



Good Construction Contracting Practices In Indian And Abroad

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ABSTRACT

Good construction contracting practises are essential for the success and efficiency of project execution in India and abroad. The paper emphasizes key aspects of these practises, including robust pre-construction planning, clearly and thorough contract documentation, transparent communication, and efficient risk management. Contracts in the construction industry are continuously evaluated through the contracting party and the contractor. Defects in these contracts frequently result in a failure to meet the expectations of each party, leading to litigation that negatively impacts the parties' relationships. This document proposes an instance study of a representative construction company in the construction industry, where contracts for reimbursable costs are not generating the anticipated earnings. In the context of India, dedication to local regulations, cost control measures, and environmentally friendly construction techniques are essential. On the global stage, cultural sensitivity, legal frameworks, and commitment to international standards assume importance. This abstract emphasizes the vital importance of adopting and adapting sound construction contracting practises to diverse geographical and regulatory environments for project success and sustainable development.

Keywords: Construction Contracts (CC), Procurement Management (GA), Construction industry, Cost Reimbursable (CR).

I. INTRODUCTION

1.1 Introduction

India is a rising global economic powerhouse. India has with an approximate GDP of US\$3.6 trillion, ranking fourth in terms of purchasing power parity, and the second-fastest rate of economic growth rate globally at 8.9%. Furthermore, India is anticipated to surpass China to become the most populated nation in the globe, in terms of population by 2050, with a projected growth of 400 million to 1.7 billion people. As a result, meeting this demand will put a huge burden on present infrastructure and the building sector. Despite the need for expansion and growth, India is now experiencing deficit concerns that might significantly limit the future development of its infrastructure and building sector. The Indian construction sector has seen substantial growth in recent years, with an annual increase of 9 to 11%, driven by both manufacturing and industrial growth both nationally and internationally. The present market value of Residential and commercial property building projects in India total more than \$44 billion. According to a 2011 EC Harris report, the Indian government's decision to allow 100% (FDI) in real estate and infrastructure has increased building activity throughout the country. Foreign companies are set to invest €3.9 billion in the sector. The President of India has declared this decade to be the decade of innovation because of the essential role that innovation plays in economic development and growth "Decade of Innovation," emphasizing inclusive growth. To benefit on this increase, the construction sector must remove inefficiencies. If the inefficiencies in the system can be addressed, the Indian construction sector will benefit from significant future investments and infrastructure needs. Based on current trends, India's GDP could decrease by \$200 billion in the fiscal year 2017 due to inefficiencies. The existing structure of the Indian construction sector cannot overcome these inefficiencies. The building business has a huge economic effect, hence it is critical to address these inefficiencies. The construction business is crucial in the development of countries' infrastructure and trade, hence the effectiveness of construction contracting processes is of the highest significance. In both the Indian context and on a global scale, the

creation and execution of construction contracts is fundamental to the success or failure of projects, having a direct impact on quality, timeliness, costs, and stakeholder satisfaction. This study investigates into the domain of excellent construction contracting practises with the intent of dissecting the strategies, standards, and approaches employed in India and abroad. Through examining the nuances of these practises, we hope to uncover the keys to successful construction project delivery in a variety of geographical and regulatory environments, thereby contributing to the construction industry's ongoing evolution and development.

1.2 Construction Industry in India: An Overview

Right now, India's economy is expanding at the second-fastest rate in the world. The building sector, a crucial component of the economy and a major driver of development investment, is poised for significant expansion due to metropolitanisation, economic growth, industrialization, and rising standards of living. After agriculture, construction is India's second-largest economic sector. It is anticipated that the industry would be the main recipient of additional infrastructure investment during the next five years, receiving around 65% of total infrastructure spending. Construction investment currently contributes approximately 11% to India's GDP. In the coming five to ten years, the infrastructure sector is projected to attract €239.68 billion in investment, concentrating on energy, ports, airports, highways, bridges, urban infrastructure, and telecommunications, all of which will significantly strengthen the building sector.



Figure 1: Construction Industry Source: (Consulting, 2023)

By fiscal year 2010, the potential for investment in this sector is €93.36 billion. Affiliated industries, including cement, are experiencing substantial growth amid infrastructure's optimistic outlook. The consumption of cement is anticipated to surpass the 150-million-tonne threshold for the first time. The commodity's demand was shown in January 2007, when capacity utilisation jumped from more than 100% to 102%, resulting in 14.10 million tonnes shipped vs 14 million tonnes produced. As opportunities in the industry have developed, investment from overseas has increased. Foreign direct investment into the building and real estate industries totalled €216.53 million for the first half of the current fiscal year.

Under automatic route, construction and other development initiatives are eligible for 100% foreign direct investment. Foreign investors have the option of investing in a variety of initiatives and policies that the Indian government has been developing and implementing.

The construction industry is the driving force behind the Indian economy. This sector is very important to the government since it serves as the foundation for all other projects and is responsible for the country's overall growth. The Indian construction business is divided separated into two sectors: Urban development and real estate are two different fields. While the urban development sector encompasses a number of sub-segments, including as water supply, sanitation, urban transit, schools, and healthcare, the real estate sector comprises residential, office, retail, hotel, and recreational park assets.

Good construction contracting practises are essential for the success and efficiency of construction initiatives in India and abroad. These practises help in establishing distinct project objectives, budgets, and schedules, thereby reducing disputes and delays. It encourages transparency, equitable tendering procedures, and compliance with local regulations, thereby nurturing confidence among stakeholders. Effective risk management, quality control, and regular communication are also essential components of these practises, assuring the deliverance of high-quality, cost-effective projects that benefit communities and the entire construction industry.

The scope and diversity of research on effective construction contracting practises in India and abroad is extensive. It involves investigating the legal frameworks and regulatory environments regulating construction contracts in various nations, comparing and analyzing successful case studies, and identifying common challenges and solutions. Risk management, dispute resolution mechanisms, sustainability considerations, and the influence of cultural and regional factors on contracting practises can be explored by researchers. In addition, technological and digital advancements in the construction industry provide opportunities to investigate their effects on contracting practises and project outcomes.

1.3 Objectives of the study

- 1) To identify and compare optimal construction contracting methods in India and abroad.

- 2) To evaluate the legal and regulatory frameworks that control building contracts indifferent nations.
- 3) To examine the impact of technology and innovation on improving global construction contracting procedures.
- 4) To promote information exchange and cooperation among construction experts in India and elsewhere in order to enhance contracting procedures constantly.

II. LITERATURE REVIEW

2.1 Introduction

Good construction contracting practises in India and internationally consist of a set of guiding principles and strategies designed to ensure the successful completion of construction projects. These practises include exhaustive project planning, explicit and detailed contracts, transparent procurement processes, and adherence to local and international regulations and standards. Fundamental aspects of these practises include effective risk management, timely communication, and collaborative relationships between all project stakeholders, including contractors, proprietors, and subcontractors.

Ruveyda Komurlu. et.al (2019) This study concentrates on the concept of the construction contract, project and contract administration, the significance of construction contracts, and the disputes between the parties through a literature review. Its objective is to furnish information to individuals, organisations, and corporations that are intrigued by the subject matter. The construction industry is a significant business sector that operates within a complex framework, requiring the coordination of multiple disciplines. It is the primary source of national income for a nation's economy. Proper planning, organisation, and definition of the parties are necessary due to its intricate structure. Contracts are legal documents that establish the rights, authorisations, and responsibilities of parties. They oversee the relationship between the parties from the initial design phase to the project's conclusion. Contracts must be exhaustive in order to provide clarification on a variety of aspects in order for projects to meet the target schedule, budget, and quality. In order to prevent contradictions and misinterpretations, they must be written in a manner that is comprehensible, plain, and open. The parties are at odds due to deficiencies and a dearth of detail. Site performance is equally critical to the success of a project as the contract. By promptly intervening in the event of deficiencies and errors, contract administration prevents deviations from project objectives, including budget and schedule.

Yogesh Kumar Raj et.al (2021) Population expansion, industrialisation, and the implementation of new infrastructure projects have all led to the fast growth of the building sector in Indian cities. during the previous decade. The supply imbalance in building materials, such as sand, limestone, and aggregate, is projected to worsen as the Indian construction sector grows. The Supreme Court's decision to criminalise river sand and stone mining has had a significant influence on the construction industry. It tries to find a new source of natural basic materials. C&D recycles an alternative source of construction aggregate. Waste has the potential to replace a large portion of natural aggregates present in nations such as the USA, France, Denmark, Germany, & Japan. Has been The literature has proposed a variety of waste management solutions; nonetheless, the volume of rubbish created in India is inadequate. This shortfall is caused by the absence of adequate classification control systems, joint C&D waste estimation procedures, and a lack of knowledge on C&D waste processing among generators, collectors, operators, regulators, and the general public.

Rohan Sawant et.al (2021) In the final study project, we developed a solution that has been supported by multiple responsible managers and should be added as a contract condition to reduce construction waste. Several contracts established by different government agencies were utilised to assess the degree to which contractual stipulations relating to construction waste reduction were implemented on construction sites. The provisions that were previously specified in the contracts were also listed. The next step is identifying a number of ideas and strategies that are presently being used in different nations to decrease construction waste. These solutions are then listed as a reference to see whether they may be included as provisions in contracts. The study effort incorporated the solutions received via discussions with the relevant administrators of several building enterprises.

Padrón Raul, et.al (2023) This article provides case study of a construction company that is indicative of the construction industry and is not making the expected profits as a consequence of contracts for reimbursable expenses. The company's conduct under this sort of contract was originally diagnosed, and deviations and practices that produced favourable outcomes were recognised. This methodology enables managers to identify and adopt these best practices at each step of the life cycle, lowering the possibility of economic losses for the contracting firm. The poll included 16 managers and assessed contracts for this type. In the construction sector, contracts are regularly scrutinised by both the contractual party and the contractor. When these contracts are defective, each party's expectations are not realised, resulting in litigation that negatively effects the parties' relationship.

Murat Gunduz, et.al (2020) The comprehensive, systematic, as well as operational The construction (CAPF) is made up of 93 CCA. core measures/tasks arranged into 11 CCA dimensions/process categories, is briefly described in this paper. After the suggested framework was verified by structural equation modelling, the (CAPM) was developed. After giving a brief overview of the CAPM and its elements, this research compares the performance to A real-world example of 13 small, medium, and big building projects in Qatar that are divided between the public and private sectors. The methodology demonstrates that it offers a strong basis for

computing the aggregate (CCAPI), the CCA (GPI), and group identification underperformance. Inadequate contract management processes are causing the sector to suffer major delays, cost overruns, and disagreements. As a consequence, construction contract administration (CCA) is becoming more and more popular worldwide.

2.2 Research Gap

While there is a substantial body of literature on global construction contracting practises, there is a significant dearth of research that compares and contrasts the specific challenges and nuances encountered by the Indian construction industry in comparison to its counterparts abroad. Additionally, there is limited empirical research that evaluates the efficacy of various strategies for instituting and enhancing good contracting practises in the Indian context, preventing the development of tailored and context-specific guidelines for the industry's stakeholders. Closing such a gap would provide helpful information for improving construction contracting practises in Indian and global contexts.

III. METHODOLOGY

3.1 Methodology

This study's research problem generated a qualitative research inquiry. Qualitative approaches are generally descriptive and inferential, with an emphasis on the types of evidence (i.e., specific words and acts) needed to comprehend the present situation. This inquiry looked at qualitative research approaches since that is how the research challenge was framed. This paper employed a case study research technique. A case study provides a thorough examination of a current phenomena in its real-world environment, where the difference between phenomenon and context is blurred.

Before undertaking extensive case studies, a study was carried out to completely define the research issue and data gathering methods. Unstructured interviews with five key construction quality management specialists were used to acquire data for the research. These professionals included A project manager, a quality assurance manager, and a human resources and talent development manager, as well as two general managers from two private quality consulting businesses. The first goal of the study was to identify the setting of the research topic, which was followed by selecting instances with theoretical value and developing interview protocols. Three large-scale contracting organisations were selected for the whole case study. Based on the advice of the study's informants, these three contractors practice quality management at a good level when compared to other contracting businesses. Furthermore, the chosen businesses successfully execute both strategic planning and quality procedures, which is critical for the second purpose of the research, which is to investigate the viability of combining the two processes via strategic quality planning.

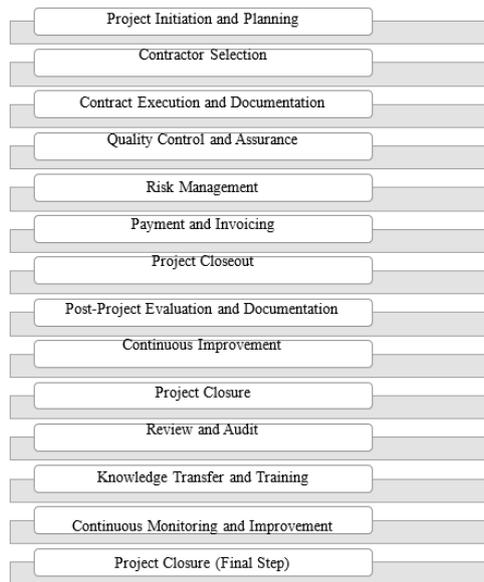


Figure 2: Process of methodology

In the early phases of a project, Project Initiation and Planning lay the groundwork for success by establishing a clear road map. Once the direction has been determined, Contractor Selection becomes crucial, as the correct team can have a substantial impact on project outcomes.

Contract Execution and Documentation become essential for legal and operational purposes as the project progresses. Simultaneously, Quality Control and Quality Assurance processes ensure that the project fulfils its predetermined requirements. In the meantime, Risk Management strategies aid in identifying and mitigating potential obstacles. Payment and Invoicing procedures ensure that financial resources are allocated

appropriately. Project Closeout represents the culmination of the project's primary activities, while Post-Project Evaluation and Documentation captures key lessons learned.

In order to maintain excellence, Continuous Improvement practises are implemented, which facilitate Project Closure and a comprehensive Review and Audit. Knowledge Transfer and Training initiatives ensure that valuable insights are transferred to future projects, While Continuous Monitoring and Improvement mechanisms facilitate the continuous improvement of the organization's project management processes, which culminates in a successful Project Closure as the concluding phase of the project lifecycle.

3.2 Research Design

The four objectives are addressed through the implementation of a comparative and exploratory design in the research. An integrated mixed-methods approach is implemented to acquire a thorough comprehension of construction contracting practices by integrating quantitative and qualitative data. This approach allows for a detailed comparison and evaluation of contracting methods, legal frameworks, technological impacts, and professional cooperation.

Stratified random sampling is used to distribute surveys and questionnaires to a broader group of construction professionals.

Data collecting is separated into both primary and secondary sources.

Primary data is collected through the following methods:

Structured questionnaires are distributed to construction professionals, contractors, and regulatory bodies in India and select countries abroad. The survey focuses on contracting methods, regulatory frameworks, technological adoption, and collaboration practices.

Detailed case studies of specific construction projects in India and abroad are analyzed to understand practical applications of contracting methods and their outcomes.

Secondary data is sourced from:

Academic Journals and Articles: Reviewing scholarly articles and papers on construction contracting practices, legal frameworks, and technological innovations.

Industry Reports: Analyzing reports from construction industry associations, regulatory bodies, and technology providers.

Legal Documents: Examining construction laws, regulations, and contract templates from various countries.

3.3 Data Analysis

The collected data is analyzed using quantitative techniques.

Quantitative Analysis

Statistical Analysis: Descriptive statistics are used to summarise survey data, whereas inferential statistics are applied to identify significant differences and correlations between variables.

Benchmarking: Performance indicators from case studies are benchmarked against industry standards to evaluate the effectiveness of different contracting practices.

IV. CASE STUDY

4.1 Introduction

• Study Area 1- Omerga Ausa

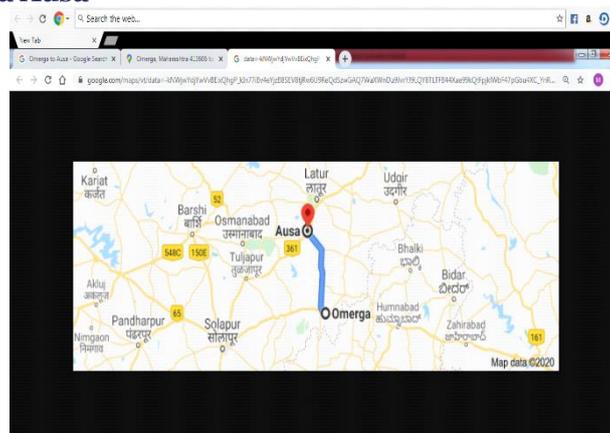


Fig 3. Location of Study Area 1



Fig 4. Site Photo

- **For Omerga AUSA**

Upgrade Omerga AUSA, Package-I from km. 0+000 to km. 47+800 is a two-lane with paved shoulder layout in Maharashtra.

4.2 Case study Abroad (Dubai)

Company Overview

Founded with the mission to provide innovative manufacturing and turnkey fit-out solutions, Havelock One Interiors services a wide range of industries include food and beverage (F&B), retail, and hospitality, health and wellness, commercial, entertainment, and high-profile residential clients, as well as government bodies and institutions. The company's headquarters are located in Bahrain, with additional offices in key cities across the GCC, including Riyadh, Kuwait City, Doha, Abu Dhabi, and Dubai.

Site Details

"Almoosa Specialist Hospital"

Almoosa Health Group

<https://almoosahealthgroup.org/>

Almoosa Health Group, which provides exceptional healthcare facilities in Al Ahsa, entrusted Havelock One with the manufacturing and installation of various packages for two of their hospitals. Following our successful partnership with the Almoosa Specialist Hospital, we were entrusted with the supply and installation of public area cladding and counters on the ground floor of the adjacent complex, Almoosa Specialist Rehabilitation & Long-term Care Facility.

Our scope of work with wall cladding installation extended to various areas, including the main lobby, first floor, rehab gym, and the rehab pool. One of the most challenging aspects of the project was installing wall claddings in public areas, where back supports for the wooden cladding exceeded three meters in height. To address this, we implemented steel structure supports for the wooden cladding above the admitting area, ensuring a smooth and successful installation process.

The dedication and expertise demonstrated by our team throughout this project have not only strengthened our relationship with the client but also instilled in us the confidence to undertake even larger-scale, world-class healthcare projects in the future.

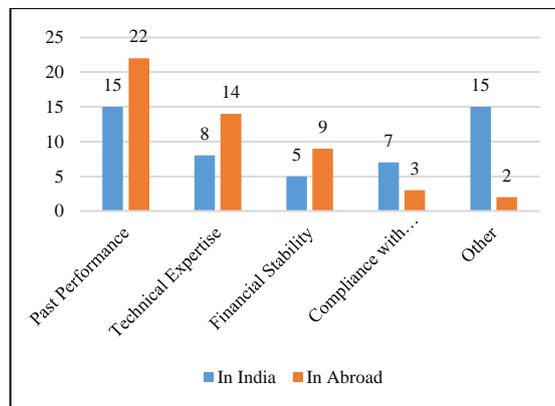
| Role | Details |
|------------------------|--------------------------------------------------------|
| Developer | Havelock One Interiors |
| Engineer | Nahush Jain (Project Management) |
| Consultant | DAR ENGINEERING & ARC International Design Consultants |
| Designer | HDR |
| Main Contractor | BAUMAT |
| Client | Almoosa Health Group |
| Location | KSA (Kingdom of Saudi Arabia) |
| Scope of Work | Interior Fit Out |
| Size | 9,200 sq. ft. |
| Sector | Health and Wellness |
| Timeline | 2024 |

Site photograph

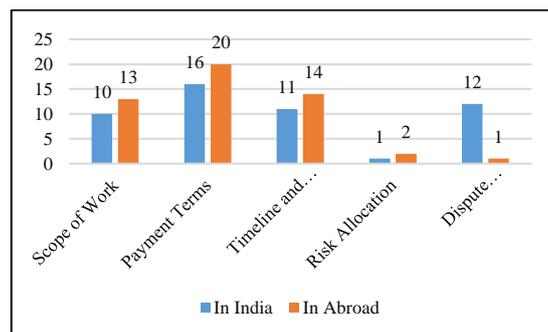


V. RESULT AND DISCUSSION

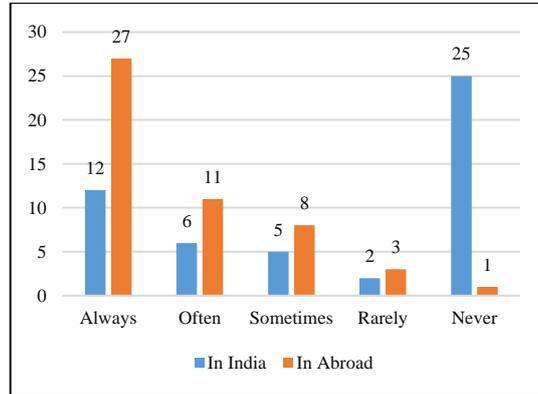
The demographic profile of respondents involved in construction projects in India and abroad reveals key similarities and differences. Age distribution shows a majority aged 35-44 years in both India (66%) and abroad (60%). Occupation-wise, the largest groups are Government Officials/Project Managers, accounting for 60% in India and 50% abroad. Both regions have an equal percentage (24%) of Contractors/Construction Company Representatives. Years of experience are notably high, with 34% (India) and 44% (abroad) having 11-15 years. A significant portion in both regions also has 5-10 years and 16-20 years of experience. Organizational types predominantly involve Government/Public Sector Organizations, representing 50% in India and 52% abroad, followed by Private Construction Companies. Consulting Firms and Academic/Research Institutions have lower representation. This profile suggests a highly experienced and government-focused demographic, with similarities in occupational roles and organizational types across both regions.



The table highlights that past performance is the most critical factor for selecting a contractor, both in India and abroad, with 30% and 44% respectively. Technical expertise follows, valued more abroad (28%) than in India (16%). Financial stability is also important, with a higher preference abroad (18%) compared to India (10%). Safety compliance is significantly more prioritized in India (14%) than abroad (6%). Notably, 'Other' factors are highly significant in India (30%) but minimally abroad (4%). This suggests a more holistic approach in India, while abroad there is a stronger focus on proven track records and technical skills.

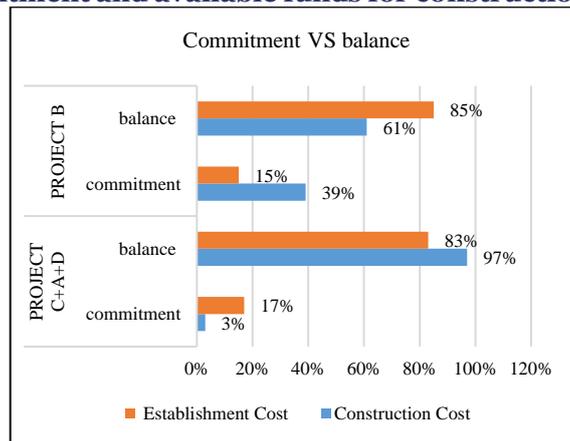


The table presents a comparative analysis of critical elements in drafting construction contracts between projects in India and abroad. Payment terms emerge as paramount in both contexts, with 34% and 40% importance domestically and internationally, respectively. This underscores the universal significance of financial agreements in construction agreements. Similarly, the scope of work and timeline/milestones are crucial, reflecting the importance of clarity and adherence to project objectives and timelines. However, there are notable differences, such as risk allocation, which is deemed less critical domestically (2%) but gains significance internationally (6%). Dispute resolution mechanisms are more emphasized domestically (24%) compared to international projects (2%), possibly due to varying legal systems and the need for clarity in resolving disputes within a specific jurisdiction.



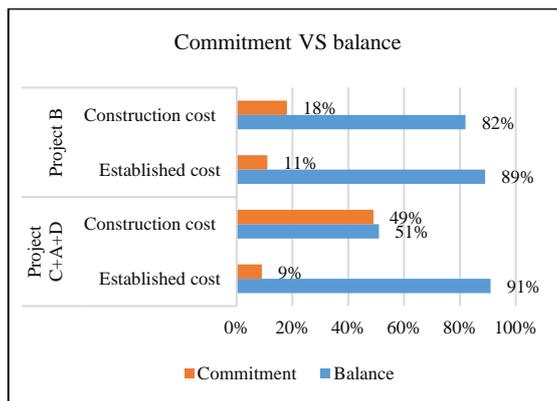
The table illustrates the frequency of using standardized contract templates like FIDIC or AIA in construction projects, distinguishing between projects in India and those abroad. In India, 24.0% of projects always use standardized templates, while 54.0% abroad follow this practice. Moreover, 12.0% and 22.0% in India and abroad, respectively, often utilize these templates. However, a significant difference emerges in the "Never" category, with 50.0% of projects in India never using standardized templates compared to only 2.0% abroad. This suggests a higher propensity for standardized contract usage internationally. The data implies that while standardized templates are relatively more prevalent abroad, there's a notable proportion of projects in both regions that do not adhere to such templates, particularly in India where half of the projects opt not to use them.

5.1 Indian and abroad construction project
Proportion of total commitment and available funds for construction and startup costs in India



Overall, the two projects demonstrate distinct allocations of funds between construction and establishment costs. Project C+A+D has a lower commitment for construction costs but a higher commitment for establishment costs compared to Project B. This suggests that Project C+A+D may prioritize establishing the project's operations and infrastructure, while Project B places greater emphasis on the construction phase. Additionally, both projects have substantial balances of available funds, implying that further decisions and allocations need to be made to fully utilize the resources for each project's construction and startup requirements.

Proportion of total commitment and available funds for construction and startup costs in Abroad

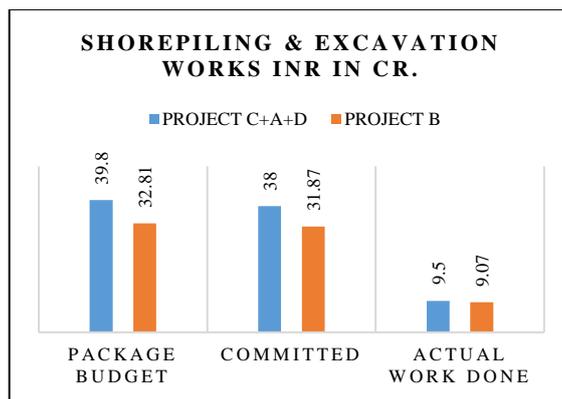


Project C+A+D demonstrates a notable disparity between its established cost and construction cost, with the latter amounting to only 51% of the former. This suggests a remarkable efficiency in cost management during the construction phase, with expenditures being significantly lower than initially anticipated. Conversely, Project B showcases a different picture, with its construction cost accounting for a larger proportion (82%) of the established cost. This indicates a higher degree of variance between projected and actual expenses, potentially pointing towards challenges or unforeseen factors encountered during execution.

Moving on to the commitment aspect, which pertains to the degree of financial dedication and adherence to the established budget, Project C+A+D and Project B exhibit distinct patterns. Despite its efficient cost management during construction, Project C+A+D allocates only 9% of its established cost towards commitment, suggesting a conservative approach or a surplus in budget allocation. In contrast, Project B demonstrates a higher level of commitment, with 18% of its established cost being utilized during construction. This could indicate a more aggressive expenditure strategy or a necessity to allocate additional resources to meet project requirements.

In essence, the table paints a nuanced picture of the financial dynamics and performance of the two projects. While both initially projected similar costs, their execution trajectories diverged significantly. Project C+A+D stands out for its efficient cost management, achieving construction expenditures well below the established budget. However, its lower commitment ratio raises questions regarding resource utilization or potential underinvestment in project execution. Conversely, Project B demonstrates a higher level of commitment but also experiences a larger variance between projected and actual construction costs, suggesting potential challenges or inefficiencies in cost control.

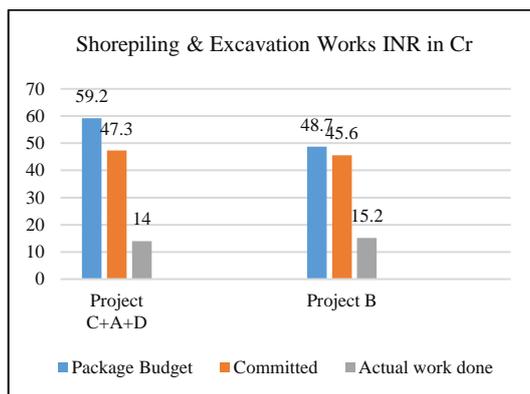
Comparison of the Package Budget to the Commitments Made and the Actual Work Completed in India



For MIXED USE DEVELOPMENT PROJECT - PROJECT C+A+D, the package budget allocated for Shore piling & Excavation Works was INR 39.8 Cr. However, the commitments made for this project were slightly lower at INR 38 Cr. As for the actual work completed, it amounted to 9.5 Cr. This suggests that the project's actual work done was significantly lower than both the package budget and the commitments made.

On the other hand, for MIXED USE DEVELOPMENT PROJECT - PROJECT B, the package budget for Shore piling & Excavation Works was INR 32.81 Cr. The commitments made for this project were slightly lower at INR 31.87 Cr. The actual work completed for this project amounted to 9.07 Cr. Similarly, to the previous project, the actual work done in this case is considerably lower than both the package budget and the commitments made.

Comparison of the Package Budget to the Commitments Made and the Actual Work Completed in Abroad



For Project C+A+D, the allocated budget stands at 59.2 Crores. Of this budget, 47.3 Crores have been committed to various contractors or resources required for completing the project. However, the actual work completed so far amounts to only 14 Crores. This indicates a significant discrepancy between the planned budget, the financial commitments made, and the actual progress on the ground. Specifically, only about 23.6% of the budgeted amount has been realized in terms of actual work done, suggesting either delays, inefficiencies, or potential issues in project execution and management.

Project B exhibits a similar pattern, though with slightly different figures. The total budget for Project B is 48.7 Crores, with commitments reaching 45.6 Crores. The actual work completed amounts to 15.2 Crores. Here, the work done represents about 31.2% of the budget, slightly better than Project C+A+D but still indicating a substantial gap between planning and execution. This gap suggests that despite substantial financial commitments, the physical progress of the project is lagging.

Risks and issues

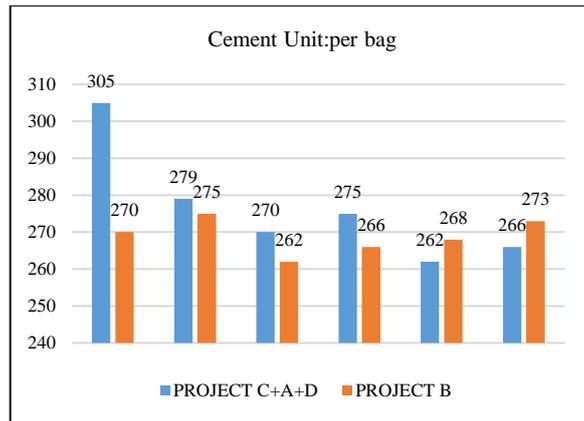
In the context of the "Mixed Use Development Project," there are several risks and issues that need to be considered for two different projects, namely Project C+A+D and Project B.

For Project C+A+D, the first risk is a potential spike in commodity rates due to market conditions and the global scenario. This could have a significant influence on the entire budget and the procurement of structural steel, making it a high-risk factor. Another high-risk issue is the finalization of shore piling alignment for affected trees. This decision will have both time and cost implications on subsequent shore piling works. Additionally, there is a concern about the schematic stage budget exceeding the target numbers, indicating a high-risk situation. A medium-risk issue is the delay in obtaining the Tree NOC (No Objection Certificate) for Phase 2, which could affect subsequent excavation and shore piling activities. The final two risks for Project C+A+D are the finalization of anchoring arrangements for overlapping locations during shore piling, which could impact both time and cost, and the delay in shifting the labor camp outside the premises, potentially affecting excavation and shore piling works.

Moving on to Project B, the first high-risk factor is the effect of the pandemic on overall costs. The unpredictable nature of the pandemic can lead to increased expenses and disruptions to the project. Another high-risk issue is the increase in market rates for reinforcement steel, aluminium, copper, and other materials. This rise in rates can escalate the project cost significantly. The medium-risk issue for Project B is the high volatility in commodity market prices due to geopolitical conditions, which can affect the finalization of the MEPF (Mechanical, Electrical, Plumbing, and Fire Protection) package. The project also faces high-risk claims from the General Contractor (GC) due to design revisions, deferment post UDCR (Urban Development Control Regulations) change, and market rate escalation. Additionally, there is a medium-risk factor related to an increase in mining royalty charges and its subsequent impact on concrete items. Lastly, last-minute changes in the GFC (Good for Construction) drawings can lead to rework and associated cost impact.

Overall, both projects face a range of risks and issues that can impact their budgets, timelines, and subsequent activities. Understanding and managing these risks are crucial for successful completion of the Mixed Use Development Project.

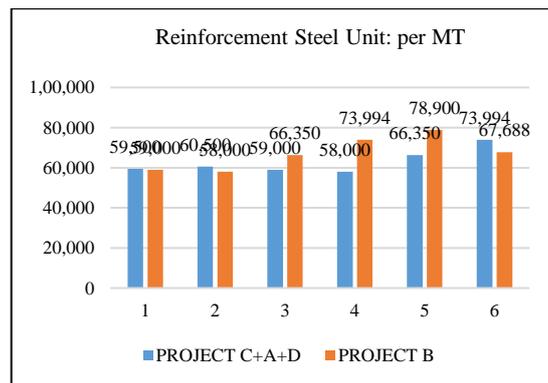
Material Trend



For Project C+A+D, the cement unit requirements per bag are as follows: 305 bags for October 2021, 279 bags for November 2021, 270 bags for December 2021, 275 bags for January 2022, 262 bags for February 2022, and 266 bags for March 2022.

On the other hand, for Project B, the cement unit requirements per bag are: 270 bags for October 2021, 275 bags for November 2021, 262 bags for December 2021, 266 bags for January 2022, 268 bags for February 2022, and 273 bags for March 2022.

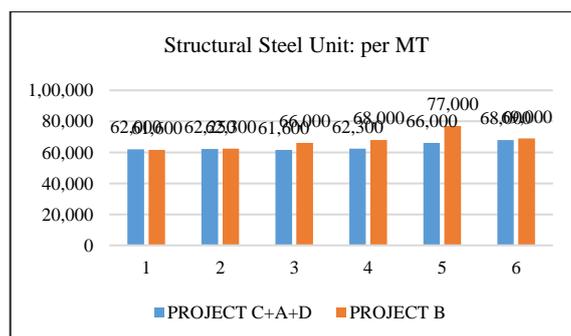
Comparing the two projects, it can be observed that the cement unit requirements per bag for Project C+A+D are generally higher than those for Project B. In October 2021, Project C+A+D requires 305 bags, while Project B requires 270 bags. The difference continues in November, where Project C+A+D requires 279 bags compared to Project B's 275 bags. Similarly, the trend continues for the subsequent months, with Project C+A+D consistently having higher cement unit requirements per bag than Project B.



Analyzing the data, we observe that the Reinforcement Steel Unit cost per MT for PROJECT C+A+D starts at 59,500 in October 2021 and increases to 73,994 in March 2022. On the other hand, for PROJECT B, the cost starts at 59,000 in October 2021, reaches its peak at 78,900 in February 2022, and then decreases to 67,688 in March 2022.

Comparing the two projects, we can see that the cost for PROJECT C+A+D is generally lower than that of PROJECT B. However, in February 2022, the cost for PROJECT B surpasses that of PROJECT C+A+D, reaching a peak of 78,900. In March 2022, the cost for PROJECT C+A+D slightly increases to 73,994, while the cost for PROJECT B decreases to 67,688.

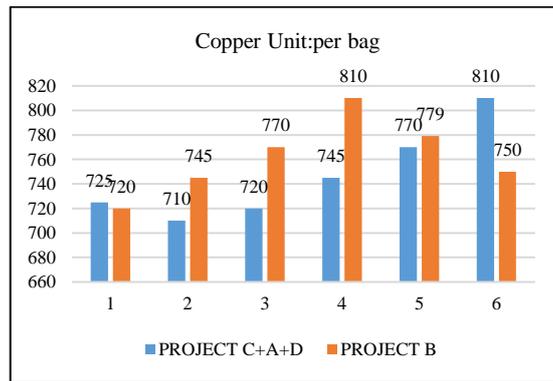
Overall, these figures provide an insight into the variation in Reinforcement Steel Unit cost per MT for the two projects over the specified time period.



In the case of PROJECT C+A+D, the unit cost of structural steel per MT varies over the course of the project. In October 2021, it stands at 62,000. It slightly increases to 62,250 in November 2021 before decreasing to 61,600 in December 2021. However, the cost then rises again to 62,300 in January 2022 and continues to escalate further to 66,000 in February 2022. The highest cost is recorded in March 2022, reaching 68,000 per MT.

On the other hand, for PROJECT B, the unit cost of structural steel follows a different pattern. It starts at 61,600 in October 2021 and experiences a moderate increase to 62,300 in November 2021. The cost then rises more significantly to 66,000 in December 2021 and continues to climb to 68,000 in January 2022. The highest cost is observed in February 2022, reaching 77,000 per MT. However, there is a slight decrease in March 2022, where the cost drops to 69,000.

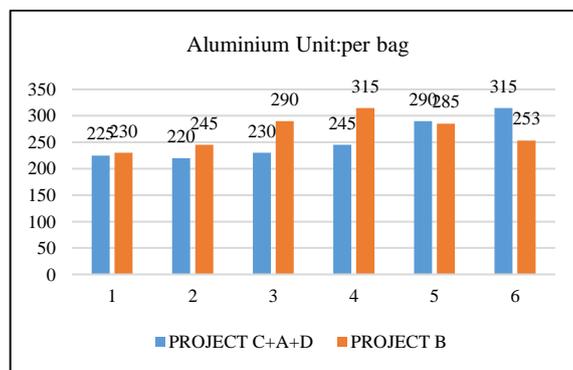
Comparatively, it is evident that the unit cost of structural steel per MT differs between the two projects. For PROJECT C+A+D, the cost ranges from 62,000 to 68,000, while for PROJECT B, it varies from 61,600 to 77,000, with a minor dip to 69,000 in the final month. This comparison indicates that the cost of structural steel fluctuates differently for each project, with PROJECT B having a broader range and reaching a higher peak cost compared to PROJECT C+A+D.



In the case of "MIXED USE DEVELOPMENT PROJECT - PROJECT C+A+D," the cost of copper units per bag varied over the duration of the project. In October 2021, the cost was 725 per bag, which decreased slightly to 710 in November 2021. However, in December 2021, the cost rose to 720 per bag. The subsequent months saw a consistent increase in the cost of copper units, reaching 745 in January 2022, 770 in February 2022, and finally peaking at 810 per bag in March 2022.

For the "MIXED USE DEVELOPMENT PROJECT - PROJECT B," the cost of copper units per bag also fluctuated throughout the specified duration. The cost in October 2021 was 720 per bag, which then increased to 745 in November 2021. In December 2021, the cost further rose to 770 per bag. The upward trend continued into January 2022, with a cost of 810 per bag. However, in February 2022, there was a slight decrease in the cost, with it being recorded as 779 per bag. Finally, in March 2022, the cost of copper units for this project dropped to 750 per bag.

Comparatively, the cost patterns for the two projects exhibit similarities and differences. Both projects experience fluctuations in the cost of copper units, suggesting that the market conditions or other factors influenced the pricing. Additionally, both projects share the same duration, spanning from October 2021 to March 2022. However, the specific values for each month differ between the two projects. For instance, in March 2022, "MIXED USE DEVELOPMENT PROJECT - PROJECT C+A+D" had a higher cost of 810 per bag compared to "MIXED USE DEVELOPMENT PROJECT - PROJECT B," which recorded a cost of 750 per bag.

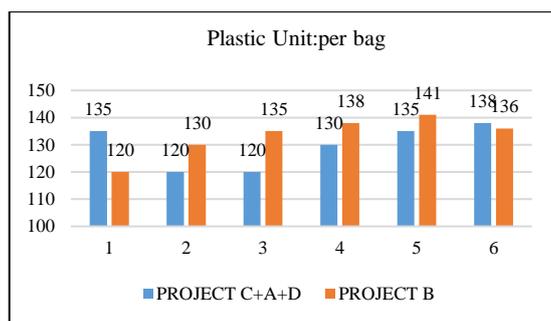


For "MIXED USE DEVELOPMENT PROJECT - PROJECT C+A+D," the data represents the Aluminium Unit per bag values over the given duration. The values recorded for each month are as follows: 225, 220, 230, 245, 290, and 315.

On the other hand, for "MIXED USE DEVELOPMENT PROJECT - PROJECT B," the Aluminium Unit per bag values over the same duration are: 230, 245, 290, 315, 285, and 253.

Comparing the two projects, we can observe that in the month of October 2021, both projects had an Aluminium Unit per bag value of 230. In November 2021, "PROJECT C+A+D" recorded a value of 220, while "PROJECT B" had a slightly higher value of 245. In December 2021, the values for both projects were the same, i.e., 230. Moving to January 2022, "PROJECT C+A+D" saw an increase to 245, while "PROJECT B" remained constant at 315. In February 2022, "PROJECT C+A+D" witnessed a significant rise to 290, whereas "PROJECT B" experienced a decrease to 285. Finally, in March 2022, "PROJECT C+A+D" further increased to 315, while "PROJECT B" had a lower value of 253.

Based on these figures, it can be concluded that the Aluminium Unit per bag values varied between the two projects during the specified duration. "PROJECT C+A+D" generally displayed a consistent upward trend, starting at 225 and progressively increasing to 315. Conversely, "PROJECT B" showed fluctuations in its values, with the highest point being 315 in November 2021 and the lowest point being 253 in March 2022.



For PROJECT C+A+D, the number of plastic units per bag is as follows: 135, 120, 120, 130, 135, and 138. These numbers represent the quantity of plastic units contained within each bag for the respective months.

In comparison, for PROJECT B, the number of plastic units per bag is as follows: 120, 130, 135, 138, 141, and 136. Similarly, these numbers indicate the quantity of plastic units per bag for the corresponding months.

By analyzing the data, it can be observed that the number of plastic units per bag fluctuates over the course of the projects. In PROJECT C+A+D, the quantity ranges from a low of 120 to a high of 138 units per bag. On the other hand, in PROJECT B, the range varies from 120 to 141 units per bag.

Additionally, a comparison between the two projects reveals that the overall quantities of plastic units per bag are similar. Both projects start with 120 units per bag in October 2021 and steadily increase until reaching their respective peak values in February 2022. While PROJECT C+A+D peaks at 138 units per bag, PROJECT B reaches a slightly higher peak at 141 units per bag. However, in March 2022, both projects show a slight decrease in the number of plastic units per bag, with PROJECT C+A+D recording 135 units and PROJECT B recording 136 units.

5.2 Result and Discussion

Results

The demographic profile of respondents reveals a middle-aged, experienced workforce predominantly engaged in government or private sector construction roles. In both India and abroad, the majority of respondents are aged 35-44 years, with 66% in India and 60% abroad. The most common occupations are Government Officials/Project Managers (60% in India, 50% abroad) and Contractors/Construction Company Representatives (24% in both regions). Regarding experience, 34% of respondents in India and 44% abroad have 11-15 years of experience. Government/Public Sector Organizations employ the majority, with 50% in India and 52% abroad.

When selecting contractors, past performance is the most critical factor, especially abroad (44% vs. 30% in India). Technical expertise is valued more internationally (28% abroad vs. 16% in India), while financial stability holds moderate importance in both regions. Safety compliance is prioritized more in India (14%) than abroad (6%).

In drafting construction contracts, payment terms are crucial in both regions (34% India, 40% abroad), followed by the scope of work and timelines/milestones. Risk allocation is more significant abroad (6% vs. 2% in India), whereas dispute resolution mechanisms are emphasized more in India (24% vs. 2% abroad).

The use of standardized contract templates is more prevalent abroad, with 54% always using them compared to 24% in India. Financial commitment analysis reveals that both Indian and international projects face significant discrepancies between budgets, commitments, and actual work completed, indicating potential inefficiencies and delays. Risks identified include market volatility, regulatory delays, and operational challenges, which are significant across both regions.

Discussion

The findings underscore several critical distinctions and similarities between construction project practices in India and abroad. Both regions share a highly experienced workforce, predominantly from government and private sectors, emphasizing the need for skilled professionals in managing large-scale projects. However, the greater emphasis on past performance and technical expertise abroad suggests a more rigorous contractor selection process that could enhance project outcomes. In contrast, India's broader evaluation criteria indicate a more holistic but potentially less focused approach.

Contract drafting practices reveal universal priorities such as payment terms and project timelines. However, the greater importance placed on risk allocation abroad highlights the structured approach to managing uncertainties in international projects. In contrast, the emphasis on dispute resolution mechanisms in India points to potential legal and operational complexities that necessitate clear conflict management strategies.

The more frequent use of standardized contract templates abroad indicates a preference for consistency and established best practices, potentially leading to more streamlined project execution. India's lower adoption of these templates suggests room for improvement in standardization to achieve similar efficiencies.

Financial discrepancies between budgeted amounts, commitments, and actual work completed highlight a significant area for improvement in project management across both regions. Addressing these gaps requires robust financial oversight, efficient resource allocation, and timely execution.

The identified risks, including market volatility and regulatory delays, necessitate proactive risk management strategies. Enhanced monitoring and adaptive planning could mitigate these risks, ensuring smoother project progress. Integrating best practices from international construction processes, such as stringent contractor selection and standardized contracts, could significantly enhance project efficiency and success in India.

VI. CONCLUSION AND SUGGESTIONS

6.1 Conclusion

The comprehensive analysis of construction project practices in India and abroad reveals a nuanced landscape shaped by demographic trends, contracting preferences, financial commitments, and identified risks. While both regions share similarities in workforce demographics, with experienced professionals predominantly engaged in government and private sector roles, notable differences emerge in contractor selection criteria, contract drafting practices, and project execution dynamics.

Abroad, a structured approach to contractor selection prioritizes past performance and technical expertise, supported by the frequent use of standardized contract templates. This streamlined approach reflects a commitment to efficiency and reliability in project execution. In contrast, India exhibits a more diverse evaluation spectrum, emphasizing a holistic consideration of factors in contractor selection and contract drafting. While this approach allows for greater flexibility, it may also introduce complexities that require careful management.

Financial analysis highlights significant discrepancies between budgeted amounts, commitments, and actual work completed in both regions, indicating potential inefficiencies and delays. Addressing these gaps necessitates enhanced financial oversight, efficient resource allocation, and proactive risk management strategies.

Identified risks, including market volatility and regulatory delays, underscore the importance of adaptive planning and robust risk mitigation measures. Integrating best practices from international construction processes, such as stringent contractor selection, standardized contracts, and proactive risk management, presents an opportunity to enhance project efficiency and success in India.

In conclusion, bridging the gap between international best practices and domestic construction processes can facilitate smoother project execution, improve resource utilization, and mitigate risks, ultimately contributing to the successful delivery of construction projects in both India and abroad.

6.2 Suggestion

- **Standardization of Practices:** Encourage the adoption of standardized practices, including contractor selection criteria and contract templates, to streamline processes and enhance project efficiency. This can be achieved through industry-wide initiatives and collaboration between stakeholders.
- **Investing in training and development programs** may enhance the skills of construction professionals in India, namely in areas like financial monitoring, contract draughting, and risk management. This would enable experts to successfully manage the difficulties of building projects and guarantee favourable results.
- **Technology Integration:** Embrace technology solutions, such as project management software and digital contract management platforms, to improve transparency, communication, and decision-making throughout the project lifecycle. This will facilitate real-time monitoring of project progress, financial commitments, and risk factors.
- **Robust Risk Management:** Create comprehensive risk management plans that detect, analyse, and mitigate possible risks throughout the project's lifespan. This involves proactive preparation for market volatility, regulatory changes, and various other external events that may influence project delivery.

- Stakeholder Collaboration: Encourage increased cooperation among government agencies, corporate sector players, and international organisations to exchange best practices, leverage expertise, and address common challenges in construction project management. This collaborative approach can drive innovation and continuous improvement in project execution.
 - Establish methods for continuous assessment and learning to track project performance and identify areas for improvement. Incorporate lessons learned into future projects. This iterative process will enable project teams to adapt to evolving dynamics and optimize project outcomes over time.
- By implementing these suggestions, construction projects in India can enhance their efficiency, effectiveness, and resilience, ultimately delivering better outcomes for stakeholders and contributing to sustainable development in the construction sector.

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