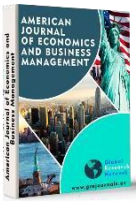

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Article

BCR Analysis and Potential For Implementing Good Agriculture Practices In Rubber (*Hevea Brasiliensis*) Production Businesses On Kalijompo Plantations Jember District

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Abstract: Natural rubber is an agricultural product that earns foreign exchange and demand tends to increase. This research aims to: (1) study the level of efficiency of rubber production (2) study the potential for implementing Good Agriculture Practices (GAP) in the cultivation of rubber plants on Klalijompo plantations. The research was conducted at Kalijompo Plantation, Gendir hamlet, Klungkung village, Sukorambi District, Jember Regency. Descriptive and analytical methods were used in this research. The data used is Kalijompo company/plantation data and is supported by additional data. The analytical tools used are Benefit Cost Ratio (BCR) analysis and Percentage of Implementation of Good Agriculture Practices. The results of the research show that rubber production at the Kalijompo Plantation in Jember Regency is financially efficient because the BCR value is > 1 because the Benefit Cost Ratio Coefficient is 1.59, which means that rubber plantation agribusiness at the Kalijompo plantation is financially feasible to continue. And the potential for implementing Good Agriculture Practices (GAP) in Rubber plants in the implementation category is quite high with a score of 4 with an implementation value of 72%.

Keywords: Natural Rubber, BCR and GAP

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1. Introduction

The development of world natural rubber exports is strongly influenced by countries in Southeast Asia. The value of natural rubber exports in Southeast Asia, especially in Indonesia, fluctuates, especially from 2016 to 2020 with a downward trend (UN Comtrade, 2022). The highest exports of Indonesian natural rubber during the period 2016 to 2020 were the United States, Japan, the European Union, China, South Korea and Canada. The growing demand for natural rubber has made natural rubber producing countries strive to increase their natural rubber production continuously (Wahyudy, 2018). The first position of the country that is the highest destination for Indonesia's natural rubber exports is the United States with a percentage share value of exports to the country amounting to 21% of the total of all Indonesian natural rubber exports to the world. The existence of this rubber plantation makes job vacancies a life expectancy that can sustain the social life of the community. However, since the last few years until now rubber production has decreased. According to the Directorate General of Plantations (agriculture.go.id: 2022).

In Kalijompo plantation, before 1995 coffee was the product that could contribute the most income compared to rubber but in 1995 it turned out that rubber contributed the most to the income of Kalijompo plantation until now (Year 2024). To improve the competitiveness of Kalijompo plantation to face the free market era, rubber production can be increased. Therefore, Good Agriculture Practices (PBB) and efficient farming can be used as an alternative in increasing production. In the era of globalization, efficient agribusiness is a necessity, meaning that it increases the competitiveness of domestic products in the international market[1]–[3].

Furthermore Soemodihardjo (2004) Based on the above, thus the need for research that can be a reference to improve economic efficiency so that some of the problems that need to be researched are; (1) How the economic efficiency of rubber production in Kalijompo plantation. (2) How is the potential implementation of Good Agriculture Practices (GAP) of rubber in Kalijompo plantation. Based on the background of these problems, a study is needed as a consideration for the development of rubber agribusiness in Kalijompo plantation in the future, namely by knowing the efficiency of production costs, the application of good and correct cultivation guidelines for rubber in Kalijompo plantation in the future. Based on this, the research aims to determine: (a) the cost efficiency of rubber agribusiness in Kalijompo plantation, (b) the extent of application of good agriculture practices on rubber plants[4]–[6]

2. Materials and Methods

The research area was selected purposively (purposive method), namely in Kalijompo plantation, Jember district. The research method used was descriptive, and analytical method. The data used are company data and secondary data.

The first hypothesis is the financial efficiency of rubber production in Kalijompo **plantation using Benefit Cost Ratio (BCR) analysis approach.**

2.1 Benefit Cost Ratio (BCR)

The benefit cost ratio (BCR) formula according to Yulianti (2008) is as follows:

Benefit cost ratio (B/C R) is a project selection analysis that is commonly done because it is easy, namely the comparison between benefits and costs. If the value is < 1 then the project is not economical, and if > 1 means the project is feasible. If, B/C ratio = 1, it is said that the project is marginal (no loss and no profit).

$$BCR = \frac{\sum_{t=0}^{n} Bt/(1+i)^t}{\sum_{t=0}^{n} Ct/(1+i)^t}$$

Description:

Bt = Benefit (income) year t

Ct = Cost (cost) year t

T = Year

I = Interest rate used

If:

BCR> 1, then the business can be continued or at a loss

BCR = 1, then the business is not profitable and has no loss

BCR < 1, then the business cannot be continued or profitable.

2.2 The second hypothesis is the implementation of Good Agriculture practices on rubber plants in Kalijompo plantation with a score

Range Percentage of implementation of each criterion = 0-100%

$$\% \textbf{ Implementation} = \frac{\text{number of sub criteria implemented in one criterion}}{\text{total number of sub criteria in one criterio}} \times 100\%$$

Table 3.1 Score for the percentage value of the implementation of each criterion:

Score Percentage of Implementation of Each Criterion	Score
0% - 20%	1 (low GAP implementation)
20% - 40%	2 (GAP implementation is rather low)
40% - 60%	3 (Partial GAP implementation)
60% - 80%	4 (Rather high GAP implementation)
80% - 100%	5 (High implementation)

Source: Department of Agriculture, Jakarta, 2006

3. Results and Discussion

Rubber production in Kalijompo Plantation, Jember Regency in terms of financial efficiency

Table 4.1 Value of Benefit cost Ratio per year Rubber production in Kalijompo plantation Jember Year 2024

	Rubber Production
Total cost	1.874.195.281
Production	114.527
Price	26.000
Revenue	2.977.702.000
B/C Ratio	**1,59**

Notes: Calculation Details Presented in the Appendix

BCR analysis is the B / C ratio calculated by dividing the total present value benefit by the total present value cost, the total amount of the total present value benefit and present value cost that has been discounted obtained B/C value of Rp. 1.59. So that the Net B/C > 1, then the rubber plantation business can be continued or feasible. This benefit is high because there are two revenues obtained, namely Rubber Smokes Sheet revenue and Lumb sales.

4.2 Application of Good Agriculture Practices in Rubber Crops and Kalijompo Plantation

No	Rubber GAP Standard	% Implementation	Score
1	Land	100	5
2	Use of superior seeds & planting materials	43	2
3	Fertilization	38,7	2
4	Plant Protection	41,3	3
5	Planting	100	5
6	Use of Windbreak Plants	87	4
7	Crop Maintenance & Management	62	4
8	Harvest and Post-Harvest Handling	100	5
	Percentage of Rubber GAP implementation	72	4

Notes: Calculation Details Presented in the Appendix

Based on Table 4.2 Implementation of Rubber GAP in Kalijompo plantation shows that the implementation of GAP is rather high, the land that has climate and soil components in Kalijompo plantation has a good land suitability value that has a score of 5. The use of superior seeds and planting materials reaches 34% with rather low implementation criteria, it is all due to the lack of labor that has labor skills, lack of adequate handling of nurseries and lack of handling of nursery management.

Fertilization of rubber plants in Kalijompo plantation, the percentage value of the implementation of good agriculture practices or good cultivation guidelines with a figure of 35.3% with a rather low category, at the time of fertilization which is usually done twice a year is carried out once a year and the type of fertilizer used is only nitrogen fertilizer (N) or urea, while the fertilizer needed is at least N, P, K, and Mg fertilizer. The provision of organic matter is also still low because the provision of organic matter is not regular both in quantity and time. Plant protection both from weeds, pests and diseases is still low in implementation, namely 39.35% with a rather low category of implementation, because it only uses mechanical means, with chemical means rarely done.

Rubber planting is carried out well in Kalijompo plantations, namely with a value of 100% with a very high category of implementation of good agricultural practices, sloping land (> 200) in Kalijompo plantations is carried out by planting sloping terraces, the benefits of planting sloping terraces reduce erosion of top soil. On slightly sloping land (<200) planting is done with bench terraces because the erosion rate is not so high. While on flat land is done by means of larikan so that in the reception of sunlight will be evenly distributed and can reduce the humidity of the garden thus the garden will reduce fungal attack resulting in decreased latex production. The use of wind-breaking plants has a rather high category because it has a value of 87%, The function of the wind breaker plant itself is to break the strong wind so as to reduce the fall of cultivated rubber plants, provide organic matter and firewood for rubber smoking. Plant maintenance and management has a rather high Good Agriculture Practices (GAP) category because it has a value of 62%, in the Trimming, it is for the maintenance of TBM rubber aims to remove unwanted branches. Routine tillage is carried out such as making dikes, kecrok and making gundang-gandung according to the size and time determined by the kalijompo plantation.

The handling of tapping and latex processing is very good and has a high implementation category of 100% implementation of Good Agriculture Practices (GAP) because if these three criteria can be met, it is expected that rubber plants at the age of 5-6 years have met the criteria for mature tapping. The criteria for mature tapping include when the circumference of the trunk at a height of 130 cm from the ground has reached a minimum of 45 cm. The function of the wind breaker plant itself is to break strong winds so as to reduce the fall of cultivated rubber plants, provide organic matter and firewood for rubber smoking. Plant maintenance and management has a rather high Good Agriculture Practices (GAP) category because it has a value of 72%, in the Trimming, it is for the maintenance of TBM rubber aims to remove unwanted branches. Routine tillage is carried out such as making dikes, kecrok and making gundang-gandung according to the size and time determined by the kalijompo plantation. The handling of tapping and latex processing is very good and has a high implementation category of 100% implementation of Good Agriculture Practices (GAP) because if these three criteria can be met, it is expected that rubber plants at the age of 5-6 years have met the criteria for mature tapping. The criteria for mature tapping include when the circumference of the trunk at a height of 130 cm from the ground has reached a minimum of 45 cm. If 60% of the plant population has met these criteria, the crop area is ready to be harvested or tapped.

The height of the tapping opening, both with the Down ward tapping system (DTS) and the Upward tapping system (UTS) is 130 cm measured from ground level. Tapping system based on the age of the rubber plant as follows Age 6-7 th s/2 d/3, Age 8-10 th s/2 d/2 100%, Age 11-15 th s/2 d/2 100%, Age 16 - 20 th a/2 d/2 100%, Age 21 - 28th 2 s/2 d/3 133%, Age 29 - 30 th 2 s/2 d/3 133%. Handling of latex in processing, milling into rubber sheets, rubber fumigation is carried out from a temperature of 60-550C for 12 hours then 55-500C for 6 hours then 50-450C for 6 hours then 45-400C for 6 hours then the rubber sheet will be brown and can only be said to be finished, sorting regarding quality Aims to classify rubber according to quality standards if Sorting to clean dirt aims to clean Rubber from dirt, such as broken twigs, seed hulls, soil, gravel,

and air bubbles. Sorting to determine the quality class that has been determined. Rubber is separated according to the number of values or levels of defects, packing and storage of very good resultsConditions for storage warehouses that must have a smooth and sufficient air flow (ventilation) The optimum temperature of the warehouse is 20-25^{0}C with a humidity of 50-70%, the warehouse must be clean. Rubber is stacked on the floor which is given a bamboo / wood base as high as ± 10 cm. The bottom and sides of the rubber should not be in direct contact with the wall or floor because it can cause the rubber to get dirty

4. Conclusion

Based on the evidence of the results of research and discussion is the basis, in drawing conclusions about this research entitled "ANALYSIS OF BCR AND POTENTIAL APPLICATION OF GOOD AGRICULTURE PRACTICES ON RUBBER PRODUCTION BUSINESS (Hevea Brasiliensis) IN KALIJOMPO FARM JEMBER DISTRICT". So that the conclusions in this study are: Rubber production in Kalijompo Plantation is financially efficient or has BCR value <1. And the application of GAP in the cultivation of rubber plants in the 72% category means that the application of GAP is rather high.

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