

## **Identification and Assessment of Risk Factors Affecting Real Estate Projects**

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**Abstract**—India has seen an exceptionally large growth into the construction sector in the current time. With the expansion in size of the civil construction projects connected to it we also have to consider the affecting risks related. All these risks can also make losses which lead to increase in delay of time, cost and bad quality of construction civil projects. It deals with mitigation and identification of risks in construction projects and helps in timely and in budget completion of projects. The risk management is component of project management. However, in present era researches has been focuses on risk management in construction than using an approach to find risks factors, identify it & assess the impacts of these risks. Questionnaire surveys were also used for collection of data. This research paper is based on risk affect in the construction phase. This study related to project managers, contractors, engineers, owners and faculties. For the analysis of data Relative Importance Index technique is taken. Among all the risk events this five affect the most as per RII ranking Labour Availability, Fluctuation in Raw Material Price, Equipment breakdown, Change in Design during Construction, Material Delivery.

**Keywords**— Risk Management, Risks, Risk Factors, RII Method, Relative Importance Index, Construction Projects, Construction management

### **I. INTRODUCTION**

A “risk” may be described as the probable for complication and problems with the end of projects and also the achievement for goal of project. “Risk is better defined as an outcome of uncertainty; it’s very positive prospect and negative risk of an events and actions. It has to be quantified in the respect of the arrangement of something happening and the impact which can arise if it’s actually happens. Management of risk also adds identification and assessment of risks and after that responding to them. Risk management is a management tool which aims to identify the sources of the risks and uncertainties, also determining their impacts, and developing better management response. Real estate construction projects are mostly different and risks also come in a numbers of the singular sources of work. Different types of participants with different skills and experience usually have different interests and expectations over project. Risk Management includes: Risk monitoring and control, Risk management planning, Risk response planning, Risk identification, Quantitative risk analysis and Qualitative risk analysis.

### **II. OBJECTIVES**

Following are the main objectives of risk management:

- Identify and study risk factors that affect in real estate construction project.
- Assessment of risks on real estate construction projects for identified risk factors.

### **III. RESEARCH METHODOLOGY**

The Data is collected to find out the factors affecting risk in construction management of the project by a survey. Survey is conducted by questionnaires and questionnaires distributed to the respondents involved who are involved in construction. For find rank of answers from respondents the questionnaire was designed. The analysis of these data was done by a ranking method named relative importance index (RII) method.

**IV. DATA COLLECTION**

We have distributed over 90, out of that we received 69 questionnaires. We received responses from Owners, Project Managers, Engineers, Contractors, Faculties and Others related to field.

A. *The Relative Importance Index (RII)*: The Relative Importance Index is used for rank the risks which affect projects. All these rankings make it possible to compare the relative importance of the risk factors as perceived by the six groups of respondents which are Project Managers, Contractors, Engineer, Faculties, Owners and Others related to field. Each individual risks RII alleged by all the respondents to be used to assess the general and overall rankings to give an overall picture of the risks of an Indian construction industries. This RII technique is used by many researchers to rank the factors. The formula to calculate RII given below:

$$RII = \frac{\Sigma W}{A \times N}$$

Where,

W = Weighting given to each factor (ranging from 1 to 5) by respondent, A = Highest weight, N = Number of total respondents.

B. *Sample Size Calculation* : To find out representative sample size of the population, following equation used:

$$n = \frac{m}{1 + \left[\frac{m-1}{N}\right]} \dots \dots \dots (Equation 1)$$

Where, N, n and m represents the sample size of limited, unlimited and available population respectively. Here, m is calculated by following equation.

$$m = \frac{z^2 * p * (1 - p)}{e^2} \dots \dots \dots (Equation 2)$$

Where,

z = the statistic value for the confidence level used, i.e. 1.96 and 1.645 for 95% and 90% confidence level respectively, p = the value of the population that estimated, e = the sampling error to estimated. Because the value of p is unknown. Value 0.5 is used in sample size.

As per the Stakeholders and City targeted, the number of total population of available population comprise of 198 construction firms which belongs to Gujarat Contractors Association and lists of registered construction firms of various departments in construction companies for Ahmedabad city.

Thus,

$$m = \frac{1.645^2 * 0.5 * (1 - 0.5)}{0.1^2}$$

$$m = 67.65$$

Here, the confidence level is taken as 90%. Now,

$$n = \frac{67.65}{1 + \left[\frac{67.65-1}{198}\right]}$$

$$n = 50.61$$

$$n \approx 51$$

Thus, contact with minimum 51 respondents of construction firms must be made for this study. To conquer the risk of not responding from the respondents and higher benefits for the study, the sample of 65 construction firms is considered and if possible, more than these respondents shall be contacted.

## V. RESULTS

Top 10 factors ranked by Relative Importance technique (RII). The RII was calculated for each affecting factors to classify the most affecting factors. All the factors were ranked based on the RII Value. Based on the rankings, the 10 important factors of risk management by RII were:

TABLE1: Critical Factors Affecting to Real Estate Construction Projects

Rank	Factor	RII
1	Labour Availability	0.90
2	Fluctuation in Raw Material Price	0.90
3	Equipment Breakdown	0.90
4	Change in Design During Construction	0.88
5	Material Delivery	0.87
6	Change in Laws	0.86
7	Geo-technical Investigation	0.83
8	Labour Productivity	0.83
9	Archaeological Survey Done	0.82
10	Construction Area (Rural/Urban)	0.82

## VI. CONCLUSION

Investments over construction industries are not by ignoring risks. Most of real estate construction projects over the developing countries as well as in India suffer from many problems in terms of the completion of the project at overrun of time and cost. These factors are more accountable for turning profitable construction projects in India in losing profits. Thirty Five factors considered for the study were categorized in nine different groups as Site Conditions, Labor, Site Condition, Equipments, Contractor, Faculty and Other External Factors. Total of 92 questionnaires were distributed, and 69 questionnaires were returned. Because contractors, engineers, project managers, owners and faculties have vast experience in construction; their enough experiences were good suggestions to study the various risk factors affect on real estate construction industries.

It has been identified based on the relative importance index method, which determined the influence ranks of thirty five (35) risk factors affect in real estate construction projects in Ahmedabad. The shown factors were classified as following Ten (10) primary classifications: Labor Availability, Fluctuation in Raw Material Price, Equipment breakdown, Change in Design during Construction, Material Delivery, Change in Laws, Geo-technical Investigation, Labor Productivity, Archeological survey done, Construction Area (Rural/Urban).

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