

Construction Subcontractor Prequalification Evaluation Criteria: A Literature Review with Implications for the Sarawak Construction Industry

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ABSTRACT

Subcontracting now accounts for the large majority of physical construction work delivered on projects worldwide, which makes the main contractor's ability to select capable subcontractors a primary determinant of project success. Yet the prequalification decision through which subcontractors are screened before award remains inconsistently theorised, with evaluation criteria scattered across country-specific, method-specific, and often incommensurable studies. This paper synthesises the construction subcontractor prequalification literature to consolidate a set of 29 evaluation criteria organised into seven categories of company, experience, financial, quality, time, safety, and general obligations. These categories critically compares how these criteria have been ranked and weighted across different national and project contexts. A substantial disagreement is observed with relative importance associated with individual criteria of reputation and tender price that are ranked at or near the top in some contexts and near the bottom in others. The review argues that this variation is a reflection of differences in procurement systems, regulatory maturity, project risk profiles, and market structure instead of measurement error alone. The review found a geographical gap, which is the fact that the empirical base is dominated by studies from Peninsular Malaysia, the Middle East, and Southeast Asian neighbours. In contrast, Sarawak is a state with a fast-growing, geographically dispersed, and infrastructure-heavy construction sector that has received negligible dedicated attention despite documented subcontracting-related project failures. Building on the synthesis, the paper proposes a conceptual framework of subcontractor prequalification for the Sarawak context, explicitly presented as a literature-derived proposition requiring empirical validation rather than a tested model. The review contributes a consolidated, critically compared evidence base and a research agenda for subsequent quantitative work in Sarawak.

Keywords: subcontractor prequalification, evaluation criteria, subcontractor selection, construction industry, Sarawak, literature review

INTRODUCTION

In developed and developing countries, the construction sector is one of the major driving forces in economic growth as it accounts for a substantial proportion of the Gross Domestic Product (GDP) of countries. In Cambodia, in turn, the construction industry accounted for about 9.1% of GDP in 2018 (Sean & Techapeeraparnich, 2021). Due to the increasing size and complexity of construction projects, main contractors rely on increasing numbers of specialist subcontractors for much of the work undertaken on their sites, with many of these countries seeing specialist subcontractors undertake the bulk of the work on the sites. The figure for subcontractors in the construction industry was estimated to be up to 90% of construction projects, either in whole or in part (Ali Meer, 2015; Haron & Arazmi, 2020).

This reliance on subcontracting is observed globally. In South Africa, approximately 70% of building works and 30% of civil works are subcontracted (Tessa & Luvara, 2017). In Hong Kong, subcontractors contribute between 70% and 90% of total project value (Ali Meer, 2015; Tan et al., 2017). In Cambodia, main contractors

distribute between 80% and 90% of total project scope to subcontractors (Sean & Techapeeraparnich, 2021), while in Saudi Arabia subcontracted work reaches up to 70% (Ali Meer, 2015; Alshamrani et al., 2023), and in Palestine subcontractors perform approximately 90% of construction work (Enshassi et al., 2012). Despite the pervasiveness of subcontracting, the practice is consistently linked to project performance problems. In South Africa, subcontracting has been associated with financial limitations, weak management practices, and a shortage of skilled labour (Tesha & Luvara, 2017). In Egypt, up to 70% of workers experience schedule delays, with roughly half of projects exceeding budget as a result (Gebrehiwet & Luo, 2017). In Ethiopia, more than 70% of construction works fail to meet planned schedules due to cost overruns, poor quality, and inadequate work performance (Dusso, 2020). Cambodia's construction industry has similarly been found to lag behind other nations in technical and financial capability (Sean & Techapeeraparnich, 2021), while Vietnam has recorded cost overruns in 66% of projects and schedule delays of up to 75% (Le, 2017). In the United States, construction spending exceeded USD 1.3 trillion in 2019, with cost and schedule overruns treated almost as an industry norm (Lucas, 2026).

The frequent occurrence of such issues across the globe highlights why prequalifying the subcontractors of a main contractor is of critical importance: the main contractor will look to subcontractors before issuing contracts, in a process of rigorous assessment based on certain criteria. Prequalifications allow main contractors to control project risk, reduce costly disruptions to the project, and ensure quality, cost, and schedule performance.

Problem Statement

Another major contributor to Malaysia's GDP is the construction sector, as the Department of Statistics Malaysia (2022) indicated the GDP rose to RM 11,815 billion in the 3rd and 4th quarters of 2021, respectively, with an increase of RM 750 billion compared to 2020. The RM 10 000 million per annum rise in construction work value since 2012 Hirschmann (2022) is from RM 146.37 billion in 2019, while there were RM 50 000 million worth of works done annually by subcontractors.

Despite the economic value, Malaysia is not immune to issues related to subcontracts. There have been several projects that have been delayed or not completed under the Works Ministry in both study areas – Johor, Sabah and Sarawak at the national level (The Star, 2021). The problems of subcontracting have been documented in previous studies conducted in Malaysia, such as: poor subcontractor performance (Y.-L. Lew et al., 2020; Maqsoom et al., 2026; Norul Izzati et al., 2019; Ramli et al., 2018), cost overruns (Kamaruddeen, 2020; Norul Izzati et al., 2019; Rahman et al., 2012), disruption of the supply chain (Y.-L. Lew et al., 2020; Norul Izzati et al., 2019), delay of works (Afsher, 2016; Rahman et al., 2012), insufficient site coordination (Y. L. Lew, 2017; Y.-L. Lew et al., 2020), unsatisfactory quality of work.

The bulk of the current research in Malaysia, however, focuses on the problems of subcontracting in the Peninsular states, with little attempt to shed light on subcontracting issues unique to Sarawak. This gap is relevant in two recent “real world cases.” The controversy about the delay in the water supply project for Sibu Jaya/Kanowit Phase 2 came into light, as it was supposed to address the problem of insufficient water pressure on the streets of Sibu Jaya and Salim, with citing manpower and equipment shortage, which was called a lame-duck excuse by Datuk Seri Tiong King Sing (Sarawak Voice 2022) as this is where the contractor had to source sufficient equipment and manpower. Likewise, the Pan Borneo Highway in Sarawak project suffered from supply chain bottle necks, surge in material cost and manpower scarcity that jeopardised the project's completion target in September 2022 (New Straits Times, 2021; The Malaysian Reserve, 2021) and has also faced concerns about poor quality of completed sections of the route, notably potholing between Miri and Sibu (Borneo Post Online, 2019).

These cases demonstrate that subcontracting problems remain a live concern in Sarawak's construction industry, yet the region lacks a dedicated framework for identifying and prioritising the criteria main contractors should use when prequalifying subcontractors. This gap forms the impetus for the present study.

Research Objectives

This research aims to identify the construction subcontractor prequalification evaluation criteria applicable to Sarawak. The specific objectives are:

- To identify the construction subcontractor prequalification evaluation criteria.
- To determine the rank of the most influential criteria in subcontractor selection.

Operational Definitions

Construction Industry refers to companies engaged in the construction of building works or engineering projects (Low & Lau, 2019), encompassing the setting up, maintaining, and repairing of buildings and structures to achieve targets of time, cost, and quality (Goh & Loosemore, 2016), and covering the entire delivery process from inception to completed product, including risk coordination among involved parties (Vo et al., 2021).

Subcontractor refers to a party engaged by a main contractor to complete a specific portion of a project, typically possessing specialised expertise such as electrical or plumbing works (Yarbrough, 2021; Ali, 2019), and operating under a legally binding agreement with the main contractor (Andreou, 2022).

Prequalification Criteria refers to the process by which a main contractor evaluates whether a subcontractor possesses the ability and suitability to perform a given contract, based on attributes such as experience, financial capability, and project completion record (The State of Queensland, 2018; Ajayi et al., 2010). A rigorous prequalification process reduces the likelihood of project failures such as delay, bankruptcy, and poor-quality work (Sean & Techapeeraparnich, 2021).

Significance of the Study

Subcontracting is an unavoidable feature of modern construction delivery, allowing project costs and risks to be shared between contractor and subcontractor (Lew, 2017). The success of a project depends substantially on the main contractor's ability to select suitable and qualified subcontractors. This study is expected to benefit main contractors by equipping them with structured evaluation knowledge rather than relying solely on the lowest bid price. It is also expected to benefit subcontractors by clarifying the criteria against which they will be assessed, enabling them to strengthen their track record and improve their competitiveness for future project awards. At an industry level, a reduction in subcontracting-related problems may enhance investor confidence in Malaysia's construction capability, supporting the delivery of increasingly complex projects such as high-rise buildings and highway infrastructure. Finally, the study helps in overcoming the issue of subcontracting phenomena in the construction industry of Sarawak.

LITERATURE REVIEW

Prequalification in Construction

Prequalification can be defined as the sequence of processes used to identify a suitable subcontractor and evaluate their background and past performance (Sean & Techapeeraparnich, 2021). It is a critical stage in subcontractor engagement because the outcome of prequalification directly influences the outcome of the works undertaken (Sean & Techapeeraparnich, 2021; Abunada & Mohammed, 2018). Main contractors typically assess subcontractors on the basis of experience, financial capability, background, management competence, and ability to undertake the required work (Sean & Techapeeraparnich, 2021). Karaman and Sandal (2021) similarly concluded that selecting a well-performing subcontractor contributes to project success, whereas selecting an unsuitable subcontractor increases the risk of project failure.

Prequalification Evaluation Criteria Adopted by Main Contractors

Even experienced main contractors may encounter technical or disciplinary problems on awarded projects, since project scopes are frequently subdivided among specialist subcontractors (Kocak et al., 2018). Improper

use of subcontracting services can therefore introduce negative impacts to project delivery. However, many of these problems can be mitigated through the systematic adoption of prequalification evaluation criteria, which help main contractors reduce project risk, secure quality commitment, and foster productive working relationships (Marzuok et al., 2013; Vo et al., 2021).

Drawing on prior studies — including Sean and Techapeeraparnich (2021), Marzuok et al. (2013), Vo et al.

(2021), Elkahlek et al. (2018), Abunada and Mohammed (2018), Karaman and Sandal (2021), Kocak et al. (2018), Gajjar and Anderson (2021), Shivam and Kashiyani (2018), and Demirkesen and Bayhan (2019), a total of 29 prequalification evaluation criteria have been identified and grouped into seven categories: criteria related to company, experience, financial standing, quality, time, safety, and general obligation.

Criteria Related to Company

This category comprises nine sub-criteria that collectively reflect a subcontractor's organisational standing and capability.

Specialty in a specific type of work is a criterion valued by main contractors because specialised subcontractors typically deliver packaged services more quickly, cheaply, and with fewer complications than generalist contractors (Sean & Techapeeraparnich, 2021; Vo et al., 2021; Kocak et al., 2018; Demirkesen & Bayhan, 2019; Abunada & Mohammed, 2018).

Duration in business signals accumulated experience; subcontractors with a longer operating history are generally regarded as more attractive to main contractors (Sean & Techapeeraparnich, 2021; Marzuok et al., 2013; Elkahlek et al., 2018).

Relationship with main contractor/subcontractors matters because the cooperative relationship between the two parties strongly influences project success, and existing relationships — whether contractual, familial, or informal — may lead to direct or negotiated awards (Sean & Techapeeraparnich, 2021; Vo et al., 2021; Elkahlek et al., 2018; Gajjar & Anderson, 2021).

Numerous studies have also highlighted that current workload is considered the most critical criterion when evaluating company-related factors, as it allows companies to understand whether they are able to add further projects to their portfolios without becoming over capacity and so endanger timely project completion (Sean & Techapeeraparnich, 2021; Marzuok et al., 2013; Elkahlek et al., 2018; Kocak et al., 2018; Gajjar & Anderson, 2021; Demirkesen & Bayhan, 2019).

Among all of the criteria in literature mentioned, reputation is one of the most consistently mentioned criteria (Sean & Techapeeraparnich, 2021; Marzuok et al., 2013; Vo et al., 2021; Elkahlek et al., 2018; Abunada & Mohammed, 2018; Kocak et al., 2018; Gajjar & Anderson, 2021; Shivam & Kashiyani, 2018; Demirkesen & Bayhan, 2019). Marzuok et al. (2013) mentioned reputation as their key criterion among 12 ones, where as Vo et al. (2021) presented it as their most important criterion among 20 in Vietnam and Elkahlek et al. (2018) ranked it as second criterion in Egypt. Sean and Techapeeraparnich (2021) ranked it third, reasoning that strong reputation increases contractor confidence in subcontracting the work. Conversely, Kocak et al. (2018) and Shivam and Kashiyani (2018) found reputation to be comparatively less influential, ranking it lowest among the criteria examined in Turkey and India, respectively, illustrating that the relative importance of criteria can vary by regional context.

Number of employees/experienced construction staff is associated with faster job completion and access to knowledgeable staff input (Abunada & Mohammed, 2018; Demirkesen & Bayhan, 2019).

Machinery and equipment reflect a subcontractor's ability to mobilise appropriate plant, whether owned or sourced externally, including the availability of on-site maintenance capability (Vo et al., 2021; Elkahlek et al., 2018; Abunada & Mohammed, 2018; Karaman & Sandal, 2021; Kocak et al., 2018; Demirkesen & Bayhan, 2019).

Technical expertise enables subcontractors to perform work efficiently and resolve technical issues without excessive disruption (Elkahlek et al., 2018; Abunada & Mohammed, 2018; Karaman & Sandal, 2021; Kocak et al., 2018; Gajjar & Anderson, 2021); Vo et al. (2021) ranked this criterion third among selection factors in Vietnam.

Labour force retention ensures a subcontractor maintains an adequate and stable workforce; insufficient labour retention has been linked directly to project delay (Marzuok et al., 2013; Vo et al., 2021).

Criteria Related to Past Experience

This category comprises five sub-criteria concerning a subcontractor's demonstrated track record.

Performance in previous similar projects is frequently ranked among the top criteria overall (Sean & Techapeeraparnich, 2021; Marzuok et al., 2013; Gajjar & Anderson, 2021), reflecting its close relationship to work quality and its indirect effect on subcontractor reputation (Vo et al., 2021; Abunada & Mohammed, 2018). Kocak et al. (2018) ranked it second, while Vo et al. (2021) ranked it third; Elkahlek et al. (2018) describe this criterion as effectively a "ticket" to future job awards.

Number of similar projects completed reflects the volume of relevant work a subcontractor has previously delivered, offering an indication of accumulated skill and capability (Marzuok et al., 2013; Abunada & Mohammed, 2018; Demirkesen & Bayhan, 2019).

Size/scale of previous similar projects completed allows main contractors to verify a subcontractor's ability to handle projects of comparable magnitude (Sean & Techapeeraparnich, 2021; Elkahlek et al., 2018; Kocak et al., 2018; Shivam & Kashiyan, 2018; Marzuok et al., 2013).

Performance during defect liability period/warranty issues captures a subcontractor's willingness to remain accountable for defects after project completion, and is ranked highly in several studies (Sean & Techapeeraparnich, 2021; Karaman & Sandal, 2021; Marzuok et al., 2013; Gajjar & Anderson, 2021; Kocak et al., 2018; Vo et al., 2021).

Ability to cooperate/collaborate with other subcontractors reduces the potential for conflict on multi-party projects and reflects professionalism (Sean & Techapeeraparnich, 2021; Elkahlek et al., 2018; Kocak et al., 2018; Gajjar & Anderson, 2021; Demirkesen & Bayhan, 2019; Marzuok et al., 2013; Vo et al., 2021).

Criteria Related to Financial Standing

This category comprises five sub-criteria addressing a subcontractor's financial soundness.

Ability to undertake the size of work was ranked second in importance by Sean and Techapeeraparnich (2021).

Prompt payment to labour is significant as a source of subcontracting problems when neglected; Kocak et al. (2018) ranked it first among eleven criteria, while Sean and Techapeeraparnich (2021) ranked it second.

Current financial statement/stability provides an assessment of whether a subcontractor can undertake works without financial burden (Sean & Techapeeraparnich, 2021; Marzuok et al., 2013; Vo et al., 2021; Elkahlek et al., 2018; Demirkesen & Bayhan, 2019; Abunada & Mohammed, 2018). It was ranked second by Sean and Techapeeraparnich (2021), fifth by Kocak et al. (2018), and eleventh by Elkahlek et al. (2018), again reflecting regional variation.

Flexibility in payment terms and conditions affects future cooperation between the involved parties and was ranked second by Sean and Techapeeraparnich (2021).

Tender price remains a widely used, if contested, criterion (Sean & Techapeeraparnich, 2021; Marzuok et al., 2013; Vo et al., 2021; Elkahlek et al., 2018; Abunada & Mohammed, 2018; Karaman & Sandal, 2021; Kocak

et al., 2018; Shivam & Kashiyani, 2018; Demirkesen & Bayhan, 2019). While some studies rank tender price as the top criterion (Sean & Techapeeraparnich, 2021; Demirkesen & Bayhan, 2019), others rank it considerably lower (Abunada & Mohammed, 2018; Shivam & Kashiyani, 2018; Elkahlek et al., 2018; Marzuok et al., 2013), with Marzuok et al. (2013) concluding that main contractors are generally cautious of unusually competitive tender prices, given their association with delay and quality problems.

Recent work continues to demonstrate that cost-related criteria are rarely weighted in isolation from performance outcomes. Weighing subcontractor selection, a 2025 study using the Fuzzy Analytic Hierarchy Process has revealed cost as the top factor in project objectives (0.273) followed closely by duration, quality, safety and environmental impact, thus confirming that the 'iron triangle' of cost–time–quality is an interdependent, rather than a singular basis of subcontractor selection (Bingol et al., 2025). This implies that, despite tender price being a ranking criteria in its own right, the main contractors will not necessarily consider tender price a separate criterion from performance risk, which is not necessarily conveyed by single criterion ranking tables.

Criteria Related to Quality

This category comprises two sub-criteria. Quality performance with standard and commitment reflects a subcontractor's demonstrated quality record, often supported by recognised certifications such as ISO 9001 and ISO 14001 (Sean & Techapeeraparnich, 2021; Marzuok et al., 2013; Vo et al., 2021; Elkahlek et al., 2018; Abunada & Mohammed, 2018; Karaman & Sandal, 2021; Kocak et al., 2018; Gajjar & Anderson, 2021; Shivam & Kashiyani, 2018; Demirkesen & Bayhan, 2019). The mechanism for monitoring remedial work captures a subcontractor's responsiveness to defects and was ranked fourth among seven criteria by Sean and Techapeeraparnich (2021). A 2022 study examining subcontractor selection for complex, multi-system building projects found that system reliability and quality, along with level of service, were ranked significantly higher than price, technological maturity, and prior work relationships (Fridkin & Kordova, 2022). This finding is a useful counterpoint to studies that place financial and relational criteria at the top of the ranking, and indicates that project complexity and system criticality may shift the relative weighting of quality-related criteria upward, a contextual variable not yet examined in the Sarawak literature.

Criteria Related to Time

This category comprises two sub-criteria. Completing the project on time was ranked second by Shivam and Kashiyani (2018) and sixth of sixteen by Gajjar and Anderson (2021). Flexibility and cooperation when resolving delays was ranked first by Marzuok et al. (2013), fifth by Shivam and Kashiyani (2018), and fifteenth of 55 criteria by Elkahlek et al. (2018), underscoring the importance placed on collaborative problem-solving in mitigating schedule risk.

Criteria Related to Safety

This category comprises three sub-criteria. Safety consciousness on the job site was ranked sixth of seven by Sean and Techapeeraparnich (2021), seventh of sixteen by Gajjar and Anderson (2021), and tenth of twenty by Marzuok et al. (2013). Compliance with site safety requirement/records was ranked ninth by both Shivam and Kashiyani (2018) and Abunada and Mohammed (2018), though Demirkesen and Bayhan (2019) note that safety records remain a major consideration even where ranked comparatively low. Insurance of major equipment and employees was ranked 46th of 55 criteria by Elkahlek et al. (2018), suggesting it plays a comparatively minor role relative to other criteria.

Criteria Related to General Obligation

This category comprises three sub-criteria and was identified by Sean and Techapeeraparnich (2021) as the least influential category overall. Compliance with regulations/instructions was ranked sixth by Vo et al. (2021). Creativity and innovation reflect a subcontractor's capacity for original problem-solving on complex projects (Marzuok et al., 2013; Elkahlek et al., 2018; Demirkesen & Bayhan, 2019). Risk planning reflects a subcontractor's ability to anticipate and mitigate potential project risks based on prior experience (Marzuok et al., 2013; Elkahlek et al., 2018).

Summary and Research Gap

The literature demonstrates broad international consensus that reputation, past performance, financial stability, and current workload are among the most consistently influential prequalification criteria, while safety-related and general obligation criteria tend to rank comparatively lower, though rankings vary meaningfully across countries, reflecting differing regulatory, cultural, and market conditions (Kocak et al., 2018; Shivam & Kashiyani, 2018; Elkahlek et al., 2018). This disagreement is not confined to older studies. Recent research published between 2022 and 2025 continues to report inconsistent weighting of cost, quality, and relational criteria depending on project type and delivery complexity, indicating that the variation identified in this review is an enduring feature of the field rather than an artefact of earlier, less rigorous methodologies. This variation itself supports the case for context-specific research: criteria rankings established in Cambodia, Vietnam, Egypt, Turkey, or India cannot be assumed to transfer directly to the Sarawak construction context. Since most prequalification research conducted in Malaysia has been on Peninsular Malaysia (e.g., Lew 2017; Lew et al., 2020; Ramli et al., 2017), specific empirical study on prequalification criteria ranking in the Sarawak region is recommendable due to the ongoing problems that these subcontractors are facing.

RESEARCH METHODOLOGY

To achieve the stated objectives, this study proposes a quantitative research design employing a structured questionnaire survey administered to main contractors registered with the Construction Industry Development Board (CIDB) Malaysia operating within Sarawak (CIDB, 2022). The target population is restricted to CIDB Grade G4 and above contractors, as these grades are eligible to tender for the mid- to large-scale infrastructure and building projects most associated with the subcontracting practices discussed in this review. Using Slovin's formula ($n = N / (1 + Ne^2)$) with a 95% confidence level and a 5% margin of error, applied to the estimated population of Sarawak-registered G4-and-above contractors obtained from the CIDB CIMS directory, a minimum sample size will be calculated prior to survey distribution.

The 29 identified criteria, grouped into the seven categories described above, will form the basis of the survey instrument. A 5-point Likert scale will be adopted (1 = Not Important, 2 = Slightly Important, 3 = Moderately Important, 4 = Important, 5 = Extremely Important), consistent with Vagias (2006) and comparable prequalification studies (Sean & Techapeeraparnich, 2021; Marzuok et al., 2013). Criteria will be presented grouped by category in the order established in this review, with category order rotated across respondent batches to reduce order-effect bias.

Eligible respondents will be limited to individuals holding a project management, procurement, or senior site management role with a minimum of three years' involvement in subcontractor engagement decisions, to ensure responses reflect direct prequalification experience rather than general industry opinion (Ellen, 2020). A pilot survey of 10–15 respondents will be conducted before full deployment to check item clarity and estimate completion time, with wording revised based on pilot feedback.

Following data collection, the Relative Importance Index (RII) method will be applied, calculated as $RII = \sum W / (A \times N)$, where W is the weighting assigned to each criterion by a respondent, A is the highest possible weight (5, under the adopted scale), and N is the total number of respondents (Tholibon et al., 2021). This produces an RII value between 0 and 1 for each of the 29 criteria, enabling ranking both within each of the seven categories and across the full criteria set. Data entry, descriptive statistics, and RII computation will be conducted using SPSS, and internal consistency of the instrument will be assessed using Cronbach's alpha, with a threshold of 0.7 required for acceptable reliability before proceeding to full analysis.

As a quantitative study, this research is expected to offer the advantages typically associated with quantitative methods — including the ability to generalise findings across a defined population and to produce statistically comparable rankings — while being subject to the corresponding limitations, such as reduced capacity to capture contextual nuance compared with qualitative approaches (Bhandari, 2020; Gaille, 2019).

FINDINGS AND DISCUSSIONS

A review of previously published literature confirms that the prequalification of subcontractors is a much more complex process that relates to the organisation, experience, financial ability, quality, time, safety and general-obligation parameters. Some patterns come into view, and immediate relevance is found as to the Sarawak situation. First, criteria related to reputation and past project performance recur as top-ranked considerations across a majority of the studies reviewed, suggesting these are likely to remain influential in Sarawak. Second, financial-related criteria, particularly tender price and financial stability, show the greatest cross-study variation in ranking, indicating that main contractors' weighting of cost versus capability may differ substantially depending on market conditions, a factor of particular relevance given the material cost and manpower constraints documented in Sarawak's Pan Borneo Highway project (New Straits Times, 2021). Third, safety and general obligation criteria consistently rank lower in importance relative to company, experience, and financial criteria, despite their evident relevance to project outcomes. Hence, this finding itself may warrant further investigation, given the potential long-term costs of under-weighting safety compliance in subcontractor selection.

These patterns should, however, be read with caution. The apparent consensus around reputation and past performance as top-ranked criteria is drawn from studies that differ substantially in sample size, respondent seniority, project type, and analytical method, where some use RII, others AHP, fuzzy AHP, or ARAS, and these methodological differences are themselves a plausible confounding factor behind observed ranking differences, independent of genuine regional variation. A study ranking criteria via pairwise AHP comparison, for instance, is not directly comparable to one using a simple RII mean, since the two methods can produce different relative weightings from the same underlying preferences. This review has treated rankings across these different methods as broadly comparable for the purpose of identifying patterns, but this comparability assumption is a limitation of the synthesis rather than a settled fact.

The literature also contains clear dissenting evidence against a cost- or reputation-first view of subcontractor selection. Studies examining complex or multi-system projects have found technical reliability and service quality to outweigh price and prior relationships, while others report that price, once considered the dominant factor, is now regarded as no more important than health and safety, past performance, and insurance cover. This divergence suggests that project complexity and risk profile — rather than national context alone — may drive criteria weighting, a variable this review has not been able to fully disentangle from country-level effects given the available studies. Future empirical work in Sarawak should therefore collect project-type and complexity data alongside criteria rankings, to test whether observed differences are attributable to regional/regulatory context, project characteristics, or both.

A further limitation concerns the composition of the evidence base itself. The studies synthesised in this review are predominantly published, English-language, peer-reviewed articles using survey-based ranking methods; grey literature, unpublished industry reports, and non-English regional studies were not systematically searched. This raises the possibility of publication bias toward studies with statistically significant or novel findings, and toward criteria sets that replicate earlier published frameworks rather than independently derived ones. The two Sarawak-specific project cases cited in this paper (the Sibu Jaya/Kanowit water project and the Pan Borneo Highway) are illustrative case examples rather than systematically collected evidence of criteria importance, and should be read as motivation for the proposed study rather than empirical support for any particular criteria ranking.

These observations support the rationale for the proposed empirical study to ensure there is no assumption the criteria rankings from other studies apply to Sarawak across the board but rather a criteria ranking exercise specific to the region that will provide main contractors with a locally vetted tool for subcontractor selection, thereby stamping out the delay, cost overrun and quality issues reported in previous studies in Malaysia and Sarawak (Ramli et al., 2017; Kamaruddeen et al., 2020; Sarawak Voice, 2022).

CONCLUSION

Subcontracting is an indispensable feature of current construction practice, both internationally and within

Malaysia, yet it remains deeply linked to persistent issues of delayed contracts, cost overruns, and declining work quality. This paper has reviewed the prequalification evaluation criteria adopted by main contractors internationally, synthesising 29 criteria across seven categories — company, experience, financial standing, quality, time, safety, and general obligation — drawn from studies conducted in Cambodia, Vietnam, Egypt, Turkey, India, Jordan, and the United States, among others. While reputation and past performance emerge as

broadly influential criteria, the literature also demonstrates that the relative importance of individual criteria varies considerably by national and regional context. Given the documented subcontracting problems evident in recent Sarawak infrastructure projects and the limited prior research specifically addressing Sarawak, this study proposes a quantitative survey of Sarawak-based main contractors, analysed using the Relative Importance Index method, to empirically identify and rank the prequalification criteria most relevant to the region. The resulting framework is intended to support more informed subcontractor selection decisions, benefiting main contractors, subcontractors, and the broader Sarawak construction industry.

This review points to a four-phase research roadmap. The first phase involves finalising and pilot-testing the survey instrument with a small sample of Sarawak-based main contractors to confirm item clarity and reliability. The second phase entails full-scale distribution of the survey to CIDB-registered G4-and-above contractors across Sarawak, followed by RII-based ranking of the 29 criteria. The third phase involves validation workshops with industry practitioners and CIDB representatives to sanity-check the resulting rankings against practical experience and to surface any criteria the literature-derived list may have omitted. The fourth phase involves translating the validated ranking into a practical prequalification scoring tool or checklist that Sarawak main contractors can adopt directly in tender evaluation.

Beyond this immediate agenda, longer-term research should examine why criteria weightings differ across contexts, through qualitative interviews probing the reasoning behind main contractors' rankings, and should track whether adoption of a validated framework measurably reduces the incidence of subcontracting-related delay, cost overrun, and quality defects in subsequent Sarawak projects. There is also scope to extend this framework to other East Malaysian states such as Sabah, which shares similar geographical and infrastructure characteristics, and to explore its integration into digital prequalification or e-procurement systems now being adopted more widely across the Malaysian construction sector.

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