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RESEARCH ARTICLE

Total value of benefits and financial costs from independent oil palm plantations in Seruyan regency in 2023

Afirus Febian[1,2]*, Bambang Joko Priatmadi[3], Danang Biyatmoko[3] & Dewi Erika Adriani[3]

[1]Faculty of Agriculture, Darwan Ali University, Kotawaringin Timur 74322, Central Kalimantan, Indonesia
[2]Doctorate Program of Agriculture Science, Lambung Mangkurat University, Banjarbaru 70714, South Kalimantan, Indonesia
[3]Faculty of Agriculture, Lambung Mangkurat University, Banjarbaru 70714, South Kalimantan, Indonesia

*Email: afirusfebian@unda.ac.id

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Abstract

Independent palm oil growers have participated in meeting the world's palm oil needs as well as contributing to economic development by increasing income and reducing poverty. Therefore, knowing the total value of benefits and financial costs from independent oil palm plantations is very important. This research aims to determine the total value of benefits and financial costs of independent oil palm plantations in Seruyan Regency. The Slovin method was used in selecting the sample size. The research method uses an exploratory research method, with benefit-cost analysis in the form of calculating Net Present Value (NPV), benefit-cost ratio (B/C Ratio) and Internal Rate of Return (IRR). The results show that independent oil palm plantations in 2023 in Seruyan Regency are financially feasible to implement, this is indicated by the value of benefits greater than the value of costs, namely the total value of PV benefits IDR 1,409,358,175,296.54 and the total value of PV costs IDR 44,466,996,210.44; a positive NPV value of IDR 1,501,380,296,994.71 and a B/C ratio of 3.169 and an IRR of 11 %. Where this analysis has shown that the benefit value is greater than the cost value, so financially independent oil palm plantations can provide benefits for improving community welfare. However, this prosperity does not last forever, because the value of the benefits provided will decrease in the long term, this shows that oil palm plantation activities are not feasible in the long term, to change this condition can be overcome by preparing to carry out replanting.

Keywords

Cost-benefit analysis; independent palm oil; independent smallholders; insurance value; Net Present Value

Introduction

Crude palm oil (CPO) is a commodity widely used to make various daily necessities, from cakes to cosmetics. Palm oil comes from oil palm plants that grow in humid tropical conditions. Palm oil was originally discovered in West Africa, but is now widely cultivated in Asia, Africa and Latin America. In December 2022, the United States Department of Agriculture (USDA) estimated world palm oil production for the 2022/2023 period at 77.22 MT, an increase of 3.39 MT or 4.59 % compared to the previous year. Of this amount, Indonesia contributed 45.5 MT, or around 59 %. Thus, it can be concluded that Indonesia is the world's largest palm oil producer (1) and

will probably continue to increase in the following years because the palm oil industry is an industry that generates large profits (2, 3). The rapid development of oil palm in Indonesia began in the 2000s, when oil palm became one of the main commodities of plantation crops producing foreign exchange which is vital in the Indonesian economy (4).

The area of oil palm plantations in Indonesia always increases every year. In 2020, it was recorded as having an area of 15080000 ha and it is estimated that in 2021, it will reach an area of 16380000 ha (5). Where, as much as 5 % or around 800 thousand ha is controlled by BUMN, 53 % or around 8.64 million ha is controlled by private companies and the other 42 % or around 6.94 million by the people (6). Increasing demand and high prices for crude palm oil (CPO) have also motivated not only investors but also farmers to increase palm oil production through intensification, replanting and expansion (7-10). Oil palm cultivation by smallholders is the main driver of the economy in rural areas, especially in reducing poverty levels and income inequality (11). This has increased the need for plantation land as long as the technical requirements are met and it is financially feasible for oil palm cultivation (12).

Seruyan Regency was formed based on Law of the Republic of Indonesia Number 5 of 2002 concerning the Establishment of Katingan Regency, Seruyan Regency, Sukamara Regency, Lamandau Regency, Gunung Mas Regency, Pulang Pisau Regency, Murung Raya Regency and East Barito Regency in Central Kalimantan. As an expanding district, the Seruyan Regency government seeks to increase development activities in all fields. One of the policies implemented by the Seruyan Regency government to obtain development funds is to utilize the potential of forest resources to convert them into oil palm plantations. In 2021, the area of oil palm plantations in Seruyan Regency will reach 438 thousand ha. Of which 27 thousand ha are allocated to independent oil palm plantations, 385 thousand ha are controlled by large private plantations and 25 thousand ha by plasma planters.

The feasibility of a business activity is an in-depth study of the business plan or business that will be carried out, to provide recommendations whether or not the business is worth carrying out. The externalities that arise are often ignored and not taken into account in the components for analyzing the feasibility of an activity (13, 14). Cost-benefit analysis (CBA) is an analysis used to study the magnitude of profits or losses as well as the feasibility of the existence of a project. This analysis includes calculations of cost variables and the benefits that will be obtained from a program (15). Cost-benefit analysis (CBA) is often used in determining the feasibility of a project because it can help decision-makers determine whether a project can provide greater benefits than the costs incurred (16-18). This study tries to determine the total value of benefits and financial costs of independent palm oil plantations in Seruyan Regency.

Materials and Methods

Analysis Method

This research was conducted in Seruyan Regency, centered on independent oil palm plantation areas. Based on data from the Food Security and Agriculture Service of Seruyan Regency, there will be 27298.50 ha of independent oil palm plantations in 2023. With purposive sampling, the research locations were in 3 sub-districts, namely Danau Sembuluh sub-district 1200 ha, Hanau sub-district 2190 ha and Seruyan Hilir Timur sub-district 1076 ha. The map of the research location is presented in Fig. 1.

The types of data used in this research are primary data and secondary data. Primary data was collected through field surveys and direct interviews with respondents. Secondary data was obtained from the Central Statistics Agency (BPS), the Agriculture Office, the District Office and others. Then the collected data was analyzed with the Componential Analysis technique, where data with the same elements was grouped, while those that did not have the same elements were separated. The Slovin method was used to select the sample size, with a precision of 10 % (19, 20).

$$n = \frac{N}{1 + N(e^2)}$$

Where, n = Number of samples of independent oil palm farmers, N = Total population of independent oil palm farmers and e =10 % error rate.

Based on the proportional sampling method, the number of respondents was 173 independent oil palm planters who came from each sub-district in the Seruyan Regency area. Multilevel respondent sampling was used to select respondents who had immature plants (2020-2023) and mature plants (2018-2023), with the pattern of fresh fruit bunches (FFB) production based on age following the pattern proposed by the Palm Oil Research Center (PPKS). Cost Benefit Analysis (CBA) was used to calculate the Total Benefit Value and Financial Costs of Independent Palm Oil Plantations in Seruyan Regency.

Identification of Financial Benefit-Cost Components of Independent Palm Oil Plantations

The components of benefits and costs of independent oil palm plantations that refer to Pahan, Manurung and Yani (15, 20-22) are as follows:

Financial Benefit Components

- Income from sales of Fresh Fruit Bunches (FFB) Production (15, 21)
- Value of wood obtained from conversion (20)

Financial Cost Components (15, 21):

- Plant Investment Costs
- Non-Crop Investment Costs
- Cost of Maintaining Plant Produce
- Harvest and Transport Costs

Hanau sub-district, Danau Sembuluh sub-district, Seruyah Hilir Timur sub-district .

Fig. 1. Map of the research location. Source: Seruyan Regency (2023).

- Processing Costs
- Labor Costs
- General Costs
- Depreciation

Identification of Financial Benefit-Cost Variables for Independent Palm Oil Plantations

Net Present Value (NPV) Variables for Independent Palm Oil Plantations:

- NPV Financial Benefits of Independent Palm Oil Plantations (BF_{PSS}), is the Net Present Value of the benefits of independent oil palm plantations obtained from the sum of the total production of fresh fruit bunches (FFB) multiplied by the market price of fresh fruit bunches (FFB) per ton for 25 years + the value of wood obtained from forest conversion with a discount factor of 10 %. The flow of income from the financial benefits of this independent oil palm plantation is assumed to be a savings flow with the concept of a present value of annuity interest rate of 10 %**.**
- NPV Financial Costs of Independent Palm Oil Plantations (CF_{PSS}), is the Net Present Value of the financial costs of independent oil palm plantations which are obtained from the sum of the total investment costs of plants + non-crop investment + costs of mature plants (TM) + harvest and transport costs + labor costs + general costs + processing costs and depreciation for 25 years with discount factor 10 %. The flow of financial costs for this independent palm oil plantation is assumed to be a loan flow

with the concept of a present value of annuity due interest rate of 10 %.

- NPV Total Independent Palm Oil Plantations (Y_{PSS}), is the difference between the NPV value of the Financial Benefits of Independent Palm Oil Plantations (BF_{PSS}) minus the NPV of the Financial Costs of Independent Palm Oil Plantations (CF_{PSS}).

Variable Financial Benefits of Independent Palm Oil Plantations, consisting of

- Price of Fresh Fruit Bunches ($X1_{PSS}$), based on the average selling price in rupiah per ton that occurs in the field during the period January to December 2023 and is considered constant throughout the analysis period.
- Production of Fresh Fruit Bunches ($X2_{PSS}$), based on the average amount of FFB production in tonnage units based on plant age by following the pattern proposed by the Palm Oil Research Center (PPKS)
- Value of Timber obtained from Conversion ($X3_{PSS}$), is the total value of wood production obtained from conversion over 3 years.

Variable Financial Costs for Independent Palm Oil Plantations based on the pattern (21), consisting of

- Plant Investment Costs ($X4_{PSS}$)
- Non-Crop Investment Costs ($X5_{PSS}$)
- Production Plant Maintenance Costs ($X6_{PSS}$)
- Harvest and Transport Costs ($X7_{PSS}$)
- Processing Fee ($X8_{PSS}$)
- Labor Costs ($X9_{PSS}$)
- General Costs ($X10_{PSS}$)
- Depreciation ($X11_{PSS}$)

Equations in Finding the Total Benefit Value and Financial Costs of Independent Palm Oil Plantations

Benefit-cost analysis is an analysis that compares the total flow of benefits and the total flow of costs sacrificed. The flow of benefits is formed by several components of benefits derived from the activities carried out. Meanwhile, cost flows are formed by several cost components derived from the activities carried out. With this understanding, the components of benefits and costs can be expressed in the form of the equation below (28)

$BF_{PSS} = (X1_{PSS} \times X2_{PSS}) + (X3_{PSS})$ .....(1)

$CF_{PSS} = (X4_{PSS} + X5_{PSS} + X6_{PSS} + X7_{PSS} + X8_{PSS} + X9_{PSS} + X10_{PSS} + X11_{PSS})$.....(2)

$Y_{PSS} = (BF_{PSS}) - (CF_{PSS})$ .....(3)

Formulation of Analysis of Total Benefit Value and Financial Costs of Independent Palm Oil Plantations

Data analysis in this research was carried out quantitatively and qualitatively. Descriptive qualitative analysis was carried out as a complement and sharpening in data analysis. Quantitative analysis was carried out mainly related to the calculation of extended benefit-cost analysis, both financial benefit-cost values. Meanwhile, qualitative descriptive analysis was carried out on data relating to the community's views and perceptions regarding independent oil palm plantation activities.

Following the data analysis stages, in this study the analytical formulation was carried out using Extended Net Present Value and Extended Benefit-Cost Analysis for financial benefit-cost analysis, research Benefit-Cost Analysis (CBA) in the form of calculating Net Present Value (NPV), Benefit Cost Ratio (B/C Ratio) and Internal Rate of Return (IRR) which refer to calculations (15, 23-25) . So you will know the total value of benefits and financial costs from independent palm oil plantations in Seruyan Regency. The formula for Extended Net Present Value is as follows:

$$NPV = \sum_{t=1}^{n} \frac{B_t - C_t}{(1+r)^t} \quad \text{.....(4)}$$

$$NPV = \frac{B_0 - C_0}{(1+r)^0} + \frac{B_1 - C_1}{(1+r)^1} + \cdots + \frac{B_t - C_t}{(1+r)^t} \quad \text{.....(5)}$$

Where, NPV = Net present value of financial, environmental, B_0 = Financial benefits, environment, C_0 = Financial costs, environment, r = Discount rate = 10 % and t = Economic age = 0 – 25.

Net Benefit Cost Ratio (Net B|C) is a comparison between the amount of positive NPV and negative NPV. Net B|C is obtained by dividing the discounted value of total income by the total discounted costs, or dividing the NPV which has a value greater than zero by the NPV which has a value less than zero. Net B|C is used to find out how many times the benefits obtained are equal to the costs incurred. The formula for calculating Net B|C following the analysis described (15) as follows:

$$\text{Net B|C} = \frac{\text{Net Present Value of Financial Benefits}}{\text{Net Present Value of Cost Benefits}} \quad \text{.....(6).}$$

Where, B = Net present value of financial benefits, C = Net present value of financial costs.

Internal Rate of Return (IRR) is used to determine the percentage of profit from a project each year. IRR can be calculated using the formula (24, 25)):

$$IRR = \sum_{t=1}^{n} \left(\frac{C_t}{C_0}\right)^{\frac{1}{t}} - 1 \quad \text{.....(7)}$$

$$IRR = r_1 + \left(\frac{NVP_1}{NVP_1 - NVP_2}\right)(r_2 - r_1) \quad \text{.....(8)}$$

C_0 = Investment cost, C_t = Cost t period and t = periods

Results and Discussion

Financial Cost-Benefit Analysis (CBA) is an analysis of an activity or project that acts as an indicator in determining whether or not the activity or project is feasible to implement. Concerning the Cost-Benefit analysis (CBA) of Independent Palm Oil Plantations, this analysis was used as an indicator to determine whether or not independent palm oil plantations are feasible from a financial aspect (cash flow) to provide benefits for the independent palm oil plantations. From the benefit aspect, the main commodity produced by independent oil palm plantations analyzed was the production of fresh fruit bunches (FFB). Apart from that, side benefits in the form of wood from the conversion of forest areas were part of the variables included in the income component. Meanwhile, in terms of cost flows, there were 8 cost components analyzed, namely: plant investment costs, non-plant investment costs, maintenance of mature plants, harvest and transport costs, processing costs, labor costs, general costs and depreciation.

The results of the cost-benefit analysis (CBA) of independent oil palm plantations in the research location for 25 years with a discount factor of 10 % are presented in Table 1.

Table 1. Financial Costs-Benefits of Independent Palm Oil Plantations.

Component	Hn District	DS District	SHT District	Seruyan Regency
Total PV Benefit (IDR/year)	743,731,224,076.41	396,991,530,049.77	268,635,421,170.36	1,409,358,175,296.54
Total PV Cost (IDR/year)	23,488,334,893.73	11,327,338,671.53	9,651,322,645.17	44,466,996,210.44
NPV (IDR/year)	792,267,178,100.94	424,230,610,516.06	284,882,508,377.71	1,501,380,296,994.71
B|C Ratio	3.166	3.505	2.783	3.169
IRR	22 %	12 %	11 %	11 %

Hn District : Hanau sub-district, **DS District** : Danau Sembuluh sub-district, **SHT District** : Seruyan Hilir Timur sub-district. Source: Primary Data (2023).

Based on the financial cost-benefit analysis (CBA) of independent oil palm plantations as in the calculation results in Table 1, it can be seen that all sample sub-districts and Seruyan Regency produce positive NPV values. Hence, financially independent oil palm plantations are profitable and feasible to implement. The highest NPV calculation value for financial aspects was presented by the Hanau sub-district, amounting to IDR 792,267,178,100.94, followed by the Danau Sembuluh sub-district and Seruyan Hilir Timur sub-district. This is because the area of independent oil palm plantations and the price of FFB in the Hanau sub-district is much higher than in others. The NPV value for Seruyan Regency provides a value of IDR 1,501,380,296,994.71 or IDR 336,180,093.37 per ha per year at an FFB price range of IDR 1,858,333 per ton.

The B/C ratio value for independent oil palm plantations in Table 1 produces a B|C Ratio value > 1. The largest sub-district B/C ratio value was obtained by Danau Sembuluh District, namely 3.505. The B/C ratio value in each sub-district means that for every IDR 100.00 spent on independent oil palm plantations, it will provide a profit of IDR 316.60 in the Hanau sub-district, IDR 350.50 in the Danau Sembuluh sub-district and IDR 278.30 for Seruyan sub-district. Lower East. Meanwhile, for Seruyan Regency, the B/C ratio value for community self-supporting oil palm plantations was obtained at 3.169, meaning that independent oil palm plantations in Seruyan Regency financially provide a profit of IDR 316.90 for every IDR 100.00 in costs charged.

The IRR calculation value for independent oil palm plantations is greater than the discount factor set at 10 %, so it can be interpreted that independent oil palm plantation activities are profitable. Table 1 shows that each sub-district has an IRR above 10 %, meaning that independent oil palm plantation activities are profitable from a financial aspect both at the sub-district and district levels. The IRR value shows that if independent oil palm plantation investment is implemented, this investment will provide a return of 22 % in the Hanau sub-district, 12 % in the Danau Sembuluh sub-district and 11 % in the Seruyan Hilir Timur sub-district on the initial investment. Apart from that, it can be seen that the IRR obtained by the Hanau sub-district is greater than the IRR obtained by Seruyan Regency, this indicates that the profits in the Hanau Sub-district provide large profits in independent oil palm plantations in Seruyan Regency. An illustration of the phenomenon of the benefits and financial costs of independent oil palm plantations can also be seen in the following graphic (Fig. 2 and 3).

An illustration of the benefit-cost phenomenon of independent oil palm plantations is in Fig. 1 and Fig. 2. In Fig. 1, it can be seen that the benefit value of independent oil palm plantations began to increase from the age of 3 years to the age of 13 years in each research sample and begins to decline from the 14th year to the 25th year. After passing this age, the value of financial benefits continued to decline, approaching or even exceeding the cost value of independent oil palm plantations. With a phenomenon like this, it can be said that the financial feasibility of oil palm plantation activities is not sustainable. Meanwhile, Fig. 2 shows that the cost value of independent oil palm plantations begins to increase from the age of 2 years and does not experience a decrease in costs from the 7th year to the 25th year.

Fig. 1 and Fig. 2 show that the value of the benefits is greater than the value of the financial costs of independent oil palm plantations. The condition that the

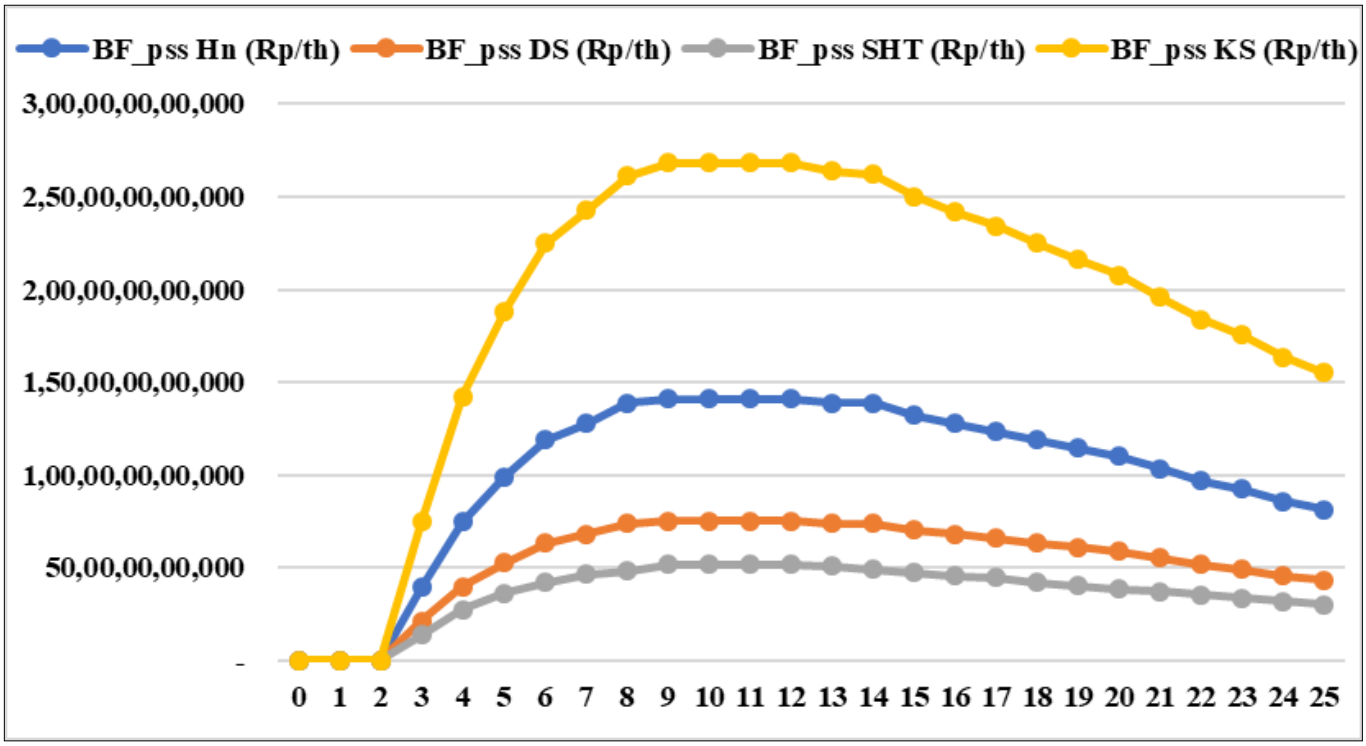

Fig. 2. Comparison chart of benefit values of independent palm oil plantations.

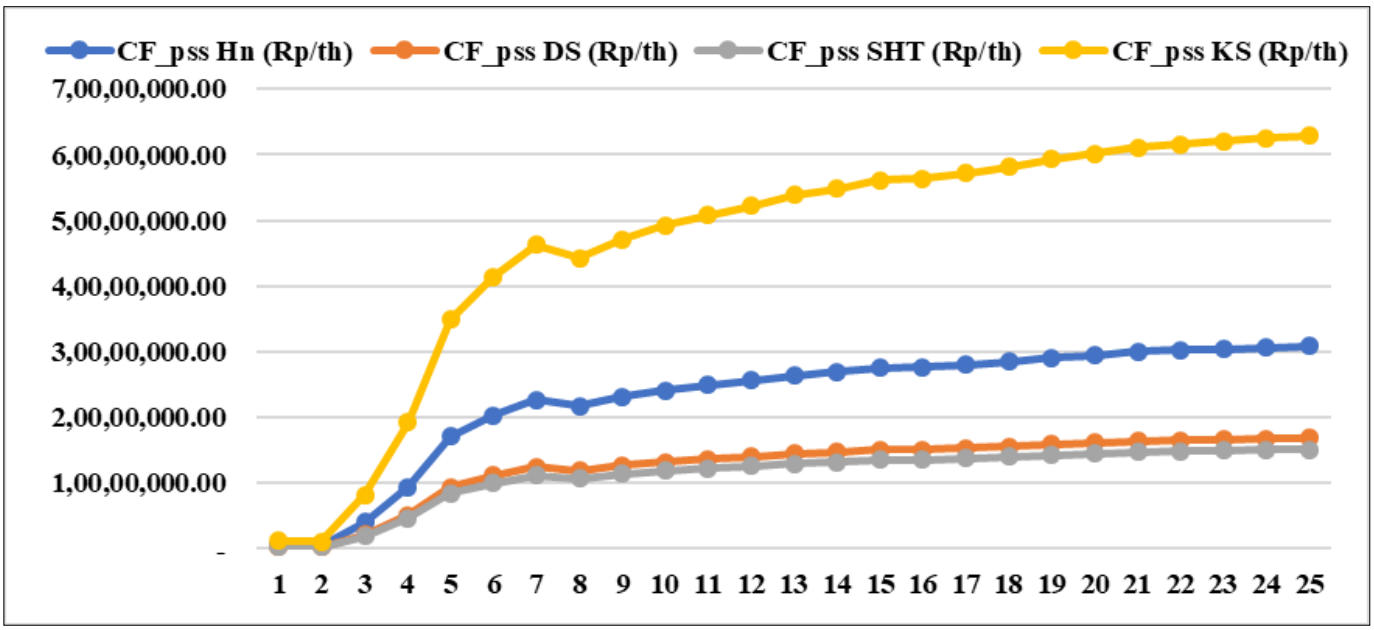

Fig. 3. Comparison chart of financial cost values of independent palm oil plantations.

benefit value is greater than the cost value shows that financially independent oil palm plantations do provide benefits for improving community welfare.

Based on the financial cost-benefit analysis as shown in Table 1 and Fig. 1 and 2, it can be said that independent oil palm plantation activities in 2023 in Seruyan Regency are financially feasible to carry out. This is indicated by positive NPV calculation results, B/C ratio > 1, and IRR > 10 %. Apart from that, it is also aimed at the total value of PV benefits being significantly greater than the total value of the financial costs of independent oil palm plantations. Based on the results of these calculations, it cannot be denied that there are strong reasons for independent oil palm plantation entrepreneurs to propose to convert forest areas into independent oil palm plantations in Seruyan Regency. This condition will certainly increase the pressure on the Seruyan Regency government to grant concessions and convert forest ecosystems into independent oil palm plantations. Additionally, to encourage development activities in the region, the Seruyan Regency government policy will strongly support the development of the plantation sector, especially oil palm plantations. This will further expand the forest area to be converted into oil palm plantations.

The condition that the benefit value is greater than the cost value shows that financially independent oil palm plantations can provide benefits for improving community welfare. However, this prosperity does not last forever, because the value of the benefits provided will decrease in the long term, this shows that oil palm plantation activities are not feasible in the long term.

The results of the financial benefit-cost analysis have shown that from a financial aspect, independent oil palm plantations have a higher benefit value than the costs incurred. However, the value of this benefit will not be obtained forever, because it is limited by the productive life of the oil palm itself. Judging from the productive age based on data analysis, it can be divided into 3 phases. The first phase is at the age of 3 to 7 years when the production of independent oil palm plantations increases; the second phase is 8 to 13 years old when independent oil palm plantation production begins to provide constant benefits; and the third phase ages 14 to 25 years, where the production of independent oil palm plantations begins to decline, the opposite of the first phase. Meanwhile, the value of costs incurred by independent oil palm plantations has a constant pattern starting in the first year, where the largest cost value is incurred at the start of the investment (year 0).

The current condition of the value of benefits which has decreased in the third phase, confirms that independent oil palm plantation activities are not sustainable. So that after its productive period ends, these oil palm plants must be immediately replaced with new plants. However, smallholders can overcome the unsustainable conditions of independent oil palm plantations by preparing themselves to carry out replanting. So that the benefit-cost cycle of independent oil palm plantations will continue and the welfare of the independent smallholder community can be maintained sustainably.

The value of forests to date has almost no value and is ignored in conventional economic benefit analysis calculations. The loss of the benefits of forest values in economic analysis causes the value of forest resources to be low and neglected. So the extraction of forest wood becomes unsustainable and is made worse by the easy conversion of forests to other uses. If forest values are not included in the economic process, there will be more conversion and over-exploitation of forests and less preservation, conservation and management of natural forests (26).

The conversion of forest areas into areas for other uses, such as independent oil palm plantation activities, has been increasing rapidly in the last few decades. This indicates that considerations in determining the feasibility of forest area conversion in economic analysis are neglected. For this reason, the conversion of wood value is used as a benefit variable in this research. The conversion of the value of forest resources to wood that has been turned into independent oil palm plantations in a cost-benefit analysis can determine the benefit value of the value of forest wood for independent oil palm plantations.

A study took into account externalities in the form of environmental costs to see the feasibility of investing in oil palm plantations using a discount factor of 10 % and an analysis period of 28 years (22). The study included environmental cost externalities, but the approach used to calculate the net value of oil palm plantation activities was partial and did not include the indirect benefit aspects of oil palm plantation activities (22). In addition, this research does not analyze the net benefits obtained from maintaining forest areas from being converted into oil palm plantation areas by including opportunity costs from the financial aspect.

Another study , on Dayak communities in West Kalimantan and East Kalimantan, tried to evaluate and compare the net benefit value of the combined net value of rubber plantations between wood trees in forest areas compared to if the entire forest area was entirely used for rubber plantations (27). Even though this study uses comparative analysis, this study does not take into account opportunity benefits and opportunity costs for both forest ecosystem values and rubber plantation areas.

Not different from the 2 previous studies, the study (28) analyzed the cost-benefit of oil palm plantations and rubber plantations on converted land in Kampar Regency. In calculating the net value, this study tries to internalize the environmental cost-benefit of oil palm and rubber plantation activities. The results of this study produce a conclusion that oil palm plantation activities carried out on converted land are more feasible than rubber plantation activities.

Several of the studies presented previously are based on the concept of externalities, namely internalizing the various impacts of externalities on the environment as a component that is taken into account in analyzing the net value of an activity related to other uses of forest areas, such as for oil palm plantations and rubber plantations. Conceptually, externalities are benefits or costs borne by one party due to consumption or production activities carried out by another party (29). However, unfortunately, this study does not include the opportunity costs of lost opportunities to gain benefits from rubber plantations, if the converted land is used as an oil palm plantation area. Likewise, opportunity costs from lost opportunities to obtain benefits from oil palm plantations are not taken into account when analyzing the net benefit value of rubber plantation activities.

Until now, studies on oil palm plantations involving forest land conversion have been dominated by whether or not the investment is feasible based on financial aspects. As with existing feasibility studies, so far studies to look at the feasibility of investing in oil palm plantations on converted forest land have placed more emphasis on the financial feasibility aspect, and financial feasibility is very dominant in determining whether or not investment in oil palm plantations is feasible. Therefore, it is almost certain that using a financial feasibility approach, investment in oil palm plantations will result in the conclusion that it is feasible to implement. Although several studies try to include aspects potential impact of environmental damage caused by coconut plantation activities in palm oil, this analysis only looks at the investment possibility aspect of the activity of oil palm plantations (22, 27, 28). And very few discuss the financial feasibility of independent oil palm plantations.

This research aims to look at independent oil palm plantation activities that provide more financial benefits

than costs. In other words, the internalization of all externality components and opportunity costs to obtain forest benefits through the conversion of timber value has provided greater benefit value for independent oil palm plantations. In this study, the most basic aspect is that using the extended CBA instrument which includes a financial cost-benefit analysis will find the proportion of the benefit-cost value of independent oil palm plantations.

Conclusion

Regarding the value of benefits and costs of independent oil palm plantations, benefit-cost analysis (CBA) can be used as an indicator to determine whether or not independent oil palm plantations are feasible from a financial aspect. The benefit aspect, which is analyzed: is fresh fruit bunch (FFB) production and side benefits in the form of wood from area conversion, while in terms of cost, analyzed are: factory investment costs, non-factory investment costs, maintenance of mature crops, harvesting and transportation costs, processing costs, labor costs, general costs and depreciation. The calculation results in a total PV benefit value of IDR 1,409,358,175,296.54 and a total PV cost of IDR 44,466,996,210.44, positive NPV, B|C Ratio > 1, and IRR > 10 %, this shows that independent oil palm plantation activities in 2023 in Seruyan Regency are financially feasible to carry out. Therefore, it is important to consider the existence of independent oil palm plantations for the economy of Seruyan Regency in improving community welfare, as an alternative source of livelihood and economic development in Seruyan Regency.

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Authors' contributions

Each author in this paper contributes their own in writing: AF as the main researcher, providing proposals and conducting research, writing research results and discussions, participating in aligning the sequence and compiling manuscripts. The BJP participated in the design of the study. DB participates in sequence alignment. The DEA participated in its design and coordination. All authors have read and approved the final manuscript.

Compliance with ethical standards

Conflict of interest: Authors do not have any conflict of interests to declare.

Ethical issues: None.

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