JIMEA | Jurnal Ilmiah MEA (Manajemen, Ekonomi, dan Akuntansi)
Vol. 9 No.2, 2025

IMPLEMENTATION OF ANALYTICAL HIERARCHY PROCESS TO CHOOSE RISK MITIGATION PLAN FOR CO-LIVING SPACE DEVELOPMENT PROJECT

Teuku Muhammad Abidzar Saddam[1]; Taufik Faturohman[2]
Institut Teknologi Bandung, Kota Bandung[1,2]
Email : teukuabidzar@gmail.com[1]; taufik.f@sbm-itb.ac.id[2]

ABSTRACT

This study comprehensively assesses and proposes mitigation strategies for critical risks within a specific co-living development project in Haji Nawi, set against the backdrop of Jakarta's increasing housing deficit. The research integrates the ISO 31000:2018 risk management framework, supplemented by PESTLE, VRIO, and SWOT analyses for environmental scanning. Its primary objective is to identify, accurately measure, prioritize, and formulate actionable mitigation plans for significant project threats. Qualitative data gathered from expert interviews and focused group discussions informed the risk assessment process. The study identified 37 distinct potential risks, categorized into Strategic, Financial, Operational, Legal & Compliance, and Reputational domains. Through rigorous measurement and prioritization aligned with the development firm's risk appetite, 11 risks were classified as High to Extreme, demanding urgent treatment. The Analytical Hierarchy Process (AHP) was then applied to evaluate and select the most suitable mitigation plans for the three highest-priority, extreme risks: Permit Delay, Community Rejection, and Contractor Failure. Results strongly recommend implementing Contingency Buffers in Project Timelines for Permit Delay. The Establishment of a Grievance Redress Mechanism emerged as the preferred strategy for Community Rejection, while Collaborative Contract Models (e.g., Alliancing) proved optimal for mitigating Contractor Failure. This research provides a robust framework and data-driven recommendations, crucial for ensuring project stability and success in dynamic urban property markets.

Keywords : Risk Assessment; Mitigation Strategies; Co-Living Space; Analytical Hierarchy Process (AHP); Project Management

ABSTRAK

Studi ini secara komprehensif menilai dan mengusulkan strategi mitigasi untuk risiko-risiko kritis dalam proyek pengembangan ruang co-living di Haji Nawi oleh sebuah perusahaan pengembang, di tengah meningkatnya defisit perumahan di Jakarta. Penelitian ini mengintegrasikan kerangka manajemen risiko ISO 31000:2018, dilengkapi dengan analisis PESTLE, VRIO, dan SWOT untuk pemindaian lingkungan. Tujuan utamanya adalah mengidentifikasi, mengukur secara akurat, memprioritaskan, dan merumuskan rencana mitigasi yang dapat ditindaklanjuti untuk ancaman proyek yang signifikan. Data kualitatif yang dikumpulkan dari wawancara ahli dan diskusi kelompok terfokus menginformasikan proses penilaian risiko. Studi ini mengidentifikasi 37 potensi risiko yang berbeda, dikategorikan ke dalam domain Strategis, Keuangan, Operasional, Hukum & Kepatuhan, dan Reputasi. Melalui pengukuran dan prioritisasi yang ketat sesuai dengan selera risiko perusahaan pengembang, 11 risiko diklasifikasikan sebagai Tinggi hingga Ekstrem, yang memerlukan penanganan segera. Analytical Hierarchy Process (AHP) kemudian diterapkan untuk mengevaluasi dan

memilih rencana mitigasi yang paling sesuai untuk tiga risiko ekstrem dengan prioritas tertinggi: Penundaan Izin, Penolakan Komunitas, dan Kegagalan Kontraktor. Hasil penelitian sangat merekomendasikan penerapan Contingency Buffers in Project Timelines untuk risiko Penundaan Izin. Establishment of a Grievance Redress Mechanism muncul sebagai strategi yang disukai untuk Penolakan Komunitas, sementara Collaborative Contract Models (misalnya, Alliancing) terbukti optimal untuk memitigasi Kegagalan Kontraktor. Penelitian ini menyediakan kerangka kerja yang kuat dan rekomendasi berbasis data, yang krusial untuk memastikan stabilitas dan keberhasilan proyek di pasar properti perkotaan yang dinamis.

Kata Kunci : Penilaian Risiko; Strategi Mitigasi; Ruang Co-Living; Analytical Hierarchy Process (AHP); Manajemen Proyek

INTRODUCTION

Jakarta's rapid urbanization has led to significant housing challenges, particularly for millennials and young professionals struggling with traditional housing costs. In 2023, Jakarta faced an estimated housing deficit of 800,000 units (Juwita, 2024). In response, a development firm, a subsidiary of a state-owned enterprise, initiated a co-living project in Haji Nawi. This project aims to transform an underperforming postal asset in South Jakarta into a premium co-living facility, targeting professionals aged 25–44 with monthly rents from Rp. 5 to 7 million. This initiative is vital for optimizing the parent company's dormant assets and addressing Jakarta's housing crisis, especially given the city's growing productive age population. The feasibility study for this co-living project concluded in 2023, with project realization planned for Q4 2025. This two-year gap between study and implementation poses inherent risks due to the dynamic nature of the real estate market. Previous projects by the development firm have also highlighted weaknesses, such as reliance on third-party contractors, which led to considerable delays. These factors underscore the necessity of a robust risk management framework for the co-living project in Haji Nawi. This research applies the ISO 31000:2018 risk management framework, augmented by PESTLE, VRIO, and SWOT analyses, to systematically identify, measure, prioritize, and propose mitigation strategies for the co-living development. The Analytical Hierarchy Process (AHP) is employed to prioritize these mitigation strategies based on expert input. The primary objectives are to:

- Identify potential risks for the development firm regarding the co-living project.
- Measure the risk levels and prioritize identified risks.
- Provide a risks mitigation plan for the co-living project.

The study focuses on negative risks that pose threats to the project. Risk identification is informed by expert interviews and group meetings with the development firm's Governance, Risk & Compliance Division. The ISO 31000:2018 framework and the company's internal regulations guide the risk management process. AHP is used to prioritize mitigation plans for risks classified as "Extreme" by the company.

LITERATURE REVIEW

This chapter lays the theoretical groundwork for assessing risks and opportunities in the co-living project in Haji Nawi. It explores key concepts and frameworks essential for comprehensive analysis and strategic planning.

Co-Living Housing

Co-living has emerged as a significant housing solution, driven by urbanization, housing affordability issues, and evolving lifestyle preferences among millennials and young professionals (Tan & Toh, 2025; Coricelli, 2022). This model integrates private living spaces with shared communal areas, offering economic, social, and locational advantages. Key dimensions of co-living include economic attributes (affordability, flexible leases), locational attributes (proximity to urban centers and amenities), physical attributes (fully furnished private rooms, shared facilities), and psychological factors (openness to new experiences, community building).

PESTLE Analysis

PESTLE (Political, Economic, Sociocultural, Technological, Legal, and Environmental) analysis is a strategic tool for evaluating external macro-environmental factors impacting an organization (Johnson et al., 2023). For the co-living project, this framework helps identify how Jakarta's zoning regulations, real estate market growth, demographic changes, and environmental risks could influence feasibility and success.

VRIO Analysis

The VRIO (Value, Rarity, Imitability, and Organization) framework assesses an organization's internal resources and capabilities to determine sustainable competitive advantages (Barney & Hesterly, 2024). For the development firm, VRIO analyzes whether assets like underperforming properties, state-owned backing, and organizational expertise provide a competitive edge in the co-living sector.

SWOT Analysis

SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is a strategic planning tool that evaluates internal strengths and weaknesses, and external opportunities and threats (Hill et al., 2021). It complements PESTLE and VRIO by providing a holistic view, linking internal capabilities with external realities to guide strategic focus.

ISO 31000 Risk Management

Risk is defined as the effect of uncertainty on objectives (ISO 31000:2018). ISO 31000:2018 is a globally recognized framework for risk governance, emphasizing stakeholder participation and continuous development. Its application in this project involves phased approaches: risk identification, analysis (probability and impact), evaluation (prioritization against thresholds), and treatment (mitigation strategies), followed by continuous monitoring and review.

Risk Taxonomy

Based on the development firm's internal regulations, risk taxonomy is categorized into five types: Strategic, Financial, Operational, Legal & Compliance, and Reputational risks. This classification helps in systematically identifying and addressing diverse threats to the organization.

Risk Prioritization

Companies prioritize risks to focus mitigation efforts effectively. This is done by multiplying the likelihood and impact levels of a risk, depicted in a risk matrix. The development firm's risk appetite is at a Moderate to Very Low level, meaning High and Extreme risks require immediate mitigation.

Analytic Hierarchy Process (AHP)

Developed by Thomas Saaty, AHP is a multi-criteria decision-making tool for prioritizing alternatives in complex decisions (Saaty & Vargas, 2021). It structures problems into a hierarchy, uses pairwise comparisons (Saaty's 1–9 scale), synthesizes priorities via eigenvalue calculations, and checks for consistency. In this study, AHP is used to rank risk mitigation plans based on criteria such as effectiveness, cost efficiency, feasibility, and implementation time.

Previous Study

This research builds upon previous studies in risk management and real estate development. Thilini & Wickramaarachchi (2019) applied Analytic Network Process (ANP) to assess risks in commercial real estate. Wiegelmann (2012) investigated risk management application in European real estate development organizations. Mutalibov & Faturohman (2021) utilized AHP and ISO 31000 for risk management in submarine cable systems, identifying fishing activity as a significant risk and recommending burial or higher specification cables for mitigation. These studies validate the methodologies applied in this thesis.

Conceptual Framework

The conceptual framework for this research is based on the ISO 31000:2018 risk management framework, which outlines a systematic process of communication, context setting, risk assessment (identification, analysis, evaluation), risk treatment, and continuous monitoring and reporting (see Figure 1).

RESEARCH METHODOLOGY

Method is a method of work that can be used to obtain something. While the research method can be interpreted as a work procedure in the research process, both in searching for data or disclosing existing phenomena (Zulkarnaen, W., et al., 2020:229).

Research Design

This study adopted a mixed-methods approach, combining qualitative analysis (PESTLE, VRIO, SWOT) with quantitative prioritization using AHP, guided by the ISO 31000:2018 framework. Qualitative data were collected through expert interviews and group meetings, and desktop study to inform risk identification and mitigation planning, while quantitative data involved expert judgment for AHP calculations (see Figure 2).

Data Collection Method

A mix-methods approach was used, integrating both primary and secondary data sources.

Primary Data Collection

Primary data collection was carried out by interviews to get a general description of the condition of the co-living project in the field, and focus group discussion with experts from the Governance, Risk & Compliance Division who have experience in the

development in handling other co-living projects before this. The key stakeholders involved in the interviews are higher-ranking staff in the development firm who have a direct connection to this project.

Secondary Data Collection

Secondary data collection is done by desk study, studying internal, and external data. Desk study done by collecting and analyzing existing data and information from various sources. Internal data collection is carried out using VRIO (Value, Rare, Inimitable, and Organization) method to determine the competitive advantage of the development firm. External data collection was carried out using the PESTLE method (Political-Legal, Economy, Sociocultural, Technology, and Environment) to determine what external factors could affect the co-living project in Haji Nawi.

Data Analysis Method

After collecting and identified the data, next step in this research is to apply the Risk Management Process based on ISO 31000:2018 and general guidelines for the development firm's Risk Management in its internal regulations. Then the next step to verify the data that gathered by desk study with interviewing the key stakeholders. The next step is doing Risk Assessment, there are three subprocesses, begin with Risk Identification, Risk Analysis, and Risk Evaluation that can be seen below:

- **Risk Identification**: Made by analyzing the primary data and secondary data that has been done in data collection process. The result from Risk Identification about the risks that occurred on the co-living project then will be validated by the key stakeholders.
- **Risk Analysis**: Carried out by analysing the risks to determine their significance and to prioritize them for further action. This involves assessing the likelihood and impact of each risk, as well as any potential interactions or dependencies between risks. The level of likelihood and level of impact for the identified risks are prepared based on the criteria of the degree of probability and impact on to the general guidelines for the development firm's Risk Management.
- **Risk Evaluation**: Carried out to evaluate the risks to determine whether they should be accepted or mitigated. This involves comparing criteria had by the development firm for risk mitigation and mitigation plan alternatives.

After carrying out the Risk Assessment, there will be a Risk Prioritization to choose the main risks to be mitigated in according to the development firm's needs. The Risk Treatment or Mitigation stage taken by company by reducing the impact or likelihood of the risks, from interviews with the higher-ups in the development firm. Then the several alternatives will be assessed by group meeting using Pairwise comparison and calculated using Analytical Hierarchy Process (AHP) to find the most suitable alternatives plan based on the criteria that has been set by the company.

RESULT AND DISCUSSION

In this chapter, the result of risk assessment obtained from the combination of main data from interview and discussion with experts in the development firm and secondary data that gained from desktop study such as document report from reliable sources. Analysis of the risks identified from various data inputs in the risk assessment will then be measured the level of risk and the priority of handling it. A mitigation plan is then drawn up to lower the level of risk on priority risk. Several risks that fall into the extreme category will then be selected by the development firm, then the mitigation plans that had been prepared will then be prioritized using AHP to match the mitigation criteria the development firm had, so that the mitigation plan can be fully implemented in the co-living project.

Business Situation Analysis

To comprehensively understand the risk landscape for the co-living project in Haji Nawi, a thorough analysis of both the internal and external environment is crucial. This section delves into the detailed findings of the PESTLE analysis, examining external macro-environmental factors, followed by a VRIO analysis to assess the development firm’s internal resources and capabilities. The insights gained from these analyses form the foundation for identifying potential business issues and risks.

Internal and External Analysis

External Environment Analysis: PESTLE Analysis

PESTLE (Political, Legal, Economy, Sociocultural, Technology, and Environment) analysis provides an overview of what external factors can affect the company’s activities and the co-living project.

- **Political & Legal**: As a subsidiary of a state-owned enterprise, the development firm must comply with Indonesian building regulations (UU Nomor 28 Tahun 2022) and

Jakarta's spatial planning laws (PERDA DKI Jakarta Nomor 1 Tahun 2014), including obtaining Building Approval (PBG) and Environmental Impact Analysis (AMDAL).

- **Economy & Social**: Jakarta's growing population and the productive age group (20-44 years) present a strong demand for co-living spaces. Manufacturing and construction industries offer high average salaries for these age groups, indicating a financially stable target market.
- **Technology**: The growing smart home system market in Indonesia (projected to reach USD 15.6 million by 2030) offers opportunities for properties equipped with advanced features to enhance value and appeal.
- **Environment**: The co-living project site placed in Jl. Haji Nawi Raya, Gandaria Utara, Kec. Kebayoran Baru, Kota Jakarta Selatan, DKI Jakarta. Located in the center of South Jakarta, this project is located around the office area and the residential village area. There is also commuting facilities like MRT station 500m from the co-living project location. According to BMKG forecast for Q2 of 2025, Haji Nawi Street which is placed in South Jakarta have a low percentage of experiencing flood. This means the co-living project development expectedly can run smoothly without any potential flooding.

Internal Environment Analysis: VRIO Analysis

After the external analysis finished, now internal analysis done to measure and evaluating the internal environmental conditions of the development firm and its capabilities to generate value. VRIO analysis is carried out by doing desk study and then verified by interview with the Chief Financial Officer of the development firm.

The results of the analysis of all key resources, capabilities or competencies are described below.

- **Extensive Property Asset Portfolio**: The company's core resource is its large, diverse real estate portfolio. Having 1,250 assets across Indonesia (Including heritage buildings and prime-location sites). This resource is valuable because it provides strategic locations and reduces significant upfront capital expenditure. It is rare as few competitors possess such a vast, nationwide portfolio of state-owned properties, and it is inimitable due to legal and regulatory constraints on private firms replicating such an asset base. The development firm is organized to optimize these assets, indicating

strong alignment. This resource provides a sustained competitive advantage for the co-living project.

- **State/Parent Ownership**: As a wholly-owned subsidiary of a state-owned enterprise, the co-living project benefits from significant institutional backing. This includes access to capital, exemplified by the Rp 10.8 billion project budget for the Haji Nawi site, and potentially favorable regulatory support or streamlined processes due to its State-Owned status. This backing is valuable, rare, and inimitable, as few companies possess such a privileged status and unique mandate. The company's structure is clearly aligned with this mandate, ensuring it is organized to capture this advantage.
- **Skilled Management & Human Capital**: The co-living project benefits from management experienced in repurposing classical structures, a crucial capability for the Haji Nawi conversion. This expertise adds value by enabling efficient development and operations of properties. While talented individuals are not inherently rare in the real estate industry, the development firm's specialized expertise in transforming dormant assets possesses intangible aspects that are difficult for competitors to quickly replicate.
- **Strategic Partnerships & Networks**: These established relationships can facilitate smoother permit processes, such as obtaining Persetujuan Bangunan Gedung (PBG) and Analisis Mengenai Dampak Lingkungan (AMDAL) approvals, and provide crucial market access. This is critical for a project like the co-living project, which relies on local government approvals and effective market penetration. These ties are valuable as they bring expertise, capital, and market access. They are rare and inimitable, built over time through the parent company's reputation and sustained engagement. The development firm has formalized these collaborations, demonstrating its organization around cooperative asset development.
- **Diversified Business Scope**: The development firm offers multiple services for their core business (Building management, property lease, hospitality development, real estate development, design/construction). While this diversification is valuable for risk reduction and cross-selling at the parent company level, for the co-living project specifically, it means access to integrated services and internal expertise across the project lifecycle, from design and construction to ongoing management. However, diversification itself is not rare nor inherently difficult to imitate, as many large real

estate developers offer integrated services. The company does align its structure to support all segments.

The VRIO analysis for the co-living project in Haji Nawi reveals that its sustained competitive advantages are rooted in the development firm's extensive portfolio of prime, underutilized state-owned properties, its unique institutional backing and capital access as state-owned enterprise, and its robust strategic partnerships that facilitate permitting and market entry, all of which are valuable, rare, inimitable, and well-organized within the company's structure. A temporary competitive advantage is observed in its specialized management expertise in repurposing dormant assets, which while valuable and difficult to imitate, is not entirely rare in the broader industry. Lastly, the project operates at competitive parity regarding its integrated project services, as this diversified business scope, though valuable, is neither rare nor particularly difficult for competitors to replicate.

SWOT Analysis

SWOT (Strength, Weakness, Opportunities, and Threat) analysis is a technique to assist organizations in identifying internal and external factors of the organization related to business competition or project planning. In this research itself, because of the research limitation, the SWOT analysis conducted will be more focused in the Weakness, and Threats that could become risks that threatened the co-living project in Haji Nawi.

- **Weakness**: Although the management team is experienced, not all resources and capabilities meet all four VRIO criteria. The diversification of business scope, while valuable, is not particularly rare or hard to imitate, reducing its strategic uniqueness. Additionally, there may be organizational inertia due to the company's state-owned nature, possibly limiting agility in responding to rapidly evolving market trends and competition in the co-living segment.
- **Threat**: Regulatory complexities in acquiring permits (PBG, AMDAL, Spatial Compliance) may slow project implementation. As a public sector-linked firm, the development firm may also face bureaucratic delays. While the market is growing, the increasing number of private real estate developers, particularly in Jakarta, intensifies competition. Lastly, macroeconomic fluctuations, such as inflation or interest rate

hikes, could impact construction costs and reduce demand from potential tenants or investors.

Leveraging the insights from the SWOT analysis, particularly the identified weaknesses and threats, the author has systematically identified potential risks that could impact the co-living project in Haji Nawi. The following paragraph details these risks, categorizing them based on the development firm's risk taxonomy and highlighting their causes stemming from the SWOT findings. First, the inherent organizational inertia within the development firm, stemming from its state-owned nature, significantly limits its agility in responding to dynamic market trends. This inertia directly contributes to risks such as Operational Disruptions due to a lack of daily Standard Operating Procedures, potential staff shortages, or an inexperienced management team. It also underlies risks like Security Incidents from inadequate CCTV and guards or insufficient tenant verification, and contributes to Material Supply Chain Disruptions and Vendor Dependency through reliance on single suppliers. Furthermore, this internal rigidity can lead to Tenant Lawsuits stemming from undetailed contracts or inaccurate marketing, and Labor Strikes due to issues like low wages or unclear employment contracts. A critical weakness highlighted is the Contractor Failure risk, which is explicitly linked to the company's dependence on third-party contractors and past mismanagement issues that caused significant project delays. Beyond operational and contractual aspects, internal weaknesses also extend to the physical and digital infrastructure, as well as market engagement. Inefficient design and oversight can lead to HVAC System Failure if AC units are not suited to occupancy loads or due to inherent design flaws, and Structural Damage if renovations do not adhere to technical SOPs. Poor internal environmental management contributes to Waste & Pollution due to a lack of 3R systems. Similarly, a lack of robust internal digital infrastructure can result in Poor Internet service from unstable ISPs or no backup connections, and broader Digital Platform Disruptions due to app issues or the absence of a proprietary website. In terms of market outreach, Weak Marketing capabilities, characterized by unattractive ads or designs irrelevant to the target market, directly hinder the project's ability to attract tenants. Lastly, internal deficiencies in community management, such as unclear rules or loose screening, can lead to Tenant Conflicts and Tenant Incompatibility, while design choices like thin walls contribute to Limited Privacy. From an external

standpoint, the project is exposed to several significant threats. Regulatory complexities and bureaucratic delays are direct causes of Permit Delays, including slow processing of PBG and environmental permits, and are further compounded by the potential for Political Policy Changes or Zoning Changes that could revise property priorities or spatial plans in the area. The intensifying competition from a growing number of private real estate developers in Jakarta directly contributes to Occupancy Decline and exacerbates Price Competition, as rivals can easily replicate offerings. Finally, broader macroeconomic fluctuations pose a substantial threat, directly leading to Construction Cost Surges due to inflation in materials and logistics, potential Property Tax Increases influenced by urban development, and overall Economic Inflation impacting operational costs.

Risk Identification

Risk identification is carried out by interviewing relevant stakeholders based on risk categories in the development firm's risk taxonomy. In this study the business process owner who acts as a stakeholder is Head of Business Development & Project Management and Chief Financial Officer. Based on previous risk in similar projects, internal and external analysis, desk study, then verified by the interview, all identified risks are listed with the categorization based on the development firm's risk taxonomy.

In total of 37 (thirty-seven) risks, those are the risk register that had been verified by the key stakeholder of the development firm. Before that, there were also 3 (three) more risks that the author included which are: 1) Failure in managing the co-living assets, 2) Communal Transportation Accessibility, and 3) The unsafe environment near the co-living vicinity. But, in the interview the stakeholder stated that those are not considered risks, thus the 3 (three) risks are removed from risks registers.

Risk Measurement & Prioritization

In determining risk prioritization, the risk rating score is measured and calculated first. The risk rating score is obtained by multiplying the probability level by the risk impact level. Before interviewing the sources, authors try to measure the risks that has been registered first using the regulation that set by the development firm. The first measurement can be seen in. As you can see from the Table 1, there is no such thing as Extreme risks, that’s because even though there is some data that author can find by himself, but without verification from the key stakeholder itself the authors

couldn't find the urgency or severity from those risk. Following validation with key stakeholders, the risk level were re-evaluated, leading to the identification of 3 extreme risks and 8 high risks, as presented in Table 1.

After measuring the risk rating, the risk above will then be prioritized. Risk prioritization aims to develop a mitigation plan for the priority risks that can reduce the level of risk to a predetermined risk appetite. Priority risks are risks that are above the company's risk appetite, which is from High to Extreme (see Table 2).

From the results of the risk measurements above, there are 5 levels of risk rating. For the Extreme level there are 3 (three) risks, for the High level there are 8 (eight) risks, for the Moderate there are 7 (seven) risks, for the Low level there are 13 (thirteen) risks, and lastly for the Very Low level there are 6 (six) risks. According to the development firm's risk appetite, there are 26 (twenty-six) risks in Moderate, Low, and Very Low levels that will be accepted. And because of the research scope and limitation that has been set before, only risks labeled Extreme, in this case Permit Delay, Community Rejection, and Contractor Failure will be prioritized.

Business Solution

Based on the comprehensive risk assessment, including identification, measurement, and prioritization, this section outlines the proposed business solutions. Given that permit delay, community rejection, and contractor failure have been identified as the three highest-priority extreme risks, the focus will be on developing specific mitigation plans for each. This involves proposing alternative strategies and then using the Analytical Hierarchy Process (AHP) to select the most suitable option for each risk, considering established criteria.

Mitigation Plan

Referring to the findings at the Risk Identification and Risk Measurement stages, it was determined that the risks of Community Rejection, Permit Delay, and Contractor Failure are the risks that have the most significant potential in the co-living project. Therefore, the next step in Risk Treatment is to reduce risk. Reducing Risk is done by determining alternative mitigation to reduce the effect caused by those risks.

Permit Delay Risk Mitigation Plan

The risk of permit delays is a critical concern for the co-living project, given Jakarta's complex regulatory environment and the potential for significant project timeline impacts. To address this, the suitable mitigation strategies that identified are:

- **Proactive Stakeholder Coordination**: For this plan, the company has to assign a dedicated permitting liaison team to engage with local government. The team uses shared dashboards to monitor deadlines and regulatory changes and negotiates fast-track approvals for critical permits like PBG and AMDAL assessment.
- **Contingency Time Buffers**: The company had to allocate a 25-25% time buffer in project schedules for high-risk permits. As an example, the company reserved 6 months for unexpected delays in PBG and AMDAL permits. The company also had to do some historical data analysis to identify recurring bottlenecks (e.g., slow responses from specific government agencies), and enable targeted contingency planning.
- **Legal and Regulatory Advisory Services**: The company hired legal experts to navigate complex regulations and pre-empt conflicts. Advisors also do some lobbying for permits to governments and stand as a company representation if any disputes occurred on project construction.
- **Pre-Application Audits**: The company conducts internal audits of permit documents before submission. Audits use a checklist aligned with local laws (e.g., Jakarta's floor area ratio) and involve third-party validators for credibility.

Community Rejection Risk Mitigation Plan

Potential resistance from the local community poses a significant threat to the co-living project. For this, there are four alternative mitigation plans that can be applied on community rejection risks at the co-living project, which are:

- **Participatory Urban Planning Workshops**: For this plan, the company had to engage residents in planning through workshops using tools and participatory budgeting. For example, the development firm can create a community hall or any project that aligns with local needs (e.g., mosques).
- **Public Awareness Campaigns**: Launch multi-channel campaigns to explain project goals and address misconceptions to educate residents around the co-living project. Build their trust by effective communication.

- **Establish a Grievance Redress Mechanism**: Form independent committee to resolve disputes, offering fair compensation (e.g., cash). A complaint system ensures minor issues (e.g., noise complaints) are resolved locally, while major disputes escalate to legal arbitrators.
- **Social Impact Assessments (SIA)**: Conduct SIA to identify and mitigate displacement risks. SIA's include surveys on livelihood impact and propose mitigation (e.g., Job Vacancy).

Contractor Failure Risk Mitigation Plan

The project's dependence on third-party contractors has been identified as a weakness, with past projects experiencing significant delays due to mismanagement. Regarding this issue there are five alternative mitigation plans that can be applied on the co-living project, which are:

- **Rigorous Contractor Pre-Qualification**: In this plan, the development firm evaluates contractors using standardized criteria such as financial stability, past project success rates, safety records, and technical expertise before awarding contracts. Key Performance Indicators (KPI) such as on-time completion rates and defect frequency can be used to rank contractors. This process is to make sure that only qualified firms are able to bid for the project, minimizing the likelihood of delays or substandard work.
- **Performance Bonds and Penalty Clauses**: Contractors must submit performance bonds (typically 5-10% of the contract value) as a financial guarantee to complete the project as agreed. Penalty clauses are included in contracts to impose daily fines for delays or failure to meet quality standards. (Kumaraswamy & Chan, 1998) found that such financial safeguards incentivize contractors to adhere to timelines and specifications. For instance, a penalty of 0.1% of the contract value per day of delay creates accountability. These mechanisms protect the owner from financial losses and ensure contractor commitment.
- **Third Party Quality Audits**: Independent auditors are hired to conduct regular inspections of materials, workmanship, and compliance with project specification. Auditors use a checklist aligned with industry standards and submit reports to stakeholders.

- **Incentive-Based Payment Structures**: Bonuses are offered for early completion, exceptional quality, or cost savings. (Bubshait, 2003) demonstrated that a 2-5% bonus for finishing two weeks ahead of schedule motivates contractors to optimize workflows. Conversely, penalties apply for defects. Payments are tied to KPI's, aligning contractor goals with project success.
- **Collaborative Contract Models (e.g., Alliancing)**: Alliancing contracts distribute risk and rewards among all stakeholders, fostering collaboration instead of adversarial relationships. In this model, contractors and clients share liability for delays or cost overruns but also benefit from project success. (Walker & Lloyd, 2015) note that alliancing improves trust and innovation, as seen in Australia's National Museum project, where shared goals reduced disputes. Regular joint workshops and open-book accounting are used to align objectives. This approach minimizes blame-shifting and encourages proactive problem-solving.

Determining The Criteria Weight

Following the identification of potential mitigation plans for the prioritized risks, the next crucial step is to determine the relative importance of the criteria that will guide the selection of most effective solutions. This involves establishing a clear set of risk mitigation criteria and weighting them based on the development firm's key strategic priorities and risk appetite. Based on the results of discussion with key stakeholders regarding the selection of alternatives, the development firm has four criteria that must be met in determining the applicable risk mitigation plan for this project.

The alternative assessment of the co-living project is carried out by Pairwise Comparison method filled by the experts from group discussions. Pairwise comparison is a process that compares entities in pairs to assess which entity is more favoured or has a greater amount of some quantitative property or whether the two entities are identical or have the same value (Ramik, 2020). The assessment on pairwise comparison used Saaty rating scale. In evaluating the criteria and alternatives, experts within the groups were asked the following questions. Criteria Question: "Dalam menentukan pengendalian risiko pada perusahaan pengembang, menurut anda seberapa pentingkah kriteria dibawah ini dibandingkan dengan kriteria lainnnya?" Alternative Question: "Dalam memutuskan untuk melakukan pengendalian pada risiko keterlambatan izin sebagai proteksi dan langkah preventif, menurut anda seberapa pentingkah alternatif ini

dibandingkan dengan alternatif lainnya dilihat dari kriteria yang ada?" The pairwise comparison that has finalized during the group discussion then entered into the Expert Choice software to process the assessment results with the priority ranking output (see Table 2).

In determining the most appropriate alternative to be implemented in the co-living project's Risk Mitigation, a pairwise comparison between criteria is needed as a priority reference material in choosing the mitigation plans. Pairwise comparison of criteria is carried out to determine the main criteria that must be met and become the most relevant in determining alternative choices. The cost efficiency criteria is the primary reference in the pairwise comparison between alternatives based on the criteria.

Permit Delay Risk Mitigation Plan AHP Results

The best alternative solution for Permit Delays risk is selected using the AHP (analytical hierarchy process) method. The following is a hierarchical diagram in determining the best risk mitigation plan for Permit Delay risk (see Figure 4).

After knowing the main criteria that need to be met with the alternatives, then a pairwise comparison between alternatives against the criteria is conducted to get an idea of which alternative best meets these criteria. Alternative Pairwise Comparison of Cost Efficiency Criteria Pairwise comparison on the Cost Efficiency criteria were carried out to determine which alternative had the highest cost efficiency (see Figure 5).

Alternative Pairwise Comparison of Feasibility Criteria A pairwise comparison based on the feasibility criteria was conducted to find out which alternative feasible to do and proportional to the level of cost efficiency (see Figure 6).

Alternative Pairwise Comparison of Implementation Time Criteria A pairwise comparison based on Implementation Time criteria was conducted to find out which alternative has the best Implementation speed comparable to the Cost Efficiency level (see Figure 7).

Alternative Pairwise Comparison of Effectiveness Criteria A pairwise comparison based on Effectiveness criteria was conducted to find out which alternative is most Effective regarding to the Cost Efficiency level (see Figure 8).

Final Pairwise Comparison Result of Permit Delays Risk Mitigation Plan After getting the results on each pairwise comparison based on the criteria, the results are

combined in the Expert Choice software to get the final result of the pairwise comparison (see Figure 9 and Table 3).

Community Rejection Mitigation Plan AHP Results

The best alternative solution for Community Rejection risk is selected using the AHP (analytical hierarchy process) method. Final Pairwise Comparison Result of Community Rejection Risk Mitigation Plan After getting the results on each pairwise comparison based on the criteria, the results are combined in the Expert Choice software to get the final result of the pairwise comparison (see Figure 10 and Table 4).

Contractor Failure Mitigation Plan AHP Results

The best alternative solution for Contractor Failure risk is selected using the AHP (analytical hierarchy process) method. Final Pairwise Comparison Result of Contractor Failure Risk Mitigation Plan After getting the results on each pairwise comparison based on the criteria, the results are combined in the Expert Choice software to get the final result of the pairwise comparison (see Figure 11 and Table 5).

Implementation Plan & Justification

The proposed implementation plan takes from all of the risks above that needed treatment, which means 3 (three) extreme risks that prioritized in this research. The implementation plan is derived in the form of an action plan to mitigate risk, which can be seen below.

- **Permit Delays**: To address this risk, the project team will implement both Contingency Time Buffering and Proactive Stakeholder Coordination strategies. This initiative is necessary due to Jakarta's complex regulatory environment where permit delays can range from 6 to 12 months. A specialized permit team, working alongside legal advisors, will begin this process in Month 1 and continue through Month 3, with contingency plans extending to Month 8. The team will work directly with government agencies and planning departments in Jakarta to track permit statuses, monitor deadlines, and ensure compliance. Internally the development firm will create a shared dashboard to identify bottlenecks and engage stakeholders early.
- **Community Rejection**: To mitigate this risk, the company will establish a Grievance Redress Mechanism. The measures are essential to address potential resistance from residents, which could obstruct permits and delay construction. Community liaison and public affairs representatives will operate this plan from Month 2 to Month 6 in

the Haji Nawi neighborhood. Mechanisms such as community committees and WhatsApp group communication will be implemented to disseminate information and process feedback. These engagements are designed to build trust, clarify project benefits, and promptly resolve complaints.

- **Contractor Failure**: Regarding this risk, the implementation will focus on forming a strategic alliance/consortium with a trusted contractor partner rather than relying solely on one-off pre-qualification or traditional procurement methods. This approach is intended to foster mutual accountability, long-term performance, and shared risk mitigation. Contractor alliances have shown strong results in complex urban developments by encouraging collaboration from the design stage through to handover. The procurement and risk committee will initiate this strategy from Month 1 and maintain it throughout the project lifecycle. This alliance model reduces disputes, improves communication, and allows flexible adjustments during execution. Monthly joint reviews will be held to evaluate progress, resolve issues, and continuously align deliverables with project goals. (See Table 6)

CONCLUSION AND RECOMMENDATION

Conclusion

This study assessed risk and opportunity in the co-living project using the ISO 31000:2018 risk management framework, supported by PESTLE, VRIO, and SWOT analysis, as well as the Analytical Hierarchy Process (AHP) for choosing mitigation plan. Through qualitative data (interviews with the development firm's executives, and group discussions) and quantitative modeling, the following conclusions can be drawn:

1. A total of 37 risks were identified, encompassing five categories based on the development firm’s risk taxonomy: Strategic, Financial, Operational, Legal & Compliance, and Reputational. The identification process involved desk study, Internal and External analysis, and complemented by interviews with key stakeholders of the development firm.
2. Based on the company’s risk appetite (moderate and below), 11 risks were classified as High to Extreme, necessitating immediate treatment. The risks rating score was determined by multiplying the probability level by the risk impact level, following the company’s regulations.

3. Due to the research scope and limitation, only three risks labeled "Extreme" (Permit Delay, Community Rejection, and Contractor Failure) were selected for detailed mitigation planning using the Analytical Hierarchy Process.
4. The Analytical Hierarchy Process (AHP) was then utilized to objectively prioritize mitigation strategies for these extreme risks. Based on criteria established by the development firm, the AHP results strongly recommend:
   - For Permit Delay risk, the most suitable mitigation plan is the use of Contingency Buffers in Project Timelines, which provides flexibility in facing regulatory delays.
   - For the Community Rejection risk, the preferred strategy is the Establishment of a Grievance Redress Mechanism, ensuring community concerns are addressed promptly and transparently.
   - For the Contractor Failure risk, the most effective mitigation is through Collaborative Contract Models (e.g., Alliancing/Consortium), which encourage shared responsibility, reduce adversarial relationships, and improve project delivery performance.

These targeted mitigation strategies address the root causes of each identified extreme risk and align with the company's operational capabilities and project priorities.

Recommendation

For the Development Firm

This study recommends formalizing ISO 31000:2018 as a standard risk management approach in all property projects. Key actions include creating a comprehensive mitigation playbook with strategies like timeline buffers, grievance mechanisms, and collaborative contractor models. Proactive and early engagement with communities through awareness campaigns or participatory planning is also essential to reduce resistance. Additionally, stricter contractor selection and alliance-based contracts can help prevent future delays and cost overruns while strengthening accountability.

For Future Researchers

This study offers a baseline for exploring risk management in co-living developments. Future work should involve more diverse stakeholders, such as local residents and regulatory bodies to gain a more holistic perspective. Additionally, considering new AHP criteria like digital readiness or ESG (Environmental, Social, and Governance) factors could enrich the analysis.

REFERENCE

Badan Pusat Statistik (BPS) DKI Jakarta. (2023). Jumlah penduduk menurut kelompok umur dan jenis kelamin di Provinsi DKI Jakarta - 2023. Retrieved June 1, 2025, from https://jakarta.bps.go.id/id/statistics-table/3/WVc0MGEyMXBkVFUxY25KeE9HdDZkbTQzWkVkb1p6MDkjMw==

Badan Pusat Statistik (BPS) DKI Jakarta. (2024). Penduduk: Laju pertumbuhan, distribusi persentase, kepadatan, dan rasio jenis kelamin menurut kabupaten/kota di Provinsi DKI Jakarta - 2024. Retrieved June 1, 2025, from https://jakarta.bps.go.id/en/statistics-table/3/V1ZSbFRUY3lTbFpEYTNsVWNGcDZjek53YkhsNFFUMDkjMw==

Barney, J. B., & Hesterly, W. S. (2024). Strategic management and competitive advantage: Concepts and cases (7th ed.). Pearson Education.

Bubshait, A. A. (2003). Incentive/disincentive contracts and its effects on industrial projects. *International Journal of Project Management*, *21*(1), 63–70. https://doi.org/10.1016/S0263-7863(01)00078-3

Carmona, M., Heath, T., Oc, T., & Tiesdell, S. (2010). Public places urban spaces: The dimensions of urban design (2nd ed.). Routledge. https://doi.org/10.4324/9781315158457

Coricelli, F. (2022). The Co-'s of Co-Living: How the advertisement of living is taking over housing realities. *Urban Planning*, *7*(1), 296–304. https://doi.org/10.17645/up.v7i1.4805

Herzasha, A. F. (2023). Risk assessment of public electric vehicle battery swapping station (SPBKLU). *Journal of Economics and Business UBS*, *12*(2), 903–918.

International Organization for Standardization (ISO). (2018). ISO 31000:2018 Risk management—Guidelines. Geneva: ISO.

Jakarta Smart City. (n.d.). Perda No. 1 Tahun 2014. Retrieved June 1, 2025, from https://jakartasatu.jakarta.go.id/geoportal/layanan/galeri-peta-dan-dashboard/perda-1-tahun-2014

Johnson, G., Whittington, R., Scholes, K., Angwin, D., & Regnér, P. (2023). Exploring strategy: Text and cases (13th ed.). Pearson Education.

Juwita, R. D. (2024, October 31). 1 million apartments won't solve urban housing crisis. *The Jakarta Post*. https://www.thejakartapost.com/business/2024/10/31/1-million-apartments-wont-solve-urban-housing-crisis.html

Kumaraswamy, M. M., & Chan, D. W. M. (1998). Contributors to construction delays. *Construction Management and Economics*, *16*(1), 17–29. https://doi.org/10.1080/014461998372556

Mordor Intelligence. (n.d.). Real estate market in Indonesia - Growth, trends, and forecasts (2024–2029). Retrieved June 1, 2025, from https://www.mordorintelligence.com/industry-reports/real-estate-market-in-indonesia

Mulyano, Y., Rahadi, R. A., & Amaliah, U. (2020). Millennials housing preferences model in Jakarta. *European Journal of Business and Management Research*, *5*(1), 1–9. https://doi.org/10.24018/ejbmr.2020.5.1.240

Mutalibov, M. A., & Faturohman, T. (2021). Risk Management of Sulawesi Maluku Papua Submarine Cable System of 20-1000 Meter Water Depth Using Analytical Hierarchy Process (AHP). *Review of Integrative Business and Economics Research*, *10*, 290–305.

Saaty, T. L. (1980). The analytic hierarchy process. McGraw-Hill.

Saaty, T. L. (2008). Decision making with the analytic hierarchy process. *International Journal of Services Sciences*, *1*(1), 83–98. https://doi.org/10.1504/IJSSCI.2008.017590

Saaty, T. L., & Vargas, L. G. (2021). Models, methods, concepts & applications of the analytic hierarchy process (3rd ed.). Springer.

Tan, T. H., & Toh, E. B. H. (2025). Millennials' perspectives: Motivations for co-living in a developing nation. *Open House International*, *50*(1), 1–17. https://doi.org/xxxx

Thilini, M., & Wickramaarachchi, N. (2019). Risk assessment in commercial real estate development: An application of analytic network process. *Journal of Property Investment & Finance*, *37*. https://doi.org/10.1108/JPIF-01-2019-0002

Vanclay, F. (2003). International principles for social impact assessment. *Impact Assessment and Project Appraisal*, *21*(1), 5–12. https://doi.org/10.3152/147154603781766491

Walker, D. H. T., & Lloyd-Walker, B. M. (2015). Collaborative project procurement arrangements. *Project Management Journal*, *46*(2), 6–21. https://doi.org/10.1002/pmj.21494

Wheelen, T. L., Hunger, J. D., Hoffman, A. N., & Bamford, C. E. (2022). Strategic management and business policy: Globalization, innovation, and sustainability (16th ed.). Pearson Education.

Wiegelmann, T. (2012). *Risk Management in the Real Estate Development Industry: Investigations into the Application of Risk Management Concepts in Leading European Real Estate Development Organisations*.

Zulkarnaen, W., Fitriani, I., & Yuningsih, N. (2020). Pengembangan Supply Chain Management Dalam Pengelolaan Distribusi Logistik Pemilu Yang Lebih Tepat Jenis, Tepat Jumlah Dan Tepat Waktu Berbasis Human Resources Competency Development Di KPU Jawa Barat. *Jurnal Ilmiah MEA (Manajemen, Ekonomi, & Akuntansi)*, *4*(2), 222-243. https://doi.org/10.31955/mea.vol4.iss2.pp222-243.

TABLES AND FIGURES

Table 1 Risk Prioritization

Risk No.	Risk Event	Risk Level	Risk Treatment
2	Permit Delay	25	Mitigate
5	Community Rejection	25	Mitigate
12	Contractor Failure	25	Mitigate
1	Occupancy Drop	16	Mitigate
4	Operational Disruption	16	Mitigate
8	Security Incident	16	Mitigate
13	Political Policy Change	16	Mitigate
14	Disease Outbreak	16	Mitigate
15	Utility Disruption	16	Mitigate
20	Price Competition	16	Mitigate
21	Zoning Change	16	Mitigate
3	Construction Cost Surge	12	Accepted
7	Natural Disaster	15	Accepted
18	Economic Inflation	15	Accepted
23	Waste & Pollution	12	Accepted
30	Weak Marketing	12	Accepted
32	Street Noise	12	Accepted
37	Limited Privacy	15	Accepted
6	Cultural Incompatibility	8	Accepted
9	Supply Chain Disruption	10	Accepted

11	Worker Strike	10	Accepted
16	Property Tax Increase	9	Accepted
17	Smart Tech Adoption Failure	10	Accepted
19	Vendor Dependency	10	Accepted
22	HVAC Failure	8	Accepted
24	Poor Internet	10	Accepted
27	Late Rent Payment	8	Accepted
33	Digital Platform Error	6	Accepted
34	Utility Instability	8	Accepted
35	Lack of Common Facilities	6	Accepted
36	Tenant Incompatibility	6	Accepted
10	Tenant Lawsuit	5	Accepted
25	Booking Platform Dependency	4	Accepted
26	Overcrowding	4	Accepted
28	Structural Damage	4	Accepted
29	Interior Design Failure	3	Accepted
31	Tenant Conflict	5	Accepted

Table 2 Criteria Ranking

Rank	Criteria	Value
1	Cost Efficiency	63,2%
2	Feasibility	19,8%
3	Implementation Time	9,5%
4	Effectiveness	7,5%

Table 3 Priority Ranking of Permit Delays Risk

Rank	Mitigation Plan / Alternative	Value
1	Contingency Buffer in Project Timelines	43,1%
2	Proactive Coordination	32%
3	Legal and Regulation Advisory Services	13,3%
4	Pre-Application Audits	11,6%

Table 4 Priority Ranking of Community Rejection Risk

Rank	Mitigation Plan / Alternative	Value
1	Establishment of a Grievance Mechanism	51,6%
2	Public Awareness Campaigns	26,6%
3	Participatory Urban Planning Workshops	15,1%
4	Social Impact Assessments (SIA)	6,8%

Table 5 Priority Ranking of Contractor Failure Risk

Rank	Mitigation Plan / Alternative	Value
1	Collaborative Contract Models (e.g., Alliancing)	43,2%
2	Incentive-Based Payment Structures	21,4%
3	Rigorous Contractor Pre-Qualification	17,2%
4	Performance Bonds and Penalty Clause	9,2%
5	Third-Party Quality Audits	8,9%

Table 6 Action Plan

Risk / Action	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Contingency for Permit Delay	■	■	■									
Community Engagement / Complaints		■	■	■	■							
Contractor Alliance & Oversight	■	■	■	■	■	■	■	■	■	■	■	■

Figure 1 Risk Management Framework (Source: ISO 31000:2018),

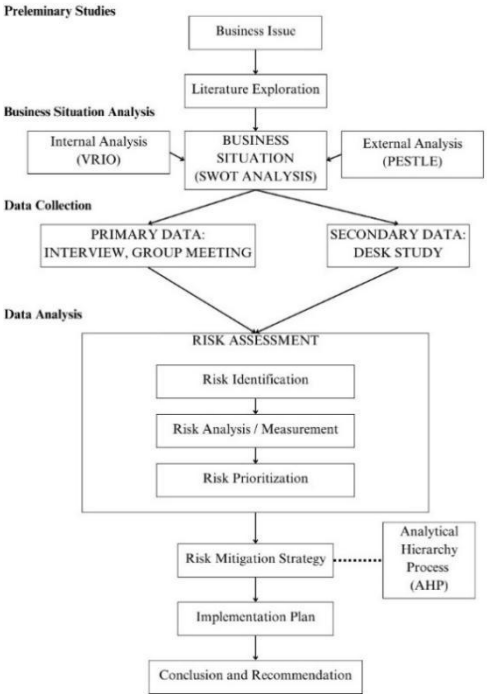

Figure 2 Research Design (Source: Author),

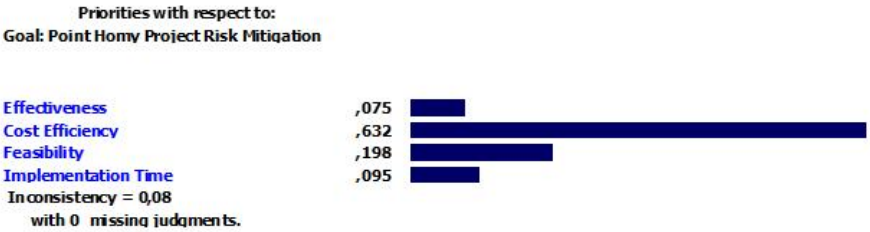

Figure 3 Result of Criteria Pairwise Comparison

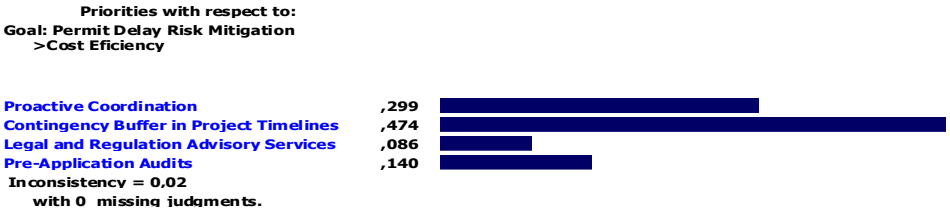

Figure 4 Selection Process of the Permit Delays Mitigation Hierarchy

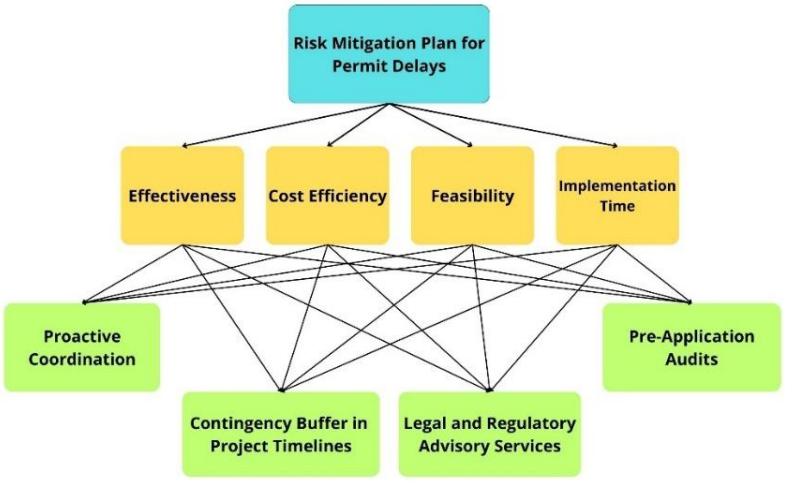

Figure 5 Permit Delay Alternative Pairwise of Cost Efficiency Criteria

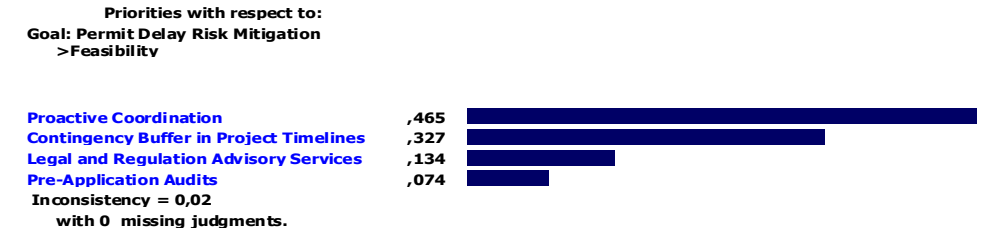

Figure 6 Permit Delay Alternative Pairwise of Feasibility Criteria

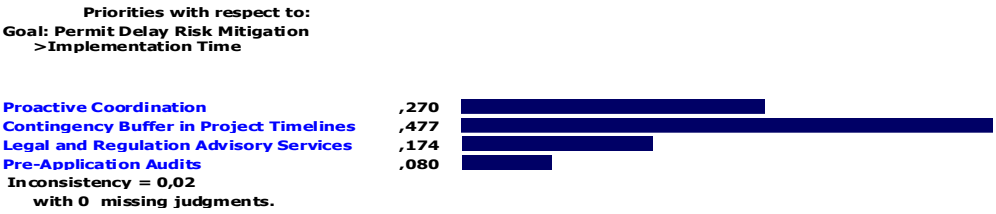

Figure 7 Permit Delay Alternative Pairwise of Implementation Time Criteria

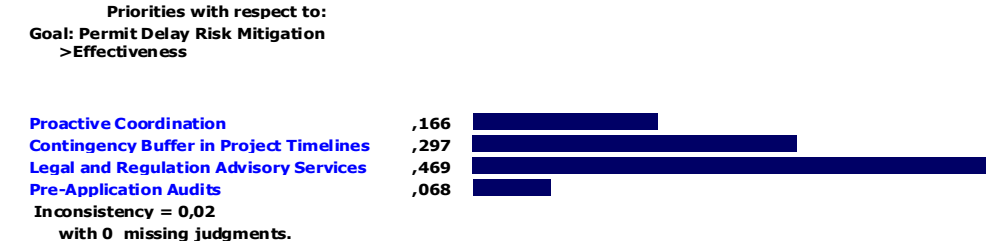

Figure 8 Permit Delay Alternative Pairwise of Effectiveness Criteria

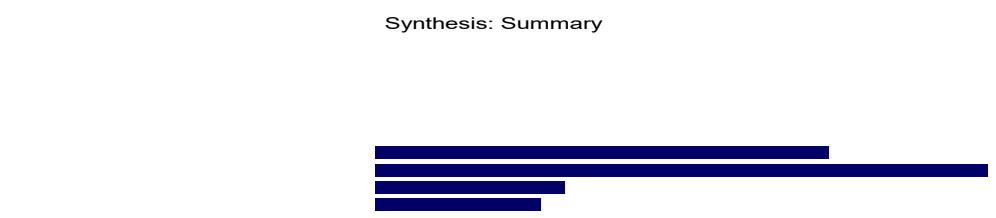

Figure 9 Final Result of Pairwise Comparison of Permit Delays AlternativeS

Synthesis: Summary

Figure 10 Final Result of Pairwise Comparison of Community Rejection Plan
Synthesis: Summary

Synthesis with respect to: Goal: Contractor Failure Risk Mitigatio

Figure 11 Final Result of Pairwise Comparison of Contractor Failure Plan

10/05/2025 |Accepted : 09/06/2025 |Published : 10/08/2025
P-ISSN; 2541-5255 E-ISSN: 2621-5306 | Page 2632