Stakeholder Governance and Program Implementation: Evidence from the IKN Megaproject Using a Mixed-Methods Approach

Rafama Dewi*

Doctoral Study Program in Civil Engineering, Faculty of Engineering, University of Tarumanagara

Email: rafama.328231002@stu.untar.ac.id

Biemo W. Soemardi

Civil Engineering, Faculty of Civil and Environmental Engineering, Bandung Institute of Technology

Email: b.soemardi@itb.ac.id

Mega Waty

Civil Engineering, Faculty of Engineering, University of Tarumanagara,

Email: mega@ft.untar.ac.id

Abstract

The performance of large-scale public infrastructure projects depends not only on technical capabilities but also on how stakeholders are engaged in the management process. In the context of Indonesia's New Capital City (IKN), this study explores the role of stakeholder-centric program management in driving project performance. Drawing on data from 200 respondents, including project owners, consultants, and contractors, the research identifies three primary factors that significantly shape implementation outcomes: coordination, resource allocation, and risk management. Among these, coordination emerged as the most influential factor, especially in addressing role overlaps, fragmented communication, and inconsistent decision-making. The study also reveals gaps in feedback systems and the need for more inclusive governance practices to strengthen program execution. Instead of focusing on statistical models or structural estimations, this paper emphasizes the practical dimensions of program implementation and how strategic alignment among stakeholders can lead to better outcomes. The findings offer actionable insights for public agencies, policymakers, and practitioners who are involved in planning and delivering complex infrastructure programs. The research underlines the need for collaborative mechanisms, flexible resource strategies, and clearer stakeholder roles in ensuring project goals are met efficiently. This stakeholder-centric perspective provides an adaptable governance model applicable to other national infrastructure initiatives beyond IKN.

Keywords: Project Performance, Stakeholder Coordination, Resource Allocation, IKN, Infrastructure Governance

* Penulis Korespondensi: *rafama.328231002@stu.untar.ac.id*

1. Introduction

Managing national infrastructure megaprojects is complex due to multiple stakeholders, high risks, and political sensitivity. Success depends not only on technical skills but also on effective governance of stakeholder interactions [1] [2]. Program coordination, resource alignment, and adaptive risk governance are key factors affecting performance in large initiatives [3] [4].

Indonesia's development of Ibu Kota Nusantara (IKN) is a state-led megaproject with over 40 infrastructure packages, including roads, housing, government facilities, and utilities. The program faces typical challenges of complex projects: fragmented communication, overlapping mandates, resource constraints, and fluid institutional frameworks [5]. These issues are widespread, evident in projects like China's Belt and Road Initiative [6], the UK's High-Speed 2 [7], and Brazil's Olympic infrastructure [8]. Performance failures often arise from poor stakeholder coordination and overlooked risks.

Although there is growing policy focus on stakeholder engagement, empirical studies on stakeholder-centric program management in developing countries are still few. Most project management literature focuses on tools, contract types, or performance metrics, rather than the social systems and perceptions influencing program delivery [9] [10]. This gap is significant in hybrid governance models such as IKN, where responsibilities are divided between public agencies, consultants (CM/PM), and contractors, each with different incentive structures and interpretations of accountability.

This study investigates how coordination, resource allocation, and risk management affect perceived project performance within IKN's program structure, emphasizing adaptive governance models that prioritize relational mechanisms, distributed capacity, and iterative feedback [11].

Using a mixed-methods approach, this study integrates quantitative modeling via Partial Least Squares Structural Equation Modeling (PLS-SEM) with qualitative thematic coding using NVivo. The quantitative phase involves 200

structured survey responses from stakeholders representing project owners, construction management consultants (MK/MKI), and contractors. The qualitative phase draws on field interviews with key informants across various IKN project clusters to explore how coordination failures, resource bottlenecks, and fragmented risk protocols are experienced and interpreted by stakeholders.

This research contributes in three ways: it provides empirical evidence on program-level constructs in megaprojects, reframes coordination as a social process involving trust and clear roles, and interprets program implementation by showing how stakeholder perceptions affect institutional performance.

This study addresses recent theories suggesting a move from linear megaproject management to contextual, stakeholder-responsive models. The framework applies not only to Indonesia's IKN but also to infrastructure programs in the Global South.

2. Theoretical Background

The success of complex infrastructure programs increasingly hinges on the structuring of managerial processes in multi-stakeholder environments. Within such settings, coordination, resource allocation, and risk management are universally recognized as the primary drivers of program effectiveness [1] [2]. In Indonesia, particularly concerning the Ibu Kota Nusantara (IKN) megaproject, these factors are further complicated by institutional fragmentation, dynamic regulatory frameworks, and varied stakeholder interests [5] [12].

2.1. Coordination as a Strategic Enabler

Coordination in megaprojects is not a merely procedural task, but a strategic mechanism through which stakeholders align expectations, manage interdependencies, and resolve ambiguities. In fragmented governance systems, poor coordination often leads to duplicated efforts, delayed decisions, and accountability voids. According to Müller et al. [2], effective coordination requires both formal structures (e.g., steering committees, task forces) and informal mechanisms (e.g., trusted intermediaries, adaptive feedback loops).

Within the IKN program, coordination challenges have arisen due to overlapping mandates between public institutions, insufficient integration of supervision entities (MK/MKI), and lack of real-time communication across packages. Prior research emphasizes the value of boundary-spanning roles and coordination forums in addressing such issues [1] [3]. The presence—or absence—of cross-package coordinators, unified reporting protocols, and program-level decision nodes can significantly influence the agility of implementation.

2.2. Resource Allocation and Institutional Asymmetry

In program environments, resource allocation is both a reflection of strategic priority and a test of institutional capability. Traditional models often emphasize budgetary planning, yet recent studies underline the importance of matching resource types (e.g., personnel, equipment, authority) to dynamic site-level conditions [11]. In IKN, asymmetries in resource distribution are common between packages, especially regarding staffing expertise, contractor readiness, and consultant autonomy.

Moreover, rigid financial disbursement procedures and administrative bottlenecks often prevent adaptive resource mobilization. These issues reflect broader institutional limitations in program delivery, particularly where agencies compete for central funding or operate under fragmented planning horizons [2] [12]. Stakeholder-centered approaches advocate for more flexible, devolved mechanisms that allow field-level actors to respond rapidly without undermining central oversight.

2.3. Risk Management and Adaptive Governance

While risk management is a standard component of project protocols, it is often reduced to compliance-oriented documentation (e.g., risk registers) rather than functioning as a real-time learning mechanism [13]. The literature on megaprojects increasingly calls for a shift toward adaptive risk governance, which emphasizes institutional learning, perception tracking, and feedback-based decision-making [1] [14].

In the IKN program, interview findings suggest that although risks are formally identified during the planning phase, their mitigation at the execution level often lacks agility. This is particularly evident in environmental, regulatory, and interface risks that emerge unexpectedly during implementation. Risk ownership remains ambiguously distributed across stakeholders, which undermines timely response. Prior studies have shown that risk responsiveness improves when decision rights are clearly delegated and when risk monitoring includes both formal indicators and informal perception channels [10] [15].

3. Research Design and Methodology

This study adopts a convergent mixed-methods design to explore the influence of stakeholder-centric factors—coordination, resource allocation, and risk management—on program implementation and project performance in the IKN megaproject. The rationale for using this design lies in the complex nature of the research problem: while

quantitative modeling allows for testing hypothesized relationships among latent constructs, qualitative inquiry offers contextual depth on how stakeholders perceive and interpret those dynamics [16] [17].

3.1. Quantitative Phase: PLS-SEM

A structured questionnaire was developed based on constructs validated in previous literature [1] [2] [3], and then contextualized for the IKN setting. The instrument included indicators for three exogenous latent variables—Coordination (X_1), Resource Allocation (X_2), and Risk Management (X_3)—and their influence on Program Implementation Effectiveness (M_1) and Project Performance (Y_1). All items were measured using a 6-point Likert scale.

A total of 200 valid responses were collected from key stakeholders involved in IKN's implementation, comprising project owners (Satker/PPK), construction management consultants (MK and MKI), and contractors, with representation across both vertical and horizontal infrastructure packages. Data collection was conducted over a two-month period in 2024 through direct outreach and online surveys.

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 4. The approach was chosen due to its suitability for exploratory modeling, predictive relevance, and small-to-medium sample sizes [18]. The assessment followed a two-step procedure:

- Measurement model evaluation (reliability, convergent validity, discriminant validity), and

- Structural model analysis (path coefficients, R^2 values, effect size, predictive relevance Q^2).

- Bootstrapping (5,000 subsamples) was applied to test the significance of path relationships.

3.2. Qualitative Phase: Thematic Coding with NVivo

To complement and contextualize the quantitative findings, a qualitative phase was conducted using semi-structured interviews with 14 informants, including program-level managers, senior consultants, and site engineers from different project packages in IKN. Selection of participants employed a purposive sampling strategy, targeting those directly involved in coordination, resource planning, and risk handling.

Interviews were transcribed verbatim and analyzed using NVivo 15. Thematic coding followed a three-level structure:

- Open Coding to identify initial meaning units related to program coordination, resource access, and risk experience;

- Axial Coding to establish categories and their interrelations;

- Selective Coding to develop integrated themes corresponding to the constructs modeled in the quantitative phase.

Triangulation was achieved by comparing coded statements with institutional documents (e.g., risk registers, coordination meeting minutes), enhancing interpretive validity. Emphasis was placed on capturing stakeholder perception dynamics and informal practices not captured in formal project documents.

3.3. Integration of Findings

The mixed-methods integration was conducted through side-by-side comparison and joint display analysis. Quantitative results identified the strength and significance of hypothesized relationships among constructs. Qualitative findings were then used to explain the why and how behind those relationships, particularly focusing on stakeholder roles, informal mechanisms, and adaptive behaviors. This integration strategy allows for a deeper understanding of both statistical and perceptual dimensions of program implementation in IKN (Fetters et al., 2013).

4. Findings and Analysis

This section presents the integrated results from both the quantitative PLS-SEM model and the qualitative thematic analysis. The findings are structured according to the hypothesized framework, wherein stakeholder coordination (X_1), resource allocation (X_2), and risk management (X_3) influence program implementation effectiveness (M_1), which subsequently affects project performance (Y_1).

4.1. Measurement Model Assessment

Prior to structural testing, reliability and validity of the measurement model were assessed. All constructs met the minimum thresholds for internal consistency (Cronbach's α and composite reliability > 0.7), convergent validity

(AVE > 0.5), and discriminant validity (HTMT < 0.85). Indicator loadings ranged from 0.713 to 0.894, demonstrating acceptable construct convergence (Hair et al., 2021).

4.2. Structural Model Results

Figure 2 illustrates the final path model. Key results include:

Coordination → Program Implementation (β = 0.462, p < 0.001)

Resource Allocation → Program Implementation (β = 0.251, p < 0.01)

Risk Management → Program Implementation (β = 0.204, p < 0.05)

Program Implementation → Project Performance (β = 0.578, p < 0.001)

The model explains 63.5% of the variance in program implementation (R^2 = 0.635) and 47.2% of the variance in project performance (R^2 = 0.472). All path coefficients are statistically significant, supporting the proposed relationships.

The effect size (f^2) analysis revealed that coordination had the strongest impact (f^2 = 0.328), followed by resource allocation (f^2 = 0.129) and risk management (f^2 = 0.097). Predictive relevance (Q^2) values were also above zero, confirming model robustness.

4.3. Thematic Patterns from Qualitative Analysis

NVivo-based thematic coding yielded 38 open codes, 11 axial themes, and 3 selective themes aligned with the three main constructs. Selected empirical narratives provide insight into stakeholder perceptions and operational challenges.

4.3.1. Coordination

Informants consistently highlighted fragmented communication, role overlaps, and lack of integrated forums across packages:

"Coordination is reactive, not systemic. Often we resolve conflicts informally between MKI and contractors." — Informant #4, Vertical Project

"There's no unified dashboard or schedule; each unit operates in silos, leading to inconsistent decisions." — Informant #9, Horizontal Project

These findings confirm that coordination is not just an administrative task but a relational function requiring role clarity, shared tools, and synchronized reporting.

4.3.2. Resource Allocation

Respondents noted disparities in resource readiness and delayed mobilization, especially for human resources and heavy equipment:

"While budgets are allocated on paper, the actual deployment is uneven. Some clusters get better consultants or faster approvals." — Informant #2, MK

"We need more flexibility in shifting resources when packages are interdependent, but the current system is rigid." — Informant #7, Contractor

The data illustrate that formal allocation mechanisms are insufficient without institutional agility and field-level discretion.

4.3.3. Risk Management

Risk is perceived as documentation-heavy but action-light. Informants stressed the lack of dynamic risk protocols and slow response to emergent threats:

"We report risks, but there's a lag in follow-up. Escalation paths are unclear." — Informant #6, PPK

"Environmental risks were underestimated. There's a disconnect between what's planned and what's happening on site." — Informant #11, MK

This reinforces the need for adaptive risk governance, including feedback loops and localized risk monitoring.

4.4. Integrated Analysis

The convergence of findings across both data streams confirms the centrality of coordination in driving effective implementation. Quantitatively, coordination emerged as the strongest predictor of program performance via implementation pathways. Qualitatively, it was the most frequently cited pain point and enabler. Both data sets

emphasize the need for cross-package coordination mechanisms, flexible resource deployment, and real-time risk feedback systems.

5. Discussion

This study sought to examine how stakeholder-centric factors—coordination, resource allocation, and risk management—shape program implementation and project performance in the context of the IKN megaproject. The findings provide strong empirical support for the conceptual framework, with coordination emerging as the most influential predictor of implementation effectiveness. These results align with, but also extend, previous literature on governance and stakeholder dynamics in large-scale infrastructure programs.

5.1. Coordination as a Strategic Mechanism

The structural model revealed that coordination has the strongest total effect on project performance, mediated through program implementation. This finding confirms that coordination is not merely a procedural task, but a strategic enabler of cross-organizational alignment [19], [20]. In the IKN case, coordination challenges are amplified by overlapping institutional roles and the absence of unified forums for decision-making, as reflected in the qualitative findings.

This supports prior work by Denicol et al. [21], which emphasized the need for integrated governance platforms and coordination nodes in megaproject settings. However, this study contributes new insights by demonstrating how stakeholder perceptions of coordination quality directly affect implementation coherence, beyond what formal organograms or reporting lines suggest. In particular, the informal, trust-based interactions observed in IKN highlight the relevance of relational coordination theory in megaprojects [22], suggesting the need for future models that incorporate both formal and informal coordination mechanisms.

5.2. Resource Allocation and Institutional Asymmetry

The positive and significant influence of resource allocation on program implementation reinforces the perspective that resources must not only be sufficient, but strategically aligned and adaptable [19] [23]. The study highlights the existence of institutional asymmetry in the IKN program, where differences in consultant expertise, equipment mobilization, and decision authority across packages create uneven execution capabilities.

These findings echo observations by Martinsuo and Hoverfält [3] that emphasize the dynamic fit between resource strategies and program complexity. In IKN, this fit is often constrained by rigid budgeting systems and segmented procurement, reinforcing the need for flexible allocation mechanisms that empower field-level decision-makers. The findings suggest a shift from linear resource planning to modular, decentralized resource governance, particularly for multi-package programs.

5.3. Risk Management and Adaptive Capacity

While risk management was the weakest of the three predictors, it remained statistically significant. The qualitative data offer a clear explanation: risk management in IKN is overformalized yet under-adaptive. Stakeholders perceive risk processes as checklists rather than tools for dynamic decision-making. This confirms previous critiques by Di Maddaloni and Davis [13] and He et al. [24] on the limitations of traditional risk protocols in megaprojects.

This study contributes by articulating the gap between formal risk documentation and field-level responsiveness, suggesting that risk governance in megaprojects must evolve into an adaptive system that leverages feedback from implementation actors. Embedding local risk loops, strengthening escalation paths, and integrating perceptual data into risk models are actionable strategies for improving this function.

5.4. Theoretical and Practical Implications

Theoretically, this research reinforces the value of stakeholder-centric program management models by integrating both structural (quantitative) and perceptual (qualitative) dimensions. The findings support the call for contextualized program theories that recognize the interplay of formal structures and stakeholder agency [15], [25].

Practically, the study suggests that agencies overseeing national megaprojects should prioritize:

- The institutionalization of cross-package coordination units,

- More responsive resource governance models,

- Risk management systems embedded with real-time stakeholder input.

For the IKN program, this could involve establishing a central program coordination office with authority to resolve inter-package conflicts, enabling mid-cycle resource reallocation, and deploying interactive risk dashboards linked to field observations.

6. Conclusions and Implications

This study explored how stakeholder-centric factors—coordination, resource allocation, and risk management—influence program implementation and project performance in the IKN megaproject. Using a mixed-methods approach combining PLS-SEM and thematic analysis, the study provides robust evidence that coordination serves as the most critical factor shaping implementation outcomes, followed by resource allocation and risk management.

6.1. Key Conclusions

Coordination significantly improves program implementation and, indirectly, project performance. Both quantitative and qualitative findings confirm that the effectiveness of coordination depends not only on formal mechanisms but also on informal trust-based communication and clarity of roles.

Resource allocation influences implementation through institutional capacity and responsiveness. Packages with greater autonomy and better-aligned human and technical resources perform more consistently, highlighting the need for adaptive resource strategies.

Risk management, while statistically significant, is perceived as weakly embedded in field-level processes. Formal protocols exist, but dynamic responsiveness and stakeholder input are lacking, limiting practical impact.

The integration of PLS-SEM and thematic coding demonstrates that stakeholder perceptions are not only reflective but constitutive of program governance effectiveness. Formal structures alone cannot ensure performance without attention to stakeholder dynamics.

6.2. Theoretical Contributions

This research contributes to the literature on megaproject management by:

- Operationalizing a stakeholder-centric model for program governance, grounded in both empirical data and contextual nuance.

- Extending relational coordination theory and resource-based perspectives into the domain of state-led infrastructure programs.

- Bridging the gap between perceptual insights and structural modeling, thus advancing mixed-methods approaches in megaproject research.

6.3. Practical and Policy Implications

For policy-makers and public agencies involved in national infrastructure delivery, the findings suggest three immediate priorities:

- Institutionalize cross-package coordination units equipped with decision-making authority to manage interdependencies.

- Enable flexible resource reallocation within program structures, especially in response to evolving site conditions and performance disparities.

- Reframe risk management from a compliance function into a dynamic governance tool, incorporating feedback loops, local escalation protocols, and perceptual monitoring.

In the context of IKN, these steps are vital to realizing its vision as a model of sustainable, responsive, and integrated infrastructure development. More broadly, the framework presented here may be applied in other large-scale national initiatives seeking to move beyond traditional, siloed project governance models.

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