

Assessment of Contractor Practices and Challenges in Vendor Selection for Public Building Projects in Kathmandu Valley

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Abstract— The construction projects in Nepal experiences time and budget overruns and client dissatisfaction. These challenges are exacerbated by inadequate vendor selection processes that prioritize cost over essential factors such as quality, reliability, and operational flexibility. This study aims to assess the current practices and challenges faced by contractors during vendor selection processes for public building projects within Kathmandu Valley. The research specifically focuses on investigating the criteria employed, challenges encountered during the selection and determining solutions to mitigate these challenges. The study was carried out on seven major public building projects having 8 respondents valued above NPR 1 billion within Kathmandu Valley. A mixed-methods research approach was employed by combining quantitative techniques including Analytic Hierarchy Process (AHP) analysis and Relative Importance Index (RII) with qualitative methods encompassing semi-structured interviews with project managers and procurement experts and Key Informant Interviews (KII) with industry specialists across three iterative rounds. The study highlighted Quality of Material Delivered as predominant criterion in vendor selection decisions, while geographical proximity consistently received low prioritization. The consensus among the experts through the multiple rounds of KII reveals that clear hierarchy of intervention is needed with financial reliability through prompt payments serving as the foundational requirement upon which other improvements can be built. The study proposes an integrated approach for vendor selection improvement with standardized quality assessment protocols to ensure consistent evaluation criteria, payment system reforms to address financial reliability concerns and centralized governance structures for institutional strengthening.

Keywords— Construction Management, Vendor Selection, Analytical Hierarchy Process, Quality-Centered Approach, Procurement Strategy, Multi-Criteria Decision Making

I. INTRODUCTION

The global construction industry is undergoing significant transformation driven by technological advancements and evolving client expectations, which demand higher quality, efficiency, and sustainability in project delivery. [1] Construction projects in Nepal, particularly in the Kathmandu Valley, face significant challenges leading to time and cost overruns. Key factors contributing to these issues include

inadequate planning, poor site conditions, design changes, lack of resources, and political instability[2]. The performance of construction projects is typically measured by how well they meet stakeholder requirements, satisfy user needs, achieve predefined objectives, and adhere to budget and schedule constraints[3]. A critical but often overlooked factor influencing project performance is the vendor selection process—the method by which contractors identify, evaluate, and choose suppliers of materials, equipment, and services essential for project execution[4]. In this study, contractor practices refer to the approaches and criteria contractors apply when selecting vendors, while challenges denote the difficulties and obstacles they face during this process.

Despite global examples of successful construction initiatives, many projects in Nepal experience time and budget overruns, client dissatisfaction, and socio-environmental conflicts [5]. The application within the construction industry—particularly for vendor selection—remains limited as the Analytical Hierarchy Process (AHP) has gained considerable traction across various sectors in Nepal over the past decade. This deficiency leads to suboptimal supplier choices that ultimately compromise project performance. Furthermore, the industry exhibits divergent supply chain priorities between public and private sectors; while public organizations emphasize quality assurance measures, private developers focus primarily on client satisfaction metrics [6]. This disparity creates complexity in implementing unified supply chain strategies and highlights the necessity for tailored approaches addressing sector-specific requirements.

The primary objective of this study is to assess the current practices and challenges faced by contractors in the vendor selection process for public building projects within Kathmandu Valley. The specific objectives of this research are to examine the current practices of criteria used in vendor selection process and the study identifies the challenges faced by contractor when choosing vendors and finding mitigating measures to solve them.

This research addresses critical gaps in Nepal's construction sector by examining how contractors actually select vendors for public buildings in Kathmandu Valley. By comparing documented procedures against actual

implementation, this study will identify specific disconnects between written policy and everyday practice in the local context. Through interviews and document analysis, study uncovers the real challenges contractors face—whether regulatory hurdles, market limitations, or institutional constraints specific to Nepal's construction environment.

II. LITERATURE REVIEW

Vendor selection is a critical component of construction supply-chain management because the quality, reliability, cost and delivery performance of vendors directly influence project outcomes. Supplier selection is inherently a multi-criteria decision problem, requiring consideration of several technical, financial and operational factors rather than price alone [7] [8]. In construction projects, structured selection processes are therefore necessary to reduce uncertainty and improve the likelihood of successful project delivery. Previous studies have identified quality, financial capability, technical competence, past performance, management capability and logistical considerations as important vendor-selection criteria. Quality of materials and workmanship is consistently identified as one of the most important factors. [9] identified financial stability as a frequently considered prequalification criterion. Technical capability and past performance provide an indication of a vendor's ability to meet project requirements. [8] emphasized technical capability and previous performance as important measures for reducing execution risks, while [10] highlighted systematic prequalification for assessing contractor capabilities. Management capability is similarly important because effective coordination, resource allocation, communication and problem-solving influence project execution [9].

Geographical proximity, although traditionally considered relevant because of transportation and logistical advantages, has become less important with improvements in supply-chain and logistics systems. [7] reviewed different MCDM approaches for supplier evaluation and highlighted the usefulness of systematic decision-making methods in supplier selection. AHP provides a structured approach for comparing criteria and assigning relative priorities, thereby reducing reliance on purely subjective decisions [11] demonstrated the application of AHP for supplier-selection decisions, while [12] emphasized systematic multi-criteria approaches for contractor selection and bid evaluation. Theoretical perspectives also explain why vendor-selection priorities differ among projects. Transaction Cost Theory emphasizes minimizing costs and uncertainties associated with supplier relationships, while Principal-Agent Theory highlights information asymmetry and the need to ensure that vendors act consistently with project objectives [13]. In Nepal, vendor selection is influenced by the regulatory and institutional environment governing public procurement. Existing studies identify inadequate planning, weak monitoring and political interference as continuing challenges in public construction [2]; [14]. [6] also found differences in supply-chain priorities between public and private construction organizations in Kathmandu Valley. However, empirical research specifically examining how vendors are actually selected for large public building projects in Kathmandu Valley remains limited.

Human resource capacity in construction companies represents a critical factor in vendor performance. In order to retain qualified personnel and increase project performance ([15]) suggested improving health and safety policies, employee involvement, and incentive packages. These

improvements can strengthen vendor capabilities and contribute to better project outcomes. Capacity building initiatives can technical and managerial capabilities of vendors, improving their ability to meet project requirements and deliver quality outcomes. Such initiatives may include training programs, knowledge sharing platforms, mentorship, and collaborative learning opportunities. The literature therefore indicates a need for context-specific evidence on the criteria used by contractors; the challenges encountered during selection and appropriate measures for improving the process. This study addresses this gap by examining vendor selection practices in public building projects within Kathmandu Valley.

III. METHODOLOGY

A. Research Design

This research adopted a mixed-methods approach, combining qualitative and quantitative techniques to achieve the research objectives. The study followed a structured framework that integrated multiple data collection methods and analytical techniques to ensure comprehensive coverage of the research questions as indicated in Fig.1.

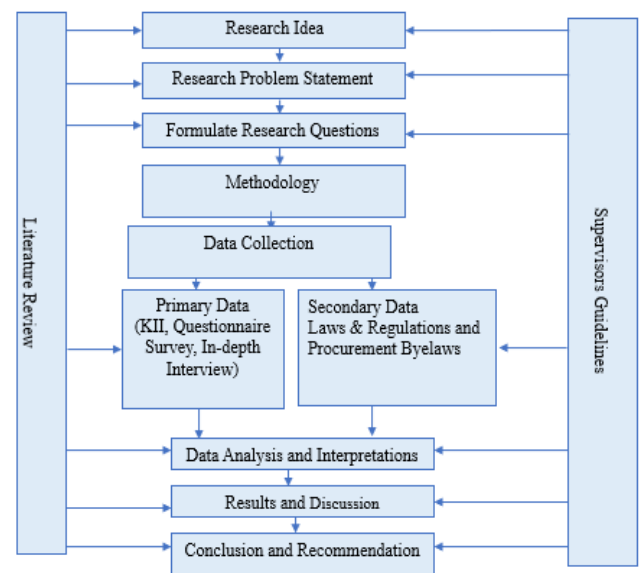


Fig. 1. Research Process Flowchart

B. Study Area and Sampling

This research is specifically centered on the Kathmandu Valley, a prominent urban region in central Nepal that comprises the cities of Kathmandu, Bhaktapur and Lalitpur. The Kathmandu Valley is characterized by intense construction activity, with public building projects playing a vital role in urban development. However, the region faces pronounced challenges such as irregular building practices, rapid and often unplanned urban expansion, and ongoing environmental and social issues. Given these dynamics, the Kathmandu Valley provides a compelling and relevant context for examining contractor practices and the challenges encountered in vendor selection for public building projects. The concentration of public construction initiatives, combined with persistent infrastructure and regulatory hurdles, makes this region an ideal case for exploring the effectiveness and limitations of current vendor selection processes in Nepal's public sector construction industry.

The study was conducted in Kathmandu Valley as shown in Fig.2. Purposive sampling was used to select information-

rich public building projects. The selection criteria included projects valued above NPR 1 billion, located within Kathmandu Valley, representing different types of public buildings and being at different stages of completion. Seven public building projects were selected, involving eight respondents: seven project managers and one procurement expert.

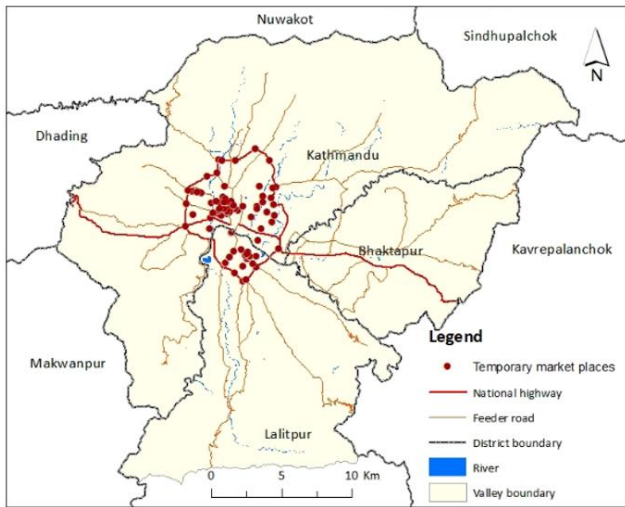


Fig. 2. Location Map of Study Area[16]

C. Quantitative approach

The quantitative component involves:

- **Analytic Hierarchy Process (AHP):** This multi-criterion decision-making technique was employed to determine the relative importance of various vendor selection criteria. The AHP helps to establish hierarchical relationships among criteria and sub-criteria, enabling the calculation of priority weights.
- **Structured Questionnaires:** Formulated questionnaires was distributed to gather statistical data on vendor selection practices, criteria prioritization, and compliance levels in public building construction activities.
- **Comparative Priority Rankings:** This technique used to analyze how different criteria are prioritized across various projects, revealing patterns and strategic orientations in procurement decision-making.

D. Qualitative Approach

The qualitative component includes:

- **In-depth Interviews:** A semi-structured interview was conducted with two key stakeholders to explore the underlying reasoning behind vendor selection decisions, challenges encountered, and potential solutions.
- **Key Informant Interview (KII):** A panel of industry 5 experts participates in three iterative rounds of consultation to establish consensus on best practices and intervention priorities for improving vendor selection processes.

E. Data Collection

Both primary and secondary data were used. Primary data were collected through structured questionnaires, interviews with project managers and procurement experts, and Key Informant Interviews (KII). The KII process involved multiple

rounds with industry specialists to identify and validate major challenges and potential solutions. Secondary information was obtained from relevant literature, procurement documents and existing studies concerning construction vendor selection and public procurement.

F. Data Analysis

Quantitative data were analyzed using the Analytical Hierarchy Process (AHP) and Relative Importance Index (RII). AHP was used to determine the relative weights and priorities of vendor-selection criteria through pairwise comparisons. The analysis was conducted using the BPMMSG AHP online calculator. RII was used to rank factors based on respondents' ratings on a five-point Likert scale, with higher RII values indicating greater perceived importance.

Qualitative interview data were analyzed through thematic analysis to identify recurring challenges and proposed solutions. Comparative analysis was also used to examine differences in the prioritization of criteria across projects. Microsoft Excel and AHP software were used for data processing and presentation.

G. Reliability and Validity

The questionnaire was pilot-tested with two academic subject specialists and revised according to their feedback. Cronbach's alpha values of 0.87 and 0.83 were obtained for the relevant objectives, exceeding the accepted threshold of 0.70 and indicating satisfactory internal consistency (Nunnally, 1978).

Ethical requirements were maintained through informed consent, confidentiality and anonymity of participants, with respondents informed of their right to withdraw from the study.

IV. RESULTS AND DISCUSSION

A. Vendor Selection Criteria

Analytical Hierarchy Process (AHP) was used to determine the relative importance of ten criteria used by contractors in selecting vendors for public building projects in Kathmandu Valley. The criteria considered were lead time, flexibility and capacity to accommodate changes, credit time, proximity to the project, storage capacity, financial stability, quality of material delivered, past performance, after-delivery services, and communication professionalism. The AHP results demonstrate that although all criteria contribute to vendor selection, their importance varies considerably across projects. The most significant finding is that Quality of Material Delivered was the dominant criterion depicted in radar plot in Fig.3, with an average priority weight of 27.46%. Its importance was consistently high across the projects, ranging from 16.92% to 42.70%. Respondent F assigned the highest weight of 42.70%, followed by Respondent E at 34.75%, while even the lowest weighting recorded for Respondent D remained relatively high at 16.92%. This consistency indicates that material quality is not merely a project-specific preference but a fundamental concern in construction vendor selection. The result is also consistent with previous studies cited in the research work, which identified quality assurance and material quality as major determinants of successful construction procurement.

The second most important criterion was Credit Time, with an average weight of 11.78%. Its relatively high position indicates that payment terms are an important consideration for vendors and contractors, particularly in large public

construction projects where delayed payments can create cash-flow problems. The finding suggests that vendor selection is not based solely on technical characteristics; financial arrangements between contractors and vendors also influence procurement decisions. The research relates this result to the importance of payment conditions in developing-country construction supply chains.

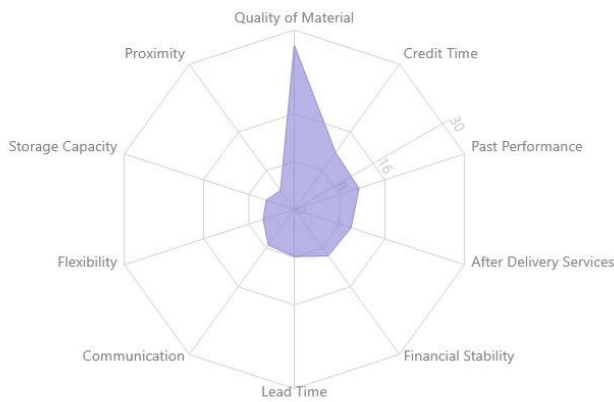


Fig. 3. Radar Chart Presenting the Average Importance of Each Criterion

Past Performance (Reliability) ranked third, with an average weight of 11.40%. However, its importance varied considerably, from only 1.82% for Respondent E to 21.96% for Respondent G. This variation suggests that previous experience with vendors strongly affects the way contractors evaluate reliability. Projects involving safety-critical or technically demanding materials may place greater emphasis on previous performance because a vendor's historical record provides evidence of its ability to deliver acceptable products and services.

After-Delivery Services ranked fourth with an average weight of 10.02%, but it displayed one of the largest differences between projects. Respondent B assigned it 23.61%, whereas Respondent F assigned only 1.78%. This indicates that after-delivery support becomes particularly important when materials or equipment require warranties, maintenance, troubleshooting or vendor intervention after installation. For standard materials that can easily be replaced, however, contractors may consider this criterion less important.

Financial Stability received an average weight of 9.63%, followed by Lead Time (7.92%), Communication Professionalism (7.40%), Flexibility and Capacity to Changes (5.49%), and Storage Capacity (4.95%). The relatively low weighting of flexibility may indicate that contractors generally prefer clearly defined specifications rather than relying on vendors' ability to accommodate frequent changes. Similarly, Proximity to Project received the lowest average weight of only 3.96%. The low importance of proximity is particularly noteworthy. Traditionally, local suppliers may be preferred because of shorter transportation distances and potentially faster delivery. However, the finding suggests that improvements in logistics and supply-chain systems have reduced the importance of physical distance. Contractors appear to prioritize quality, financial terms and reliability over geographical convenience. Thus, the findings challenge the assumption that vendors located close to a project will necessarily be preferred.

B. Variation in Vendor Selection Priorities

Although quality emerged as the dominant criterion overall, the AHP results demonstrate that there is no uniform vendor-selection strategy across all projects. Different respondents emphasized different criteria depending on their project circumstances and previous experiences. For example, Respondent A adopted a relatively balanced approach, emphasizing Credit Time, Quality and After-Delivery Services. Respondent B emphasized After-Delivery Services and Quality, while Respondent C prioritized Quality and Financial Stability. Respondent D emphasized on financial stability and Quality, whereas Respondent E placed particularly high importance on Quality and Credit Time. The project-specific analysis becomes particularly important when interpreting the overall average. The high average for quality should not be interpreted as meaning that every project should apply exactly the same weighting. Rather, the findings indicate that quality provides a common foundation, while the relative importance of other criteria changes according to project-specific risks and requirements. The coefficient of variation analysis supports this interpretation. Communication and Collaboration had the highest variability (CV = 89.7%), followed by Financial Capability (76.8%), Past Performance (75.3%), and Legal Compliance (63.2%) demonstrated in Fig.4. In contrast, Quality Assurance had a much lower CV of 33.4%, demonstrating that its importance was comparatively consistent across projects.

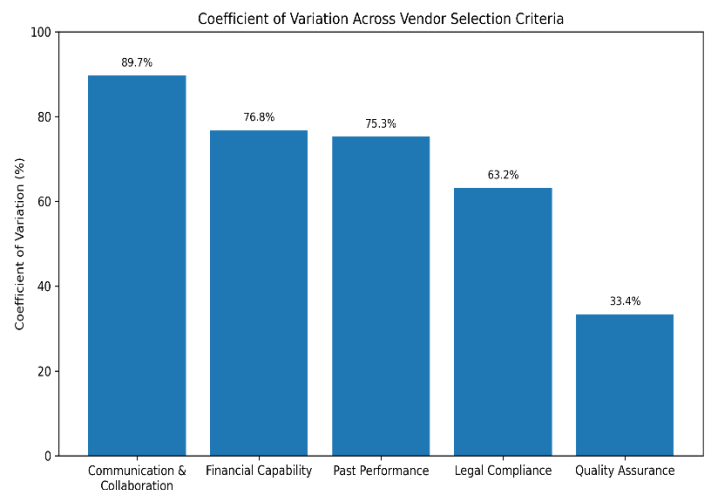


Fig. 4. Coefficient of variation across vendor selection criteria.

This result is important for procurement policy. A rigid vendor-selection framework assigning identical weights to every criterion may not adequately represent the requirements of different public building projects. The results instead support a context-sensitive selection framework, where core criteria such as quality are consistently evaluated but the weighting of risk, financial, legal, communication and performance criteria can be adjusted according to project characteristics. The cluster analysis further identified three broad approaches: risk-focused projects (A, F and H), quality-centered projects (C, E and G), and balanced projects (B and D).

C. Major Challenges in Vendor Selection

The analysis identified three major tensions in the vendor-selection process. The first was the quality assurance versus risk-management trade-off. Quality-centered projects placed strong emphasis on Quality Assurance and Experience, whereas risk-focused projects gave greater importance to

Government Risk and Legal Compliance. This indicates that procurement teams may sometimes be forced to concentrate on either ensuring technical quality or reducing regulatory and governmental risks, potentially leaving weaknesses in the other dimension.

The second challenge was the tension between technical excellence and communication/collaboration. The analysis indicated a negative relationship between Communication and several technical criteria, particularly Quality Assurance. This suggests that vendor selection practices may unintentionally treat technical competence and collaborative capability as competing attributes, even though successful construction projects require both. The third challenge involved historical performance versus current capability. Past Performance reflects a vendor's previous record, whereas current expertise and financial capability provide information about its present capacity. The high CV of 75.3% for Past Performance demonstrates substantial disagreement between projects regarding how much historical performance should influence current selection decisions[fig.5.].

These findings indicate that the major problem is not simply the absence of vendor-selection criteria. Rather, the difficulty lies in balancing multiple criteria that can become more or less important depending on project conditions.

D. Remedial Measures and Discussion

The Key Informant Interviews were used to identify and rank possible measures for addressing the challenges. The results demonstrate a clear hierarchy of interventions. The highest-rated measure was prompt release of contractor payments upon receipt of invoices, with an RII of 1.00. This was followed by establishing a centralized construction authority (RII = 0.92) and strictly enforcing supplier compliance with standards (RII = 0.92). Merit-based contract awards and maintaining a single project manager from project commencement to completion both received an RII of 0.88.

The highest ranking of prompt payment is particularly significant because financial reliability affects the entire vendor relationship. Delayed payments can discourage capable vendors from participating, disrupt supply continuity and encourage vendors to demand unfavorable payment conditions. Therefore, improving payment reliability represents a foundational intervention rather than merely an administrative improvement.

The second major intervention, a centralized construction authority, reflects the experts' perception that fragmented institutional arrangements contribute to inconsistent standards and procurement practices. A centralized authority could establish common qualification criteria, enforce quality standards, improve coordination and provide clearer accountability. The emphasis on merit-based contract awards similarly indicates the need for transparent and objective vendor selection.

Quality-related interventions were also strongly supported. Strict enforcement of supplier compliance and regular monitoring of manufacturers and border testing received high RII values. This directly addresses the dominant finding that material quality is the most important vendor-selection criterion. The results therefore show a clear connection between the selection problem identified through AHP and the solutions identified through KII.

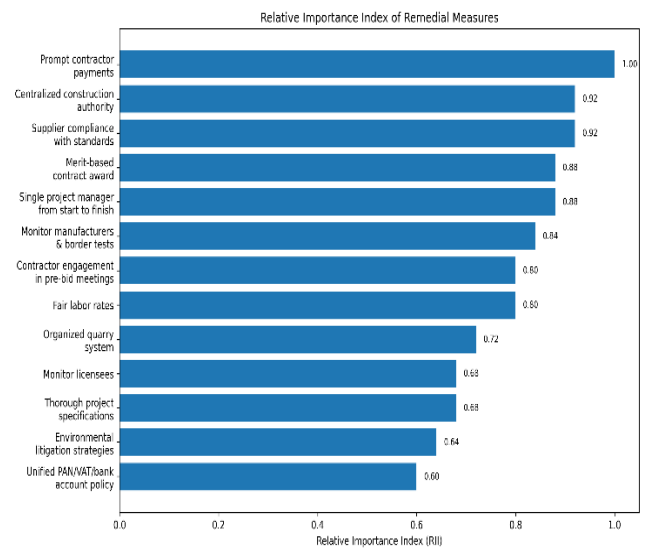


Fig. 5. Relative Importance Index of Remedial measures

Medium-priority measures included monitoring local manufacturers and conducting border tests (RII = 0.84), enhancing contractor participation in pre-bid meetings (RII = 0.80), and increasing labor rates to reflect fair wages (RII = 0.80). Lower-priority measures included developing organized quarry systems (RII = 0.72), monitoring licensees and improving project specifications (RII = 0.68), and environmental litigation strategies (RII = 0.64).

Overall, the results indicate that improving vendor selection requires an integrated financial, institutional and technical approach. The study does not support solving the problem through stricter regulations alone. Rather, prompt payments, centralized governance, objective selection, quality enforcement, contractor engagement and management continuity need to operate together. This interpretation is consistent with the study's theoretical discussion: better governance and payment systems can reduce transaction costs, while merit-based selection and stronger compliance mechanisms can reduce information asymmetry and improve alignment between project owners and vendors.

V. CONCLUSION AND RECOMMENDATION

The study identified ten criteria currently considered in vendor selection. The AHP results showed that Quality of Material Delivered was the most important criterion, with an average priority weight of 27.46%, while Proximity to Project was the least prioritized criterion, with an average weight of 3.96%. Credit Time (11.78%), Past Performance (11.40%), After-Delivery Services (10.02%), and Financial Stability (9.63%) were also important. However, substantial variation in the priority weights across projects indicates that contractors do not follow a single uniform approach to vendor selection.

Furthermore, the analysis identified three major challenges in vendor selection. The first was the trade-off between quality assurance and risk management, where some projects emphasized quality and experience while others placed greater emphasis on government risk and legal compliance. The second was the tension between technical excellence and communication/collaborative capabilities. The third was the difficulty in balancing past performance with current expertise and financial capability. The variation in priority patterns across projects further indicates that vendor-selection

decisions are influenced by project-specific requirements and organizational contexts.

The KII results identified a hierarchy of measures for mitigating these challenges. Prompt contractor payment received the highest level of expert agreement, followed by centralized construction authority, supplier compliance with standards, merit-based contract award, and continuity of project management. The results therefore indicate that improvements are required in financial reliability, institutional arrangements, quality compliance, vendor selection and project management practices.

Overall, the study concludes that vendor selection in public building projects in Kathmandu Valley is primarily quality-centered but context-dependent. The findings do not support a single fixed priority structure for all projects. Instead, the selection process involves different priorities and trade-offs, while the identified expert measures provide specific areas for improving the existing vendor-selection process.

Based directly on the findings of the study, the following recommendations are made:

1. Quality of material should remain a primary criterion in vendor selection, as it received the highest average AHP priority. Quality assessment should therefore be given adequate weight during vendor evaluation.
2. Vendor-selection criteria should be prioritized according to project requirements. The considerable variation among projects indicates that a single fixed weighting of all criteria may not be appropriate. The relative importance of quality, risk, financial capability, past performance and communication should be adjusted according to the project context.
3. Prompt payment to contractors should be improved, as it received the highest RII among the proposed remedial measures. Financial reliability should therefore be treated as an important condition for improving vendor-selection and supply-chain practices.
4. A centralized construction authority should be considered to strengthen institutional coordination and provide consistent approaches to vendor qualification, standards and compliance.
5. Supplier compliance with required standards should be strengthened, particularly because quality of material delivered was identified as the most important vendor-selection criterion.
6. Merit-based vendor selection should be adopted, with selection decisions based on relevant qualifications and performance rather than inconsistent project-specific practices.
7. Technical capability and communication should be considered together during vendor evaluation, rather than allowing emphasis on one to reduce attention to

the other, as the results identified a clear tension between these two dimensions.

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