

Enhancing Risk Management in Subsidized Housing: A Strategic Approach for Sustainable Development in Indonesia

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ABSTRACT: The development of subsidized housing in Indonesia faces significant challenges, including regulatory complexity, financial constraints, and market uncertainties. This study aims to identify and classify key risks in subsidized housing projects in Serang Regency, Banten Province, Indonesia, and to formulate risk mitigation strategies using ISO 31000:2018 and ISO 31010:2019 frameworks. The research employs a mixed-methods approach, integrating qualitative and quantitative methods. Primary data were collected through semi-structured interviews with 23 developers to identify risks, followed by Probability Impact Matrix (PIM) analysis to assess probability and impact levels. Further, in-depth interviews with five experienced developers were conducted to formulate mitigation strategies. Findings reveal that mortgage approval difficulties, limited FLPP quotas, regulatory uncertainty, and government budget constraints are the most critical risks. To mitigate these risks, strategies such as improving mortgage accessibility, diversifying funding sources, enhancing regulatory adaptability, and optimizing budget efficiency are proposed. The study confirms that subsidized housing risks extend beyond technical factors, emphasizing the need for a systematic and experience-based risk management approach. These insights contribute to improving project sustainability and providing practical recommendations for developers and policymakers in ensuring effective and sustainable subsidized housing programs.

KEYWORDS: Affordable Housing, Risk Management, ISO 31000:2018, Probability Impact Matrix, Banten Province, Indonesia

I. INTRODUCTION

The provision of adequate and subsidized housing (affordable housing) remains a major challenge in developing countries such as Indonesia, which has a population exceeding 270 million. Rapid urbanization, limited land availability, and rising property prices have exacerbated the housing crisis, particularly for low-income communities. To address this issue, the Indonesian government has implemented a subsidized housing program through policies such as Ministerial Regulation of Public Works and Housing (PUPR) No. 20 of 2019 and Ministerial Regulation No. 35 of 2021. This program aims to enhance homeownership accessibility through affordable financing schemes. However, its implementation faces various challenges, particularly concerning risks encountered by developers during the construction process.

Serang Regency, located in Banten Province, Indonesia, is one of the areas with high demand for subsidized housing due to its role as a satellite region of Jakarta. However, developers in this region face multiple risks, including land scarcity, material price volatility, complex regulatory frameworks, and financial constraints, which may lead to project delays. These risks not only impact the sustainability of developers' businesses but also affect the communities that rely on subsidized housing as their primary housing solution.

Several previous studies have examined risk management in subsidized housing projects. Othman (2008) demonstrated that integrating risk and value management can enhance project efficiency and occupant satisfaction, yet its application in subsidized housing projects remains limited. Tian et al. (2024) highlighted that fluctuations in occupancy rates and rental price growth pose significant challenges in financing subsidized housing projects in China. Priyanto et al. (2024) identified cost estimation errors and project funding constraints as major risks in subsidized housing development in Sukoharjo, Indonesia. Muka & Boy (2021) emphasized the necessity of data-driven approaches to minimize project uncertainty, while Lestari et al. (2024) found that economic instability and regulatory uncertainty are the primary obstacles faced by subsidized housing developers in Indonesia.

Moreover, several studies have emphasized the use of international standards in risk management. ISO 31000:2018 and ISO 31010:2019 have been applied across various sectors, including the construction industry, to develop systematic approaches to risk management (International Organization for Standardization, 2018, 2019). In the context of subsidized housing, Tang et al. (2021) demonstrated that implementing ISO 31000 helps developers identify and manage complex risks, particularly in projects involving both government and private sector

participation. Smith & Brown (2020) also revealed that ISO-based risk analysis methods allow developers to reduce uncertainties in subsidized housing projects, particularly in terms of financial management and regulatory policies.

Although numerous studies have investigated risks in subsidized housing projects, there remains a research gap regarding the systematic application of risk mitigation strategies in Indonesia. Specifically, no prior studies have adapted the ISO 31000:2018 and ISO 31010:2019 frameworks to manage risks in subsidized housing projects in Serang Regency, Banten Province, Indonesia.

This study aims to identify and classify the key risks faced by subsidized housing developers in Serang Regency, Banten Province, Indonesia, and to formulate mitigation strategies based on ISO 31000:2018 and ISO 31010:2019. Through this approach, the study is expected to provide not only academic insights but also practical solutions for stakeholders to enhance the effectiveness and sustainability of subsidized housing projects in Indonesia.

The structure of this paper is as follows: Section 2 discusses the research methodology. Section 3 presents the result and discussion. Finally, Section 4 provides conclusions and the implications of this study for policies and practices in the subsidized housing construction industry in Indonesia.

II. METHODOLOGY

This study employs a mixed-methods approach, combining qualitative and quantitative methods to identify, analyze, and develop risk mitigation strategies in subsidized housing development. The research focuses on subsidized housing developers in Serang Regency, Banten Province, Indonesia, and adopts the ISO 31000:2018 framework and ISO 31010:2019, which encompasses risk identification, analysis, evaluation, mitigation, and monitoring (International Organization for Standardization [ISO], 2018).

Primary data for this study was collected through two phases of interviews with subsidized housing developers. The first phase involved 23 developers to identify risks encountered in subsidized housing projects and conduct risk analysis using the Probability Impact Matrix (PIM) (Bahamid et al., 2021). Respondents in this phase were selected based on specific criteria, including a minimum of five years of experience in subsidized housing development, active involvement in project management, and an understanding of regulatory and financial challenges in the sector. The interviews were conducted using a semi-structured format, focusing on risk factors that impact subsidized housing projects, including financial, technical, regulatory, and socio-economic aspects (Smith & Brown, 2020). Thematic analysis was employed to identify recurring risk patterns with significant implications for project implementation.

Following risk identification, risk analysis was conducted using the Probability Impact Matrix (PIM) to assess the probability and impact levels of each identified risk. Risks were classified into four levels: low, moderate, high, and critical, based on a combination of probability and impact (Tang et al., 2021). This analysis aimed to determine which risks require priority attention in mitigation strategies and to establish a clear risk management hierarchy for subsidized housing projects.

The next phase of this study focuses on formulating risk mitigation strategies through in-depth interviews with five highly experienced developers. Respondents in this phase were selected based on specific criteria, including more than 10 years of experience in subsidized housing development, a proven track record in successfully completing high-risk projects, and direct involvement in risk management processes within their companies. These interviews aimed to explore the strategies that developers have implemented in addressing significant risks and to develop recommendations based on best practices.

To enhance the validity of the study’s findings, data triangulation was conducted by comparing interview results from different developers and analyzing project documentation related to subsidized housing. Additionally, a comparative analysis with existing literature and previous studies was performed to ensure that the proposed mitigation strategies align with industry best practices in the construction sector and subsidized housing policies.

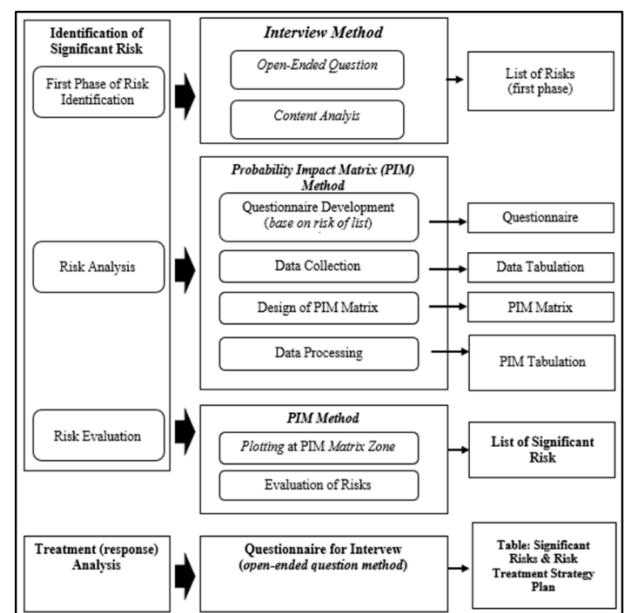


Figure 1. Methodology Diagram

The methodological approach applied in this study enables a systematic mapping of risks and the development of mitigation strategies based on data and practical experience. By adopting ISO 31010:2019 as the primary framework, this research is expected to make a significant academic

contribution to risk management in subsidized housing projects while providing recommendations for developers and other stakeholders to enhance the effectiveness and sustainability of subsidized housing projects in Indonesia.

III. RESULT AND DISCUSSION

The development of subsidized housing in Banten Province, particularly in Serang Regency, faces various challenges that may hinder project continuity. From the developers’ perspective, the primary obstacles include complex permitting processes, limited availability of the Housing Financing Liquidity Facility (FLPP) quota, and frequent changes in government policies. These factors not only affect project sustainability but also impact the availability of housing for low-income communities. Therefore, an effective risk management strategy is essential to ensure that projects remain on track and provide optimal benefits to the target population.

This study successfully identified 11 major risks faced by developers in subsidized housing projects in Serang Regency, covering aspects such as permitting, land accessibility, competition among developers, and budget constraints from both government and private developers. The Probability Impact Matrix (PIM) analysis revealed that four critical risks significantly impact project sustainability and require priority mitigation strategies. These key risks include difficulty in mortgage approval (KPR), limited FLPP quota, regulatory uncertainty, and government budget constraints.

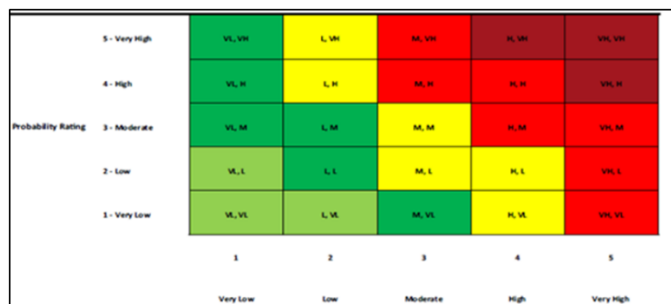


Figure 2. PIM Matrix (source: Kaseem et.al, 2019)

Table 1. List of Risk (first phase)

No	Significant Risk
1	Complex Licensing Process
2	Limited Land Supply
3	Mortgage Approval Difficulty
4	Restricted Mortgage Access
5	High Developer Competition
6	Strict Banking Requirements
7	Material Price Volatility
8	Limited FLPP Quota
9	Policy Uncertainty
10	Limited Government Budget
11	Limited Developer Budget

Table 2. List of Significant Risks

No	Significant Risk	Impact Mean	Probability Mean	Risk Zone
3	Mortgage Approval Difficulty	3.9565	4.5217	Dark Red
8	Limited FLPP Quota	4.6087	3.9130	Dark Red
9	Policy Uncertainty	4.7391	4.6522	Dark Red
10	Limited Government Budget	4.6522	4.2609	Dark Red

Several previous studies emphasize that policy instability and financial constraints are major challenges in subsidized housing projects. Othman (2008) highlights the importance of stable regulations and clear financing schemes to ensure project continuity. Tian et al. (2024) found that changes in housing finance policies often create uncertainty for developers. Similarly, Priyanto et al. (2024) identified difficulties in mortgage approval (KPR) and limited subsidy quotas as significant barriers in this sector.

Other studies reinforce these findings, showing that regulatory uncertainty and funding limitations are among the main risks affecting the sustainability of affordable housing projects (Smith & Brown, 2020; Tang et al., 2021). Research by Jones & Taylor (2023) found that inconsistent government housing policies negatively impact investor confidence, further delaying project implementation. Liu et al. (2022) emphasized that a lack of financial liquidity can lead to incomplete housing developments, increasing the risk of project failure.

The findings of this study align with these prior works, demonstrating that risks in subsidized housing projects are not only technical but are also significantly influenced by regulations and financial availability. Therefore, mitigation strategies focusing on policy adaptation, diversification of funding sources, and improved mortgage accessibility are crucial to enhancing project sustainability.

In order to mitigate these risks, this study has formulated several risk mitigation strategies that can be implemented by subsidized housing developers. One of the key strategies is enhancing transparency and access to mortgage (KPR) information, by providing guidance for prospective applicants and collaborating with financial institutions to facilitate mortgage approval. Additionally, diversifying FLPP financing schemes is essential, including proposing additional quotas to the government and exploring alternative funding sources through partnerships with the private sector.

In response to government policy changes, developers can implement regular regulatory monitoring, engage in

policy advocacy through developer associations, and develop long-term mitigation strategies to anticipate potential regulatory shifts. Meanwhile, to address budget constraints, developers can optimize fund allocation by prioritizing essential projects, establishing partnerships with private investors, and implementing cost-efficiency measures in construction processes.

Table 3. List of risk treatment (mitigation) strategies

No	Significant Risks	Final Risk Treatment Strategy
1	Mortgage Approval Difficulty	Enhance transparency in KPR processes, collaborate with banks to ease mortgage approvals, and provide financial literacy programs for prospective buyers.
2	Limited FLPP Quota	Advocate for increased FLPP quota, explore alternative financing schemes, and engage in public-private partnerships to expand funding sources.
3	Policy Uncertainty	Monitor regulatory changes regularly, engage in policy advocacy through developer associations, and develop long-term mitigation strategies.
4	Limited Government Budget	Optimize budget efficiency, seek alternative funding sources such as private investors, and implement cost-saving measures in project execution.

The findings of this study confirm that risks in subsidized housing projects do not solely originate from technical factors but are also significantly influenced by policy stability and developers' financial preparedness. By adopting ISO 31000:2018 and ISO 31010:2019, this study provides new insights into a systematic and experience-based approach to risk management in subsidized housing projects. The proposed strategies are expected to assist developers in enhancing risk management effectiveness and supporting the sustainability of subsidized housing programs for low-income communities in Indonesia.

CONCLUSIONS

This study identifies various risks in the development of subsidized housing in Serang Regency, Banten Province, including challenges related to permitting processes, land availability, competition among developers, material price fluctuations, and government policy uncertainty. Based on the Probability Impact Matrix (PIM) analysis, four major risks were identified as requiring priority mitigation strategies: mortgage approval difficulties (KPR), limited

FLPP quota, government policy changes, and government budget constraints.

From in-depth interviews with five experienced developers, this study proposes mitigation strategies that include improving access to mortgage (KPR) information, diversifying funding sources, adapting to policy changes, and optimizing budget efficiency. The findings highlight that risk management in subsidized housing projects is not solely dependent on technical aspects but is also heavily influenced by government policies and financial conditions. Therefore, a systematic and experience-based mitigation strategy is crucial to ensuring the sustainability of these projects.

To enhance risk management effectiveness, developers should strengthen collaboration with financial institutions to facilitate mortgage approvals, establish long-term contracts with suppliers to mitigate material price fluctuations, and explore alternative financing through private sector partnerships. The government is advised to maintain policy stability, simplify permitting processes, and provide financial incentives to support project sustainability. Future research should expand risk analysis using a quantitative approach and compare risk management models from other countries. By implementing the appropriate mitigation strategies and fostering stronger collaboration between developers and policymakers, subsidized housing projects can operate more efficiently and sustainably, ultimately maximizing their benefits for low-income communities.

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