

# Identification and Critical Analysis of Risk Factors in Construction Projects

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**Abstract:** Present days in construction projects risk management is considered to be a very main managerial process for accomplishment of completing the project within the financial aspects and within the time period. The document has been mostly focuses to identification and critical analysis of risk factors in construction projects, in with the intention of procedure to first identifying the risk factors from the literature review and collecting the data related risk factors from site works. Methodology process is direct interviews with project managers, contractors and site engineers. To identifying the construction risk factors mainly focus monetary, political, environmental, technical, management, safety and materials. In this process conducting the interviews and questionnaire surveys, after completion of survey analyze the data collected from site work and responses.

**Index Terms:** risk management, factors identification, factors analysis.

## I. INTRODUCTION

Hazard the executives characterize as to decrease the apathetic procedures and amplify the empowering results, to keeping away from the hazard factors for the most part on examination the sneak peaks ventures confronting any hazard tribulations and to assess the date associated with hazard, In development ventures chance association is for the most part to distinguishing the hazard exercises, estimation the of the danger and examination the hazard. Present days development enterprises most created ventures in the around the world. In order to case decline the likelihood factors confronting the development chance tribulations. Inferable from the commitment of various partners associated with the development venture, fringe factors, and inward factors are gives extra hazard occasionally high. To balance the hazard factors with additional development organizations. Hazard can be affecting brilliance, generation, the course of action and financial arrangement of development ventures. In participation days essential a raised period fused hazard association, consolidated danger the board implies unremitting, idealistic and standard advancement to distinguishing the hazard, trade a couple of words and regulate chance starting at a standard perspective. Coordinated hazard the executives requires a present estimation of hazard for a task at each stage and afterward total the outcomes at relative time frame, incorporated hazard the board does not point of convergence only on

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decrease of hazard, other than it furthermore bolsters activities in the development ventures, all things considered to finish with up to standard results, contained by spending plan and time plan. Venture association, for the most part, contains the strategies, devices, aptitudes, and learning to accomplish the task, the fundamental objective of undertaking administrator so as to keep up the partner's prerequisites and potential from the task. In development, chance administration contain the procedure of recognizable proof of hazard, evaluation, examination of hazard, chance checking and hazard control, The undertaking the board fundamental objectives are accomplish expanding the yield of positive occasions and limiting the yield results of troublesome occasions. To keep up legitimate arranging at beginning phase of venture for better approach to assembled and dodge the hazard factors in the event of amid the task. Hazard the executives in an undertaking includes distinguishing affecting elements that could conceivably wretchedly crash a task's spending project or quality baselines, evaluating the related imminent effect of the perceived hazard; and actualizing systems to control and ease the plausible impact. The more hazardous the disturbance is, the costlier the punishment if the mixed up decision is finished. Organizations might want to evaluate chance for some reasons. Realizing how much hazard is ensnared will help pick if costly activities to diminish the dimension of hazard are advocated.

## II. IDENTIFICATION OF RISK FACTORS

### A. Monetary

Economic risk mostly analysis by the corporation confrontation based, major intend to reduce the expenditure of construction vocation and obtain the majority out of the earnings of construction project, major risk in pecuniary information that the company offers a prominent financial plan the affectionate will be defeat and an extraordinarily low down finances may the consequences in the economic defeat at the development end. It is the majority significant risk on construction filed, if some government can modify the tax relating to the resources and growing the fuel cost, based on some circumstances the project financial plan will be greater than before. In that analysis monetary risk has focal point on postponed of imbursement, vacillation of switch over rate; fuel price will be increases, indecisiveness of worth raises charge and adjust of bank bureaucrat procedure and system. The capability overcomes the economic risk of the project during to final conclusion and procedure. This risk dynamic involves issues or concerns

associated with the financing of the project, together with the implementation phase and operations or evenhandedness financing.

#### B. Political

Political risk are different factors compare one state to other states, the government changes the strategy of government has not revolutionize but has enhanced incredibly a great deal, but wide-ranging support for the new-fangled projects is current which causes postpone and smooth financial beating intended for the companies. The qualification to surmount the political risk of the project, among local, state and national political opponent, system and authoritarian impediments. This risk factor involves issues or concerns connected with the local, regional, and national political and authoritarian circumstances confronting the project.

#### C. Environmental

Environment risks are facing in every construction projects, a lot of environmental risks are characteristically ineligible or harshly imperfect by standard marketable broad-spectrum difficulty policies and that can fade away contractors devoid of passionate, project can for the duration of in rainy season outpouring of water in organization in the foundation juncture of development, for the development human resources operational under the sunshine are convoluted. The capability of overcome the environmental risk of project. Construction project facing risk factor involves concerned related with the environmental problems, concerns, and measures confronting the project at some stage in the project accomplishment and the project process.

#### D. Technical

Technical risk is more often than not fashioned by unfortunate groundwork, budgeting, and possibility schoolwork; no precedent understanding in comparable projects any construction project has some technical risk, such as paraphernalia disappointment design disappointment

Some technical failures are

- Paraphernalia and arrangement breakdown.
- Cost and other Estimation errors.
- Filed Accident / construction work collision.
- Access and Site location.
- In satisfactory curriculum.
- Work plan changes and design distinction by client.
- Inappropriate excellence material procuring.
- Storage space of materials supple water, gas, electricity.

#### E. Safety

Present day's construction filed is an imperative part of the financial system in many countries and developing economic growth particularly in rising countries. Owing to it's relatively labor severe nature, construction projects provide opportunities for employment for a broad variety of people semi-skilled, unskilled and skilled,. in spite of its significance, construction field are measured risky with everyday and high accidents rates and ill health problems to

employees, practitioners and end users. However, information on how health and safety risks are managed construction sites is imperfect.

#### F. Materials

If any construction be able to be accomplishment more often than not is decide by the capability of the building project group to diminish the risk factors and achievement of development appropriate, it mostly based on appropriate material organization is single significant factor. Resource management is to procurement of bits and pieces for appropriate grounding and bits and pieces price will be augment the total cost of project will be augment material price will be augment mostly suffers is the middle class populace. A procurement risk factor: The colossal costs of projects are pouring the search for the cheapest material that meets provision which is to be fictitious in a location that has the least cost-often in different countries.

#### G. Management Risk

In this risk means mostly to administer the hazard in project, to administer the danger by position or evaluation of risk, classification of project danger and to review the jeopardy in every likelihood of risk in that development, in that case recognition of jeopardy to provide the position rate of jeopardy, primary to administer the pinnacle or far above the ground rate position jeopardy be able to relieve and smallest amount or short jeopardy rating be capable of soothe throughout project or after salving the most important risk factors. Organization risks are mostly insufficiency of skilful workers, material storage, anonymous site circumstances and drawing changes and any errors.

### III. RESEARCH SIGNIFICANCE

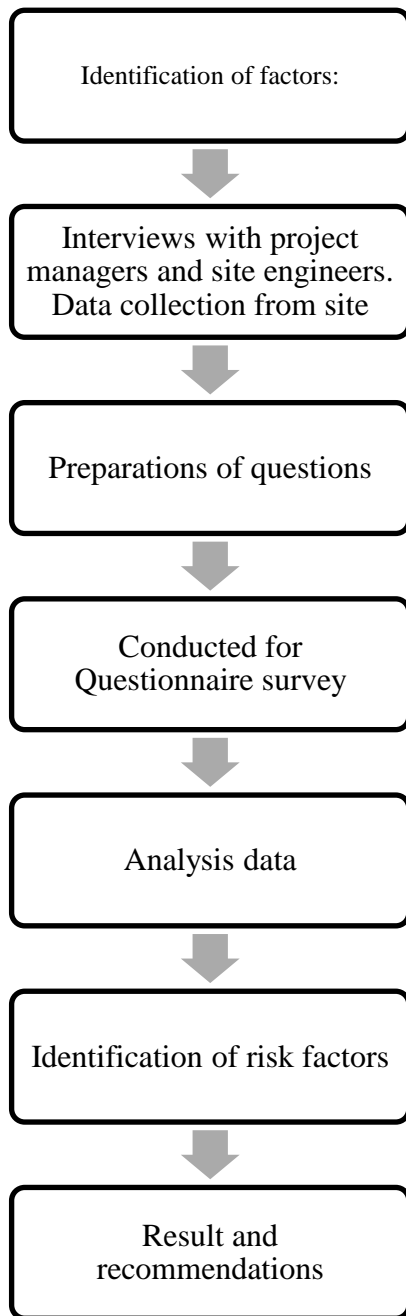
The main purpose of the present study is to identify the risk factors in construction industry and also to identify the critical analysis of risk factors that are involved in the construction industry.

### IV. METHODOLOGY

Methodology procedure is Study of literature related identification of risk factors and critical analysis in construction projects, after completion to identify the factors related risk management in construction projects, after that Preparation of Questionnaire for questionnaire survey, next conducting the Questionnaire survey and personnel interviews with in-charges, managers and site engineers, and same as collection of data from site. Analyzing the Questionnaire, Qualitative analysis of data obtained from site and to identify the root cause. Results and recommendations. Below Flowchart represents the methodology. Table I shows the Analysis of risk factors.



A. Flowchart for Methodology



Flowchart: Detailed methodology of the project

Table I: Analysis of risk factors

S.NO	Risk factors	Sub risk factors	1	2	3	4	5
1	Monetary	postponed expenditure on contract based on economic conditions					
		hammering due to variation of price rises rate risk level					
		When the fuel cost will be rise risk level					
		loss due to fluctuation of exchange rate					

		risk level					
		Risk rating in changes of bank formalities and regulations					
2	Political risk	changes of Govt policies the project and materials cost increase					
		bribery and corruption					
		Loss incurred due to political problems					
3	Environmental risk	Loss due to government for late approvals					
		Healthy working environment for the worker					
		Any adverse impact on project due to climatic condition					
4	Technical risk	Any impact on the environment due to the project					
		Problems facing in design chages					
		Resource storage and quality less of procuring resources					
		deficiency of water, oil ,electrical energy					
		Risk stage based on site circumstances					
		Risk stage based on failures of equipment					
		Risk level in act of god					
weather circumstances							
complicated to right to use the site							
Variations of environment							

5	Management risk	inappropriate preparation and financial problems						
		association and transform management						
		resource organization						
		harmonization with associate contractors						
		the price's increases due to modify of govt policies						
		loss due to bureaucracy for behind schedule endorsement						
		government acts based risk level						
		corruption						
		Planning changes or design changes						
		quality less materials procuring						
6	Safety and health risk	Falling from height						
		Health problem caused by dust						
		Health problem caused by too long bending and twisting						
		enclosed by earthwork through excavation of underground store and						

7	Material risk	trenches					
		Back pain, muscular pain, due to manual handling					
		Increase of accessory facilities price					
		Increase of labour costs					
		Increase of resettlement cost					
		ncrease of materials price					
Inadequate forecast about market demand							

**V. Results**

*A. Risk Rating*

A Likert scale of 1-5 was used in the questionnaire. A Likert scale is a type of psychometric answer scale regularly used in questionnaires survey, and is the majority expansively used hodgepodge in survey investigate. When responding to a Likert questionnaire survey point, respondents categorize their level of traditional values to a proclamation. The scale is named after Rensis Likert, who published a description recitation its use. The respondents were essential to summit in the direction of their relative with criticality/ capability of each of the probability of risk causes and their accident to the management

*B. Design of Survey*

$$\sum_{i=1}^{10} \frac{[(X_i * Y_i)]}{N}$$

The computation of ranking factor =  
 Xi= response ranking  
 Yi=number of point (1, 2, 3,4, 5)  
 N= number of response

The below Table II shows the Result of questionnaire survey.

**Table II: Result of questionnaire survey**

S. NO	Different types of Risks	1	2	3	4	5	Total points (1)*(2)*(3)* (4)*(5)	Risk rating level $\sum_{i=1}^{10} \frac{(x_i * y_i)}{N}$
1	monetary risk	1	3	2	10	14	(1*1)+(2*3)+ (3*2)+(4*10)+(5* 14)= 123	4.1
2	Political risk	5	7	6	9	3	93	3.1
3	Environmental risk	6	9	6	5	4	82	2.7
4	Technical risk	8	7	8	4	3	77	2.5





5	Management risk	6	8	9	5	2	79	2.66
6	Safety and health risk	1	3	6	10	10	115	3.83
7	Material risk	7	6	4	9	4	87	2.9

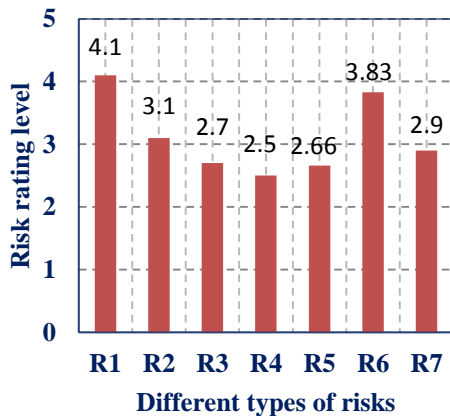


Fig. 1: Analysis of Risk Factors

Where

- R1= monetary risk
- R2= Political risk
- R3= Environmental risk
- R4= Technical risk
- R5= Management risk
- R6= Safety and health risk
- R7= Material risk

Above Fig. 1 shows factors risk rating for risks factors, monetary has high 4.1 out of points, safety and health risk factors has 3.85 and least technical factors risk has 2.5. In questionnaire survey Totally 40 members the questionnaires were given, out of which filled by 30 members had a valuable reply and 10 members not replying to the questionnaire survey. Thus the response rate is ninety percentages has gives good response in the survey. In those twenty companies surveyed, 19 are site engineers and 11 are project managers. Questionnaire survey and interviews will be conducting with project managers and site engineers, In some cases, counselor gave the answers on behalf of their clients, both from the project managers and the contractor side

## VI. CONCLUSION

ID and investigation of the hazard factors are essentially centered around 7 chance variables; they are a fiscal hazard, political hazard, ecological hazard, specialized hazard, the executive's hazard, wellbeing and wellbeing danger, and material hazard. In those dangers money related hazard like budgetary issues have high appraising danger; a second position has security and wellbeing danger and least specialized hazard. in light of site work involvement and writing audit recognizing Some different dangers like apparatus, labor and spending plan and planning, and furthermore center around hazard factors are other like structure and wellbeing methods, and a few undertakings for the most part listening cautiously on plan, in that structure any mistakes the all-out task getting extra hazard, in that all out investigation chance rating in building segments are

some lessen and in street and far over the ground development ventures are confronting the hazard factors. In view of poll overview and meetings, finding the more dangers looking in site work dependent on experiences like undertaking directors and site architects or contractual workers. In that Risk because of emergency, Risk related with time the executives, entomb division coordination, security the board, Unskilled Operators for machine keep up in the venture work spot, labor and apparatus, wellbeing measures are not utilized in development workplace, Delay of material buy and obtaining of talented works for primary works, Perfect security precautionary measures are not utilized, Accommodations are serious issues in site work, generally change the undertaking arranging and not understandability compliance about the task work.

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