

INVESTMENT FEASIBILITY ANALYSIS AND ITS IMPACT ON THE PROFITABILITY OF COFFEE SMES (CASE STUDY: INVESTMENT IN ROASTING EQUIPMENT AND SUSTAINABLE PACKAGING)

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Abstract

This community engagement initiative focuses on enhancing the financial literacy of coffee Small and Medium Enterprises (SMEs) by introducing investment feasibility analysis. The core problem addressed is the low profitability of SMEs that sell unprocessed (green) beans and their difficulty in accessing premium markets. This program analyzes the feasibility of two strategic investments: acquiring in-house roasting equipment and adopting sustainable packaging. The methodology involved participatory workshops with 20 coffee SMEs in the West Java region, where participants were trained to use financial metrics such as Payback Period (PP), Net Present Value (NPV), and Internal Rate of Return (IRR) to evaluate these investments. The results of the financial modeling show that the combined investment is highly feasible, with a calculated Payback Period of 2.5 years and an IRR of 28%, significantly exceeding the typical cost of capital. SMEs that adopted the strategy reported an average profitability increase of 37%. This program concludes that strategic investment

in value-addition technology and sustainable branding is a viable and critical pathway for enhancing the competitiveness and profitability of coffee SMEs.

Keywords: *Investment Feasibility, Profitability, Coffee SMEs, Roasting Equipment, Sustainable Packaging, Financial Literacy*

INTRODUCTION

Indonesia's coffee sector is a vital component of the national economy, positioning the country as one of the world's top coffee producers. This sector is predominantly driven by Small and Medium Enterprises (SMEs), which include millions of smallholder farmers and small-scale processors ([BPS, 2023](#)). These SMEs are crucial for rural employment and contribute significantly to non-oil and gas export revenues. Despite their importance, a vast majority of these enterprises operate at the primary production level, focusing on selling raw, unprocessed green beans. This position in the value chain captures only a minimal fraction of the final market price, leaving the most significant profit margins to international traders, roasters, and retailers ([Neilson, 2008](#)). The primary bottleneck to increasing SME profitability is the lack of value-added processing capabilities, specifically in-house roasting. The transition from selling green beans (a commodity) to selling roasted coffee (a branded product) represents the single largest jump in value within the coffee supply chain. By roasting their own beans, SMEs can create a unique brand identity, control product quality, and access higher-margin markets, such as direct-to-consumer (D2C) sales, local cafés, and specialty retailers. However, the perceived high capital cost of industrial-grade roasting equipment acts as a significant deterrent. Many SME owners view this as an insurmountable financial barrier rather than a strategic investment ([Tambunan, 2011](#)). Simultaneously, the global and domestic consumer markets are undergoing a profound shift toward sustainability. Modern consumers are increasingly environmentally conscious and

demand transparency in the products they purchase. This trend is particularly strong in the coffee industry, where "sustainable" and "eco-friendly" are powerful purchasing drivers. Adopting sustainable packaging (e.g., compostable bags, recycled materials) is no longer a niche preference but is rapidly becoming a prerequisite for accessing premium markets. For coffee SMEs, this presents both a challenge (higher material costs) and a significant opportunity to differentiate their brand and justify a premium price point.

The convergence of these two challenges—the need for technological investment (roasting) and the need for market-access investment (packaging)—is compounded by a pervasive lack of financial literacy. Based on national surveys, many micro-entrepreneurs make financial decisions based on intuition or available cash flow rather than on formal analysis ([OJK, 2022](#)). They often lack the skills to calculate long-term returns, assess risk, or understand concepts like Net Present Value (NPV) or Internal Rate of Return (IRR) ([Rustan, 2021](#)). This knowledge gap prevents them from confidently securing financing or making strategic investments that could fundamentally transform their businesses.

This community engagement program was designed to bridge this critical gap. The primary objective was to empower coffee SME owners with the practical financial skills to conduct their own investment feasibility analysis. By focusing on a tangible case study—investing in a small-batch roaster and sustainable packaging—this initiative aimed to (1) model the financial viability of such investments, (2) train SMEs to use these analytical tools, and (3) measure the subsequent impact on profitability. This paper presents the methods, findings, and

implications of this program, offering a practical model for SME empowerment.

METHOD

The implementation of this engagement program was designed using a participatory and educational approach, ensuring that the methods were directly applicable to the SMEs' daily operations.

1) Target Audience and Location

The program targeted 20 coffee SMEs located in the Pangalengan region of West Java, an area renowned for its high-quality Arabica coffee production. Participants were selected based on their operational scale (micro to small), their primary business model (selling green beans), and their expressed interest in scaling up their operations. Data was initially gathered through collaboration with local coffee cooperatives.

2) Phase 1: Financial Model Development

Prior to the workshop, the engagement team developed a standardized financial feasibility model using Microsoft Excel. This model was based on market-rate data for:

- a. Capital Expenditure (CapEx): The cost of a 5kg capacity coffee roasting machine.
- b. Operational Expenditure (OpEx): Increased costs for electricity, labor, and sustainable packaging materials (compostable bags) versus traditional plastic-foil bags.
- c. Revenue Projections: The price difference between selling green beans, roasted beans (wholesale), and roasted beans (retail).
- d. Financial Metrics: The model was built to automatically calculate Payback Period (PP), Net Present Value (NPV), and Internal Rate of Return (IRR).

3) Phase 2: Educational Workshop and Simulation

The core of the program was a two-day intensive workshop, which included:

- a. Financial Literacy Training: A simplified module on "Finance for Non-Financial Managers," covering cash flow, profit vs. loss, and the time value of money.
- b. Investment Analysis Module: Training participants on the purpose and interpretation of PP, NPV, and IRR.
- c. Simulation: Participants used the pre-built Excel model to run "what-if" scenarios. They could change variables like the initial investment cost, the selling price of their roasted coffee, or the cost of packaging to see the immediate impact on feasibility.
- d. Case Study Discussion: SMEs that had already partially invested in roasting shared their real-world challenges and successes.

4) Phase 3: Post-Intervention Evaluation

Evaluation was conducted through two methods:

- a. Pre- and Post-Workshop Surveys: To measure the change in participants' understanding of financial feasibility concepts.
- b. Six-Month Follow-Up: The team conducted follow-up interviews with a subset of 8 participants (including 4 who proceeded with the investment) to gather qualitative feedback and collect quantitative data on changes in their sales volumes and profit margins.

RESULT AND DISCUSSION

The program yielded significant and measurable results in both financial literacy and tangible business performance. The initial pre-workshop survey confirmed the findings from national studies ([OJK, 2022](#)); only 10% of participants (2 out of 20) had ever heard of Net Present Value (NPV), and none had ever used it to make a business decision. 90% of participants stated that their primary barrier to investing in a roaster was "lack of capital,"

without having calculated the potential return on that capital. The post-workshop survey showed a dramatic improvement, with 85% of participants able to correctly define Payback Period and explain why a positive NPV is desirable.

The core result of the financial modeling phase was the demonstration of clear financial viability for the proposed investment. Using conservative market data (an initial investment of IDR 80 million for the roaster and packaging transition, a 10% discount rate), the model projected a Payback Period (PP) of 2.5 years. The Net Present Value (NPV) over a 5-year forecast period was calculated at IDR 120 million, indicating a highly profitable venture. Furthermore, the Internal Rate of Return (IRR) was 28%. This figure was the most impactful for the SMEs; when compared to the local bank's micro-loan interest rate (KUR) of 6%-9%, it became clear that borrowing money for this investment was a financially sound decision.

The six-month follow-up provided concrete evidence of the program's real-world impact. Four of the 20 participants successfully secured financing and implemented the investments in roasting equipment and sustainable packaging. Data collected from these four SMEs showed their average profit margin increased from a baseline of 15% (selling green beans) to 37% (selling branded, roasted beans). This substantial increase was driven by two primary factors: (1) capturing the entire value chain margin by processing their own beans, and (2) successfully implementing a 10%-15% price premium for their "sustainably packaged" product, which gained them entry into several premium cafes in Bandung and Jakarta that mandated eco-friendly suppliers.

Discussion

The quantitative results are strongly supported by the qualitative feedback, which highlighted a crucial psychological shift among the participants. The act of investing in roasting equipment transformed the participants' identity from "farmers" or "bean sellers" to "producers"

and "brand owners." This aligns with research on value chain upgrading ([Neilson, 2008](#)), where technological adoption is a key enabler for moving from a commodity-based to a product-based business model. One participant noted, "The roaster is not just a machine; it is our brand. We finally have control over our final product and our story." This sense of ownership and empowerment is a critical, non-financial outcome that enables SMEs to move from being price-takers to price-setters in a competitive market.

Despite the overwhelmingly positive financial models and early adopter success, the discussions also revealed significant structural challenges that could hinder widespread adoption. The primary obstacle identified by participants was not access to finance (which the feasibility study helped secure), but the supply chain for sustainable packaging. SMEs reported that while they could find eco-friendly bags, purchasing them at low volumes (Minimum Order Quantities or MOQs) was prohibitively expensive compared to large corporations. This suggests a market failure that needs addressing, possibly through cooperative purchasing. Furthermore, several SMEs noted that while they now had the product (roasted coffee) and packaging, they lacked the skills in digital marketing and branding to effectively reach D2C customers online, identifying a clear need for future training modules.

CONCLUSION

This community engagement program successfully achieved its primary objective: enhancing the financial literacy of coffee SMEs to drive profitability. The initiative confirmed that a combined investment in roasting equipment and sustainable packaging is not only financially feasible but highly lucrative, with a calculated IRR of 28% and a Payback Period of 2.5 years. Early adopters validated this model, reporting an average profit margin increase from 15% to 37%. Critically, the program bridged a significant knowledge gap, shifting participants' decision-making from intuition to a data-driven, investment-focused approach.

The financial implications of these findings are profound for the SME sector. The 28% IRR starkly contrasts with typical micro-loan interest rates (KUR) of 6-9%. This demonstrates that leveraging debt for this specific capital expenditure is not a burden, but a powerful growth strategy. The feasibility model provided participants with the concrete evidence needed to confidently approach financial institutions, transforming a perceived "insurmountable cost" into a well-defined, profitable investment.

Strategically, the investment represents a fundamental leap up the coffee value chain. By transitioning from selling a raw commodity (green beans) to a branded, finished product (packaged roasted coffee), SMEs seize control over quality, branding, and pricing. This initiative fostered a crucial psychological shift, empowering participants to see themselves as "brand owners" rather than just "farmers." This change in identity is essential for building long-term brand equity and moving from a position of being a price-taker to a price-setter.

Suggestions Based on these conclusions, we propose suggestions for key stakeholders. For Financial Institutions, there is a clear opportunity to develop "Green Technology" micro-loan packages. These products should be specifically tailored for SMEs purchasing value-adding equipment (like roasters) and sustainable materials, recognizing the high, verifiable IRR of such investments. For Government and Cooperatives, we strongly recommend facilitating the creation of SME clusters for the bulk-purchasing of sustainable packaging. This would directly address the prohibitive high-cost, low-volume (MOQ) barrier identified by participants.

For Future Engagement Programs, the results highlight the need for a holistic, sequential approach. After mastering financial feasibility, SMEs require follow-up modules in digital marketing, e-commerce, and brand storytelling. This ensures they not only create a high-value product but also possess the skills to market and sell it effectively to premium, direct-to-consumer (D2C) audiences.

Finally, for the SMEs participants themselves, the feasibility model should be adopted as a living document. We suggest they continue to use and update this tool annually. It should guide future strategic decisions, such as analyzing the ROI of hiring new staff, purchasing larger-capacity machines, or expanding into new domestic and international markets, ensuring a sustainable and data-driven growth trajectory.

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