

# Financial Management Strategies for Rattan Farming Enterprises

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This study aims to determine financial management strategies for rattan farming enterprises. The object of the study was the community enterprises of rattan in Sigi Regency. The results of the financial analysis of a batang rattan farming at an interest rate of 5%, obtained a Net Present Value (NPV) and Net B / C of Rp29,910,000 and 2.30. For the financial income of lambang rattan at an interest rate of 5%, the Net Present Value (NPV) and Net B / C values were Rp16,361,000 and 1.71. The financial income of tohiti rattan at an interest rate of 5%, with a value Net Present Value (NPV) and Net B / C was Rp8,161,000 and 1.35. The financial income from noko rattan at an interest rate of 5%, Net Present Value (NPV) and Net B / C showed negative Rp 2,082,000 and 0,91. Meanwhile, the financial income of Pahit rattan at an interest rate of 5%, Net Present Value (NPV) and Net B / C was Rp 804,000 and 1.03. The financial analysis results at an interest rate of 5%, obtained Net Present Values (NPV) and Net B / C of Rp29,910,000 and 2.30, respectively. As a result of this study, the recommendations to rattan entrepreneurs are that rattan should be cultivated with agroforestry systems, especially in the case of noko rattan because if monocultures are cultivated, this type of rattan is not financially feasible enough to be solely cultivated.

**Key words:** *Income, rattan enterprises, financial management, management strategy.*

## Introduction

Rattan is an endemic plant growing in the tropics. In Indonesia, rattan grows in almost all islands that have natural forests, thus rattan is a by-product with various kinds of uses. Indonesia is therefore one of the primary producers of rattan and is able to supply around 80% of the world's need for rattan, which is currently still being collected by selection from forests (Roslim, 2018).

Rattans (*Calamus sp*) grow abundantly in the tropics, including Indonesia. In Indonesia, rattan grows naturally and is widely spread across the islands of Java, Sumatra, Borneo, Sulawesi, and Papua. In Sulawesi, rattan is mainly found in Kendari, Kolaka, Towuli, Donggala, Poso, Buol Toli-toli, Gorontalo, Palopo, Buton and the Latimojong Mountains (Tellu, 2008).

The types of rattan that grow and are popular in Central Sulawesi are Batang (*calamus zilingerii Becc*), Large Tohiti (*calamus dydimocarus becc*), Tohiti (*calamus inops becc*), and Lambang (*calamus qrnartus becc*). Most of the domestic and foreign furniture and rattan handicraft industries use this type of rattan, and therefore it has high economic value (Tellu, 2006).

The rattan planting system is traditionally carried out by rattan farmers, with seeds and deep tillers (extraction). Growing rattan from seeds is facilitated by using a planting system on the side of the treetops (Rotinsulu et al., 2014). A stump function is used to make the rattan easier to find when carrying out maintenance. With respect to the dynamics of the time dimension of planting, in the last decade, many farmers planted rattan with extractions obtained from their own rattan gardens or from close relatives and seedlings obtained from their own cultivation. Seeds that have been grown are weaned in polybags and then planted with spacing adjusted to the distance of the tree that will grow and later used as a climbing tree for rattan to help with maintenance (Siebert, 2005).

A type of tree that is frequently used is Suren/malapoga (*Toona clyliata*). An optimal estimation cycle of Suren/malapoga (*Toona clyliata*) stands at 25 years of age with 45 years of stand age. Therefore, Suren/malapoga (*Toona clyliata*) is highly suitable as a climbing tree for rattan plants (Kumar et al., 2011).

In this study, farming enterprises included various enterprises that utilise forest products which have direct benefits (in this case, rattan). Forest products are divided into two, namely yield and environmentally oriented. Forests with yield-oriented products, are seen as production forests, such as those that yield direct resource benefits in the form of wood, sap, bark, medicines, fruits, rattan, mushrooms, huntable animals, etc. Environmentally friendly forest products (ecosystems) provide indirect benefits such as water sources, animal shelter, recreation and so on. In addition, the optimisation of the role of stakeholders as partners in business development must be considered (Solikin et al., 2019). The present study is aimed at understanding the management strategies of financial planning for rattan enterprises.

## Methodology

This study focused upon the community engaged in rattan farming enterprises in Sigi Regency, Indonesia.

### **Data Collecting Methods**

#### 1) Observation

This technique of data collection is made through direct observation of the focus of study in order to describe with accuracy the conditions in the field related to the research.

#### 2) Interview

This technique is conducted by way of direct, unstructured interviews with several informants in order to obtain information and collect data relating to problems of the study.

#### 3) Documentation

This method is used as a support in research, which is carried out by tracing a number of documents and references and reports relating to problems in this study.

### **Methods of Analysis**

1. Net Present Value (NPV) is calculated by the following formula:

$$NPV = \sum_{t=0}^{t=n} (Bt - Ct)(DF)$$

Bt = benefit in year of t;

Ct = cost in year of t;

DF = discount factor;

I = interest rates apply;

N = length of project.

2. Net Benefit-Cost Ratio (Net B/C) is calculated by the following formula:

$$\text{Net B/C} = \frac{\sum_{t=0}^{t=n} NPV_1}{\sum_{t=0}^{t=n} NPV_2}$$

NPV<sub>1</sub> = positive net present value

NPV<sub>2</sub> = negative net present value

n = length of time period

## Results and Discussion

### *Condition of Rattan in the Study Area*

The Sigi forest area extends across 391.005,53 ha. Of these forest areas, some are still suitable for residences, including Lempelero Village, South Kulawi District, Sigi Regency.

There are more than 40 types of rattan in the Sigi forest, but currently, only 4 types of rattan are bought by traders.

### *Details of Rattan Farming Business Costs*

The rattan cultivation described in this section includes the costs that have been incurred, the predicted costs until the end of the cycle, estimated growth of Suren/malapoga stands (*Toona cyliata*), the price of Batang Rattan, Lambang, Tohiti, Tarumpu, Pahit and Noko, per kilogram, per hectare, based on the following assumptions:

1. The optimal estimation cycle for all rattan at the age of 7 years.
2. The optimal estimation cycle of Suren stands / malapoga (*Toona cyliata*) at the age of 25 years with a stand age of 45 years.
3. Costs for rattan cultivation based on the Workers' Day (HOK) required. The labour wage per day is IDR 50,000 / day.
4. Estimated production (physical) is determined based on cycle, diameter class and total volume of rattan and Suren/malapoga (*Toona cyliata*).
5. The price of rattan is based on current market prices , namely the price of Rp.2,000 / kg of Batang rattan, Lambang of Rp.1,900 / kg, Tohiti of Rp.2,000 / kg, Pahit rattan of Rp.1,800 / kg and Noko rattan of Rp.1,700 / kg kg.

To facilitate the calculation of financial analysis, the costs incurred, and the predicted costs incurred until the end of the cycle are described. These costs are grouped into fixed costs and variable costs. The details of these costs are described as follows:

### **Fixed Cost**

Fixed costs are costs that are always constant and are not influenced by the amount of production volume produced. The fixed cost components in rattan cultivation are as follows:

#### 1) Planning

Planning for this activity includes establishing land boundaries, assuming the costs incurred are IDR 50,000 / ha, for each hectare.

2) Property (Land and Building) tax

The land and building tax financing in this business from the first year of management until the end of the cycle is assumed to be Rp. 50,000 / ha per year, for every hectare cultivated it is considered the same.

3) Guardhouse

Construction of the guard house is conducted at the beginning of planting. Not all respondents construct a hut when they are working on rattan since for some, the location is close to where they live. For financial analysis purposes the cost of the cottage used is the average cost assumed to be Rp. 1,000,000. This cottage can generally be used for five years, and every five years of renovations and repairs will be carried out at a repair fee of 10% of the initial cost.

4) Wages/Management costs

The amount of permanent labour wages charged here is the same every year, from the beginning of the activity until the end of the rattan cultivation cycle, at a cost of Rp. 1,000,000.- / ha / yr. The wages obtained here are the basic wages outside the piece rate paid for each activity.

### **Variable Cost**

Variable costs will change in proportion to changes in the volume of activities. The variable costs of operating this activity are different for each activity, with details of the cost per hectare being as follows:

1) Planning

Planning for this activity includes the establishment of land boundaries, assuming the costs incurred are Rp. 50,000 / ha, for each hectare it is considered the same.

2) Land preparation

The purpose of the land preparation activity is the eradication of wild plants, grasses, shrubs, and unwanted woody plants.. In preparing land using 100 working day people (HOK), the cost required for land preparation is Rp. 50,000 x 100 people = Rp. 5,000,000 / ha, each hectare is considered the same.

3) Procurement and transportation of seeds

Seed procurement and transportation of seedlings is the provision of rattan seeds, assuming the price of rattan seedlings is Rp.2,000 / seed, then replanted. . The cost of rattan seedlings is Rp. 1,600,000 / ha.

4) Establishing the planting holes and planting

The activity of establishing planting holes and planting requires a fee of Rp. 300 / seed and depending on the planting distance of each stand, each hectare is considered the same.

5) Embroidery

Embroidery is a process carried out on the plants one year after planting, which aims to replace dead plants. However, if during the growth process many plants are found dead, then the second embroidery is carried out in the second year and the third embroidery the year after. The average assumption for replanting dead rattan is 10% in the second year. The amount of replanting costs is Rp.500 / seed and for each hectare it is considered the same.

6) Maintenance

Maintenance activities in the form of weeding plants, and protections against pests and diseases. This maintenance activity is carried out every year and requires a labour force ranging from 20 workers, at a cost of Rp1,000,000 / ha per year.

7) Weeding

This weeding activity is related to cleaning the stands from weeds. Weeding activities are carried out for 2 years only, at a cost of Rp. 300,000 - Rp. 500,000 / ha / yr.

8) Fertilisation

Fertilisation is carried out at the start of planting until the rattan is two years old. This is aimed at stimulating the growth of rattan. The fertilisation process is carried out twice a year. The fertilisers that are used are manure (organic) and chemical (inorganic). The amount of chemical fertiliser needed in one hectare during the first and second years is 50 kg / ha, while the manure is applied at the beginning of planting at a cost of of 2,000 kg / ha.

9) Equipment

The types of equipment used in rattan cultivation includes machetes, hoes, buckets, axes, drums, ropes and others. This equipment is counted according to the length of its expected life with the assumption that every five years a tool is changed until the end of the first batch of rattan, including three things, namely harvesting from thinning, intermediate harvesting and total harvesting. Harvesting costs are assumed at a total of 10% - 20% of the total income.

### **Income Analysis of Batang Rattan Enterprises**

The cash flow in batang rattan showed an initial investment of Rp 23,685,000. The amount of this investment was derived from all costs incurred starting from year zero to year 14, before the cultivation of batang rattan was harvested and gained income, while the total cost for the entire activity of batang rattan farming over 45 years amounted to Rp 110,602,000 with a gross

income of Rp 319,712,000. Thus, the business had a value of benefits (B / C Ratio) of 2.9. This means that every Rp 1,000 of costs incurred will generate an income of Rp 2,900. This indicates that the cultivation of batang rattan is economically feasible.

Batang rattan is harvested between the age of 15 to 45 years. However, optimal production is achieved by waiting until the rattan is 33 years. With a selling price of batang rattan of Rp 2,000 / kg, the total income received from the cultivation of batang rattan can be seen in Table 1.

**Table 1:** The income from batang rattan (Rp/Ha/Year)

Number	Age (year)	Production Level (kg/ha)	Price (Rp/Kg)	Income (Rp/Kg/ha)
1	15	6,190	2,000	12,380,000
2	18	7,630	2,000	15,260,000
3	21	9,220	2,000	18,440,000
4	24	10,940	2,000	21,880,000
5	27	12,960	2,000	25,920,000
6	30	15,700	2,000	31,400,000
7	33	17,280	2,000	34,560,000
8	36	18,500	2,000	37,000,000
9	39	19,560	2,000	39,120,000
10	42	20,500	2,000	41,000,000
11	45	21,376	2,000	42,752,000

Table 1 shows that batan rattan can be harvested between the age of 15 to 45 years. After the production levels and income were determined, the data was financially analysed at an interest rate of 5%, and obtained Net Present Value (NPV) and Net B / C of Rp 29,910,000 and 2.30, at an interest rate of 5%; the resulting NPV and Net B / C values were Rp 57,020,000 and 2.26 respectively, while the land area is 14 ha with an average income level of Rp 3,563,182.

### **Financial Analysis and Business Scale of Lambang Rattan Enterprises**

The initial investment amount derived from all costs incurred from the first year to the 14th year was Rp 23,685,000. This figure is before the cultivation of the symbol rattan is harvested. The total cost for the operation of the lambang rattan over 45 years was Rp 94,744,000 with a gross income of Rp240,426,000. The business had a value of benefits (B / C Ratio) of 2.5 which means that every Rp 1,000 of costs generates an income of Rp 2,500. This indicates that the cultivation of lambang rattan is economically feasible.

Lambang rattan is harvested from the age of 15 to 45 years. However, optimal production is achieved by the age of 33 years. With the selling price of lambang rattan of Rp 1,900/kg, the total income received from the cultivation of rattan can be seen in Table 2.

**Table 2:** The income from lambang rattan (Rp/Ha/Year)

Number	Age (year)	Production Level (kg/ha)	Price (Rp/Kg)	Income (Rp/Kg/ha)
1	15	4,940	1,900	9,386,000
2	18	6,100	1,900	11,590,000
3	21	7,360	1,900	13,984,000
4	24	8,740	1,900	16,606,000
5	27	10,340	1,900	19,646,000
6	30	12,540	1,900	23,826,000
7	33	13,800	1,900	26,220,000
8	36	14,720	1,900	27,968,000
9	39	15,450	1,900	29,355,000
10	42	16,100	1,900	30,590,000
11	45	16,450	1,900	31,255,000

Table 2 shows that lambang rattan can be harvested from the age of 15 to 45 years with total production costs ranging between 4,940 (kg/ha) and 16,450 kg/ha, and a selling price of Rp1,900/Kg. The data was financially analysed at an interest rate of 5%, and obtained a Net Present Value (NPV) and Net B / C of Rp 16,361,000 and 1.71, at an interest rate of 5%. The resulting NPV and Net B / C values were Rp 43,471,000 and 1.96 respectively, while the land area is 18 ha with an average income level of Rp 2,716,505.

### Financial Analysis and Business Scale of Tohiti Rattan Enterprises

The cash flow of tohiti rattan showed an initial investment of Rp 23,685,000. The amount of this investment was derived from all costs incurred starting from year zero to year 14, before the cultivation of tohiti rattan was harvested and gained income. The total cost for the whole activity of tohiti rattan enterprises over 45 years amounted to Rp 85,211,000 with a gross income of Rp 192,760,000. Thus, the business had a value of benefits (B / C Ratio) of 2.26. This means that every Rp 1,000 of costs incurred will generate an income of Rp 2,260. This indicates that the cultivation of tohiti rattan is economically feasible.

Tohiti rattan is harvested from the age of 15 to 45 years. However, optimal production is achieved by the age of 33 years. With a selling price of tohiti rattan of Rp 2,000 / kg, the total income received from the cultivation of tohiti rattan can be seen in Table 3.

**Table 3:** The income from tohiti rattan (Rp/Ha/Year)

Number	Age (year)	Production Level (kg/ha)	Price (Rp/Kg)	Income (Rp/Kg/ha)
1	15	3,800	2,000	7,600,000
2	18	4,640	2,000	9,280,000
3	21	5,640	2,000	11,280,000
4	24	6,680	2,000	13,360,000
5	27	7,920	2,000	15,840,000
6	30	9,600	2,000	19,200,000
7	33	10,560	2,000	21,120,000
8	36	11,280	2,000	22,560,000
9	39	11,760	2,000	23,520,000
10	42	12,100	2,000	24,200,000
11	45	12,400	2,000	24,800,000

Table 3 shows that tohiti rattan can be harvested from the age of 15 to 45 years with total production costs ranging between 3,800 (kg/ha) and 12,400 kg/ha with a selling price of Rp2,000/Kg, and gross income as derived from Table 3. After obtaining the production level and the income, the data was financially analysed at an interest rate of 5%, 10%, and 15%. The interest rate of 5%, obtained Net Present Value (NPV) and Net B / C of Rp8,161,000 and 1.35 respectively. Meanwhile, at an interest rate of 5% resulting in NPV and Net B / C values of Rp35,270,000 and 1.78 respectively, tohiti rattan combined with Suren wood of 23 ha was estimated at an average income of Rp2,204,024.

### **Financial Analysis and Business Scale of Noko Rattan Enterprises**

The cash flow of noko rattan showed an initial investment of Rp 23,685,000. The amount of this investment was derived from all costs incurred starting from year zero to year 14, before the cultivation of noko rattan was harvested and gained income, while the total cost for the whole activity of noko rattan enterprises over 45 years totalled Rp 73,380,000 with a gross income of Rp 133,603,000. Thus, the business had a value of benefits (B / C Ratio) of 1.8, which means that every Rp 1,000 of costs incurred will generate an income of Rp 1,800. This indicates that the cultivation of noko rattan is economically feasible.

Noko rattan is harvested between the ages of 15 and 45 years. However, optimal production is achieved by the age of 33 years. With a selling price of noko rattan of Rp 2,000 / kg, the total income received from the cultivation of noko rattan can be seen in Table 4.

**Table 4:** The income of noko rattan (Rp/Ha/Year)

Number	Age (year)	Production Level (kg/ha)	Price (Rp/Kg)	Income (Rp/Kg/ha)
1	15	3,120	1,700	5,304,000
2	18	3,820	1,700	6,494,000
3	21	4,600	1,700	7,820,000
4	24	5,460	1,700	9,282,000
5	27	6,480	1,700	11,016,000
6	30	7,840	1,700	13,328,000
7	33	8,640	1,700	14,688,000
8	36	9,230	1,700	15,691,000
9	39	9,610	1,700	16,337,000
10	42	9,810	1,700	16,677,000
11	45	9,980	1,700	16,966,000

Table 4 shows that noko rattan can be harvested between the ages of 15 and 45 years with total production costs ranging between 3,120 (kg/ha) and 9,980 kg/ha with a selling price of Rp1,700/Kg. The gross income can be derived from Table 4. After obtaining the production level and the income, the data was financially analysed at an interest rate of 5%, 10%, and 15%. At an interest rate of 5%, Net Present Value (NPV) and Net B / C of negative were Rp2,082,000 and 0.91 respectively.

### **Financial Analysis and Business Scale of Pahit Rattan Enterprises**

The cash flow of pahit rattan showed an initial investment of Rp 23,685,000. The amount of this investment was derived from all costs incurred starting from year zero to year 14, before the cultivation of pahit rattan was harvested and gained income, while the total cost for the whole activity of pahit rattan enterprises over 45 years amounted to Rp 76,726,000 with a gross income of Rp 150,336,000. Thus, the business had a value of benefits (B / C Ratio) of 1.96, which means that every Rp 1,000 of costs incurred will generate an income of Rp 1,960. This indicates that the cultivation of pahit rattan is economically feasible.

Pahit rattan is harvested between the age of 15 to 45 years. However, optimal production is achieved by the age of 33 years. With a selling price of pahit rattan of Rp 1,800 / kg, the total income received from the cultivation of pahit rattan can be seen in Table 5.

**Table 5:** The income of pahit rattan (Rp/Ha/Year)

Number	Age (year)	Production Level (kg/ha)	Price (Rp/Kg)	Income (Rp/Kg/ha)
1	15	3,280	1,800	5,904,000
2	18	4,040	1,800	7,272,000
3	21	4,900	1,800	8,820,000
4	24	5,800	1,800	10,440,000
5	27	6,880	1,800	12,384,000
6	30	8,340	1,800	15,012,000
7	33	9,180	1,800	16,524,000
8	36	9,800	1,800	17,640,000
9	39	10,150	1,800	18,270,000
10	42	10,450	1,800	18,810,000
11	45	10,700	1,800	19,260,000

Table 5 shows that pahit rattan can be harvested between the age of 15 to 45 years with total production costs ranging between 3,280 (kg/ha) and 10,700 kg/ha and a selling price of Rp1,800/Kg, the gross income of which can be derived from Table 3. After obtaining the production level and the income, the data was financially analysed at an interest rate of 5%, 10%, and 15%. At an interest rate of 5%, the Net Present Value (NPV) and Net B / C of negative was Rp804,000 and 1.03 respectively.

## Conclusion

This study concludes that the total cost for the entire activity of batang rattan enterprises over a span of 45 years is Rp110,602,000 with a gross income of Rp319,712,000. The total cost for the entire lambang rattan enterprises over 45 years amounted to Rp 94,744,000 with a gross income of Rp240,426,000. The total cost for the entire tohiti rattan enterprises over 45 years amounted to Rp76,726,000 with a gross income of Rp.150,336,000. The total cost for all tohiti rattan business activities over 45 years amounted to Rp85,211,000 with a gross income of Rp192,760,000. The total cost for all noko rattan enterprises over 45 years amounted to Rp73,380,000 with a gross income of Rp133,603,000. The total cost for pahit rattan business activities amounted to Rp 76,726,000 with a gross income of Rp150,33,000. From the results of the financial analysis of rattan farming income at a 5% interest rate, the Net Present Value (NPV) and Net B / C values were Rp29,910,000 and 2.30. The financial income of lambang rattan at an interest rate of 5%, the Net Present Value (NPV) and Net B / C values were Rp16,361,000 and 1.71. Meanwhile, the financial income of a tohiti rattan at an interest rate of 5%, with value Net Present Value (NPV) and Net B / C was Rp8,161,000 and 1.35, and the financial income of noko rattan at an interest rate of 5%, showed the Net Present Value (NPV) and Net B / C were negative Rp 2,082,000 and 0,91. Finally, the financial income of pahit rattan at an interest rate of 5%, with a Net Present Value (NPV) and Net B / C amounted to



Rp804,000 and 1.03, meanwhile pahit rattan produces a NPV value and Net B/C of Rp 28,074,000 and 1.62 respectively.

Based on the conclusion, this study recommends that batang and lambang rattan can be prioritised for planting because in addition to greater total production, it is also very much needed by the processed wood industry. Rattan cultivation should be cultivated with agroforestry systems, especially in the case of noko rattan, because if it is cultivated as monoculture, noko rattan is not financially feasible enough to be cultivated. Other rattan, however, is still financially feasible enough to be cultivated. Considering that rattan has a strategic value in meeting the raw materials for the furniture industry, one of these types of rattan needs to be developed with financial subsidies and monetary policy at no more than 5%.

### **Conflict of Interest**

None.



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