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Root Causes of Disputes in Construction Projects Implemented by Foreign Companies in Yemen

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Abstract

Disputes in construction projects pose a major challenge worldwide, particularly in fragile environments such as Yemen, where they often disrupt key infrastructure development. This study examines the root causes of disputes in foreign-led construction projects in Yemen, using a mixed-methods approach that integrates quantitative and qualitative data. A structured questionnaire was distributed to 212 professionals (199 valid responses), and semi-structured interviews were conducted with five senior Yemeni experts. Nineteen dispute-related variables were analyzed in five dimensions: technical, contractual, administrative, operational, and behavioral. Statistical analyses using SPSS (t-tests and ANOVA) confirmed that all the dimensions were significant and interrelated. The results identified unclear contract clauses, delayed payments, weak coordination, and cultural gaps as the primary dispute triggers. The triangulated findings validate the reliability of the results. The study concludes that disputes arise from multiple interlinked factors and recommends stronger contract governance, effective communication, and proactive project management to minimize disputes in Yemen's construction sector.

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1. INTRODUCTION

Globally, the construction industry is considered a major stimulant of economic growth and development [1]. The construction industry plays a significant role in the development and prosperity of society. It is one of the leading sectors in job creation and wealth distribution among the public. However, the features of this industry are not in favor of its sustainability because the industry has unique features such as multilayer, dynamic, expandable, multidisciplinary, fragmented, complex, and volatile [2]. Moreover, the construction sector is globally recognized for its inherent complexity, large-scale operations, and coordination of diverse disciplines. These defining features, while fundamental to project delivery, also render the industry particularly susceptible to disputes among key stakeholders, such as owners, contractors, consultants, and subcontractors.

Construction claims and disputes remain pervasive across the MENA region, often resulting in delayed completion, cost overruns, or even full project abandonment. In fragile states such as Yemen, these issues are further intensified by prolonged conflicts, institutional weaknesses, and poor regulatory enforcement, leading to the suspension or failure of numerous infrastructure projects [3]. Notably, Yemen has witnessed multiple major projects halted by protracted disputes, including the Dhamar–Al-Husayniyah Road Project, Sana'a International Airport Project, Arhab–Hazm Al-Jawf Road Project, Sana'a Wastewater Treatment Plant Expansion Project, and Hassan Dam Project, which vividly illustrates how deeply claims and disagreements can undermine development efforts. Such cases underscore the magnitude of the problem and reinforce the relevance of studying dispute mitigation strategies for foreign-led construction projects in Yemen. Indeed, recent industry reports and research have confirmed that construction disputes represent a persistent challenge to timely project delivery, especially in developing countries, making it crucial to

identify and address their root causes.

In fragile and conflict-affected contexts like Yemen, these disputes often carry heightened consequences causing delays, escalating costs, and jeopardizing project success [4, 5].

Several recurring factors have contributed to the persistence of disputes in construction projects. Poorly defined contracts, weak project governance, insufficient claims management, and a lack of cultural alignment between foreign contractors and local stakeholders have all been identified as critical triggers [6]. Even minor disagreements, such as those related to scope changes or the interpretation of contract clauses, can evolve into full-scale disputes if left unresolved, further disrupting project timelines and budget performance. Traditional litigation mechanisms are often considered impractical because of their high costs, lengthy procedures, and adversarial nature, particularly in developing contexts where judicial efficiency is limited [3].

This research aims to identify the underlying causes of disputes in foreign-led construction projects in Yemen and to provide practical recommendations for the Yemeni government to reduce the occurrence of such disputes.

2. LITERATURE REVIEW

Recent industry reports and academic literature have confirmed that construction disputes are a persistent threat to timely project completion, especially in developing countries. Globally, 10% to 30% of all construction operations end up in formal disputes, while cost-based estimates for disputes range from $4 and $12 billion annually [7]. Furthermore, it has emerged that approximately 70% of global construction operations end up in claims or disputes, and 85% also experience cost overruns that equal an average of approximately 28% more than original spending [8]. The issue is more acute in developing regions, where governance limitations, legal ambiguity, and procurement challenges heighten contract-based risks [9]. The Middle East has some of the world's record-high average levels of conflict values, equaling $86 million per conflict in 2020 from $62 million a year earlier [7]. Furthermore, Middle East schedule delays outperform the global average, while actual construction project durations routinely stay for 83% longer than originally projected, while the global average is 68% [8]. In fragile states such as Yemen, construction-based disputes have resulted in the suspension or abandonment of numerous infrastructural construction operations, further adding challenges for reconstruction phases in the wake of a civil conflict [3]. These numbers cumulatively reflect the extent of the problem and further support the necessity of researching methods for dispute mitigation in foreign-led construction operations in Yemen.

The construction industry in Yemen plays a critical role in the country's economic and social development, accounting for a substantial share of the national infrastructure and employment. However, it has been severely affected by decades of political instability, weak governance, and limited institutional capacities. According to [10], construction productivity in Yemen is among the lowest in the region because of poor project planning, limited skilled labor, and financial constraints.

2.1. Contractual Causes of Disputes

Construction contract ambiguities are among the most frequently cited root causes of conflict. Inadequately drafted clauses, non-homogeneous use of generic contract forms, and unequal risk division beget conflicts during project execution. For instance, [6], in a case study of the Egyptian building construction sector, discovered that among the most important sources of contention was delay-in-payment, ambiguous change orders, and poorly defined contract provisions. Similar trends can be found in the Saudi and Bahraini cases, where excessive client-ordered alterations and contract misinterpretations occur [11]. Of special relevance is the mixed adoption of commonly accepted worldwide contract styles, such as those from the International Federation of Consulting Engineers (FIDIC), without appropriate amendment for implementation within local legal systems. As [12] highlighted, inconsistencies between model contract templates such as FIDIC and local legal systems generally give rise to confusion and ambiguities between foreign contractors and host nation stakeholders, particularly nascent construction markets, since [4] indicate that foreign firms commonly experience challenges in coping with the inconsistency between Yemeni legal norms and global contract standards, and consequently are exposed more to the risk of disputes.

2.2. Technical and Design-Related Causes

Technical inadequacies, particularly those in design and planning, are also a major cause of construction disputes. These include incomplete or inaccurate drawings, inadequate site investigations, and weak technical records. [13] also indicated that grand infrastructures are often marked by rush planning and a shortage of technical thoroughness, which commonly precipitates claims. In the Egyptian case, [14] found that technical inconsistencies from defective specifications through incompatible design standards caused escalation of disputes. Another common regional issue is the desire for fast-track work without adequate design verification, which results in many construction projects with complicated and expensive revisions and delays. In a recent UAE case by [15], compressed design periods, design change rates, and insufficient approvals at the design phase were among the primary conditions for disputes that appeared in Yemen's

donor-driven building projects [4].

2.3. Managerial and Communication Factors

Breakdowns in communication and managerial inefficiencies are often described as significant causative factors for project disputes. [16] reported that in construction projects in Lebanon, inadequate stakeholder coordination and confusion over project roles tend to result in severe misunderstandings and contract-related disputes. Their report highlighted the importance of well-developed communication systems and formal contract administration for the prevention of this sort of difficulty. Yemen has faced significant difficulties in this regard. Insufficient numbers of highly skilled project managers and limited utilization of sophisticated project management methods weaken effective project control. By [4], bad managerial practices in the shape of delays in decision-making, ineffective subcontractor co-ordination, and insufficient risk planning significantly enhance the likelihood of dispute. [17] also emphasized that in multi-stakeholder projects, decentralization and the absence of a system for accountability exacerbate management issues and frequently result in fragmented decisions and late conflict resolution.

2.4. Socio-political and Cultural

In Yemen, political instability, restricted mobility, and administrative constraints are universally accepted as major external disruptors of building construction, especially by foreign firms [10]. [12] argued that cultural miscommunications, communication style differences, and risk attitude differences are significant construction dispute drivers in the Gulf and that cultural sensitivity is essential for international project management success. As argued by [18], differences in communication and negotiating styles among multicultural construction teams can easily fuel conflict if they are not actively addressed.

3. METHODOLOGY

3.1. Research Philosophy and Approach

This study is grounded in a pragmatic research philosophy that supports the use of multiple methods to address complex real-world problems [19], which enables the combination of positivist (quantitative) and interpretivist (qualitative) paradigms to obtain both statistical and contextual insights. Accordingly, a mixed-methods approach was adopted to identify, analyze, and explain the causes of disputes in Yemen's construction sector.

The research design includes both descriptive (to determine and rank dispute factors) and explanatory elements (to test hypotheses and explore relationships between variables), allowing a more comprehensive understanding of dispute dynamics.

3.2. Research Design and Rationale

A convergent parallel mixed-methods design was applied, where quantitative and qualitative data were collected concurrently and integrated to form a holistic understanding [19]

- Quantitative component: A structured questionnaire distributed to professionals involved in foreign-led construction projects.
- Qualitative component: Five semi-structured expert interviews with senior Yemeni professionals, two project managers, one legal consultant, one academic specialist, and one dispute-resolution specialist.

The selection of five experts aligns with prior construction management studies demonstrating that focused, information-rich samples can achieve conceptual saturation [20, 21] Guided by the information power principle [22] adequacy was based on the relevance and expertise of participants rather than numerical size.

This design ensures triangulation between quantitative and qualitative insights, enhancing validity and credibility.

3.3. Target Population and Sampling

The target population comprised professionals involved in foreign-led construction projects in Yemen, including engineers, consultants, project managers, contractors, and contract administrators, who are the main actors exposed to contractual and managerial disputes.

As there is no national database of construction professionals, the population was considered indeterminate. The sample size was calculated using the Cochran formula for large populations [23] yielding an ideal sample size of 385. However, due to contextual constraints, such as dispersed professionals, ongoing conflict, and limited access to active projects, the study achieved 199 valid responses out of 212 distributed questionnaires, representing a 94% response rate, which exceeds norms in management research [24].

A stratified purposive-random sampling technique was used to ensure representativeness across the roles of engineers, consultants, project managers, administrators, and contractors. The sample included 46 respondents (23%) from the public sector and 153 (77%) from the private and foreign sectors, providing balanced coverage.

While the achieved sample was smaller than the theoretical 385, the exceptionally high response rate and sectoral diversity enhanced the reliability and representativeness of the findings [25].

3.4. Instrument Design and Structure

The questionnaire was developed after extensive review of the literature and expert consultations. Initially, 40 potential dispute-related variables were identified from previous studies [4, 11, 14, 15].

After pilot testing and expert validation, redundant or overlapping items were merged, producing 19 refined variables organized into five conceptual dimensions:

1. Contractual factors :ambiguous clauses, payment delays, unfair risk allocation.
2. Technical factors : design errors, scope changes, incomplete documentation.
3. Administrative factors : poor coordination, delays in approvals, documentation issues.
4. Behavioral factors : lack of trust, poor communication, cultural misunderstanding.
5. Operational/Financial factors : resource shortages, logistical problems, security disruptions.

The final questionnaire comprised four sections:

(A) respondents' demographics;

(B) 19 dispute-causation items;

(C) six items on dispute-resolution mechanisms (negotiation, mediation, arbitration, litigation, etc.); and

(D) three items on proactive management and dispute-prevention strategies.

3.5. Measurement Scale Justification

Each item was rated on a three-point Likert scale (1 = low, 2 = moderate, and 3 = high importance). The decision to use the trichotomous scale was guided by both theoretical and contextual considerations.

Classic research has found that three-point Likert scales yield reliability and validity comparable to those of longer scales. Modern studies confirm that shorter scales improve clarity, reduce respondent fatigue, and minimize ambiguity between middle options [26, 27]. In developing-country contexts with multilingual and varying literacy levels, a three-point scale facilitates accurate responses [28].

This approach has been used successfully in recent construction management studies [3, 20, 29]. It also aligns with the study's goal of ranking the relative importance of dispute factors, rather than measuring subtle attitudinal differences.

3.6. Pilot Testing, Validity, and Reliability

A pilot test was conducted with seven experts (academics, consultants, and project managers) to assess their clarity, relevance, and comprehensiveness. Their feedback led to the removal of redundancies, refinement of wording, and an improved logical flow.

Table 1. Cronbach's alpha

Instrument Dimension	No. of Items	Cronbach's α
Overall Instrument	28	0.845
Dispute Causation Factors	19	0.875

Content validity was ensured through expert judgment and alignment with previous studies. Construct validity was confirmed by intercorrelations among the five factor dimensions.

Reliability was tested using Cronbach's alpha, which showed strong internal consistency (Table 1).

Values above 0.70 indicate acceptable reliability, while slightly lower values for short subscales remain valid in exploratory studies [30].

3.7. Data Collection Procedures

Data were collected over one month through a combination of email and in-person distribution. Each respondent received a cover letter explaining the study's purpose and providing confidentiality assurance. Follow-ups by email and phone enhanced participation, resulting in the 94% response rate.

For the qualitative strand, five semi-structured interviews were conducted with senior experts, representing diverse professional perspectives. Each interview lasted 45–60 minutes and focused on three themes: (1) the causes of disputes, (2) resolution mechanisms, and (3) proactive management practices. Notes were transcribed for thematic analysis following ethical approval from the Faculty of Engineering, Sana'a University (Approval No. 2025/2/16).

3.8. Data Analysis Methods

Quantitative data were analyzed using IBM SPSS v28.

- Descriptive statistics summarized demographics and mean scores.
- T-tests and one-way ANOVA (with Scheffé post-hoc tests) were used to test differences across roles, sectors, and experience levels.
- Pearson correlation identified interrelationships among factor categories ($p < 0.05$).

Qualitative data from interviews were analyzed using thematic analysis [31] to extract recurring themes that explained or expanded upon the quantitative findings.

To facilitate the interpretation of the mean values obtained from the Likert-scale responses, a verbal evaluation system was adopted following the categorization criteria commonly used in construction management research (for example, [15, 20]. Table 2 presents the corresponding verbal interpretations of the average scores.

This classification was used to describe the relative importance of each factor throughout the Results section, allowing for a clear understanding of how the respon-

Table 2. Interpretation of Mean Scores for Verbal Evaluation

Mean Range	Verbal Evaluation
Less than 1.66	Not Important
1.66 – 2.33	Moderately Important
2.34 – 3.00	Important

dents perceived the significance of each dispute-causing variable.

3.9. Triangulation and Integration

The integration of the results followed a joint display matrix [32]. Quantitative findings identifying the top dispute causes, such as payment delays, design errors, and coordination failures, were compared with qualitative insights. Strong convergence was found between the datasets, reinforcing the multidimensional nature of the disputes. Minor differences were interpreted as contextual rather than contradictory.

This triangulated integration strengthens the credibility, validity, and transferability of the results, providing a comprehensive understanding of dispute causation and management in Yemen's construction industry.

3.10. Respondent Characteristics

Survey respondents displayed diverse demographic and professional characteristics across three key dimensions: position, sector, and years of experience.

Position: The largest proportion of respondents were engineers, accounting for approximately 50% of the total sample. This was followed by consultants (21%), and project managers (19%). Company owners comprised 8%, while contractor representatives comprised the remaining 2%.

This distribution indicates that insights are drawn predominantly from technical and managerial professionals who are actively involved in project execution and consulting roles, with some input from senior executives and contractors.

Sector: A clear majority of participants (77%) reported working in the private sector, which included private engineering firms, international contractors, and non-governmental organizations. The remaining 23% were affiliated with the public sector, including government ministries and public agencies.

This suggests that the data predominantly reflect perspectives of private and international practitioners, although valuable insights from public sector professionals are also presented.

Years of Experience: A substantial portion of respondents have significant professional experience in the field of construction and project management. Specifically, 33.9% had 5–10 years of experience, 30.5% had 10–15 years of experience, and 28.8% had more than 15 years of experience.

This indicates that the responses were largely informed by experienced professionals with a deep understanding of engineering consultancy and the construction environment.

To verify whether respondents from different sectors, roles, and levels of experience perceived the dispute causes differently, inferential statistical tests were conducted using independent sample t-tests and one-way ANOVA. The results demonstrated no statistically significant differences across all groups, indicating a high degree of consensus among professionals regarding the importance of the identified dispute factors.Table 4 presents the detailed results of these hypothesis tests, including the F-values, t-values, degrees of freedom (df), and p-values for each comparison. The absence of significant variation supports the reliability and generalizability of the findings, suggesting that the causes of disputes are consistently perceived across both public and private sectors.

Note**:** *$p > 0.05$ indicates that no statistically significant difference exists among groups, confirming high consistency of perceptions regarding the main causes of disputes.*

4. RESULTS AND DISCUSSION

The findings of the survey confirmed that foreign-led Yemeni project disputes have a multidimensional set of interrelated causes, and that almost all posited causative factors are regarded as significant by respondents. Table 5 provides a summary of the perceived importance of the five general categories of the causative factors of disputes. All categories report high average levels of importance (all > 90% on our scale), which implies that practitioners consider disputes as a multi-faceted phenomenon encompassing administrative, technical, behavioral, contractual, and operational issues. It was found that technical issues, on average, ranked the highest (overall importance of ~94%), and this was closely followed by contractual and operational issues at ~92%. Even the lowest-scoring group administrative issues averaged approximately 91% importance, underscoring that none of the above areas should be sidestepped in the pursuit of preventing/dispute mitigation.

4.1. Technical Factors

Technical deficiencies were identified as the most critical cause of dispute (RII = 0.94). Respondents highlighted that incomplete or inaccurate design documents, insufficient site investigations, and a lack of technical expertise frequently lead to cost and time claims. Expert interviewees confirmed that weak pre-construction preparation, especially poor coordination between foreign contractors and local consultants, was the leading trigger for disputes. Frequent design modifications during construction are

Table 3. Frequency of Position

Position	Frequency	Percent	Valid Percent	Cumulative Percent
Project Manager	37	18.6%	18.6%	18.6%
Consultant	41	20.6%	20.6%	39.2%
Engineer	100	50.3%	50.3%	89.4%
Contractor	5	2.5%	2.5%	92.0%
Administrator	16	8.0%	8.0%	100.0%
Total	**199**	**100.0%**	**100.0%**	**100.0%**

Table 4. Results of Hypothesis Testing Using Independent Samples t-Test and ANOVA

Test Type	Comparison Variable	N	df	F-value	t-value	p-value	Decision	Interpretation
Independent Samples t-test	Sector (Public vs. Private)	199	197	1.843	0.927	0.356	Not Significant	No significant difference between public and private respondents
One-Way ANOVA	Position (Manager, Engineer, Consultant, Administrator)	199	4, 194	2.031	—	0.178	Not Significant	Responses consistent across professional roles
One-Way ANOVA	Experience (Less than 5 yrs, 5–10 yrs, >10 yrs)	199	2, 196	1.672	—	0.191	Not Significant	Agreement across different experience levels

Note: *$p > 0.05$ indicates that no statistically significant difference exists among groups, confirming high consistency of perceptions regarding the main causes of disputes.*

Table 5. Descriptive Statistics of Causes of Disputes

Rank	Factors	Mean	Standard Deviation	RII (%)	Verbal Appreciation
1	Technical Factors	2.83	0.3297	94.4%	Important
2	Contractual Factors	2.78	0.3228	92.8%	Important
3	Behavioral Factors	2.74	0.3447	91.3%	Important
4	Administrative Factors	2.73	0.3410	90.9%	Important
5	Operational Factors	2.77	0.3135	92.2%	Important
—	**Overall Average**	**2.77**	**0.2531**	**92.3%**	**Important**

attributed to inadequate feasibility and engineering studies.

These findings are consistent with those of [15, 20], who noted that design errors and documentation deficiencies were among the most recurrent causes of disputes in the Middle East. Similarly, [10] reported that a shortage of skilled technical personnel in Yemen contributes to poor supervision and coordination, leading to dispute escalation.

4.2. Contractual Factors

Contractual factors ranked second (RII = 0.93) and were viewed as the legal foundations of most disputes. The most significant issues were unclear contract clauses, delayed payments, and unfair risk allocations. According to experts, modifications to standard FIDIC contracts without legal reviews often result in inconsistencies that become major sources of conflict. Additionally, most contracts lack structured dispute resolution mechanisms such as mediation or Dispute Adjudication Boards (DABs).

These findings align with those of [4, 11], who found that ambiguous contractual provisions and late payments are key causes of disputes in the Gulf and Yemeni projects. Similarly, [14] confirmed that unclear risk distribution and weak contractual governance are major dispute triggers in developing countries.

4.3. Operational Factors

Operational issues ranked third (RII = 0.92). Respondents emphasized that inadequate quality control, delays in resource mobilization, and irregular payment schedules are among the main operational causes of disputes. Experts further noted that delayed fund disbursements by public clients often force contractors to suspend or slow work, leading to cost overruns and claims.

These results are supported by previous studies [15, 21]. who found that financial constraints, weak logistical coordination, and poor site management were major predictors of disputes. In Yemen, these operational prob-

Table 6. Descriptive Statistics of Technical Factors

Rank	Factors	Mean	Standard Deviation	RII (%)	Verbal Appreciation
1	Quality of design and engineering documents	2.88	0.3510	96.1%	Important
2	Accuracy of pre-implementation field investigations	2.81	0.4423	93.6%	Important
3	Technical expertise of the project team	2.80	0.4492	93.3%	Important
—	**Overall Average**	**2.83**	**0.3297**	**94.4%**	**Important**

Table 7. Descriptive Statistics of Contractual Factors

Rank	Factors	Mean	Standard Deviation	RII (%)	Verbal Appreciation
1	Clarity of contract terms (e.g., scope of work, risk allocation)	2.88	0.3964	96.0%	Important
2	Efficiency of contractor selection mechanisms	2.80	0.4141	93.3%	Important
3	Presence of clear dispute resolution clauses in local contracts	2.78	0.4710	92.7%	Important
4	Impact of change orders on costs and timelines	2.68	0.4996	89.3%	Important
—	**Overall Average**	**2.78**	**0.3228**	**92.8%**	**Important**

Table 8. Descriptive Statistics of Operational Factors

Rank	Factors	Mean	Standard Deviation	RII (%)	Verbal Appreciation
1	Effectiveness of quality control procedures	2.85	0.4112	95.0%	Important
2	Timely availability of resources (equipment, materials, labor)	2.83	0.4115	94.3%	Important
3	Employer's adherence to agreed payment schedules	2.80	0.4230	93.3%	Important
4	Contractor's financial capability to fund the project	2.77	0.4900	92.3%	Important
5	Impact of external factors (e.g., regulations, political conditions)	2.59	0.5422	86.3%	Important
—	**Overall Average**	**2.77**	**0.3135**	**92.3%**	**Important**

lems are aggravated by the limited access to construction materials, security restrictions, and bureaucratic payment procedures.

4.4. Behavioral Factors

Behavioral factors were ranked fourth (RII = 0.91), reflecting the importance of interpersonal and cultural aspects of project management. The highest-ranked behavioral issue was a lack of teamwork and trust among stakeholders, followed by poor communication and limited negotiation experience. Both survey respondents and experts agreed that ineffective communication between local and foreign teams leads to misunderstandings and adversarial attitudes.

These findings are in line with those of [12, 18], who emphasized that cultural and communication barriers are among the strongest determinants of disputes in multicultural construction environments. [4] also confirmed that communication breakdowns are a major problem in Yemeni construction projects, particularly in foreign-led contracts.

4.5. Administrative Factors

Administrative issues, although ranked lowest (RII = 0.91), remain highly significant. Respondents reported that unclear authority lines, delays in approval, and poor coordination between project entities often lead to miscommunication and rework. Experts have added that many public agencies lack qualified project managers capable of proactive decision-making and documentation control.

These findings agree with [29], who observed that weak administration and slow decision-making are persistent causes of disputes in developing countries. In Yemen, overlapping responsibilities between ministries and limited project management capacity further intensify the administrative challenges.

4.6. Integration of Quantitative and Qualitative Findings

Triangulation between the survey and expert interviews revealed strong convergence in identifying key dispute causes. Both datasets emphasize that disputes primarily arise from technical weaknesses, contractual ambiguities, financial delays, and communication breakdowns. Experts have placed additional emphasis on security disruptions, political instability, and inconsistent regulatory environments, which aggravate these disputes but are beyond the direct control of project parties.

This integration demonstrates that disputes in foreign-led Yemeni projects are not caused by isolated factors,

Table 9. Descriptive Statistics of Behavioral Factors

Rank	Factors	Mean	Standard Deviation	RII (%)	Verbal Appreciation
1	Level of cooperation among team members	2.86	0.3433	95.3%	Important
2	Degree of trust between stakeholders	2.70	0.5218	90.0%	Important
3	Team's experience in contract negotiation	2.65	0.5079	88.3%	Important
—	**Overall Average**	**2.74**	**0.3447**	**91.3%**	**Important**

Table 10. Descriptive Statistics of Administrative Factors

Rank	Factors	Mean	Standard Deviation	RII (%)	Verbal Appreciation
1	Clarity of communication channels between stakeholders	2.82	0.4195	94.1%	Important
2	Appropriate allocation of resources and budgets	2.81	0.4501	93.8%	Important
3	Adequacy of training provided to project managers	2.66	0.5354	88.6%	Important
4	Effectiveness of international project management practices	2.61	0.5280	87.1%	Important
—	**Overall Average**	**2.73**	**0.3410**	**90.9%**	**Important**

but by the compounded effects of technical, managerial, and behavioral deficiencies. Convergence between the datasets enhances the credibility and robustness of the results.

This study confirms that disputes in foreign-led Yemeni construction projects are multifaceted, with interdependent technical, contractual, operational, behavioral, and administrative dimensions.

The results indicate the following.

- Technical and contractual problems are the leading dispute causes.
- Operational and financial issues aggravate disputes through resource shortages and payment delays.
- Behavioral and administrative weaknesses serve as catalysts that intensify conflicts.

The strong consensus among respondents ($p > 0.05$, ANOVA tests) across the public and private sectors indicates a shared understanding of these challenges. These findings underscore the urgent need for improved contract governance, effective communication frameworks, capacity-building programs, and transparent payment systems to reduce disputes and enhance project success in Yemen's construction sector.

The consistency of the perceptions observed in the statistical results was further supported by the qualitative findings obtained from expert interviews. The five interviewed professionals confirmed nearly identical patterns of dispute causes to those identified in the survey, emphasizing issues such as unclear contract clauses, delayed payments, weak coordination, and inadequate technical documentation.

This alignment between the quantitative and qualitative results demonstrates strong methodological triangulation and reinforces the robustness of the conclusions of the study. No contradictions were observed between the two data sources; rather, the expert insights provided deeper contextual explanations for the statistical findings, confirming that disputes in foreign-led Yemeni projects stem from interrelated technical, contractual, administrative, behavioral, and operational deficiencies.

5. CONCLUSION AND RECOMMENDATION

Field research confirmed that disputes in foreign-led construction projects in Yemen arise from a complex interplay of causes rather than a single factor. A questionnaire survey of 199 professionals revealed that disputes primarily stem from incomplete design documents, contractual ambiguities, weak communication, and insufficient managerial practices. Statistical analysis further demonstrated that the contractual, technical, managerial, and financialoperational dimensions all carry high levels of importance.

Insights from expert interviews further emphasized the significance of unclear risk allocation, inadequate contract administration, weak governance structures, cultural misalignments, and the lack of proactive dispute resolution mechanisms. Experts have consistently highlighted the absence of transparent communication protocols and scarcity of highly skilled project managers as recurring triggers.

Through triangulation of evidence linking the survey findings, case study analysis, expert perspectives, and insights from previous literature, the study concludes that the root causes of disputes in Yemen's foreign-led projects can be grouped into four major categories:

1. Technical: incomplete or inaccurate designs, poor planning, and inadequate site investigations.
2. Contractual: unclear clauses, imprecise risk allocation, weak dispute resolution provisions.
3. Managerial: ineffective communication, weak project governance, and insufficiently trained project man-

agers.

4. Financial–Operational: payment delays, resource shortages, and approval bottlenecks.

Based on these findings, the article recommends that the Yemeni government adopt the following proactive measures to minimize disputes in foreign-led projects:

- Clear and comprehensive contracts: Ensure that contracts are precisely drafted, with transparent risk allocation and embedded dispute resolution mechanisms aligned with international standards but adapted to Yemen's legal context.
- Capacity building: Invest training programs to strengthen the capabilities of Yemeni project managers, engineers, and contract administrators in proactive claims management and dispute avoidance.
- Proactive conflict avoidance measures: Establish structured communication protocols, multi-tier dispute resolution mechanisms (negotiation, mediation, adjudication), and monitoring committees that include all stakeholders.
- Rigorous contractor qualification: Introduces stricter prequalification processes to ensure that foreign contractors possess the financial capacity, technical expertise, and cultural awareness necessary for Yemen's challenging environment.
- Strengthened financial discipline: Guarantee timely payments by government clients and transparent approval procedures to reduce mistrust and avoid unnecessary delays.

By adopting these measures, the Yemeni government can reduce the recurrence of disputes, enhance collaboration between foreign and local stakeholders, and improve the resilience and success of infrastructure projects under fragile conditions.

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