [14] related to the GGM value chain shows that all the marketing channels in Majalengka Regency are said to be efficient in terms of marketing efficiency, farmers share, profits, and marketing margins. In addition, through R/C ratio analysis techniques, it is known that GGM farming is worth the effort because farmers get the highest profit. Other research related to GGM commodities is the one conducted by Hidayat [15] with the results of the study showing that GGM farmers in Majalengka Regency and Cirebon Regency have already implemented GAP in accordance with the SOP. Applying the appropriate GAP affects the income of GGM farmers amounting to Rp. 59,359,022, - with the farming feasibility level of 2,05.

Similar to the previous research, this study also analyzes the feasibility of GGM agribusiness. Using the same analytical technique, this research tests the feasibility of GGM farm that is cultivated off-season. This research is conducted to determine the comparison of income received by farmers and test the financial feasibility of GGM farming so that farmers are interested in developing GGM agribusiness through off-season technology.

2. Research Method

2.1. Location and time of research
The study was conducted at Muara Farmer’s Group, Wanasalam Village, Ligung District, Majalengka Regency West Java Province of Indonesia. The determination of research location was carried out deliberately with the consideration that the group being studied has consecutively applied off-season technology since 2016 in their cultivation techniques. In addition, Muara Group is also farmer group that is used as a pilot by the local government for the development of the off-season GGM agribusiness. Time of research begin on June to August 2017, starting with collecting data through the distribution of questionnaires, tabulating data, processing data into interpretations and discussion.

2.2. Research and respondent technique
This research uses quantitative method, which is a method that describes the phenomena that occur now in the form of significant numbers [16]. Determination of respondents was carried out using a non
probability sampling method, deliberately respondents were selected as many as 31 farmers who were members of the Muara Farmers Group. And they are GGM Farmers who are used to planting mangoes off season techniques. The sampling technique used in this study is the survey method, meaning that from the whole population only a part of the sample is taken and generalized.

2.3. Type and method of data collection
Data being collected are primary data and secondary data. Primary data include the state of the respondent, the amount of production, and the production costs used for off-season techniques. Data were collected through interview and questionnaires that have been prepared before. Secondary data includes literature reviews from various sources such as research journals, proceedings, data on the condition of study area, and data from relevant agencies. Primary data and secondary data from interview, questionnaire and review then analysed and reviewed together with the team.

2.4. Analysis Technique
The analysis technique used is the analysis of farmer income and business feasibility by taking into account the R/C Ratio. Farmer income and business feasibility analysis is calculated based on:

\[ I = TR - TC \quad \text{and} \quad R/C \text{ratio} = \frac{TR}{TC} \]

Note: \( I \) = Income of Farming; \( TC \) = Total Cost; \( TR \) = Total Revenue; \( TC \) = Total Cost (factors of production, Land Rent, Labour, and Depreciation of Equipment). Criteria for a feasible farm is that the R/C ratio is more than one; if it is less than one and equal to zero, then GGM farming is not feasible. The following figure 1 shows the research flow that includes determination of GGM feasibility.

![Figure 1. Research Flow](image-url)
3. Result and Discussions

3.1. Analysis of GGM Revenue and Business Feasibility

Every farming activity carried out by farmers, whether of small, medium or large scale, of course, aims to benefit. Thus, it requires careful planning starting from the capital, farming location, products, to marketing. To determine whether a farming activity is worth to run or not, among others, it can be seen from its financial feasibility. This study examines the financial feasibility of GGM agribusiness using the R/C Ratio test. The following table 1 is the results of analysis of GGM income and feasibility.

Table 1. Analysis of Production Costs and GGM Farmers' Income per Hectare

| No | Description                      | Off-Season       | High-Season     |
|----|----------------------------------|------------------|-----------------|
| 1  | Revenue (Rp)                     | 58,946,000,-     | 24,864,000,-    |
| 2  | Production Cost (Rp)             |                  |                 |
|    | • Factors of Production (Rp)     | 35,884,600,-     | 9,085,200,-     |
|    | • Land Rent (Rp)                 | 5,375,000,-      | 5,375,000,-     |
|    | • Labor (Rp)                     | 3,928,000,-      | 3,928,000,-     |
|    | • Depreciation of Equipment (Rp) | 352,540,-        | 352,540,-       |
|    | Total (Rp)                       | 45,540,140,-     | 18,740,740,-    |
| 3  | Income (Rp)                      | 13,405,860,-     | 6,123,260,-     |
| 4  | R/C ratio                        | 1,30             | 1,33            |

Source: Primary data, processed.

Table 1 shows that the per hectare revenue of GGM farmers after using the off-season technique is Rp. 58,946,000, while in the high season is Rp. 24,864,000. It is caused by the differences in prices received by farmers, which are Rp. 20,000 per kg during off-season and Rp. 7,000 per kg during peak season. The price difference during the off-season is almost three times higher than that during the peak season. The high price of GGM commodities in the off-season is due to limited supply from farmers. However, the amount of production during peak season is still higher than those in the off-season.

The total production costs needed by farmers to manage GGM farming during the off-season is Rp. 45,540,140,-, which is far greater than that during the high season (Rp. 18,740,740,-). A large number of production factors used and the complexity of off-season technology maintenance cause the production costs high. The high production costs incurred will affect the amount of farmer's income. Through off-season cultivation techniques, farmers receive income of Rp. 13,405,860, which is higher than that in the high season (Rp. 6,123,260,-). The high income of GGM farmers who utilize the off-season techniques shows that GGM farming is a very promising business, especially if it is cultivated on a large area since the more extensive the cultivation land is, the more efficient the production costs will be [17]. The results of feasibility test using the R/C ratio show the number 1.30 for off-season and 1.33 for high season. Based on the criteria of farming feasibility, these results indicate that GGM agribusiness is feasible to be cultivated and developed.

The off-season technology is a great opportunity for farmers to make a profit outside the mango season, considering that mango is one of the annual crops that bear fruit 1 time in a year. The development of GGM agribusiness by off-season techniques on a broader area will contribute substantial income not only to farmers but also to other business actors such as dealers, traders, and exporters.

However, in the research location, not all farmers do business-oriented GGM farming. This is influenced by several factors such as information technology, market information, skilled labor, institutional and government support [18][2]. Mango planting is still done conventionally and is carried out on a narrow land of yard. Likewise, the average ownership of GGM trees is still small, around 7 trees per farmer. Only a few people have developed the GGM agribusiness professionally,
but still, their businesses are on a small scale level (ownership of mango trees is around 10-100 trees). Limited farmers’ land ownership is also one of the obstacles in developing GGM agribusiness [4]. Some farmers try to overcome such problem by renting land from the landlord. In the future, it is hoped that GGM farmers can further increase their business volume and pay more attention to product quality and continuity for the guaranteed supply.

3.2. The Role of Institutions in Developing GGM Agribusiness

Muara Farmers group has been developing the GGM agribusiness for 9 years and only in 2016 the group started to cultivate the GGM in the off-season on an area of 15 hectares. The land was originally an abandoned land which was then converted into a GGM plantation to optimize farmers' incomes. This optimization of land use is an effort to increase the income of the community, especially those who are members of the Tani Muara group.

Institutional support of farmers is needed as a policy strategy in increasing the competitive advantage of the GGM in West Java. Institutionality is needed as a place to exchange information, whether it is price information, consumer demand, business networks to cultivation technical information. In order for this farmer group to continue to develop, the basic thing that needs to be owned by members in a group is skill. Skills are one of the internal factors that can contribute to increasing group motivation [19]. Then the existence of the Muara Farmer Group should be utilized by its members to practice their skills in developing the GGM agribusiness.

In addition, government support is also very much needed in the efforts to develop the GGM agribusiness, especially in terms of developing farmers’ resources and facilitating the needs of off-season cultivation. The government through related agencies has done much to facilitate farmer groups in the development of GGM agribusiness, including seedlings, equipment, medicines, fertilizers, pesticides, and also training of off-season cultivation technique. Nevertheless, the government is still struggling and has no power in terms of prices. In fact, GGM price fluctuations on the market are still influenced by traders who generally receive information more quickly. While, farmers only accept the price that has been set by traders. Moreover, to distribute their products, farmers have made partnerships with a number of mangoes agribusiness actors in the local area. Therefore, the partnership between farmers and supporting institutions is needed to develop a policy strategy to increase the competitive advantage of GGM in West Java [20].

4. Conclusion

The research results showed that GGM agribusiness in the off-season was able to provide an income of Rp. 13,405,860, - (± 100% higher than that in the high season) with an R/C ratio of 1.30. This finding shows that GGM agribusiness in the off-season can significantly increase farmers' incomes.

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