



Financial Feasibility of Palm Sugar Business in Ogomoli Village, District Galang Tolitoli Regency

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Abstract: Sugar palm (*Arenga pinnata*) is a type of plant that has been known for a long time because almost all parts of this palm tree can be used and contribute to people's income. Sugar palm as an NTFP product has a very important role in the development of NTFPs in Indonesia can support the economy of rural communities and has a bright market and high demand. This research aims to determine the financial feasibility of the palm sugar business and determine community income from selling palm sugar in Ogomoli Village, Tolitoli Regency, Galang District. The method used in this research is the census method (which is studied in measuring variables), namely, all individuals in the population are enumerated (investigated or interviewed) as respondents. Results of research carried out in Ogomoli Village, Galang District, Tolitoli Regency. Took a sample of 44 people. Based on the research results above, the average income from the palm sugar business in Ogomoli Village, Galang District, Toli-Toli Regency obtained by respondents was equal to. Rp. 19.584.00/ year with an average NPV of Rp. 105.950.39, with a Net B/ C of Rp. 5.33. The IRR value is 11.50% and the payback period (PP) in the palm sugar business is the profit earned or returned in the sixth year.

Keywords: Diversity; Important value index; Invasive plants; Nature tourism park

Introduction

A forest is a unified ecosystem in the form of a land area containing biological natural resources and an environment dominated by trees, which cannot be separated from each other. Forests provide many benefits for human life. These benefits can be seen in terms of the environment, hydropower, economy, and health, such as regulating the forest climate as the lungs of the world, fighting global warming, storing groundwater, and coordinating water management (Mishra et al., 2021). NTFPs are a natural resource that is still abundant in Indonesia and their existence is used as a livelihood by the community (Pasaribu et al., 2021; Harbi et al., 2018); Zhu & Lo, 2021). Non-timber forest products are products sourced from forests other than wood in the form of vegetable objects such as rattan,

bamboo, gum, seeds, leaves, and medicines. According to the Minister of Forestry Regulation Number P.35/Menhut-II/2007 concerning Non-Timber Forest Products, these are biological forest products, both vegetable and animal, along with derivative and cultivated products except wood originating from the forest (Triawanati et al., 2022). The Ministry of Forestry has initiated a policy to encourage the development of NTFPs, namely efforts to utilize NTFPs in natural forests and efforts to utilize NTFPs in plantation forests.

The development of NTFPs in natural forests is difficult to implement because the forest management system regarding the use of NTFPs in natural forests and information on their types, capacity, and distribution is not yet available or is limited (Dou et al., 2023). In addition, natural forests tend to have different types of NTFPs, with low efficiency for each type (Nguyen et al.,

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2020; Mugido & Shackleton, 2018). Only a few types of high-potential NTFPs can be developed in such conditions, one of the NTFPs is sugar palm. Sugar palm (*Arenga pinnata*) is a type of plant that has been known for a long time because almost all parts of this palm tree can be used and contribute to people's income. Sugar palm as one of the NTFP products has a very important role in the development of NTFPs in Indonesia and can support the economy of rural communities and has a bright market and high demand, the economic value of sugar palm is that it has a high selling value (Azhar et al., 2021; Imran et al., 2023; Afghan et al., 2023). National sugar needs, both for household and industrial scale needs, are influenced by the increase in Indonesia's population.

On the other hand, Makkarenu et al. (2021) stated that domestic sugar needs, both for direct consumption and supply to industry, have not been able to be met, so it is supplied from imports. It is recorded that national sugar imports have increased, where in 2014 sugar imports amounted to 2.97 million tonnes to 5.03 million tonnes in 2018. As for previous research, this is an important milestone in exploring and understanding a scientific field. In addition, previous research also provides the knowledge necessary to conduct a comprehensive literature review, evaluate the results of previous research, and identify potential research directions. Therefore, previous research is not only a source of information, but also an important instrument in guiding the ongoing research process, ensuring that every step taken by researchers is aligned with the best knowledge and practices in their scientific discipline. The following is research that becomes a reference and reference for researchers in conducting research: Previous research was written by Mulyani et al. (2020), entitled "Financial Feasibility Analysis of Palm Flour Agroindustry (Case Study in Sumber Jaya Village, Cihaurbeuti District, Ciamdis Regency).

In this research, the management of sugar palm trees is managed into palm flour, where palm flour is flour which has an important role as a food ingredient, because of the various kinds of food that are popular (Akhtar et al., 2024; Islam et al., 2022). Seeing the prospects for palm flour products in terms of consumer needs is good, this business needs proper handling so that can develop and be highly competitive. Therefore, a financial feasibility analysis of palm flour agro-industry products is needed (Colpo et al., 2022; Wan-Mohtar et al., 2023; Martinez-Burgos et al., 2021). Then research from Lubis et al. (2022), entitled "Analysis of the Benefits Value of Sugar Palm Plants (*Arenga Pinnata* Merr) in Langi Village, Bontacani District, Bone Regency". Where in the lives of rural communities, especially in Langi Village, Bontocani District, Bone Regency, and South Sulawesi, sugar palm plants play a very important role

in the utilization of non-timber forest products. in the management of sugar palm plants into sap. Sugar palm plants are used as an ingredient for the production of palm sugar. Tuak and also broom sticks. The research results show that sugar palm plants have been processed into palm sugar, sap, and broom sticks. In Busetto et al. (2020) research entitled "Income Analysis and Feasibility of Palm Sugar Business in Gantarang Village, Sinjai Tengah District, Sinjai Regency". Where is the sampling technique (purposive sampling)? This data analysis and research technique is quantitative descriptive and business feasibility. Usman et al. (2023), entitled "Financial Feasibility Analysis of Palm Sugar Management Business in Rantau District, Aceh Tamiang Regency.

This research aims to determine the effect of price, production, and labor on palm sugar management business income in the Rantau sub-district, Aceh Tamiang Regency. The research carried out on this occasion focused on the economic evaluation stage in the financial feasibility of the palm sugar business. This study has not been carried out much and has not been widely published. The economic evaluation stage carried out in this study focused on the financial feasibility study (LeFevre et al., 2017; Ćetković et al., 2022). Financial feasibility analysis is a tool used to determine whether the idea of a business establishment can be realized or not based on its financial condition. Several parameters that are usually used in financial feasibility analysis are return on investment (ROI), net present value (NPV), internal rate of return (IRR), payback period (PBP), break-even point, and sensitivity analysis (Agusdin & Aidil, 2022). Meanwhile, small rural industry has an important meaning in efforts to reduce the level of poverty in rural areas other words, it is hoped that it can improve the welfare of rural communities.

Ogomoli Village, Tolitoli Regency has a small industry with local resources, namely the palm sugar manufacturing industry. Therefore, with final feasibility research, ways can be found to increase farmers' income and the quality of palm sugar products and help optimize the use of local resources to build regional economic development.

Method

The appointment of respondents was carried out deliberately (purposive sampling) considering that the respondents were quite familiar with the palm sugar industry. Data collection was carried out by direct observation or survey at the location. The type of data collected consisted of primary and secondary data.

Data Types and Sources

Primary data

Primary data was obtained from observations and direct interviews with respondents, and using a questionnaire. The variables that will be taken or measured in this research are: Labor: the number of workers who help during the palm sugar production process, starting from extracting sap water until it becomes palm sugar or brown sugar. Raw materials: the raw material used in making brown sugar is sap taken from palm trees to make palm sugar, calculated each time it is tapped (morning and afternoon collection). Transportation costs: the total costs incurred during the production of palm sugar, from the use of motorbikes, wood sawing machines, and other wood transportation costs. Production costs: how much production costs are incurred to make palm sugar in 1 production. Selling price of palm sugar: how much is the price of palm sugar per one seed or one kilo that farmers sell to wholesalers or buyers. Profit level: revenue minus costs used during the manufacture of palm sugar per month of the manufacturing or production process.

Secondary data

Secondary data taken from literature, village offices and related governments.

Observation Method

Field observation aims to obtain information that cannot be obtained through interview or questionnaire. Some reasons why research should include observations: Observation based on direct observation. Observation is the best way to verify beliefs that may be biased. Observation allows you to see and observe yourself, then record behavior and events as they occur in real situations. Observation allows researchers to record events in situations that relate directly to the information obtained from the data. Observations allow scientists to understand complex situations. Field observations provide an overview of the community of the research location, economic life, socio-culture. In addition, researchers studied the use and processing of sugar palm plants (*A. pinnata*).

Sampling Method

The sampling method in this research is to use the census method (which is studied in measuring variables), that is, all individuals in the population are enumerated (investigated or interviewed) as respondents. The respondents who make palm sugar are in Ogomoli Village, which is located in the five Ogomoli hamlets with 44 members. The location of this research is within the HPL (Land Management Rights) area. The production of sap water in the village comes from sugar

palm trees that live naturally in the forest area in Lima Ogomoli Hamlet.

Data analysis

The data obtained were primary and secondary data, and analyzed quantitatively. Data analysis for this research was carried out by analyzing income and business feasibility. Using quantitative analysis techniques, the income level of palm sugar producers.

Result and Discussion

Research carried out in Ogomoli Village, Galang District, Tolitoli Regency. took a sample of 44 people. The characteristics of respondents in this study include age, highest level of education, business status, number of family dependents, and length of business. Business costs can be divided into two, namely, fixed costs (Fixed Costs) and non-fixed costs (Variable Costs). Costs can generally be interpreted as costs that are relatively fixed in amount and continue to be incurred regardless of whether more or less output is produced (Friedl et al., 2023; Budinis et al., 2018). Fixed costs are costs that are incurred, or that do not affect the size of the production produced, or costs that are not dependent on changes in the production of an item. In sugar palm business activities, fixed costs are defined as equipment depreciation costs, including the purchase of machetes, ladders, axes, saws, pans, spatulas, sieves, buckets, basins, jars, hammers, ropes, ladles, baskets.

Table 1. Fixed Costs of Palm Sugar Business in Ogomoli Village

Description	Average Depreciation Value
Machete	60.23
Ladder	124.42
Saw	51.62
Wok	105.93
Spatula	66.13
Filter	5.96
Buckets	24.45
Basin	25.36
Jergen	7.51
Hammers	12.88
Rope	5.85
Dipper	5.87
Axes	63.50
Baskets	12.75
Stoves	300.00
Production houses	983.40
Total	1.767.96

Based on the results of the fixed cost calculation, which can be seen in table 1 above, the fixed costs are calculated the average is 1.767.96.

Variable costs

Variable costs are production process costs whose amounts always change professionally depending on the production produced, or costs that are directly connected to the amount of production produced (Aji & Syaputra, 2023). In the sugar palm farming business, variable costs include purchases such as lime, petrol, coconut oil, cigarettes and firewood (Mirza et al., 2022; Syahidah et al., 2023; Azhar et al., 2020).

Table 2. Variable Costs of Palm Sugar Business

Description	Average Value
Lime Series	15.00
Petrol	12.00
Coconut Oil	15.00
Cigarettes	30.00
Firewood	37.00
Average	21.80

Based on the results of the variable cost calculation in the table above, the variable costs required are 21.800.

Analysis of Palm Sugar Business Income in Ogomoli Village

Palm sugar business production is the total business production in one month calculated in units of kg or tonnes. Meanwhile, production costs are all expenditure costs incurred to produce a certain number of products in one production (Palo et al., 2020). Variable costs are costs incurred by palm sugar entrepreneurs in Ogomoli Village, Galang District, Tolitoli Regency whose nature changes according to the needs of palm sugar entrepreneurs. The variable costs in question are labor costs such as daily expenses for purchasing cigarettes and purchasing fuel, namely gasoline. Then other costs are costs that include the purchase of fuel for burning wood, namely matches, and the purchase of candlenuts and coconuts as a mixture for processing sap.

Meanwhile, fixed costs are costs incurred by palm sugar entrepreneurs in palm sugar business activities in Ogomoli Village, Galang District, Tolitoli Regency. The fixed costs in question are the costs of the building where the process of making palm sugar is carried out. As well as tools and equipment used to assist entrepreneurs in harvesting sap from sugar palm trees to processing such as tapping machetes, ordinary machetes, axes, saws, frying pans, spatulas, sieves, buckets, basins, jars, ropes, pickaxes, scoops and baskets. After getting the average results of variable costs and fixed costs, the costs are added up to find out the average total costs incurred by palm sugar entrepreneurs used in palm sugar production in Ogomoli Village, Galang District, Tolitoli Regency.

Revenue analysis is an analysis that aims to find out how much revenue palm sugar entrepreneurs get in a

month. Revenue from the palm sugar business can be obtained by multiplying the amount of palm sugar production by the price of palm sugar at that time of IDR 12.000 per/Kg. Then, after getting the average revenue and total costs, we can find out the average income of palm sugar entrepreneurs in a month.

Table 3. Average Palm Sugar Business Income in a Month in Ogomoli Village, Glang District, Tolitoli Regency

Description	Average Value (year/ Unit)
Machete	60.23
Ladder	124.42
Saw	51.62
Wok	105.93
Spatula	66.13
Filter	5.90
Buckets	24.45
Basin	25.36
Jergen	7.51
Hammers	12.88
Rope	5.85
Dipper	5.87
Axes	63.50
Baskets	12.75
Stoves	300.00
Production houses	983.40
Fixed costs variable costs	1.767.96
Lime series	15.00
Gasoline	12.00
Cigarette	30.00
Firewood	37.00
Variable cost	21.80
Total	1.767.96
Cost revenue	17.816.03

Based on Table 3, it shows that the average amount of palm sugar production obtained by palm sugar entrepreneurs in Ogomoli Village in a month is 132 kg. With the price of palm sugar that was valid that day, it was IDR 12.000 per/Kg. So, the average amount of revenue from the palm sugar business for 1 year that entrepreneurs get is IDR 19.584.00. Furthermore, costs consisting of variable costs and fixed costs are the entrepreneur's expenses in running a palm sugar business. Variable costs consist of the cost of purchasing quicklime, petrol, coconut oil, cigarettes and firewood with an average of IDR 21.800. So, the average amount of variable costs incurred by palm sugar entrepreneur respondents is IDR 21.800. Then fixed costs are costs incurred for equipment costs with an average of IDR 1.767.964. So, the average fixed cost of the palm sugar business in Ogomoli Village is IDR. 1.767.96 So the average total expenditure costs of palm sugar entrepreneurs in Ogomoli Village, Galang District, Tolitoli Regency calculated from the sum of variable costs and fixed costs is IDR 1.789.76.

Table 4. Feasibility of Palm Sugar Business for a Month in Ogomoli Village Galang, Tolitoli Regency

Description	Average cost
Receipts	19.584.00
Total cost R/C	1.767.964.11

Based on table 4 above, the feasibility analysis uses the R/C ratio for the palm sugar business in Ogomoli Village, namely dividing the total income from the palm sugar business for a month with an average of IDR 19.584.000 and the total expenditure costs of the palm sugar business with an average of IDR 1.767.96. Feasibility analysis using the R/C ratio for the palm sugar business in Ogomoli Village, namely dividing the total income from the palm sugar business for a month with an average of IDR 19.584.000 and the total expenditure costs of the palm sugar business with an average of IDR 1.767.964 and getting R /C is 11. So, the palm sugar business in Ogomoli village is profitable because R/C is equal to 11 so it worth pursuing.

Net Present Value (NPV)

Net present value analysis is used to calculate the value of an investment. The interest rate applied is calculated at 5% which has been determined in accordance with BI regulations, namely the nil interest rate is an interest rate that takes into account changes in the value or purchasing power of money from time to time. If the net cash flow in the future is greater than the current value, then the business is considered worth pursuing and conversely, if the business we are running is smaller than the current value, then the business is considered not profitable (Suprayogi & Barokah, 2019; Ball & Nikolaev, 2022; Noury et al., 2020). The calculation of the NPV value obtained in the palm sugar processing business in Ogomoli Village is shown in table 5.

Table 5. Net Present Value (NPV) of Palm Sugar Business for a Year in Ogomoli Village, Galang District, Tolitoli Regency

Years	Revenue	Cost	Net benefit	Df 5%	NPV
0		19.585.70	19.585.70	1.00	-19.585.70
1	19.584.00	15.386.10	4.197.90	0.95	14.653.42
2	19.584.00	15.386.10	4.197.90	0.90	13.955.64
3	19.584.00	16.878.00	2.706.00	0.86	14.579.85
4	19.584.00	15.386.10	4.197.90	0.82	12.658.18
5	19.584.00	17.878.99	1.705.01	0.78	14.008.65
6	19.584.00	16.878.00	2.706.00	0.74	12.594.62
7	19.584.00	15.386.10	4.197.90	0.71	10.934.61
8	19.584.00	15.386.10	4.197.90	0.67	10.413.91
9	19.584.00	16.878.00	2.706.00	0.64	10.879.70
10	19.584.00	17.685.66	1.898.33	0.61	10.857.46
NPV					105.950.39

The table above shows the Net Present Value (NPV) of the total cash inflows obtained from the palm sugar business in Ogomoli Village. With an interest rate of 5%, the NPV is calculated at Rp 105.950.39, indicating a positive value greater than the present value (investment). Economically, this demonstrates that the palm sugar processing business in Ogomoli Village, Galang District, Tolitoli Regency, is considered viable. Given the initial investment of Rp 19,585,700 in the palm sugar business, it is projected to yield a profit of Rp 105.950.391 over a 10-year period.

Benefit Cost Ratio (B/C)

Net benefit cost ratio (net B/C) is a comparison between income that has been presented at a present value and operating costs that have been at a present value so that information will be obtained on the investment that will be made so that we can know whether the business we are running is profitable or detrimental. If $B/C > 1$, then the investment we are carrying out is profitable (Barko et al., 2022; Chen et al., 2018; Weber & Wasner, 2023). Likewise, if the B/C value is < 1 , it can be said that the investment we are carrying out is detrimental. Furthermore, the B/C calculation can be seen in table 6.

Table 6. Calculation of the Benefit Cost Ratio (B/C) of Palm Sugar Business for a Year in Ogomoli Village, Galang District, Tolitoli Regency

Years	Net Benefit	Df 5%	Disc Benefit
0	-19.585.700	1.000	-19.585.700
1	4.197.900	0.952	14.653.429
2	4.197.900	0.907	13.955.646
3	2.706,000	0.864	14.579.851
4	4.197.900	0.823	12.658.183
5	1.705.010	0.784	14.008.656
6	2.706.000	0.746	12.594.623
7	4.197.900	0.711	10.934.614
8	4.197.900	0.677	10.413.918
9	2.706.000	0.645	10.879.709
10	1.898.339	0.614	10.857.462
Disc Net Benefit +			105.950.391
Disc Net Benefit -			19.585.700

Based on the table above, calculating the net B/C ratio, the net B/C ratio value is 5.33. A net B/C ratio value greater than 1 indicates that the palm sugar business in Ogomoli Village, Galang District, Tolitoli Regency is feasible to run, and the investment is said to be profitable for palm sugar entrepreneurs.

Internal Rate of Return (IRR)

Internal rate of return (IRR) is an interest rate calculation that equates the value of the initial investment. If the interest rate is greater, then the investment can be said to be feasible and if the interest

rate is small, then the investment is not profitable or not feasible. Next, the IRR calculation can be seen on table 7.

The IRR value of the palm sugar business in Ogomoli Village, Galang District, Tolitoli Regency from the calculation of NPV 1 (5%) and NPV 2 (10%) results

in an IRR of 11.50%, where this value is greater than the prevailing bank interest rate, which is 5% more. The large amount of bank interest indicates that the palm sugar business is worth running (Salama & Chikudate, 2023).

Table 7. Calculation of the Internal Rate of Return (IRR) for the Palm Sugar Business for a Year in Ogomoli Village, Galang District, Tolitoli Regency

TH	Revenue	Cost	Net Benefit	Df 5%	NPV 5%	Df 10%	NPV 10%
0	-	-19.585.70	-19.585.70	1.00	-19.585.70	1.00	19.585.00
1	19.584.00	15.386.10	4.197.90	0.95	14.653.42	0.90	64.589.30
2	19.584.00	15.386.10	4.197.90	0.90	13.955.64	0.82	64.589.30
3	19.584.00	16.878.00	2.706.00	0.86	14.579.85	0.75	45.671.86
4	19.584.00	15.386.10	4.197.90	0.82	12.658.18	0.68	64.589.30
5	19.584.00	17.878.99	1.705.01	0.784	14.008.65	0.62	30.483.85
6	19.584.00	16.878.00	2.706.00	0.74	12.594.62	0.56	45.671.86
7	19.584.00	15.386.10	4.197.90	0.71	10.934.61	0.51	64.589.30
8	19.584.00	15.386.10	4.197.90	0.67	10.413.91	0.46	64.589.30
9	19.584.00	16.878.00	2.706.00	0.64	10.879.70	0.42	45.671.86
10	19.584.00	17.685.66	1.898.33	0.61	10.857.46	0.38	33.573.38
					105.950.39		504.434.38

Payback Period (PP)

This is the time period for withdrawing capital issued for a specific investment in a business that we run in the form of present value so that if the time period for capital withdrawal is faster then the business can be said to be feasible (Suharti & Murwaningsari, 2024).

Table 8. Calculation of Payback Period (PP) for Palm Sugar Business for a Year in Ogomoli Village, Glang District, Tolitoli Regency

Year	Cos	Balance
0	-19585.70	-19585.70
1	19584	-15387.80
2	19584	-11189.90
3	19584	-8483.90
4	19584	-4286
5	19584	-2580.99
6	19584	125.01
7	19584	4322.91
8	19584	8520.81
9	19584	11226.81
10	19584	13125.149
		5.13

Payback Period (PP) for the palm sugar business in Ogomoli Village, Galang District, Tolitoli Regency, investment carried out by the business based on the Payback Priod calculation (10%) is obtained from years 0-10, so profits are found in year. Where in years 0-5 the value the value is still negative, while from years 6-10 the value is positive. This means that in that year we have made a profit from this business (Pranoto et al., 2022).

Conclusion

Based on the research results above, it can be concluded that the average income from the palm sugar business in Ogomoli Village, Galang District, Tolitoli Regency obtained by respondents is equal to. Rp. 19.584.00/year with an average NPV of Rp. 105.950.39, with a Net B/C of Rp. 5.33. The IRR value is 11.50% and the payback period (PP) in the palm sugar business is the profit gained or returned in the sixth year because from the first year to the fifth year it is still negative, while in the sixth year it is positive, meaning that in that year we have already made a profit from the business and the results of the financial analysis calculations can be concluded that the palm sugar business in Ogomoli Village, Galang District, Tolitoli Regency is feasible.

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Author Contributions

Conceptualization; A. S. A.; methodology; R.; validation; B. S.; formal analysis; H.; investigation; P. K.; resources; A. S. A.; data curation; R.; writing—original draft preparation; B. S.; writing—review and editing; H.; visualization; A. S. A.: All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

References

- Afghan, S., Ehsan Khan, M., Raza Arshad, W., Bukhsh Malik, K., & Nikpay, A. (2023). Economic Importance and Yield Potential of Sugarcane in Pakistan. In B. Kumar Ghimire (Ed.), *Sugarcane – Its Products and Sustainability*. IntechOpen. <https://doi.org/10.5772/intechopen.105517>
- Agusdin, R. P., & Aidil, N. N. (2022). Feasibility Analysis of Information Technology Investment Using Cost Benefit Analysis Method. *Telematika*, 19(2), 245. <https://doi.org/10.31315/telematika.v19i2.7598>
- Aji, I. M. L., & Syaputra, M. (2023). Viability and Growth of Sugar Palm (*Arenga pinnata* (Wurmb.) Merr.) on Various Seed Maturity Levels Using Natural Soaking Solutions. *Jurnal Multidisiplin Madani*, 3(5), 981-993. <https://doi.org/10.55927/mudima.v3i5.4105>
- Akhtar, S., Gupta, A. K., Varshney, A., Rawat, M., Choudhary, A., Kandpal, R., Jha, A. K., Mishra, S., Naik, B., Kumar, V., Ranjan, R., Rather, M. A., Rustagi, S., & Preet, M. S. (2024). Comprehensive review of sustainable utilization of *Arenga obtusifolia* Griff. As a food. *Journal of Agriculture and Food Research*, 15, 100945. <https://doi.org/10.1016/j.jafr.2023.100945>
- Azhar, I., Nasution, Z., Delvian, Agussabti, Aulin, F. R., & Sembiring, M. R. (2021). Utilization of sugar palm (*Arenga pinnata* Merr) by the communities around the PT Toba Pulp Lestari. *IOP Conference Series: Earth and Environmental Science*, 782(3), 032017. <https://doi.org/10.1088/1755-1315/782/3/032017>
- Azhar, I., Riswan, Risnasari, I., Aulin, F. R., & Muhdi. (2020). Feasibility analysis of sugar palm (*Arenga pinnata* Merr) by the people around Batang Gadis National Park area. *IOP Conference Series: Earth and Environmental Science*, 454(1), 012020. <https://doi.org/10.1088/1755-1315/454/1/012020>
- Ball, R., & Nikolaev, V. V. (2022). On earnings and cash flows as predictors of future cash flows. *Journal of Accounting and Economics*, 73(1), 101430. <https://doi.org/10.1016/j.jacceco.2021.101430>
- Barko, T., Cremers, M., & Renneboog, L. (2022). Shareholder Engagement on Environmental, Social, and Governance Performance. *Journal of Business Ethics*, 180(2), 777-812. <https://doi.org/10.1007/s10551-021-04850-z>
- Budinis, S., Krevor, S., Dowell, N. M., Brandon, N., & Hawkes, A. (2018). An assessment of CCS costs, barriers and potential. *Energy Strategy Reviews*, 22, 61-81. <https://doi.org/10.1016/j.esr.2018.08.003>
- Busetto, L., Wick, W., & Gumbinger, C. (2020). How to use and assess qualitative research methods. *Neurological Research and Practice*, 2(1), 14. <https://doi.org/10.1186/s42466-020-00059-z>
- Ćetković, J., Knežević, M., Lakić, S., Žarković, M., Vujadinović, R., Živković, A., & Cvijović, J. (2022). Financial and Economic Investment Evaluation of Wastewater Treatment Plant. *Water*, 14(1), 122. <https://doi.org/10.3390/w14010122>
- Charis, A., Alwi, A. Z., Arianti, L. A., & Hidayat, W. W. N. (2022). Identifikasi Populasi Pohon Aren (*Arenga pinnata*) sebagai Potensi Utama Produk Kreatif Desa Wisata Branjangan Ungaran. *Media Informasi Penelitian Kabupaten Semarang*, 4(1), 100-111. <https://doi.org/10.55606/sinov.v5i1.220>
- Chen, Y.-C., Hung, M., & Wang, Y. (2018). The effect of mandatory CSR disclosure on firm profitability and social externalities: Evidence from China. *Journal of Accounting and Economics*, 65(1), 169-190. <https://doi.org/10.1016/j.jacceco.2017.11.009>
- Colpo, L., Rabenschlag, D. R., De Lima, M. S., Martins, M. E. S., & Sellitto, M. A. (2022). Economic and Financial Feasibility of a Biorefinery for Conversion of Brewers' Spent Grain into a Special Flour. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(2), 79. <https://doi.org/10.3390/joitmc8020079>
- Dou, Y., Wu, J., Li, Y., Chen, X., & Zhao, X. (2023). Has the Development of the Non-Timber Forest Products Industry Achieved Poverty Alleviation? Evidence from Lower-Income Forest Areas in Yunnan Province. *Forests*, 14(4), 776. <https://doi.org/10.3390/f14040776>
- Friedl, G., Reichelstein, S., Bach, A., Blaschke, M., & Kemmer, L. (2023). Applications of the levelized cost concept. *Journal of Business Economics*, 93(6-7), 1125-1148. <https://doi.org/10.1007/s11573-023-01171-7>
- Harbi, J., Erbaugh, J. T., Sidiq, M., Haasler, B., & Nurrochmat, D. R. (2018). Making a bridge between livelihoods and forest conservation: Lessons from non timber forest products' utilization in South Sumatera, Indonesia. *Forest Policy and Economics*, 94, 1-10. <https://doi.org/10.1016/j.forpol.2018.05.011>
- Imran, S., Indriani, R., & Bakari, Y. (2023). Perbandingan nilai tambah dan peluang pasar gula aren dan gula semut. *Jurnal Agercolere*, 5(1), 1-9. <https://doi.org/10.37195/jac.v5i1.180>
- Islam, F., Saeed, F., Afzaal, M., Hussain, M., Al Jbawi, E., Armghan Khalid, M., & Asif Khan, M. (2022). Nutritional and functional properties of *Hyphaene thebaica* L . flour: A critical treatise and review. *International Journal of Food Properties*, 25(1), 1234-1245. <https://doi.org/10.1080/10942912.2022.2078836>
- LeFevre, A. E., Shillcutt, S. D., Broomhead, S., Labrique, A. B., & Jones, T. (2017). Defining a staged-based process for economic and financial evaluations of mHealth programs. *Cost Effectiveness and Resource*

- Allocation*, 15(1), 5.
<https://doi.org/10.1186/s12962-017-0067-6>
- Lubis, J., Maharani, E., & Khaswarina, S. (2022). Analysis of The Added Value of The Palm Sugar In Rambah District Rokan Hulu Regency. *Jambura Agribusiness Journal*, 4(1), 41-47.
<https://doi.org/10.37046/jaj.v4i1.15019>
- Makkarennu, M., & Rahmadani, I. (2021). Penerapan Business Model Canvas pada pengembangan Usaha Gula Aren: Studi Kasus Di Kabupaten Soppeng, Sulawesi Selatan. *JBMI (Jurnal Bisnis, Manajemen, Dan Informatika)*, 18(1), 1-18.
<https://doi.org/10.26487/jbmi.v18i1.13175>
- Martinez-Burgos, W. J., Bittencourt Sydney, E., Bianchi Pedroni Medeiros, A., Magalhães, A. I., De Carvalho, J. C., Karp, S. G., Porto De Souza Vandenberghe, L., Junior Letti, L. A., Thomaz Soccol, V., De Melo Pereira, G. V., Rodrigues, C., Lorenci Woiciechowski, A., & Soccol, C. R. (2021). Agro-industrial wastewater in a circular economy: Characteristics, impacts and applications for bioenergy and biochemicals. *Bioresource Technology*, 341, 125795.
<https://doi.org/10.1016/j.biortech.2021.125795>
- Mirza, D. F., Alindra, D. A., & Yunior, K. (2022). Increasing the productivity of palm sugar through high degree of crystalline sugar production. *International Journal of Science, Technology & Management*, 3(1), 1-5.
<https://doi.org/10.46729/ijstm.v3i1.433>
- Mishra, B., Kumar, P., Saraswat, C., Chakraborty, S., & Gautam, A. (2021). Water Security in a Changing Environment: Concept, Challenges and Solutions. *Water*, 13(4), 490.
<https://doi.org/10.3390/w13040490>
- Mugido, W., & Shackleton, C. M. (2018). Price Determination of Non-timber Forest Products in Different Areas of South Africa. *Ecological Economics*, 146, 597-606.
<https://doi.org/10.1016/j.ecolecon.2017.12.010>
- Mulyani, M. S., Rochdiani, D., & Setia, B. (2020). Analisis Kelayakan Finansial Agroindustri Tepung Aren (Studi Kasus di Desa Sumberjaya Kecamatan Cihaurbeuti Kabupaten Ciamis). *Jurnal Ilmiah Mahasiswa Agroinfo Galuh*, 7(3), 797.
<https://doi.org/10.25157/jimag.v7i3.4018>
- Nguyen, T. V., Lv, J. H., Vu, T. T. H., & Zhang, B. (2020). Determinants of Non-Timber Forest Product Planting, Development, and Trading: Case Study in Central Vietnam. *Forests*, 11(1), 116.
<https://doi.org/10.3390/f11010116>
- Noury, B., Hammami, H., Ousama, A. A., & Zeitun, R. (2020). The prediction of future cash flows based on operating cash flows, earnings and accruals in the French context. *Journal of Behavioral and Experimental Finance*, 28, 100414.
<https://doi.org/10.1016/j.jbef.2020.100414>
- Palo, E., Iaquaniello, G., & Mosca, L. (2020). Calculate the production costs of your own process. In *Studies in Surface Science and Catalysis* (Vol. 179, pp. 141-157). Elsevier. <https://doi.org/10.1016/B978-0-444-64337-7.00009-4>
- Pasaribu, G., Winarni, I., Gusti, R. E. P., Maharani, R., Fernandes, A., Harianja, A. H., Saragih, G. S., Turjaman, M., Tampubolon, A. P., Kuspradini, H., Lukmandaru, G., Njurumana, G. N., Sukito, A., Aswandi, A., & Kholibrina, C. R. (2021). Current Challenges and Prospects of Indonesian Non-Timber Forest Products (NTFPs): A Review. *Forests*, 12(12), 1743. <https://doi.org/10.3390/f12121743>
- Rayu, S. M. F., Akbar, M. I., & Rahma, A. S. (2023, September). Production process and its influence on the quality of palm sugar from various regions in South Sulawesi. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1230, No. 1, p. 012168). IOP Publishing.
<https://doi.org/10.1088/1755-1315/1230/1/012168>
- Salama, N., & Chikudate, N. (2023). Unpacking the lived experiences of corporate bribery: A phenomenological analysis of the common sense in the Indonesian business world. *Social Responsibility Journal*, 19(3), 446-459.
<https://doi.org/10.1108/SRJ-06-2021-0232>
- Suharti, S., & Murwaningsari, E. (2024). The Effect of Profit Persistency, Business Risk and Capital Structure on Earnings Return Coefficient with Good Corporate Governance as Moderating Variable. *Journal of Applied Business and Technology*, 5(1), 1-7. <https://doi.org/10.35145/jabt.v5i1.158>
- Suprayogi, B. S., & Barokah, Z. (2019). Does Comprehensive Income Predict Future Cashflow Better Than Net Income? *The Indonesian Journal of Accounting Research*, 22(02).
<https://doi.org/10.33312/ijar.469>
- Triawanawati, F., Tavita, G. E., & Oramahi, H. A. (2022). Pemanfaatan Tumbuhan Hasil Hutan Bukan Kayu Oleh Masyarakat Desa Mekar Raya Kecamatan Simpang Dua Kabupaten Ketapang. *Jurnal Hutan Lestari*, 9(4), 661.
<https://doi.org/10.26418/jhl.v9i4.52116>
- Usman, Y., & Yusmarni, Y. (2023). Analysis of Palm Sugar Production and Marketing from Nagari Talang Anau, Gunung Omeh District, 50 Kota Regency. *Journal of Social Research*, 2(6), 2144-2154.
<https://doi.org/10.55324/josr.v2i6.984>
- Wan-Mohtar, W. A. A. Q. I., Khalid, N. I., Rahim, M. H. A., Luthfi, A. A. I., Zaini, N. S. M., Din, N. A. S., & Mohd Zaini, N. A. (2023). Underutilized Malaysian Agro-Industrial Wastes as Sustainable Carbon

- Sources for Lactic Acid Production. *Fermentation*, 9(10), 905.
<https://doi.org/10.3390/fermentation9100905>
- Weber, I. M., & Wasner, E. (2023). Sellers' inflation, profits and conflict: Why can large firms hike prices in an emergency? *Review of Keynesian Economics*, 11(2), 183–213.
<https://doi.org/10.4337/roke.2023.02.05>
- Zhu, L., & Lo, K. (2021). Non-timber forest products as livelihood restoration in forest conservation: A restorative justice approach. *Trees, Forests and People*, 6, 100130.
<https://doi.org/10.1016/j.tfp.2021.100130>