

# **INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & MANAGEMENT**

## **A REVIEW ARTICLE ON RISK MANAGEMENT IN CONSTRUCTION PROJECTS**

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### **ABSTRACT**

Risks are very common in construction industry. The construction industry is widely associated with a high risk and uncertainty due to the nature of its working environment. Thus, the need of risk management is compulsory. Risk management is to identifying risk, analysis risk and provided most suitable treatments. Risk analysis is done to identify these risks in the project and manage it accordingly. By using probability and impact method which is a very simple method we can manage risk at construction projects. This paper present a review of need for risk management in the construction project

**KEY WORDS:** Construction risk management, risk factors, probability, impact

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### **INTRODUCTION**

Construction project are come up with in very complex and dynamic nature Construction projects are always unique and arise risks from a number of the different sources. Construction projects are instinctively complex and dynamic, and involving multiple feedback processes. A lot of stakeholder– individuals and organisations are actively involved in the construction project, and they interests may be positively or negatively affected on the performance of the projects. Different participants with different knowledge and skills usually have different expectations and interests.

A successful construction project is typically regarded as one that produces a quality facility that meets or exceeds the expectations of the project sponsor on time and within budget. Due to the nature of the different activities involved, in construction projects can be complex and involve a number of uncertainties such as uncertainties about material delivery times and costs, labour issues, task completion times and costs, environmental conditions, and the quality of work completed by subcontractors. These uncertainties can lead to project risks and can be the cause of a construction project's failure to achieve predefined goal. The research paper focuses on the major risk factors that affect the construction project.

**Risk:** Uncertainty about a situation can often indicate risk, which is the possibility of loss, damage, or any other undesirable event. Most people desire low risk, which would translate to a high probability of success, profit, or some form of gain.

**Risks associated with the construction projects can be broadly categorized into:**

- (1) Technical risks
- (2) Logistical risks
- (3) Management related risks
- (4) Environmental risks
- (5) Financial risks
- (6) Political risks

### **RISK MANAGEMENT**

Risk management in a project encompasses identifying factors that could potentially negatively impact on the projects. Risk management means how to manage the risk, how to take correct decision at correct time. The main purpose of the project risk management is to identifying different types of risk, in the form of threats and opportunities that exist for a project and understanding the impact they can have on the project's objectives. Risk management also includes to developing strategies to preventing the undesirable risks, or threats, from occurring, or to minimize their impact to the project if they do occur. Risk management processes ensure a proper planning, identification, analysis, monitoring and control to best interest of the project.

### **Risk Management process**

- (a) Risk identification
- (b) Risk Analysis
- (c) Risk evaluation Process
- (d) Response to Risk

**(a) Risk identification:** - Risk identification is the first and perhaps the most important step in the risk management process, as it attempts to identify the source and type of risks. It includes the recognition of potential risk event conditions in the construction project and the clarification of risk responsibilities. Risk identification develops the basis for the next steps: analysis and control of risk management. Corrects risk identification ensures risk management effectiveness.

Some of the methods used for risk identification are.

- Brainstorming
- Delphi technique
- Interviews
- Checklists
- Experiential Knowledge

**(b) Risk Analysis and evaluation:** - Risk analysis is the systematic use of available information to characterise the risks, determine how often the specified events could occur, and judge the magnitude of their likely sequence. On the other hand, risk evaluation is the process to decide risk management priorities by evaluating and comparing the level of risk against predetermined standards, target risk levels, or other criteria. Types of risk analysis are.

- Qualitative Risk Analysis
- Quantitative Risk Analysis

**(c) Risk Response:** -Can be done by the following methods:

- Accepting
- Avoiding
- Monitoring
- Transferring
- Mitigating

### **LITERATURE REVIEW**

#### **Akintola S Akintoye and Malcolm J MacLeod (1997)**

Studied the construction industry's perception of risk associated with the activities and the extent to which the construction industry uses risk analysis and management techniques with the help of a questionnaire survey of contractors and project managers. The authors concluded that risk management is very essential to all construction activities to minimizing losses and enhancing profitability. Construction risk is generally perceived as events that influence project objectives of time, cost and quality .Risk analysis and management in construction depend mainly on judgement and experience. Formal risk analysis and management techniques are rarely used due to a lack of knowledge's and to doubts on the suitability of these techniques for construction industry activities.

#### **Hastak and Shaked (2000)**

Classified construction risk into three broad level i.e. market, country and project level, and identifying the construction economic shocks.Construction market level risks, for foreign firm, include technological benefit over local competitors, availability of construction resources,while project level risks are specific to construction sites and includeimproper design, site safety, improper quality control and environmental protection, etc.

**Shen L Y (1997)** identified the most serious construction project delay risks and the effective actions for managing these risks. Practitioners' risk management actions and their effectiveness have been studied through a questionnaire survey. It illumined that methods where practitioners' experience and subjective judgment are used are the most

effective and important risk management action, and that approaches using quantitative analytical methods have been infrequently used due to limited understanding and experience. The findings also suggest a need to promote the application and awareness of various systematic techniques for risk management in an appropriate context in the Hong Kong construction industry.

**Thomas E Uher and A Ray Toakley (1999)** studied the use of risk management in the conceptual phase of the construction project in the Australian construction industry through a survey. It was found that while most respondents were aware with risk management; its application in the conceptual period was relatively low, even though individuals were ready to embrace change.

**Li Bing and Robert L. K. Tiong (1999)** categorized the risk factors and their mitigating measures, the most of actual risk mitigating measures were categorized into eight groups. Those are partner selection, agreement, employment, control, subcontracting, and engineering contract, and renegotiation, good relationship. They proposed a risk management model incorporating measures. Three cases of international construction were analysed from the perspectives of the execution of these measures.

**Jaser Hmaid Abu Mousa(2005)** In this paper the main objective is to gain understanding of risk factors that could be in front of building projects in Gaza Strip. The study aims also to investigate the effectiveness of risk preventive and mitigative methods. Moreover, the usage of risk analysis techniques is addressed. The objectives of this research have been achieved through a comparative study of closed ended questionnaires with interviews and a case study in Gaza Strip. The results concluded that the most important risk factors are: financial failure of the contractor, working at hot (dangerous) areas, closure, defective design and delayed payments on contract. On the other hand, owner respondents concluded that the most important risk factors are: awarding the design to unqualified designer, Defective design, Occurrence of accidents, Difficulty to access the site, inaccurate quantities.

**Kansal and Manoj Sharma (2012)** present risks are very common in construction sector. Risk is the possibility of suffering losses and the impact on the involved parties. Risk is identified and then risk assessment and analysis is done. Then risk management and risk mitigation is carried out. Risk affect construction sector negatively and focusing on risk reduction measure and its significant. The purpose of this study is to assess the use and method of risk identification techniques in the construction industry. They are classified in particular industrial construction, infrastructure and heavy construction. We conducted a survey research by applying a questionnaire among in the construction industry. The risk identification techniques more frequently applied in construction are flowchart, checklist, Brain storming, Delphi method etc.

**Patel Ankit Mahendra et al., (2013)** present significant impact on construction projects in terms of its primary objectives. The Construction projects which are complex in nature, uncertainty and risks in the same can develop from different sources. The record of the construction industry is not acceptable in terms of coping up with risks in projects. Risk management is a process which involves of identification of risks, assessment of risk with qualitatively and quantitatively, response with a suitable method for handling risks, and then control the risks by monitoring. This study proposes to apply the risk management technique which includes well - documented procedures for the one stop solution all types of hazards most likely to occur during any construction project Lifecycle.

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**K Jayasudha and Dr.B.Vidivelli (2014)** studied the construction companies and firms, those which are face different risk. His research focus on risk identification. The whole research is based on brain-storming session.

**V.Sathishkumar, et al., (2015)** the objective of this study is to identify the risks that are affected in various construction projects and calculating the risks severity to personal and the property.

The general methodology of this study relies largely on the survey questionnaire which was collected from various sources. In this study questionnaire has been sent to three hundred and twelve companies. The data were analysed by Descriptive Statistics and ANOVA.

**Dr. Firas Khairy Jaber (2015)** this study aims to identify and evaluate key risk factors and their frequency and severity and then their impact in different types of construction projects in Iraq. Questionnaire survey was conducted and a total of sixty five critical factors were identified and categorized into eight groups. These are: 1. Financial related risk, 2. Legal related risk, 3. Management risk, 4. Market related risk, 5. Political and security related risk, 6. Technical related risk, 7. Environmental related risk, and 8. Social related risk. Seventy five respondents participated in the survey representing 22 clients, 21 consultants and 32 contractors. The results are presented on the basis of their frequency, severity and importance.

## CONCLUSION

This paper contains a review of risk management by using probability (likelihoods) and impact method. By applying a simple method, it is possible to identify the potential of risks factors in a simple way. Moreover it gives possibility to detect which of the identified risks has the largest impact on time, cost and quality. So those risks can be rejected or mitigated by taking a suitable action. The research showed that the most common action was risk mitigation. Moreover it was proven that the results from probability and impact method may vary among projects due to the fact that each project and its scope are unique. In today's situation the risk management has paramount importance as it can bring down risk associated with construction to the great level. If used effectively on time, cost and quality it can yield brilliant results.

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