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# An Assessment of Current State of Risk Management and its Practices in Afghanistan Construction Projects

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## Abstract

*In Afghanistan, construction projects face risks and uncertainties in their entire lifecycle from initiation to handover and operation. This is mainly because risk management in Afghanistan's construction sector remains underdeveloped, limited to documentation, and is not embedded into all stages of project development. Through review of current literature and academic studies, this paper assesses the current state of risk management and its practices in Afghanistan construction projects. Within the local context of Afghanistan, it analyses key risk factors—such as cost escalation, time delays, technical errors, safety deficiencies, quality defects, environmental issues, and legal disputes. The paper further assesses how risk identification, risk assessment, and risk mitigation strategies are applied in Afghan construction practice compared to international standards and practices. A questionnaire survey was also conducted among engineers, staff, and project managers working in three active building construction projects and two active road construction projects to complement the review and capture perceptions of critical risks and current risk management approaches. The questionnaire concentrates on risk identification, risk assessment, risk allocation & response, and risk monitoring & control practices in these ongoing projects. The findings reveal an increased awareness about management principles; however, the overall consistent application of proactive and structured/systematic risk management practices remains limited. Projects rely on inconsistent personal experience-based methods instead of adopting recognised standards such as ISO 31000 or PMBOK. The study ends with recommendations for developing a standardised national approach to enhance efficiency, safety, and sustainability in Afghanistan's construction sector*.

**Keywords:** Construction Projects, Contingency, Risk Assessment, Risk Control, Risk Identification, Risk Management, Risk Mitigation, Risk Monitoring.

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## 1. Introduction

The construction industry is one of the most vital sectors for industrial development and economic advancement of Afghanistan. After years of conflicts and economic hardships, this sector promotes national rebuilding, increases physical infrastructure, and generates jobs for thousands of people. As reported by Afghanistan Investment Support Agency (AISA), the construction industry has a share of 7–10 % in GDP [1], [2]. Due to the unique features of its activities, organisation, and environment, among many other industries, this industry is subject to more risks and uncertainty [3]. A country's economic growth and employment opportunities are closely related to infrastructure development; however, potential risks associated with construction projects bring monetary losses [4]. Besides that, the delivery of essential infrastructure projects faces unnecessary and avoidable cost overruns and delays [1], [2]. By prolonging project schedules/timeframes, raising costs, and impeding project performance in terms of time, cost, and quality, these delays have a substantial negative influence on the national economy [5]. Consequently, the majority of construction projects in Afghanistan are facing time and cost overruns. Most of these projects are completed with poor quality and are unable to meet the terms of their contract. To improve the performance of construction projects in terms of cost and quality, effective risk management is critical [6]. The absence of a systematic and proactive risk management strategy across the entire lifecycle of the project is strongly felt. The establishment of an integrated and proactive risk management framework is important not only for reducing technical and financial uncertainty but also for enhancing project performance and institutional learning.

The construction works are inherently risky. These risks shall be managed, minimised, shared, transferred, and/or accepted, but they should not be ignored [4]. On a global scale, risk management has become a crucial element of project management. Overall, in construction projects and particularly in infrastructure projects that need significant investments and complex operations, it is very important to achieve project objectives in terms of time, money, and quality [7]. To achieve project objectives, risk management has become an essential process for determining the unpredictability of future events and how these events affect the goals of building projects in terms of cost, schedule, and quality [8]. Risk management is a systematic and structured approach of recognising, evaluating, and addressing risks in order to accomplish project goals [8]. Efficient risk management increases the chance of project success, lowers uncertainty, and ensures that project goals and objectives are met in time and within budget [8]. The Project Management Institute (PMI) [9] acknowledges Project Risk Management (PRM) as a systematic and methodical approach to risk identification, risk analysis and assessment, risk response preparation, and risk response monitoring and control during the entire life cycle of a project [10].

Since risk management is a relatively recent concept in the construction sector of developing nations, there is a need of an integrated risk management approach [6]. Despite the fact that it has a vital role in the improvement of quality in construction projects, there is only a small number researches conducted on this subject in Afghanistan, and it is rarely addressed by academics [1]. Ye and Ahmadzai [5] found that in Afghanistan, risk management is mostly handled reactively, with unclear responsibilities,

and unstructured approaches. In local projects, this lack of consistent standards and formal training further exacerbates the inefficiency of risk control measures.

Besides applying a methodological approach, efficient risk management also necessitates knowledge and expertise [11]. Many international standards, including PMBOK recommendations and ISO 31000 [12], emphasised the significance of structured risk management frameworks. ISO 31000 defines risk management as “coordinated activities to direct and control an organisation with regard to risk" [1]. As construction projects encounter multiple risks in their lifecycle, risk management should be prioritised for projects of all sizes to achieve intended goals and objectives [4]. These standards and guidelines aim to highlight risk identification, qualitative and quantitative analysis procedures, and the creation of mitigation measures as key factors to improve project performance and outcomes. However, in Afghanistan, several contextual constraints limit the implementation of these standards. The limitations include low institutional capacity, disjointed project delivery systems, inadequate technology utilisation, and reliance on conventional contracting models. Consequently, project teams tend to heavily rely on intuition or informal experience for decisions rather than on evidence and data.

This research aims to evaluate the current state of risk management practices in Afghanistan’s construction projects. The assessment is based on a literature review and a field-based questionnaire survey. The review of literature synthesises results from various existing professional and academic studies. It identifies key risk categories affecting Afghan construction projects. The questionnaire survey adds practical perspectives about various risk categories and the means currently employed to manage them. It collects the practical viewpoints of engineers, project managers, and site personnel involved in three active building construction projects and two ongoing road construction projects.

## 2. Literature Review

Risk may emerge at every phase of a construction project’s lifecycle. At the project initiation and feasibility stages, projects face risks such as inaccurate cost estimations, limited site investigation, and political, environmetal and regulatory uncertainties. The design stage risks typically arise from errors, design changes, and poor coordination issues between architects and engineers [3]. The construction phase risks commonly include material shortages, workforce skill gaps, health and safety hazards, subcontractor issues, and delays caused by weather or logistics. Lastly, the handover and operation phase is exposed to major risks arising from defects, maintenance uncertainties, and deficiencies in quality control and quality assurance procedures [13].

Addressing all these risks requires systematic planning and proactive management supported by effective communication among all project stakeholders. That is why risk management has become an indispensable part of modern construction project management because it provides systematic methods to identify, evaluate, and mitigate risks that may impact project objectives in terms of cost, time, quality, and safety [9]. Risk management is a structured procedure of recognising risks and evaluating risks in order to provide the necessary information to decide on appropriate risk reduction and mitigation efforts [11]. A project risk is an uncertain possibility or situation that, if it

happens, may have a positive or negative impact on the project's objectives, for which there will be consequences in terms of cost, schedule, or quality [14].

Risk management is considered a vital tool to minimise losses and maximise profitability by identifying, controlling, and reducing construction project hazards/risks [3]. Risk management process is mainly composed of defining risk management scope, risk identification, risk analysis and assessment, risk treatment plans, and risk monitoring and control [11], [14]. During this process, all critical factors like inflation, environmental conditions, design changes, poor safety, and managerial deficiencies are consistently identified and recorded in a risk register document [4]. The main focus of risk management is to find out the likelihood and consequences of identified risks and prioritise them accordingly [8].

In the 90s**,** the development of techniques for identifying and assessing risk factors became a popular subject for research. During this era, contractors created thumb rules to analyse and assess risks [4]. Until the 2000s, little research had been done on the identification and assessment of critical risk factors. This was mainly due to a lack of systematic approaches to managing risks in construction projects [4]. Following 2010, the field of risk management advanced with the creation of complicated risk assessment models, which were integrated into comprehensive decision-making frameworks [4].

There have been some studies on risk management practices across developed and developing countries, and Afghanistan. Most of these studies have focused on how risks are identified or analysed/assessed in different countries such as Australia, China, Ghana, India, Malaysia, Nigeria, and the United States [14]. Universally, risk management practices are guided by standardised frameworks, including ISO 31000, PMBOK, and FIDIC guidelines. All of these standards promote a structured approach to identifying, analysing (both qualitatively and quantitatively), prioritising, and closely tracking risks. Figure 2 presents the ISO 31000:2012 standard risk management framework, including its relation with the risk management process.

As guided by these standardised frameworks, in developed countries such as the UK, USA, Japan, Singapore, and Western Europe, risk management is driven by mature frameworks, institutional standardisation, and full integration across all project lifecycle phases. These counties integrate risk management (RM) into all project development stages with strong regulatory and educational support that incorporates structured, qualitative, quantitative, and software-driven risk management systems [10]. On the other hand, in developing countries, such as India, China, Ghana, Nigeria, and Malaysia, risk management awareness is growing. However, its implementation is partial, inconsistent, and under-resourced. In most countries within this group, construction projects face high risk exposures due to the absence of standardised risk management practices and limited data availability [8]. Thus, it can be said that developing countries exhibit growing RM awareness but face barriers such as weak institutional capacity, lack of expertise, and absence of standardised guidelines [1].

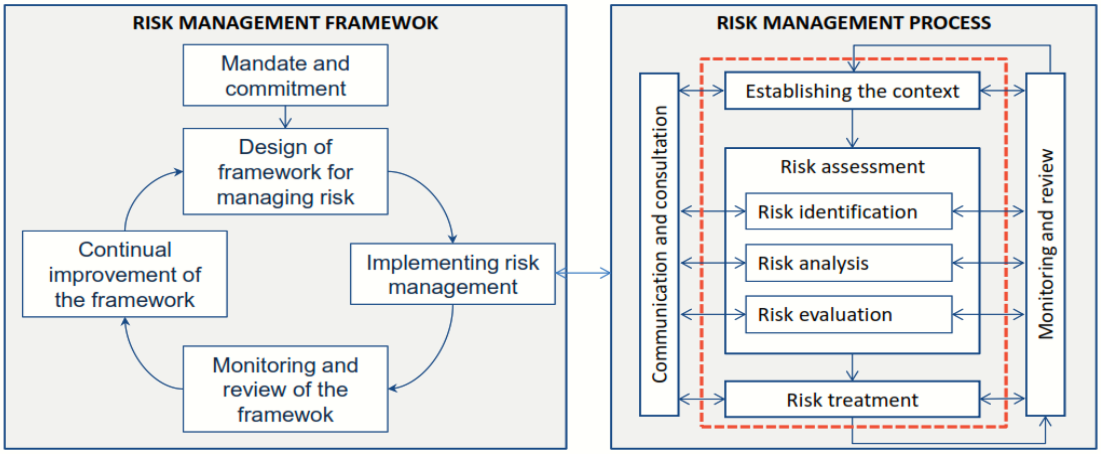



**Fig. 1.** ISO 31000 (2018) Risk management framework

When it comes to neighbouring countries of Afghanistan, they show significantly more progress than Afghanistan, but have features of developing countries [15]. While neighbouring countries such as Iran, Uzbekistan, and China have moved toward partial institutionalisation of risk management, Afghanistan still depends heavily on informal, experience-based risk perception [4]. Furthermore, almost all Afghan-based studies (e.g., [1], [2], [16], [17], [5]) concur that RM in Afghanistan is at a basic or immature phase. A large number of construction projects lack a proactive risk management approach, which leads to addressing risks only after they have occurred. These issues cause cost overruns, quality problems, and schedule delays [1], [2]. Table 1 lists the current state of risk management practices in developed, developing, and neighbouring countries and Afghanistan.

**Table 1.** Current state of risk management practices in developed, developing, and neighbouring countries and Afghanistan

| Region | Risk Management Maturity | Key Characteristics | Representative Sources |
|---|---|---|---|
| **Developed countries** | High | Standardised, quantitative, software-driven; embedded in all project phases | [10], [18], [19] |
| **Developing countries** | Medium / Emerging | Growing awareness; weak enforcement; limited expertise | [4], [22], [20], [15], [21] |
| **Afghanistan** | Low / Nascent | Fragmented RM practice; informal methods; limited data and training | [1], [2], [5], [17], [16] |
| **Neighboring countries** | Medium | Institutional progress, but inconsistent application | [4], [15], [20] |

Attention for risk management practices in construction projects has increased in Afghanistan, but it still remains at its early stages because limited empirical research is available that combines literature review with field-level evidence. The majority of previous studies concentrate on single risk categories, specific project types, or conceptual discussions without integrating practical data. Therefore, this study addresses this gap by providing a dual perspective: (1) a review of existing knowledge, and (2) a

quantitative survey analysis of on-site practices. This dual approach provides a comprehensive perspective of risk management practices and lays the foundation for the national risk management framework in Afghanistan.

## 3. Research Methodology

The nature of this research required a systematic review of the literature and a quantitative survey to capture the current practices at construction sites. Therefore, a mixed-method design that combines a systematic literature review and a quantitative survey was adopted. The review of literature outlines common risk factors throughout the construction project lifecycle and creates a conceptual framework. Simultaneously, the accompanying questionnaire survey gathers data about real on-site practices, perceptions, and experiences from various construction professionals. The combination of review and questionnaire survey not only adds to the credibility of findings, but it also provides a solid foundation for the formation of practical guidance for risk management within the construction industry of Afghanistan. The literature review covers the following important points:

- Types and classifications of risks in construction projects.
- Risk management frameworks.
- Implementation and challenges in developed, developing, and neighbouring countries.
- Empirical findings specific to Afghanistan and similar environments.

To cover the entire topic of risk management practices, 25 multiple-choice questions were asked in five major sections. Table 2 lists sections, topics, the number of questions in each section, and the focus of each section.

**Table 2.** Questionnaire Structure

| Section | Topic | No. of Questions | Example Focus |
|---|---|---|---|
| **Section A** | General Information | 3 | Role, Experience, Type of project contract |
| **Section B** | Risk Identification | 4 | Critical risks, identification methods, Stakeholder involvement, and past project experiences |
| **Section C** | Risk Assessment | 5 | Risk register, Risks prioritisation, Quantitative methods, Risk register updates, Highest risk in this project |
| **Section D** | Risk Allocation & Response | 6 | Risk bearing, Financial risks, Schedule risks, Safety risks, Subcontractor risks, Risk mitigation strategies |
| **Section E** | Risk Monitoring & Control | 7 | Risk review meetings, Risk communication, Risk report to higher management, Lessons learned, Risk management software/tools, Time and budget pressures on risk reporting, Suggestions for improvement |

The research gathered data from the following two categories of projects:

- Category 1: Three private residential building projects in Kabul.
- Category 2: Two road construction projects in nearby provinces.

Responses reported by participants were coded and entered into Microsoft Excel for analysis. To process data and obtain results, means, frequencies, and percentages were

calculated. Bar charts and pie charts were used to illustrate how the results were distributed across four risk management sections.

## 4. Results

To conduct this survey, 40 questionnaires were sent to three residential projects, and 25 questionnaires were sent to two road projects; fortunately, all 65 professionals participated in the survey. The participants represented various roles and responsibilities on construction sites. This distribution is intended to capture a holistic view and a broad spectrum of risk management practices. Table 3 lists the participants' frequency and percentage in line with their role and experience, and the type of contract used in the project, respectively.

**Table 3.** Section A. General Information

| Category | Sub-category | Frequency | Percentage (%) |
|---|---|---|---|
| **Role** | Project Manager | 4 | 6.2 |
| | Site Engineer | 41 | 63 |
| | Risk/Safety Officer | 11 | 17 |
| | Supervisor/Foreman | 4 | 6.2 |
| | Other | 5 | 7.7 |
| **Experience** | | | |
| | Less than 2 years | 4 | 6.2 |
| | 2–5 years | 16 | 24.6 |
| | 6–10 years | 24 | 37 |
| | More than 10 years | 21 | 32.3 |
| **Type of contract in this project** | | | |
| | Lump sum | 30 | 46.2 |
| | Unit price | 31 | 47.7 |
| | Cost-plus | 4 | 6.2 |
| | Design-build | 0 | 0.0 |
| | Other | 0 | 0.0 |

The internal consistency and reliability of the questionnaire were tested using a 1–5 Likert scale. As per standard practice, non-Likert and categorical questions were excluded from analysis. Out of 25 total survey questions, 10 items were selected for the analysis. The value obtained for Cronbach's alpha was $\alpha = 0.91$. This value demonstrates excellent reliability and confirms that selected questions measure a coherent construct within the context of construction risk management.

### 4.1. Risk Identification

Figure 2 presents the percentage share of various methods used for risk identification in Afghan Construction projects. The majority of respondents 52.3% reported the use of checklists. This basically suggests that project teams heavily rely on predefined lists and past experiences to identify risks. The second most common method, reported by 38.5%, is expert judgement, which illustrates the vital role of professional experience in risk

identification. On the other hand, only 6.2% of respondents use brainstorming/workshops. Similarly, a small but significant 3.1% have no formal risk identification process.

In the risk identification process, respondents were also asked to determine the categories of risk that they consider most critical in their project. Safety risks ranked highest among all risks at 30.8% and were considered the primary issue within the ongoing construction project environment. This means that the hazardous nature of construction activities requires perpetual management and control of risks to safe guard worker and employees. Time and cost-related risks ranked at 23.1% and 20.0% respectively, which suggests they are also perceived as major threats, acknowledging common challenges in schedule and budgeting management. Risks related to quality were selected by 16.9%, implying that there is a moderate concern in construction projects regarding meeting technical and performance requirements. Ranked at 9.2%, respondents have shown a lower concern for legal risk compared to technical and operational risks. Interestingly, environmental risks were recorded at 0%, meaning that either the project has minimal environmental exposure or the respondents lacked the awareness or understanding to properly identify and assess environment-related risks. Figure 2. Illustrates the most critical risks identified in construction projects.

The effectiveness of current risk identification practices is further illustrated by the analysis of Likert-scale questions. On average, respondents indicated moderate agreement (Mean = 3.3) that there is an association between risks and a project team's past experience. Likewise, the average score for stakeholder (client, consultant, and contractor) involvement in risk identification was 3.1, which suggests a moderate level of agreement among respondents. Table 4 lists Mean scores for past project experiences and stakeholder involvement in risk identification.




**Fig. 2.** Risk identification methods

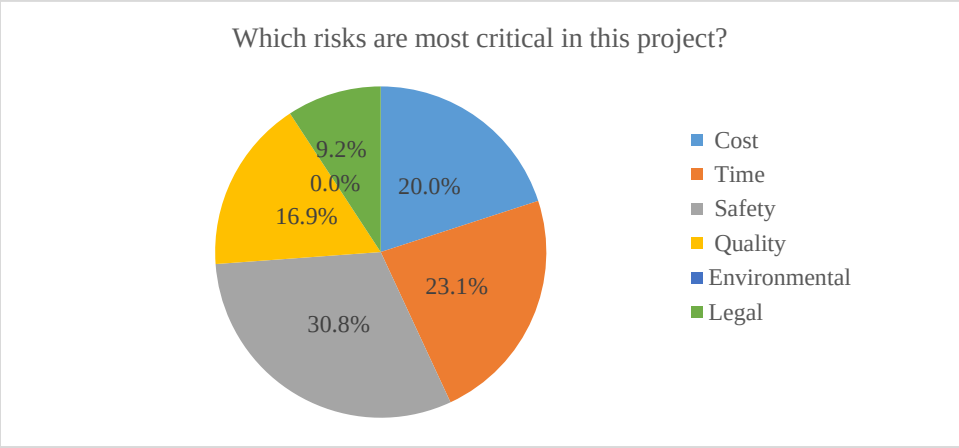



**Fig. 3.** Most critical risk in the current project

**Table 4.** Mean scores (past project experiences and stakeholder involvement)

| Question | Mean Score (1–5) | Rank | Interpretation |
|---|---|---|---|
| **Are risks linked to past project experiences?** | 3.3 | Moderate agreement | Acceptable practice, but not fully consistent across respondents; improvement needed |
| **Are stakeholders (client, consultant, and contractor) involved in risk identification?** | 3.1 | Moderate agreement | Stakeholder participation occurs but is insufficient; mixed responses indicate inconsistent collaboration |

## 4.2. Risk Assessment

Figure 4 presents risk prioritisation practices. The results reveal that for prioritising risks in Afghan construction projects, the majority of respondents (58.5%) rely mainly on management experience as the main approach for prioritising risks. This means that risk prioritisation is mainly informal and largely depends on individuals' personal experience rather than systematic analytical approaches. A smaller number, 36.9 % of respondents, reported the use of a systematic/structured probability–impact matrix assessment, a method widely recommended by International project risk management frameworks such as PMI and ISO 31000. This low level of application of international standards implies that standardised assessment tools designed to quantify risk's severity are not commonly used in the Afghan construction sector. A tiny percentage (4.6%) of respondents selected that risk prioritisation is not conducted.

During the risk assessment phase, the most significant concerns reported by 35.4% were related to safety risks, followed by technical risks with a percentage 33.8%. Legal, financial, and environmental risk received a relatively low score of 16.9% 7.7% and 6.2%, respectively. The high incidence of safety and technical risks reflects the complexity and hazard-intensity of construction projects in the examined context. This necessitates a focus on improving both technical controls and overall safety management practices. Figure 5 depicts the highest risk in ongoing construction project.




**Fig. 4.** How risks are identified

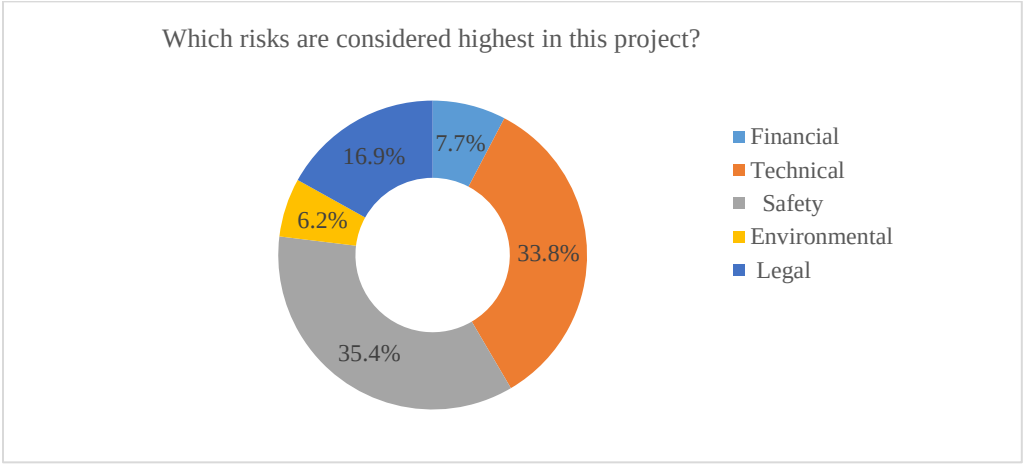



**Fig. 5.** Highest risk in ongoing construction project

The evaluation of project-level risk assessment management practices reveals that construction organisations follow structured risk assessment processes in a moderate yet inconsistent manner. The statement asking about the project risk register received a mean score of 3.5, which indicates a moderate agreement. This means that while many projects use a risk register, these practices are not applied consistently. The deployment of analytical instruments also remains limited. The statement asking about the use of quantitative methods (e.g., Monte Carlo analysis, simulations) had a mean score of 3.4, which again reflects moderate agreement. These findings suggest that advanced analytical techniques and tools are known and used in some projects; however, these practices are not widespread across the construction industry. The frequency at which the risk register is updated received a mean score of 3.7, slightly higher, indicating a relatively stronger agreement. This indicates that in project where risk register are present, its update practices are somehow common. Nevertheless, this value is not equal to strong agreement, meaning that updates may not be systematic and structured across all projects.

**Table 5.** Mean scores for risk assessment practices

| Question | Mean Score (1–5) | Rank | Interpretation |
|---|---|---|---|
| **Does this project maintain a risk register?** | **3.5** | Moderate agreement | Risk registers are used, but not consistently across all projects |
| **Are quantitative methods (e.g., Monte Carlo, simulations) used?** | **3.4** | Moderate agreement | Awareness exists, but practical adoption is limited; mixed implementation |
| **How often is the risk register updated?** | **3.7** | Moderate agreement approaching high | Updating happens more regularly where registers exist, but still not systematic |

### 4.3. Risk Allocation and Response

For the successful completion of construction projects, it is critical to have effective risk allocation strategies employed. Figure 6 illustrates how respondents assign responsibility of project risk among stakeholders in Afghanistan's construction projects. The results show that most respondents 52.3% believe that risk responsibility should be shared among stakeholders (typically the client, contractor, and consultant)**.** A significant portion of respondents 38.5% reported that contractors carries the highest burden which aligns with conventional procurement model called design–bid–build. In this model, once construction begins, contractors take substantial financial, technical, and schedule-related exposures. In contrast, a small minority, just 3.1% of the respondents, reported that the client shoulders the majority of the risks. This illustrates the fact that the client takes minimal risk and transfers the rest to other stakeholders. It is also noteworthy that 6.2% of respondents reported the absence of a defined risk responsibility structure between various stakeholders.

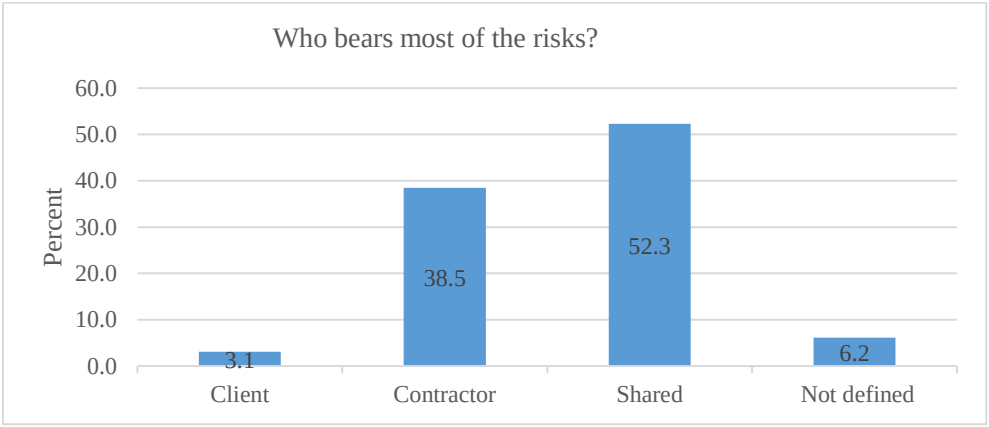



**Fig. 6.** Project risk responsibility among stakeholders

Further results demonstrate that construction firms devise different approaches to handle important financial, safety, subcontractor, and schedule risks. Depending on the specific risk category, these methods vary in impact and efficiency. Financial risks, particularly those related to cost overruns, are commonly managed through contingency funds. The

use of this method indicates a tendency to use financial buffers to absorb uncertainty rather than transferring or systematically mitigating financial exposure. Fixed price contracts and insurance are used to a lesser extents which indicates a limited reliance on contractual or market-based financial risk transfer methods. Figure 7 illustrates how financial risks are managed.

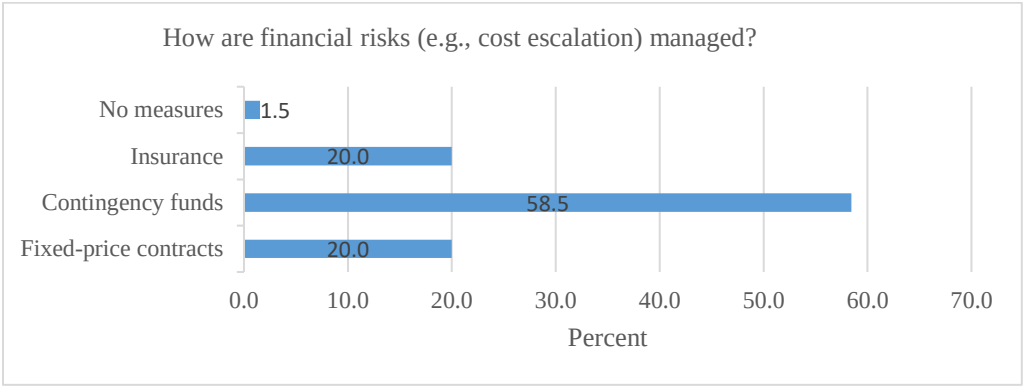



**Fig. 7.** Response and management of financial risk

For response and mitigation of schedule risks, the dominant method used is fast-tracking, which is closely followed by the addition of manpower, reflecting a reactive approach focused on recovery rather than prevention or proactive approach. This reactive approach suggests that once delays occur, then project acceleration measures are applied. Buffering, which is a more proactive schedule protection approach, is applied in only some cases. A small proportion of projects reported to have no clear schedule risk mitigation strategy, increasing the vulnerability of projects to delays. Figure 8 illustrates how schedule risks are managed. These findings show that while schedule risk management practices exist, long-term planning is still not fully utilised.

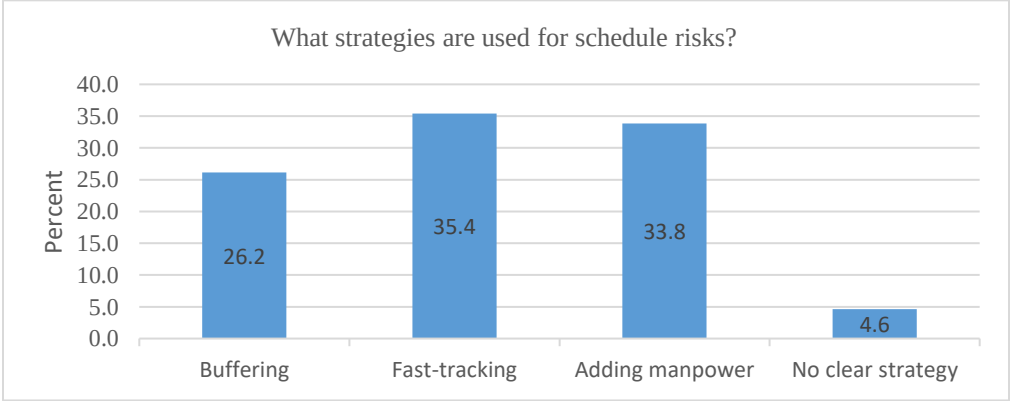



**Fig. 8.** Schedule risk management strategies

With safety audits and regular inspections being widely practised, respectively, it appears that safety risks are more systematically managed. This reflects the importance of monitoring site conditions, meeting regulatory requirements, and inspection-based

controls to ensure compliance. PPE and safety training are also used in some projects, which reflects an acceptable commitment to preventing workplace accidents, but somehow it is less prioritised compared to procedural oversight mechanisms. A very low percentage of respondents reported no systematic safety control, suggesting that formal safety management systems are present in nearly all projects. Figure 9 illustrates how safety risks are managed.

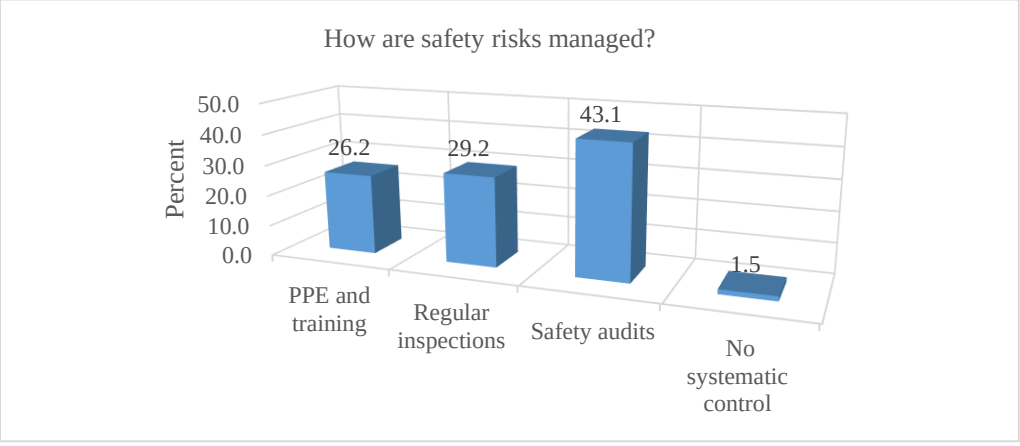



**Fig. 9.** Safety risks management strategies

The results indicate that subcontractor performance risks are mainly managed through strong monitoring and penalties, highlighting a control-oriented approach. This control-oriented approach concentrates on continuous monitoring and implementation of penalties for noncompliance, such as delays or inadequate workmanship, rather than preventing subcontractor performance risks through systematic planning and transparent risk allocation from project inception. One out of four respondents reported the use of informal handling, which highlights the fact that some projects still rely on unstructured communication and personal expertise to mitigate subcontractor performance risks. The use of strict contractual obligations, such as performance bonds and well-defined liability clauses were reported by only one-fifth of respondents. Strict contracts are widely considered the best means for contractual risk transfer and ensuring transparency. Figure 10 illustrates how subcontractor risks are managed.

In order to assess the efficiency of risk response and mitigation strategies, a 5-point Likert scale was employed. With a score of of 4.17, respondents strongly affirmed the effectiveness of risk mitigation strategies in Afghan construction projects. This suggests that while current risk mitigation practices in Afghan construction projects are highly effective, gaps for improvement remain. Table 6 lists the mean score of the overall effectiveness of risk response and mitigation strategies.

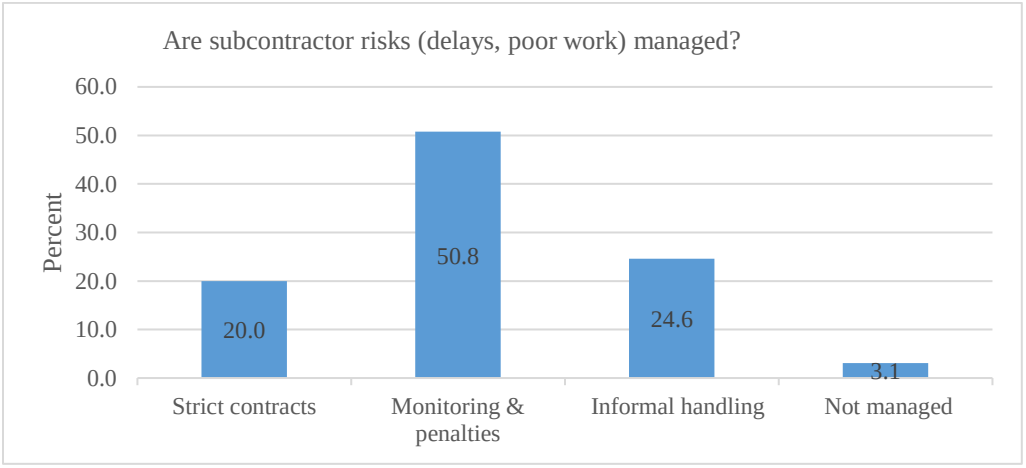



**Fig. 10.** Subcontractor risk management strategies

**Table 6.** Mean score of the overall effectiveness of risk response and mitigation strategies

| Question | Mean Score (1–5) | Rank | Interpretation |
|---|---|---|---|
| **How effective are risk mitigation strategies overall?** | 4.17 | High Agreement | Good practice; respondents generally agree |

### 4.4. Risk Monitoring & Control

Risk monitoring and control is a stage where identified risks are tracked, new risks are detected, and risk responses are implemented. Effective communication across different stakeholders is essential for the analysis and results to be useful. Risk communication across construction projects of Afghanistan appears to be diverse and inconsistent. Almost half of the respondents reported the use of formal methods like regular meetings and written reports, which indicates a structured approach to sharing risk information and a preference for systematic communication. In contrast, 24.6% of respondents still use informal methods like verbal exchanges or ad-hoc conversations, a method that leads to delayed or incomplete communication of vital risk information. Nearly one-third of respondents reported poor communication, which is a substantial weakness, as inadequate communication is a well-known contributing factor for small risks to become larger issues. Figure 11 illustrates the risk communication practices in Afghanistan construction projects.

The results presented in Table 7 illustrate the maturity and effectiveness of the project's risk communication and control practices. For all four questions, the mean score falls within a narrow range (3.4–3.7 on a 5-point scale), which indicates moderate agreement. This means that while fundamental risk management practices are present, they are not systematic, fully institutionalised, and consistently utilised.

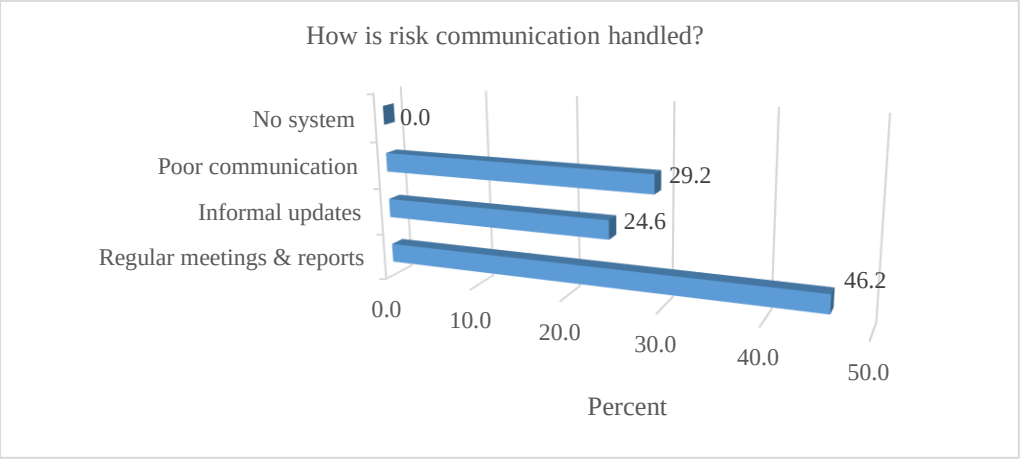



**Fig. 11.** Risk communication practices in Afghanistan construction projects

**Table 7.** Maturity and effectiveness of the project's risk communication and control practices

| Question | Mean Score (1–5) | Rank | Interpretation |
|---|---|---|---|
| **How often are risk review meetings held?** | 3.6 | Moderate agreement | Acceptable but needs improvement; mixed responses |
| **Are risks formally reported to higher management?** | 3.7 | Moderate agreement | Acceptable but needs improvement; mixed responses |
| **Are lessons learned from risks documented?** | 3.7 | Moderate agreement | Acceptable but needs improvement; mixed responses |
| **Do time and budget pressures discourage risk reporting?** | 3.4 | Moderate agreement | Acceptable but needs improvement; mixed responses |

Modern construction risk management utilises specialised software for effective risk quantification and tracking, which ensures risks are continuously monitored, controlled, and integrated into schedule and cost systems. Thus, respondents were also asked about the use of risk management software tools. The majority of respondents reported no, and only a small minority of respondents reported using specialised software tools such as (e.g., Primavera Risk, @Risk), which indicates a significant inability of Afghan construction projects to conduct robust data-driven and probabilistic assessments. Instead, only one-third of respondents reported the use of some very basic tools, such as spreadsheets or simple qualitative models, suggesting that risk monitoring and control processes may be lacking analytical depth in many construction projects. Figure 12 illustrates the current state of use of software tools in Afghan construction projects.

The questionnaire survey ended with a question asking respondents to offer their recommendations in order to enhance risk management practices in the Afghan construction sector. The majority of responses illustrate that current risk management strategies are deemed inadequate and significant improvements are needed. For earlier risk detection and control compliance, they emphasised stronger monitoring, which is often done through effective oversight and proactive risk management frameworks. Enhancing contract clauses was ranked as the second top priority, because better contract clauses can mitigate disputes and uncertainty, remove ambiguities, and create well-

defined structures for responsibilities, penalties, and risk-transfer. Another key area for improvement is the use of technology and risk management software, as current practices largely remain manual and informal. Training, in contrast, is seen as a low priority that may suggest an underestimation of its role in risk management. Figure 13 illustrates respondents' suggested improvements for risk management practices.

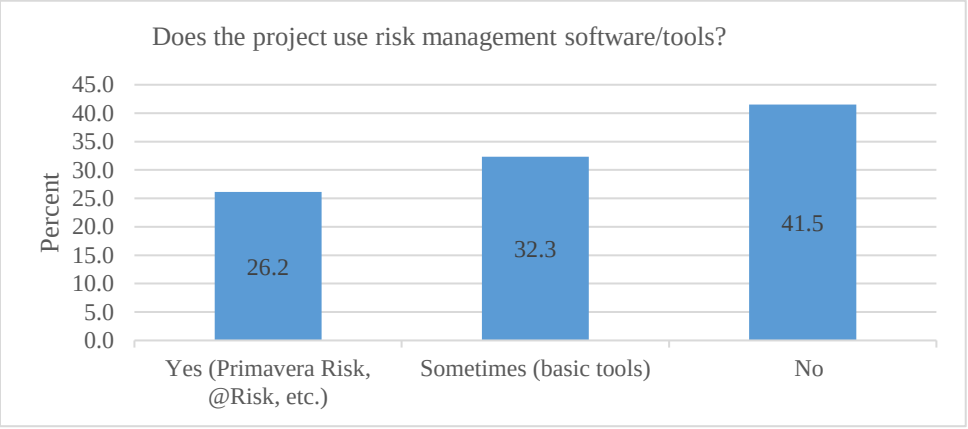



**Fig. 12**. The current state of use of software tools in Afghan construction projects




**Fig. 13**. Respondents suggested improvements for risk management practices

## 5. Discussion

The findings of this research, in general, confirm the results of the literature review[1], [2], [5], [17], [16] that Afghan construction projects lack a unified risk management strategy and continue to operate with fragmented risk management frameworks. However, certain practices, such as risk response and risk allocation, are moderately mature, while the other three sections require substantial improvement.

The results indicate that for risk identification, many organisations rely on historical project data to identify risks, and stakeholder involvement is also present in the risk identification process. However, these practices are not fully consistent and need improvement. Overall, most respondents favour formal, document-based approaches for

identifying risks, with little use of collaborative methods like brainstorming or workshops. This confirms the outcome of review in earlier Afghan studies [1], [2], [5], [17], [16], which indicated that risk identification is mostly reactive and is based on individual expertise rather than on systematic frameworks.

In the risk assessment phase, in most cases, risk prioritisation is present, but the formalisation is not fully integrated. As a result, depending on the experiences of practitioners involved, the capability to continually rank and allocate resources to critical risks may very largely form one project to another. In general, the mean scores portray an industry which is aware of risk assessment tools and practices, but it still lacks consistent and fully implemented practices. These inconsistencies are particularly proved by the absence of a structured documentation system and lack of advanced analytical methods, which aligns with earlier Afghan studies [1], [2], [5], [17], [16].

For risk allocation and response, as stated in the literature review, the lack of clear risk ownership highlights potential gaps in risk allocation practices, contract documentation, and communication across teams, which eventually leads to disputes, delays, and reduced effectiveness of risk mitigation strategies. For financial, safety, subcontractor, and schedule risk, varying strategies were used. The results suggest that current risk mitigation practices in Afghan construction projects are very effective; however, there is still room for improvement.

The effectiveness level of the project's risk monitoring and control practices was evaluated. All four questions asking about risk monitoring and control practices received a mean score that falls within a narrow range (3.4–3.7 on a 5-point scale). This indicates moderate agreement, meaning that while fundamental risk management practices for risk monitoring and control are present, they are not systematic, fully institutionalised, and consistently utilised as stated in the literature review.

## 6. Conclusion

Through a combined approach of literature review and a field-based questionnaire survey, this study evaluated the current state of risk management practices in Afghanistan’s construction projects. The findings reveal an increased awareness of risk management principles; however, the overall consistent application of proactive and structured risk management practices remains limited. From initial design to construction, monitoring and completion, throughout the lifecycle of a construction project, risk management remains largely unsystematic and casual. Projects continue to rely on frangmented experienced based approaches rather than recognised standards such as ISO 31000 or PMBOK, which are designed to provide consistent oversight from inception to completion.

The survey results indicate that while risk identification and risk assessment are practised to a moderate extent, they typically rely on basic checklists and personal experience instead of data-driven, systematic analytical tools. Generally, risk allocation is intended to be a collaborative responsibility among all stakeholders of the project; however, conventional procurement models often place an uneven burden of project risk on the contractor, a trend which reflects the nature of traditional procurement models. Despite the efficiency of existing risk mitigation strategies for financial, schedule, safety, and

subcontractor risks, the practice remains reactive, which prioritises consequence management rather than early-stage prevention. Additionally, risk monitoring and control activities such as communication, reporting, and lessons learned show moderate progress, yet they remain ad hoc rather than fully integrated across organisations. The low adoption of risk management software tools further stifles the ability to make evidence-based and data-based decision-making.

In summary, the findings of this research confirm that formalised risk management strategies and practices are still nascent across the Afghan construction industry. To elevate outcomes, safety, and sustainability of construction projects, it is vital to prioritise organisational capacity, integrate modern technology, ensure contractual clarity, and implement standardised frameworks.

## 7. Recommendations

To optimise risk management practices in the Afghanistan construction sector/projects, this study proposes several practical and policy recommendations obtained from its findings:

First, construction companies shall transition from informal, subjective, and experience-based methods to the adoption of standardised risk management frameworks such as the ISO 31000 standard and PMBOK guidelines. Implementing standardised risk management frameworks will ensure a unified and transparent approach across the lifecycle of construction projects.

Second, strengthen the contractual framework and clarity by explicitly mapping out risk ownership, roles, and response mechanisms, particularly for managing subcontractor-related risks. Well-structured contract clauses can mitigate disputes and foster equitable risk allocation for all project stakeholders.

Third, it is essential for construction entities to prioritise proactive risk management exposure. This involves institutionalising early-stage planning, systematic risk reviews, and the development of preventive strategies to mitigate potential threats.

Fourth, through the provision of software training and technical support, institutions should empower employees to create analytical and data-driven decision-making tools.

Finally, to drive continuous improvement, enhanced communication, and organisational learning, institutions should standardise reporting channels, document lessons learned, and cultivate a transparent culture where employees can report risks without fear of negative consequences.

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# Appendices
## Questionnaire: Risk Management in Construction Projects

**Section A – General Information**

1. What is your role in the project?
   ☐ Project Manager ☐ Site Engineer ☐ Risk/Safety Officer ☐ Supervisor/Foreman ☐ Other
2. Years of experience in construction?
   ☐ <2 years ☐ 2–5 years ☐ 6–10 years ☐ >10 years
3. Type of contract used in this project?
   ☐ Lump sum ☐ Unit price ☐ Cost-plus ☐ Design-build ☐ Other

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**Section B – Risk Identification**

4. Which risks are most critical in this project? (select up to 3)
   ☐ Cost ☐ Time ☐ Safety ☐ Quality ☐ Environmental ☐ Legal
5. How are risks identified?
   ☐ Brainstorming/workshops ☐ Checklists ☐ Expert judgment ☐ Not identified formally
6. Are stakeholders (client, consultant, contractor) involved in risk identification?
   ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
7. Are risks linked to past project experiences?
   ☐ Always ☐ Sometimes ☐ Rarely ☐ Never

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**Section C – Risk Assessment**

8. Does this project maintain a risk register?
   ☐ Yes, updated regularly ☐ Yes, but rarely updated ☐ No
9. How are risks prioritized?
   ☐ Probability × Impact ☐ Management experience only ☐ No prioritization
10. Are quantitative methods (e.g., Monte Carlo, simulations) used?
    ☐ Yes ☐ Sometimes ☐ No
11. How often is the risk register updated?
    ☐ Weekly ☐ Monthly ☐ Quarterly ☐ Never
12. Which risks are considered highest in this project?
    ☐ Financial ☐ Technical ☐ Safety ☐ Environmental ☐ Legal

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**Section D – Risk Allocation & Response**

13. Who bears most of the risks?
    ☐ Client ☐ Contractor ☐ Shared ☐ Not defined
14. How are financial risks (e.g., cost escalation) managed?
    ☐ Fixed-price contracts ☐ Contingency funds ☐ Insurance ☐ No measures
15. What strategies are used for schedule risks?
    ☐ Buffering ☐ Fast-tracking ☐ Adding manpower ☐ No clear strategy
16. How are safety risks managed?
    ☐ PPE and training ☐ Regular inspections ☐ Safety audits ☐ No systematic control
17. Are subcontractor risks (delays, poor work) managed?
    ☐ Strict contracts ☐ Monitoring & penalties ☐ Informal handling ☐ Not managed
18. How effective are risk mitigation strategies overall?
    ☐ Very effective ☐ Effective ☐ Neutral ☐ Ineffective

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**Section E – Risk Monitoring & Control**

19. How often are risk review meetings held?
    ☐ Weekly ☐ Monthly ☐ Quarterly ☐ Never
20. How is risk communication handled?
    ☐ Regular meetings & reports ☐ Informal updates ☐ Poor communication ☐ No system
21. Are risks formally reported to higher management?
    ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
22. Are lessons learned from risks documented?
    ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
23. Does the project use risk management software/tools?
    ☐ Yes (Primavera Risk, @Risk, etc.) ☐ Sometimes (basic tools) ☐ No
24. Do time and budget pressures discourage risk reporting?
    ☐ Always ☐ Often ☐ Sometimes ☐ Never
25. What improvements would you suggest for risk management?
    ☐ More training ☐ Better contract clauses ☐ Stronger monitoring ☐ Use of technology/software