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Feasibility Analysis of Industrial Waste Reduction Investment: Potential of Fruit Basket and Mat Products

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Abstract

Unprocessed waste has become a major issue in the world today. In 2021, Indonesia's environmental statistics recorded that approximately 24.5% of the total waste generated was not properly managed. One of the subjects of this issue is palm oil and textiles. Palm oil is a commodity that has experienced rapid growth, with a growth rate of 22.72% from 2017 to 2018. Meanwhile, textile waste is commonly found, especially in garment companies. This research aims to conduct an investment feasibility analysis from a financial perspective for industrial waste reduction, focusing on the business potential of fruit baskets made from palm oil waste and mats made from fabric scraps. The products generated from this waste can provide a sustainable solution while also generating financial profit. Therefore, a feasibility analysis was carried out for these two products. The investment feasibility analysis method is used to evaluate the potential success of these two waste-reducing products. The feasibility analysis involves calculating initial costs, revenue, operational costs, and cash flow projections over a certain period. Additionally, various risk factors and relevant assumptions are also considered in this analysis. The results of the feasibility analysis conclude that the fruit basket made from palm oil waste is more feasible than the mat made from fabric scraps.

Keywords fabric scrap mat; feasibility analysis; fruit basket; industrial waste; sustainable business.

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1. INTRODUCTION

Waste is one of the main challenges in environmental management in Indonesia. Improper waste management can contaminate soil, water, and air, and contribute to ecosystem degradation and human health problems (Mandataris, 2023). According to the 2021 Environmental Statistics data from the Badan Pusat Statistik (BPS), approximately 24.5% of total waste in Indonesia is not properly managed. This highlights the need for serious efforts in waste reduction and utilization, especially solid waste from industrial and household sectors.

Two types of waste that are abundant but not optimally utilized are palm oil fronds and textile waste. Palm oil fronds come from the palm oil plantation industry, which continues to grow in Indonesia. Palm oil commodities have become one of the main pillars of the national economy, with production reaching 42.88 million tons in 2018 and a planted area of 14.32 million hectares (Dumaria, 2021). However, the increase in production also results in a rise in organic waste such as palm fronds, which are often underutilized.

Meanwhile, textile waste is largely generated by the garment and textile industries and is considered an inorganic waste that is difficult to decompose. According to the Kementerian Perencanaan Pembangunan Nasional (Kementerian PPN), Indonesia generated around 2.3 million tons of textile waste in 2021, accounting for 12% of total household waste. This waste is often left to accumulate as residual waste that has no economic value (Parikesit, 2019).

Despite the growing awareness of waste-to-product innovation, existing studies tend to focus on large-scale industrial conversion technologies or generic recycling efforts, leaving a research gap in evaluating small-scale, community-based waste product ventures from an investment feasibility standpoint. There is limited literature analyzing how low-cost waste-based products, such as household items made from palm fronds or fabric scraps, perform in terms of financial viability using comprehensive investment criteria.

This study stems from the need to identify solutions for waste management based on economically valuable products using a grass-root approach. One of the approaches is to process palm fronds into fruit baskets and textile waste into doormats. Through a waste-to-product approach and financial feasibility evaluation, this study aims to compare these two product alternatives and determine which business option is the most financially viable.

Therefore, the objective of this study is to evaluate the investment feasibility of two types of waste-based household products—fruit baskets made from palm oil fronds and mats made from textile waste by calculating and comparing key financial indicators such as Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period (PBP), Profitability Index (PI), Benefit-Cost Ratio (B/C), and Break-Even Point (BEP). The focus of the research is on the environmental contribution as well as the entrepreneurial opportunities from utilizing abundant local waste that has yet to be optimally processed.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Waste Management and Circular Economy

Waste is a significant environmental issue, both in terms of pollution and its impacts on human health. Waste types are classified based on chemical compounds (organic, inorganic, hazardous), form (solid, liquid, gas), and sources (households, industry, agriculture, medical, etc.). The circular economy approach emphasizes minimizing waste and maximizing resource utilization by transforming waste into value-added products (Mandataris, 2023).

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2.2. Palm Oil Waste Utilization

One source of waste that has not been optimally utilized is waste from the plantation sector, particularly palm oil fronds. Palm oil is a strategic commodity with a significant contribution to the national economy. Palm oil production increased significantly from 34.94 million tons to 42.88 million tons between 2017 and 2018 (Dumaria, 2021). This increase in production also generates a considerable amount of organic waste, including palm fronds, which are generally discarded or used as low-value biomass.

According to Abdullah and Sulaiman (2013), palm frond waste has the potential to be processed into functional products such as fruit baskets. However, in practice, this potential has not been widely realized in small-scale industries or local businesses.

2.3. Textile Waste Utilization

Textile waste is another underutilized waste stream, especially from the garment and textile industries. Classified as inorganic and difficult to decompose, textile waste often ends up in landfills. According to Parikesit (2019), such waste is frequently treated as valueless trash. The Kementerian PPN (2021) reports that 2.3 million tons of textile waste are generated annually in Indonesia, contributing to approximately 12% of total household waste. This volume highlights a significant opportunity to explore fabric waste as a raw material for durable, low-cost products such as mats or rugs.

2.4. Financial Feasibility in Waste-Based Product Businesses

Previous studies have explored investment evaluation for conventional business models, yet there is still limited literature analyzing financial viability for waste-based product ventures, especially those operating at a household or micro-industry scale. Feasibility analysis using financial indicators such as Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period (PBP), Profitability Index (PI), Benefit-Cost Ratio (B/C Ratio), and Break-Even Point (BEP) provides a structured way to assess investment worthiness (Pasqual et al., 2013; Iankovyi, 2021; Pathak, 2024; Rahmawati & Drianti, 2024; Akhiroh et al., 2023).

Considering the low utilization of industrial waste, the availability of palm frond and textile scrap materials, and the opportunity to transform them into marketable products, this study adopts the following hypothesis:

H1: The utilization of palm oil fronds and textile waste into marketable household products is a financially viable business, as indicated by the following investment indicators: NPV ≥ 0, IRR ≥ 6%, Payback Period < minimum period, PI > 1, B/C Ratio > 1, and achieving BEP within a realistic timeframe.

3. RESEARCH METHOD

3.1. Data Collection

This study uses both primary and secondary data. Primary data were collected through direct interviews with eight selected sellers on online marketplaces, focusing on products similar to the fruit baskets and mats under study. The criteria for selection included seller activity, customer review count, and product similarity.

Secondary data were obtained from official websites, journals, and government reports. These included data on machine and tool prices, national economic indicators, and related case studies of waste product utilization. The collected data included:

a. Raw material prices (e.g., palm fronds, fabric scraps),
b. Production tools and equipment cost,
c. Daily production capacity,
d. Product pricing and market demand,
e. Operational and maintenance costs.

The aim was to build realistic assumptions for financial modeling and feasibility calculations.

3.2. Investment Evaluation Criteria

The investment evaluation in this study was done by analyzing the financial performance of a business based on cash flow criteria. The methods used include Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period (PBP), Profitability Index (PI), Benefit-Cost Ratio (B/C Ratio), and Break-Even Point (BEP). The formulation and indicators for each criterion are as follows:

1. Net Present Value (NPV)

   NPV is a method used to calculate the difference between the cost of investment expenditure and the present value based on net cash inflows (Pasqual et al., 2013). The formula for calculating NPV is as follows:

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

   Where:

   R_t : revenue in year *t*

   C_t : cost in year *t*

   r : discount rate

   I : initial investment

   Investment feasibility criteria based on NPV:

   a. Investment is feasible if NPV ≥ 0 (zero).
   b. Investment is not feasible if NPV < 0 (zero).

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2. Internal Rate of Return (IRR)

   IRR is an indicator of the efficiency level of an investment. IRR is also known as a method to calculate the interest rate of an investment, equating the investment value and current expenditure based on net future cash inflows. Therefore, the IRR value shows an equivalent cost/expenditure value equal to the equivalent income value (Iankovyi, 2021). IRR is the rate *r* at which:

   $$\text{NPV} = 0 = \sum_{t=1}^{n} \frac{R_t - C_t}{(1+r)^t} - I \quad (2)$$

   IRR is computed through interpolation between two discount rates resulting in positive and negative NPV.

3. Payback Period (PBP)

   PBP is a method used to measure the length of time required to recover the investment from the annual cash inflows generated by the investment project. The unit of measurement is time. The faster or shorter the period required to recover the investment, the better the investment (Al Rasyid, 2016). The formula for calculating PBP is as follows:

   $$\text{Payback Period} = \frac{\text{Initial Investment}}{\text{Annual Net Cash Inflow}} \quad (3)$$

   Investment feasibility criteria based on PBP:

   a. Investment is feasible if PBP < minimum payback period.

   b. Investment is not feasible if PBP ≥ minimum payback period.

4. Profitability Index (PI)

   This method is used to compare the current investment value plus the future net cash flows with the current investment value. An investment will be considered feasible if PI > 1, and the higher the PI value, the better the investment (Pathak, 2024). The formula for calculating the PI is as follows:

   $$PI = \frac{Present\ Value\ of\ Future\ Cash\ Flows}{Initial\ Investment} \quad (4)$$

5. Benefit-Cost Ratio (B/C Ratio)

   This method is used to compare various risk reduction actions by estimating costs and benefits, providing a measure for decision-making. It can be used to assess the efficiency of an investment. The B/C Ratio compares the total economic benefits of an investment with the total cost of the investment. This is used to determine whether an investment is profitable or not. The analysis compares benefits to costs, and the larger the benefit-to-cost ratio, the more profitable the investment will be (Rahmawati & Drianti, 2024). B/C Ratio is expressed as a ratio, where a value greater than 1 indicates that the expected benefits of the investment outweigh the costs incurred. The higher the B/C Ratio, the better the investment (Yi et al., 2020). The formula for B/C Ratio is as follows:

   $$\text{B/C Ratio} = \frac{Total\ Present\ Value\ of\ Benefits}{Total\ Present\ Value\ o\ Costs} \quad (5)$$

6. Break Even Point (BEP)

BEP is defined as the break-even point or the state of an investment when it neither makes a profit nor incurs a loss. This method analyzes the minimum number of units sold to reach the break-even point or avoid losses, which is known as BEP (Units). Additionally, this method also looks at the sales value of the units sold, to determine the minimum sales value required to reach the break-even point, referred to as BEP (Revenue) (Akhiroh et al., 2023). The formulas used are as follows:

$$\text{BEP (Unit)} = \frac{Fixed\ Cost}{(Selling\ Price\ per\ unit - Variable\ Cost\ per\ unit)} \quad (6)$$

$$\text{BEP (Revenue)} = BEP\ (Units) \times Selling\ Price\ per\ unit \quad (7)$$

7. Selection of the Chosen Business Alternative
   The selection of the chosen business alternative is made by considering the results of calculations from several investment feasibility analysis methods above. The selected business alternative will be considered by comparing the investment feasibility analysis results of both alternatives. The chosen alternative will show the highest NPV, the smallest Payback Period, the highest IRR (≥ 6%), the highest Profitability Index, and the highest B/C Ratio.

These metrics are chosen because they provide a comprehensive picture of the financial performance of each business alternative. For example, NPV is used to determine the present value of net profits generated by the project, IRR shows the relative efficiency of the project, PBP measures the speed of capital recovery for small-medium enterprises, PI shows the effectiveness of investment relative to the value produced, B/C Ratio compares the benefits and costs, and BEP shows the minimum break-even point to avoid losses. The selection of these six methods is relevant for comparing two products that have different costs, market potential, and production scales.

4. RESULTS AND DISCUSSIONS

4.1. Funding and Capital Requirements

The funding and capital required for this report come from previously received costs for production and operational needs. The costs involved include fixed costs, raw material costs, variable costs, depreciation costs, and investment costs. These result in the cost of goods sold for each product. Fixed costs include labor costs and operational expenses. Raw material costs cover the expenses of purchasing the necessary materials for the production process. Variable costs include supporting costs used in the production process. Depreciation costs are associated with the wear and tear of machines and other equipment used in the production process. Meanwhile, investment costs involve the capital required to start the production process. Below is an explanation of the funding requirements for each product. A summary of the investment costs for each business is shown in Table 1.

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Table 1.

Financial Summary of Each Business

No	Description	Fruit Basket (Rp)	Fabric Scrap Mat (Rp)
1	Investment Costs	51,103,000	110,131,440
2	Inventory Value	37,968,000	30,240,000
3	Depreciation	3,426,800	2,500,000
4	Operational Costs	58,084,900	97,631,440

4.2. Production Capacity

The annual production capacity for each product (business alternative) is determined by multiplying the daily production quantity by the number of working days in a year. The target production per day for the fruit baskets is 20 pieces per day. This number is based on a market share of 10% from similar competitors in Central Java and Yogyakarta. Meanwhile, the fabric scrap doormats target production is 30 pieces per day, based on a market share of 15% from similar competitors in Klaten Regency. There is a difference in business management for the fruit basket, which operates with 6 working days (with Sunday off), while the fabric scrap doormat operates with a shifting system for 7 working days, as explained in Table 2.

Table 2.

Production Capacity of Each Business

Business Type	Main Materials	Capacity (pcs per year)	Working Days
Fruit Basket	1. Palm Fronds 2. Wood Paint 3. Fox Glue 4. Spray Paint Machine 5. Cutter Knife 6. Gloves 7. Assembly Table 8. Chairs 9. Drying Wire	6,260	313
Fabric Scrap Mat	1. Fabric Scraps 2. Sewing Thread 3. Sewing Machine 4. Needles	10,800	360

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4.3. Annual Revenue Projection

The annual revenue projection is part of the calculation of the Cost of Goods Sold (COGS). The annual revenue is obtained by multiplying the selling price per unit by the number of units produced in a year. This annual revenue will be used for investment feasibility analysis. Table 3 shows the revenue projection for the business alternatives, Fruit Basket and Fabric Scrap Mat.

Table 3.

Annual Business Revenue Projections

Business Type	Revenue (Rp)
Fruit Basket	93,790,112
Fabric Scrap Mat	162,000,000

4.4. Cash Flow

Table 4 shows the cash inflows and outflows for both business alternatives in this study. The cash flow presented in Table 4 reflects the difference between the annual revenue and expenses, accumulated over the years.

Tabel 4.

Net Cash Flow

Period	0 (Rp)	1 (Rp)	2 (Rp)	3 (Rp)	4 (Rp)	5 (Rp)
Fruit Basket	-51,103,000	-11,868,488	27,366,024	66,600,536	105,835,048	146,409,560
Fabric Scrap Mat	-110,131,440	-43,328,157	23,475,124	90,278,406	157,081,688	224,384,971

4.5. Evaluation Characteristics

After performing the investment feasibility analysis for each alternative using several methods, the results will be compared, and the alternatives will be ranked to determine which is the better choice based on each investment evaluation method. Table 5 shows the comparison of each product.

Tabel 5.

Investment Feasibility Analysis Summary

No	Description	Fruit Basket	Fabric Scrap Mat
1	NPV	Rp115,154,147	Rp171,617,634.72
2	PBP	1.30 Years	1.65 Years
3	IRR	72.54%	53.90%
4	PI	3.30	2.56
5	B/C Ratio	1.409	1.33
6	BEP (Unit)	2.853	2.089

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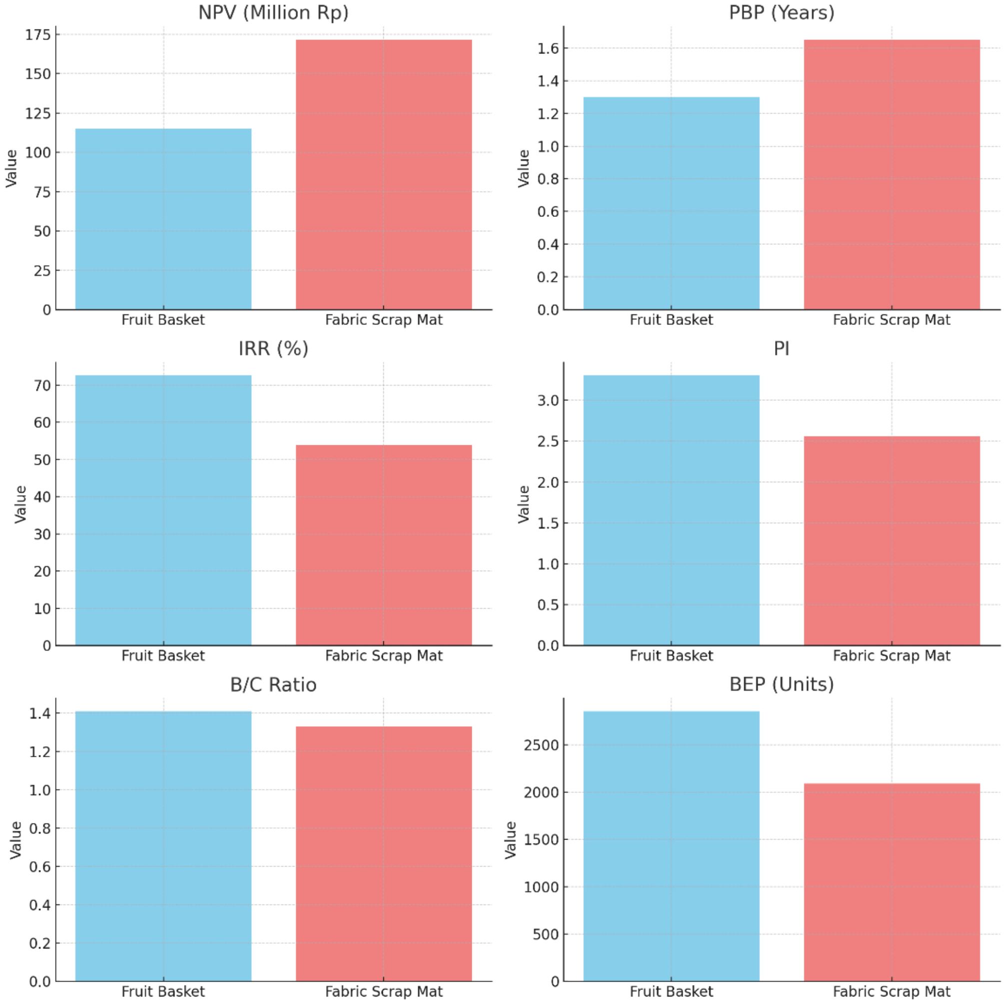
Figure 1.

Comparison of Feasibility Indicators for Two Waste-Based Products



Based on Figure 1, the fruit basket product demonstrates stronger investment performance across several key indicators compared to the fabric scrap mat. The Internal Rate of Return (IRR) for the fruit basket reaches 72.54%, which is significantly higher than the mat's IRR of 53.90%. This indicates that, relative to the initial capital invested, the fruit basket business is able to generate returns more efficiently. This is primarily due to its lower operational costs and smaller initial investment, which enhance capital productivity.

Although the Net Present Value (NPV) of the fabric scrap mat is higher (Rp171,617,634.72) than that of the fruit basket (Rp115,154,147), this is attributed to its larger cash inflows over time. However, the higher NPV comes at the cost of greater upfront investment and operational complexity, such as equipment and rental expenses. The Payback Period (PBP) further reinforces the fruit basket's advantage in efficiency, requiring only 1.30 years to recover its initial investment, compared to 1.65 years for the mat. A shorter PBP implies a faster return on investment and reduced financial risk.

In terms of the Profitability Index (PI), the fruit basket scores 3.30, higher than the mat's 2.56, suggesting that each rupiah invested in the fruit basket yields greater value. Similarly, the Benefit-Cost

(B/C) Ratio of the fruit basket (1.409) exceeds that of the mat (1.33), indicating better cost-benefit performance. However, the Break-Even Point (BEP) in units for the fruit basket is 2,853, which is higher than the mat's 2,089. This means the fruit basket must sell more units to reach a point where costs are fully covered. While this indicates a higher sales threshold, it does not offset the overall superior performance of the fruit basket in other investment criteria.

5. CONCLUSION

Based on the investment feasibility analysis, it can be concluded that the fruit basket business alternative, which utilizes palm fronds, is more financially feasible than the fabric scrap mat alternative. This conclusion is supported by superior performance in four key indicators, namely Payback Period (PBP), Internal Rate of Return (IRR), Profitability Index (PI), and Benefit-Cost Ratio (B/C Ratio). Although the fabric scrap mat shows a higher Net Present Value (NPV) and a lower Break-Even Point (BEP) in units, the overall investment efficiency and capital recovery speed favor the fruit basket venture.

Both products, however, demonstrate strong alignment with circular economy principles by transforming underutilized industrial waste into value-added household items. These initiatives not only reduce environmental burdens but also present opportunities for micro-enterprises and local economic development. Despite these promising outcomes, the study has several limitations. Key external variables such as tax obligations, potential government subsidies, and regulatory compliance costs were not included in the financial analysis. Additionally, the market share estimates were based on simplified assumptions without empirical consumer demand validation. Therefore, the following actionable recommendations are proposed:

1) Incorporate fiscal variables (e.g., corporate tax, subsidies, incentives from waste-to-product programs) into future financial models (Ahmad and Satrovic, 2023), to obtain a more realistic investment projection.
2) Develop community-based production models (Sun, 2024), especially for fruit baskets, to promote grassroots entrepreneurship and reduce dependency on industrial-scale infrastructure.
3) Explore partnerships with local governments to access technical assistance, funding support, and distribution networks for sustainable product ventures (Li & Wang, 2024).
4) Conduct life cycle assessments (LCA) in future studies to quantify the environmental impact reduction of each product (Camilis & Goralczyk, 2013), strengthening their value proposition in sustainability-focused markets.

With these steps, future initiatives can enhance both the economic viability and environmental impact of industrial waste utilization projects, turning them into scalable and inclusive solutions for sustainable development.

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Reference

Abdullah, N., & Sulaiman, F. (2013). The oil palm wastes in Malaysia. In *Biomass now-sustainable growth and use*. IntechOpen.

Afif, Y. K., Affan, S., Renaldi, M., & Lubis, M. H. (2023). Sosialisasi Pemanfaatan Limbah Lidi Kelapa Sawit Menjadi Inovasi Kerajinan Bernilai Jual Bagi Masyarakat di Desa Makmur Kecamatan Sei Lepan Kabupaten Langkat. *Fusion: Jurnal Pengabdian kepada Masyarakat*, 24-28.

Ahmad, M., & Satrovic, E. (2023). How do fiscal policy, technological innovation, and economic openness expedite environmental sustainability?. *Gondwana Research*, *124*, 143-164.

Akhiroh, P., Dinata, J. M., & Nugroho, E. (2023). The feasibility of broiler farming in a partnership model. In *BIO Web of Conferences* (Vol. 81, p. 00020). EDP Sciences.

Al Rasyid, M. N. (2016). Persepsi Patner Strategis Terhadap Kualitas Layanan (Studi Kasus Pada Jasa Laundry Adi Pratama Palembang). *Orasi Bisnis: Jurnal Ilmiah Administrasi Niaga*, *16*(2).

De Camillis, C., & Goralczyk, M. (2013). Towards stronger measures for sustainable consumption and production policies: proposal of a new fiscal framework based on a life cycle approach. *The International Journal of Life Cycle Assessment*, *18*(1), 263-272.

Dumaria, D., Adrian, B., Dandi, D., Ananda, I., Canda, P., Kanida, S., & Soehardi, F. (2021, August). Pemanfaatan limbah lidi kelapa sawit menjadi inovasi kerajinan bernilai jual. In *SENKIM: Seminar Nasional Karya Ilmiah Multidisiplin* (Vol. 1, No. 1, pp. 351-355).

Iankovyi, V. (2021). Comparative analysis of the most important economic criteria for the company's investment projects. *Socio-Econ. Res. Bull*, *2*, 125-141.

Li, G., & Wang, X. (2024). Can green fiscal policy improve green total factor carbon efficiency? Evidence from China. *Journal of Environmental Planning and Management*, 1-30.

Mandataris, M., Karneli, O., Pakpahan, S., Safitri, S., Ruzikna, R., Othman, L., & Ibrahim, M. (2023). Limbah Plastik Menjadi Industri Kreatif Bernilai Ekonomi Sebagai Kreativitas dan Inovasi Mahasiswa Prodi Administrasi Bisnis. Madaniya, 4(3), 1273-1280.

Newnan, D. G., Eschenbach, T. G., & Lavelle, J. P. (2004). Engineering Economic Analysis. Oxford University Press.

Parikesit, D., Prabowo, F. H., Suryo, R., Prapmanto, B., & Km, J. A. (2019). Perancangan Unit Weaving Pada Mesin Anyam Keset Dengan Transmisi Program Studi Teknik Perancangan Mekanik dan Mesin, Politeknik ATMI Surakarta Abstrak Mesin anyam keset berfungsi untuk menganyam kain perca menjadi keset. Input utama mesin anyam keset be. 1–16.

Pasqual, J., Padilla, E., & Jadotte, E. (2013). Equivalence of different profitability criteria with the net present value. *International Journal of Production Economics*, *142*(1), 205-210.

Pathak, A. N. (2024). Evaluating the Financial Performance of Bharti Airtel: An Analysis of WACC, NPV, IRR, Profitability Index, and Payback Period. *International Journal of Innovative Science and Research Technology (IJISRT)*.

Rahmawati, E., & Drianti, A. (2024). Financial feasibility of swallow business in Selerong Village, Kutai Kartanegara Regency. *World Journal of Advanced Research and Reviews*, *22*(3), 931-937.

Sun, T. (2024). Role of inclusive finance on oil resource production targets: how fiscal pressures influence natural resources policy and green recovery in Gulf countries?. *Resources Policy*, *88*, 104337.

Yi, Z., Burton, H. V., Shokrabadi, M., & Issa, O. (2020). Multi-scale cost-benefit analysis of the Los Angeles Soft-Story Ordinance. *Engineering Structures*, *214*, 110652.

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