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Developing Crowdfunding-Based Financing Scheme to Increase Potential of Micro, Small, and Medium Business in Urban Green Space

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Abstract. Micro, Small, and Medium Business (MSMEs) are vital to the Indonesian economic development, and the government is focusing on this sector for post-pandemic recovery. There is an emphasis on infrastructure such as urban green spaces, or Ruang Terbuka Hijau (RTH). RTHs have untapped potential as centers for agricultural and processing MSMEs. However, these businesses often face financing challenges, prompting the exploration of alternative scheme like crowdfunding. Therefore, this study aimed to (1) explore how RTH lands can be leveraged for local economic activities, and (2) devise a public fund-based crowdfunding financing model. Using RTH Kalijodo in Jakarta as a case study, the study included literature reviews, benchmarking, fieldwork, and Life Cycle Cost (LCC) analysis. The results show the need for the development of vertical hydroponics, tilapia farming, and tilapia fillet processing business in RTH Kalijodo. Financial analyses, including IRR calculations exceeding the 10.41% WACC, a positive NPV, and a payback period under five years, show the financial viability of these sectors.

Keywords: Crowdfunding; Life cycle cost; MSMEs; Urban green space

1. Introduction

Micro, Small, and Medium Business (MSMEs) are pivotal to economic growth of a country. Improved access to finance can make it easier for individuals and MSMEs in Indonesia to drive economic expansion. MSMEs make substantial contributions to employment, gross domestic product (GDP), exports, and tax revenues (Gherghina *et al.,* 2020). In 2017, they were responsible for 60% of Indonesia's GDP, a figure that slightly increased to 60.34% in 2018. Additionally, they are significant for job creation, having used 116,978,631 people or 97% of the Indonesian total workforce. Developing markets are projected to account for 60% of global banking revenues from 2010 to 2020, with MSMEs playing a critical role in this economic segment (Chironga *et al.,* 2012).

MSMEs are crucial for bolstering economic growth in developing nations (Orjuela, Gómez, and Sandoval, 2022). They make significant contributions to employment, Gross Domestic Product (GDP), exports, and tax revenues (Gherghina *et al.,* 2020). In Indonesia,

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MSMEs comprised 60% of the total GDP and used 97% of the workforce in 2018. However, the COVID-19 pandemic has had a profound impact on MSMEs and the broader economy, causing a GDP downturn. Indonesian MSMEs face multiple challenges, such as limited access to finance, varying human resource quality, innovation capacity, and institutional support (Sugiarto, 2018; Yoshino and Taghizadeh-Hesary, 2016).

The advent of Industry 4.0 technology presents potential solutions to the challenges faced by MSMEs (Naruetharadhol *et al.,* 2022; Lestari *et al.,* 2020; Candra *et al.,* 2020). Financial sector technological advancements have given rise to innovative funding methods such as crowdfunding (Hossain and Oparaocha, 2017; Moritz and Block, 2016). Crowdfunding serves as a viable alternative to conventional financing, easing financial limitations and improving fundraising by using online discoverability and social networks (Kubo *et al.,* 2021; Berawi *et al.,* 2020). For example, Bizhare, a securities crowdfunding platform, reported significant success with the Tilapia Cultivation Project in Pancawangi Village, raising IDR 1,171,800,000 from 195 investors (Bizhare, 2023). Furthermore, startups like Kapital Boost in Singapore and Ternaknesia in Indonesia have successfully leveraged crowdfunding to facilitate sustainability-focused investments (Hendratmi, Ryandono, and Sukmaningrum, 2020).

The government has invested in developing physical and information and communication technology (ICT) infrastructures to improve logistics networks for supply chain distribution and to facilitate digital transformation in business processes (Berawi *et al.,* 2021). However, certain assets, such as public green spaces, or Ruang Terbuka Hijau (RTH), are underused, offering opportunities to support MSMEs. This study aims to (1) analyse land use within RTH areas for their potential as production hubs for local MSMEs, and (2) devise crowdfunding-based financing model to fund MSMEs, enabling the commencement of business activities by local communities, with RTH Kalijodo as the focal case study.

RTH Kalijodo in DKI Jakarta province was selected as the study's focus because of its multifunctional importance as an urban green space. It fulfils ecological, social, cultural, and aesthetic functions, enhancing DKI Jakarta's landscape. However, the area is not fully used, a critical issue considering the high population density of the adjacent neighbourhoods, where three of the four local administrative units (RWs) have densities exceeding 600 people per hectare.

Urban green spaces spur economic growth by drawing in visitors (Ali *et al.,* 2021), benefiting nearby business and retailers (Pratiwi *et al.,* 2022), and raising property values (Kim and Peiser, 2018). However, their role as centres for production and processing by local business is not well-documented. Additionally, the use of crowdfunding for Micro, Small, and Medium Business (MSMEs) has been examined in countries such as India (Srivastava, 2016), Peru (Gómez, Barranzuela, and Ojeda, 2022), and Indonesia (Root, 2020). Crowdfunding models tailored to MSMEs that capitalize on urban green spaces has not been examined. This gap shows a novel opportunity to leverage public land for economic benefit.

2. Methods

This study had two primary objectives, (1) to assess business potential of urban green spaces and (2) to develop crowdfunding-based financing strategy for exploiting this potential, using RTH Kalijodo Jakarta as a case study. Initially, a thorough literature review and benchmarking against industrial sector best practices were conducted to pinpoint viable business opportunities in the RTH Kalijodo, focusing on the agriculture, fisheries, and processing sectors. Field observations and analyses of business potential followed,

evaluating RTH Kalijodo's suitability for commodity production. The assessment of MSMEs' business potential included analysing market prospects, current land use, startup costs, maintenance needs, revenue models, and business planning. Moreover, extensive interviews with seasoned professionals, each with at least 15 years of industry experience and a master's degree in MSMEs and crowdfunding domains provided further insights.

The second objective was creating crowdfunding financing model for MSMEs in urban green spaces. This study used source triangulation to corroborate results by cross-referencing data from various sources to achieve the objective. Additionally, business potential for MSMEs was evaluated through data analysis and the application of business design patterns. This evaluation included factors such as market potential, current land use, initial capital requirements, ongoing maintenance, revenue streams, and the structuring of business plans.

The financial viability assessment included a Life Cycle Cost (LCC) analysis that considered initial costs, operation and maintenance expenses, and potential revenue. This was followed by an exploration of crowdfunding-based financing models, informed by literature and benchmarking studies. A comprehensive financial analysis was performed, examining costs, maintenance expenses, income, and underlying assumptions. Within this framework, three essential financial metrics were used, including Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period.

NPV is a critical measure for evaluating the financial viability of business project. Specifically, it calculates the current value of expected future cash flows, balancing them against initial and ongoing costs. It is meant to assess the long-term investment returns, incorporating a specific discount rate (Kelly and Male, 1993). This discount rate is essential for determining the project appeal by assessing its potential profitability.

IRR is a crucial metric for assessing the feasibility of a project. It determines the rate at which the NPV of all cash flows (both positive and negative) from a project equals zero. A project is considered feasible if its IRR is greater than the Weighted Average Cost of Capital (WACC), which in this case is set at 10.41% for the personal and household goods sector. IRR effectively determines whether the expected returns are sufficient to justify the costs. The Payback Period calculates the time needed for an investment to recover its initial outlay through cash inflows (Blank and Tarquin, 2013).

The financial analysis considered crucial cost elements for MSMEs development, using metrics such as NPV, IRR, and the payback period. This analysis identified significant factors affecting the business viability, with positive cash flow being a primary contributor. This inflow is vital in assessing the financial feasibility of MSMEs.

Negative cash flow elements, which can diminish profitability, include maintenance costs, loan interest, service fees, depreciation, taxes, and investor payouts. Particularly, loan interest, set at an assumed rate of 15%, is based on the current rates for loans ranging from IDR 100 million to IDR 1 billion with tenures of 3 to 6 months. This rate is a critical factor in determining the financial viability of MSMEs.

Service fees, mandated by Financial Services Authority Regulation Number 77/POJK.01/2016, are fixed at 3% of the total loan amount. These charges are applied proportionally over the loan period, adding to the cost structure. Depreciation, representing the asset's value reduction from use over time, offers tax benefits and facilitates the recovery of the initial capital outlay. For depreciation, we consider the asset's purchase or production cost, salvage value, estimated useful life, and business's projected duration. We apply the straight-line depreciation method for simplicity, assuming a prudent 5-year life

expectancy for business in the agriculture, fisheries, and processing sectors.

MSMEs tax is a significant factor in financial planning. According to Government Regulation (PP) No. 23 of 2018, MSMEs with annual revenues up to IDR 4.8 billion are subject to a reduced final income tax rate of 0.5% monthly, a decrease from the earlier 1%. This preferential tax rate aims to encourage MSMEs growth, entrepreneurial activity, and tax compliance, contributing to the sustainable development of business. Figure 1 shows the workflow, summarizing the conducted activities.

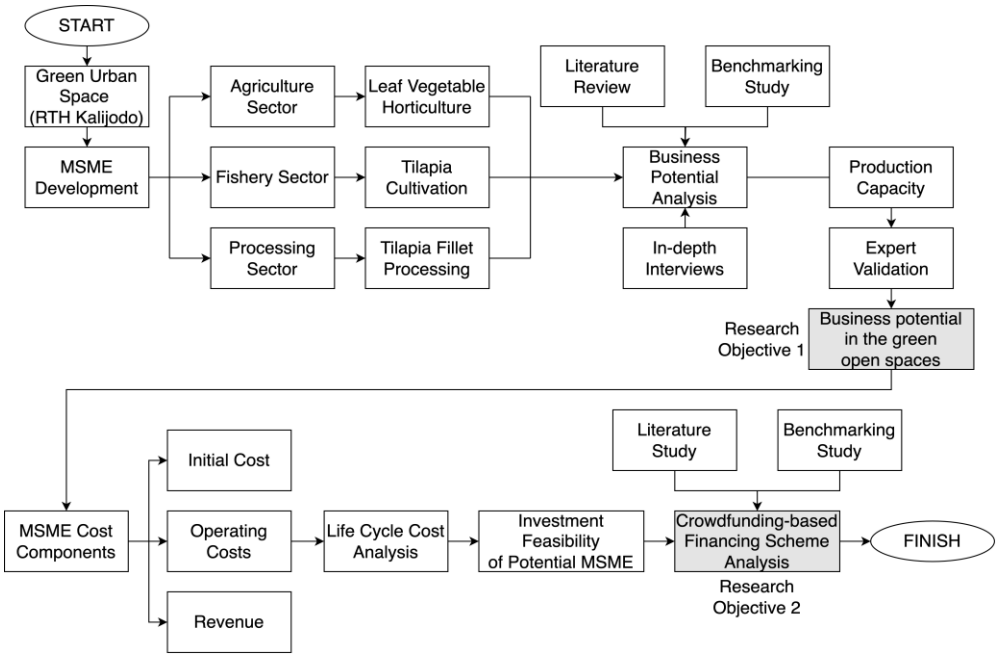

Figure 1 Study Workflow

3. Results and Discussion

3.1 Analyzing Business Potential in the Use of RTH Kalijodo

Urban green spaces are crucial in maintaining ecosystems, enhancing the urban environment, and supporting social, cultural, and economic activities. Economically, they provide local communities with opportunities to create economically valuable products. However, in DKI Jakarta Province, potential of these spaces has yet to be fully harnessed. A feasibility analysis of RTH Kalijodo suggests that introducing agricultural, fisheries, and processing activities within these urban green areas could realize significant financial benefits.

Introducing vertical hydroponic vegetable farming in urban green spaces can yield a profitable return of 14.87% and achieve a payback period of 18 months. This method is advantageous as it conserves space, maintaining the ecological integrity of these areas. Additionally, vertical hydroponics enhance the value of urban green spaces by serving as hubs for community study and training, fostering social empowerment. They contribute to the economy by providing market-ready produce and promoting growth. Moreover, the aesthetic quality of these spaces is maintained, with vertical hydroponic setups contributing to their visual appeal through vibrant vegetation.

Urban green spaces provide avenues for business diversification tailored to the unique potential of the local area. For instance, RTH Kalijodo's close access to freshwater sources such as Kali Kerendang and the Ciliwung River tributaries makes tilapia farming a promising endeavour. This venture yields a substantial return of 39.7% and boasts a rapid payback period of just 5 months.

Urban green spaces can bolster the fisheries sector, particularly in optimizing fish processing resources. For instance, producing gel-based fish products and tilapia fillets for both local markets and exports, specifically to the United States, is a lucrative opportunity. Asia leads global tilapia production with around 72% of total production, as established by the FAO's "World Tilapia Production in 2012" report. To maintain this momentum, enhancing productivity is vital, considering brief three-month cultivation cycle of tilapia. Life-cycle cost analysis for tilapia processing indicates a high potential return rate of up to 49% and a quick payback period of six months. The following table provides a comprehensive investment feasibility analysis for prospective business in RTH Kalijodo.

Table 1 Investment feasibility analysis for RTH Kalijodo

Indicator	Agriculture Sector	Fishery Sector	Processing Sector
Business Type	Vertical hydroponic vegetable farming	Fish farming	Processing fish farming products
Production Results	Water spinach, Spinach	Tilapia Fish	Fish Filet
IRR	14.87%	39.73%	49,07%
Payback period	1 year 6 months	5 months	6 months

3.2. Developing Crowdfunding Platform for Business Financing Scheme

Crowdfunding has become a practical financing solution for MSMEs growth in RTH Kalijodo by tapping into community funding. These platforms act as crucial intermediaries, linking MSMEs with potential investors. In Indonesia's financial ecosystem, lending-based and equity-based crowdfunding are the primary models offered for investment.

This study proposes a lending-based crowdfunding model, showing its advantages such as reduced risk, quicker returns, and more consistent dividends for investors. The model is organized into three clear stages, including preparation, implementation, and operation. The details of these stages are discussed in the following sections.

Figure 2 shows a detailed visual representation of the stages and their interactions within MSMEs-tailored crowdfunding financing scheme in urban green spaces. It illustrates the operational flow and the interrelated processes of the framework for clearer comprehension.

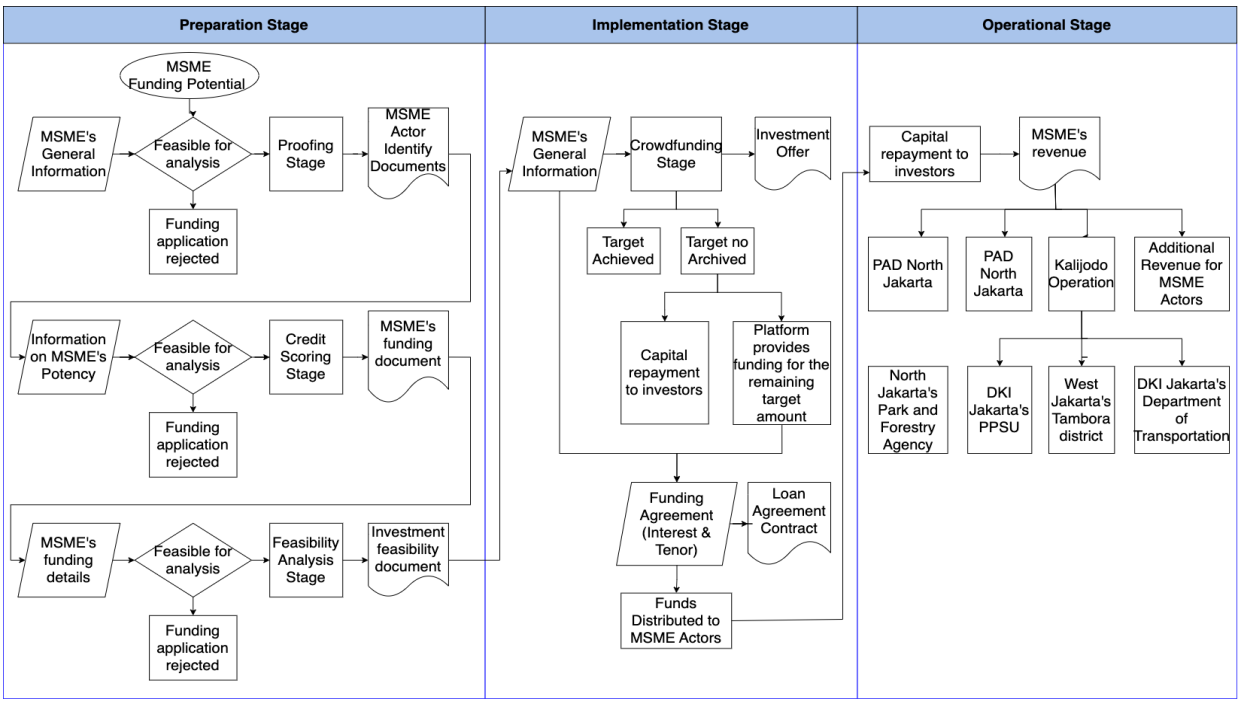

Figure 2 Crowdfunding Financing Scheme for MSMEs developed in Urban Green Space

3.2.1. Preparation Stage

To launch crowdfunding initiative, MSMEs and investors must satisfy certain criteria. MSMEs need to have digital devices capable of communication and sharing images, addressing the platform's limitations in reaching users directly. They are also required to have a bank account to streamline finance and repayment transactions.

In the preparatory stage before a project is approved, rigorous verification is carried out for MSMEs applicant. This includes filling out a detailed form with vital personal information. A thorough credit assessment is then performed to minimize default risks. This includes direct discussions with MSMEs applicant about their experiences, project sites, and market dynamics for their products. These interactions are crucial for crowdfunding platforms to understand expected capital flows and evaluate the applicants ability to secure the investment.

During the preparation phase, a detailed project analysis is conducted to assess the development potential of selected commodities, which is critical for gauging the project feasibility. Suppose the project is economically unviable, and the funding is declined. Conversely, a positive assessment leads to the initiation of the implementation phase, starting with fundraising on the platform's website. This thorough method guarantees that only financially promising projects proceed, maintaining crowdfunding platform's credibility.

3.2.2. Implementation Stage

In case the project analysis concludes a lack of financial feasibility, the project is not approved. Should the analysis affirm viability, the execution phase begins with fundraising efforts on crowdfunding platform. At this stage, the platform launches a campaign to attract investors by presenting a detailed business prospectus. The campaign aims to raise the required funds within a set timeframe. Typically, the fundraising durations range from 5 to 10 days for investment targets not exceeding IDR 1 billion.

In case the fundraising campaign fails to achieve target, investors are offered the option to retrieve their funds without any added benefit, or the project may continue with the available funds, depending on the policies of the platform. Suppose the fundraising is successful within the allotted time, the platform formalizes a contract outlining the investment details, including interest rates and agreed-upon repayment periods. These terms are in line with those previously presented to MSMEs seeking investment through the platform.

3.2.3. Operational Stage

After successfully raising the funds and finalizing the contract, MSMEs enter the operational phase, where they begin their business activities and receive the investment capital. During this phase, MSMEs are obligated to make monthly repayments with interest. The interest rate is set at 1.3% monthly, equivalent to an annual rate of 16%. MSMEs are also responsible for a service fee to crowdfunding platform, which is 3% of the loan amount. Repayments, interest calculations, and fund management are conducted via the digital wallet system of the platform. This feature ensures secure transactions and offers the convenience of transferring funds to registered bank accounts or reinvesting in new projects, thus providing flexibility for both investors and MSMEs.

Profits from MSMEs within Kalijodo RTH are earmarked for operational expenses, providing income to MSMEs participant, and enhancing the Regional Original Income (PAD) for North and West Jakarta. The management of Kalijodo RTH includes multiple departments, including North Jakarta City Parks and Forests Department handles maintenance and security, DKI Jakarta Infrastructure and Public Facilities Management (PPSU) officers ensure cleanliness, Tambora District covers electricity costs, and the DKI

Jakarta transportation department oversees parking facilities. This study proposes crowdfunding scheme for MSMEs that simplifies the procedural steps and documentation across the preparation, implementation, and operation stages, incorporating the relevant institutions in the profit-sharing process. In contrast, Hendratmi, Ryandono, and Sukmaningrum (2020) method does not factor in institutional participation in the payment mechanisms.

4. Conclusions

RTH Kalijodo in DKI Jakarta offers opportunities for enhancing local agriculture and fisheries. Government support is essential in these areas, particularly in establishing policies to develop MSMEs business and financing models. This includes streamlining the licensing process for small business without legal entity status and regulating crowdfunding platforms to support community business that lack bank financing. This study shows that community funding of MSMEs via crowdfunding can provide investors with returns through interest or profits from the business they support.

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