

# Risk Assessment and Management in Real Estate Project

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## Abstract

The construction industry in general and the real estate industry in particular have undergone tremendous changes over the past few years. It is an industry driven primarily by private investors and the presence of securitised real estate has increased considerably. The vulnerability of real estate to plethora of risks causes more exposures than those that can be insured and this cannot be understated. To be successful in this environment, where the collective performance bar is being raised significantly, the real estate industry needs to gear up to address the risks by deploying effective risk management techniques by way of operational sophistication. This paper deals with risks in real estate project and measures to be taken to mitigate the same.

**Keywords :** Real estate, risk assessment, risk management

## I. INTRODUCTION

The construction industry is perhaps one such industry which is highly vulnerable to extreme risks, which in most cases are beyond the purview of stakeholders. Too often these risks are not dealt with in a satisfactory manner and as a result, the industry is giving an output which the stakeholders have nothing to cheer about. Real estate projects involve substantial investment of money and any unproductive issues arising out of time. Resources etc. would lead to huge monetary losses. The losses are due to various risks associated with such complex projects. Identification of such risks at an early stage go a long way in mitigating the losses arising out of these risks,

Positive response from the industry was evoked when there was a move to introduce risk-rating system at the pre-bid stage. A detailed analysis of the various risk parameters to which any real estate project is exposed has been done by rating agencies. The primary purpose of grading will be to assess the quantum of risks involved in undertaking the project. A grading methodology was developed by credit rating agencies for rating the projects based on their exposure to risks. Industry experts are of the opinion that private participation will be discouraged in rural development projects due to

introduction of risk rating system. Investors and financiers may be driven away from participating in such projects as most of rural development projects are likely to get lower rating.

## II. LITERATURE REVIEW

Akintoye and MacLeod [1] researched the construction industry's perception of risk associated with its activities with the help of a questionnaire survey and concluded that risk management is a pre-requisite to minimizing losses and enhancing profitability in the construction industry, and that informal risk analysis and management techniques are used rather than formal risk analysis.

Chaphalkar, Shelar, and Patil [2] highlighted the various risks prevailing in a construction project and their sources of origin and emphasized that identification and assessment of real estate projects will go a long way in prioritising and mitigating the risks for successful completion of project.

Huffman [3] analyzed the inherent risks associated with Corporate Real Estate (CRE) and offered possible risk management strategies and recommendations for accounting for risk in CRE management which gives a new perspective on management of CRE assets.

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Manuscript Received : May 3, 2020 ; Revised : May 15, 2020; Accepted : May 17, 2020.

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DOI: 10.17010/ijce/2020/v3i1/152723

Udoudoh [4] conducted a research on evaluating the various risks at different stages of real estate development and recommended that real estate investors and managers should evolve effective and efficient strategies to mitigate dominant risk elements for enhanced investment opportunity in the real estate sector.

Halman, Gehner, and de Jonge [5] conducted a survey to gain insight into the real estate development process, risks involved, risk analysis, and control methods used, and concluded that real estate development process, risks involved, and usage of risk analysis techniques should proceed in unison in decision making process. It is imperative to develop a risk management methodology for decision making process in a real estate project.

Ling and Hoi [6] studied the risks that Singapore based architecture, engineering, and construction (AEC) firms face when working in India and investigated the risk response techniques adopted by them. The main risks that international firms face in India encompass political and social risks, high cost of financing, fluctuating currency exchange rates, and huge cultural differences between foreigners and Indians. The risk response techniques include having adequate insurances and careful planning and management.

Shen, Yi, and Sun [7] quantitatively assessed the risks during the construction of a residential project and provided suggestions for risk coping and managing real estate enterprises.

Khumpaisal and Chen [8] did an analysis on the basis of Analytic Network Process (ANP) theory. The result of an experimental case study reveals that ANP is an effective tool to support developers in decision-making based on risk assessment and can be adopted by real estate developers to assess risks in real estate development projects.

Ye [9] conducted risk analysis in the process of real estate development factors in China by evaluating the risk with Fuzzy Comprehensive Evaluation method and concluded that quality management, proper feasibility study of project, and insurance can reduce/transfer the investment risk.

**Literature Gap :** This literature review identified risks on the basis of which the study was conducted.

### III. RESEARCH METHODOLOGY

A structured questionnaire was sent to reputed contractors on the basis of their experience and turnover either by mail or in person. Questionnaires were sent to contractors of 25 large construction companies out of which replies were received from 15 companies (60%). The probability of occurrence of various risks in their projects on a scale of 1-5 [denoted by(P)] and the degree of impact if the risk occurs also on the scale of 1-5 [denoted by (I)] were to be furnished by the respondents. The respondents were required to select the appropriate level from among five scales as shown in Table I.

A Risk Significance Index is calculated for each risk by multiplying the probability of occurrence by the degree of impact. Thus, the risk significance index for each risk assessed by each respondent can be obtained through the model.

$$RSI = P * I$$

Where, RSI = Risk Significant index assessed for a particular risk

P = Probability of occurrence of risk

I = Degree of impact of risk.

By averaging scores from all the responses received from the respondents, the average risk significance score for each risk was worked out. This is called average risk index score and is used to rank risks.

Based on the literature review, this study classified risks into these categories :

- ↳ Legal risk
- ↳ Risk of managerial aspects

**TABLE I.**  
**CONNOTATION FOR PROBABILITY AND DEGREE OF IMPACT**

Scale	Probability of Occurrence	Degree of Impact
1	Improbable	Insignificant
2	Unlikely	Minor
3	As likely as not	Serious
4	Probable	Critical
5	Highly probable	Catastrophic

TABLE II.

## CALCULATION OF MEAN RSI

S. No.	Risk	Risk Significance Index values from the responses received to questionnaires															Mean RSI
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	Shortage of skilled workers	4	3	4	3	4	6	3	3	4	6	6	9	6	3	4	4.58

⇒ Financial risks

⇒ Contractual/operational risks

⇒ Environmental risk and

⇒ Political risk

**Period of study**

The study was conducted from October 2019 to December 2019.

**IV. ANALYSIS OF SURVEY RESULTS**

On the basis of responses received from the respondents, the Risk Significance Index (RSI) and the mean RSI were calculated. The Risk Significance Index (RSI) was calculated by multiplying the probability and degree of impact on the basis of responses received from respondents. A sample calculation of risk of shortage of

skilled workers is given in Table II.

In the same manner, the mean RSI for all the sub-risks was calculated.

Mean RSI of various sub-risks in respect of the earlier mentioned categories of main risks is furnished in Fig. 1 to Fig. 7.

**V. FINDINGS**

(1) Almost all the companies face risk of shortage of skilled workers. This is because the skilled workers are in great demand in foreign countries where there is huge demand and they are offered substantial packages because of which vacuum of skilled workers is created.

(2) Owing to boom in real estate in the construction

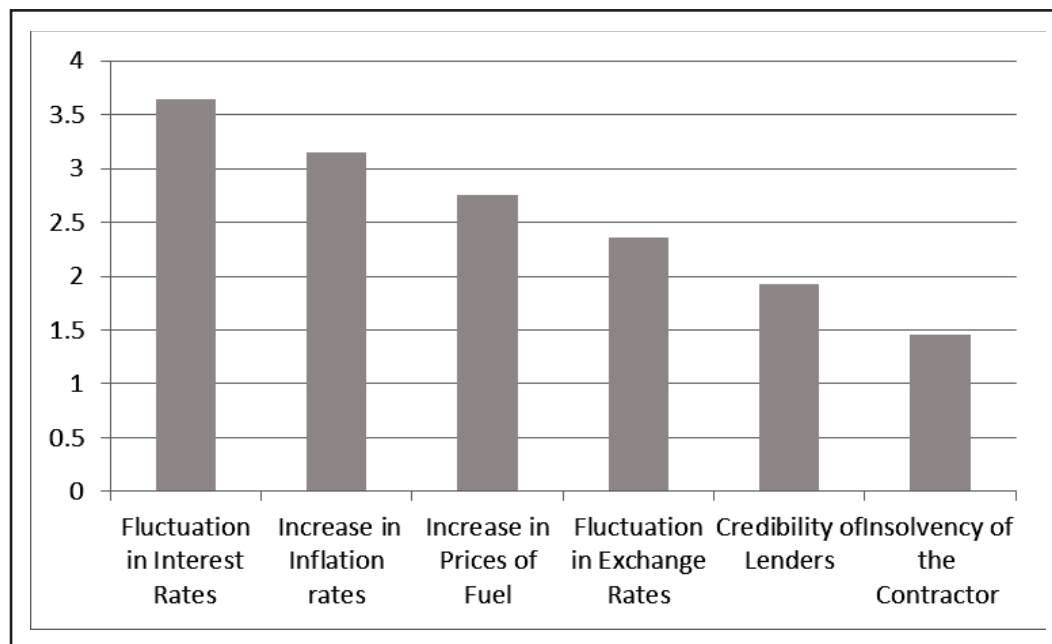
**A. Financial Risk**

Fig. 1. Mean RSI of Sub-Risks Under Financial Risk

### B. Risk of Managerial Aspects

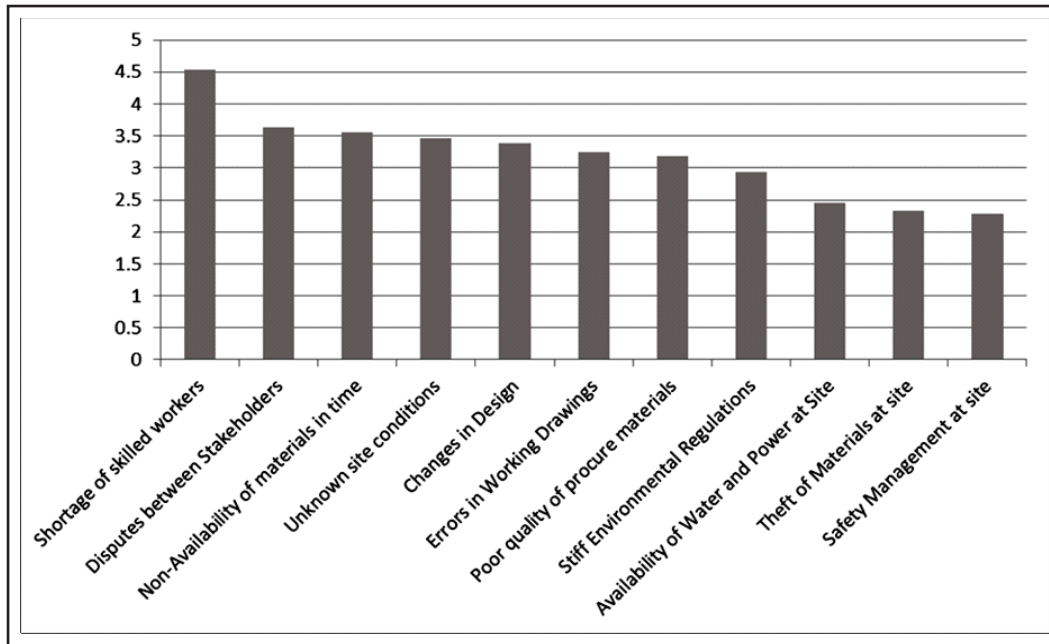


Fig. 2. Mean RSI of Various Sub- Risks Under Management Risk

### C. Contractual/ Operational Risk

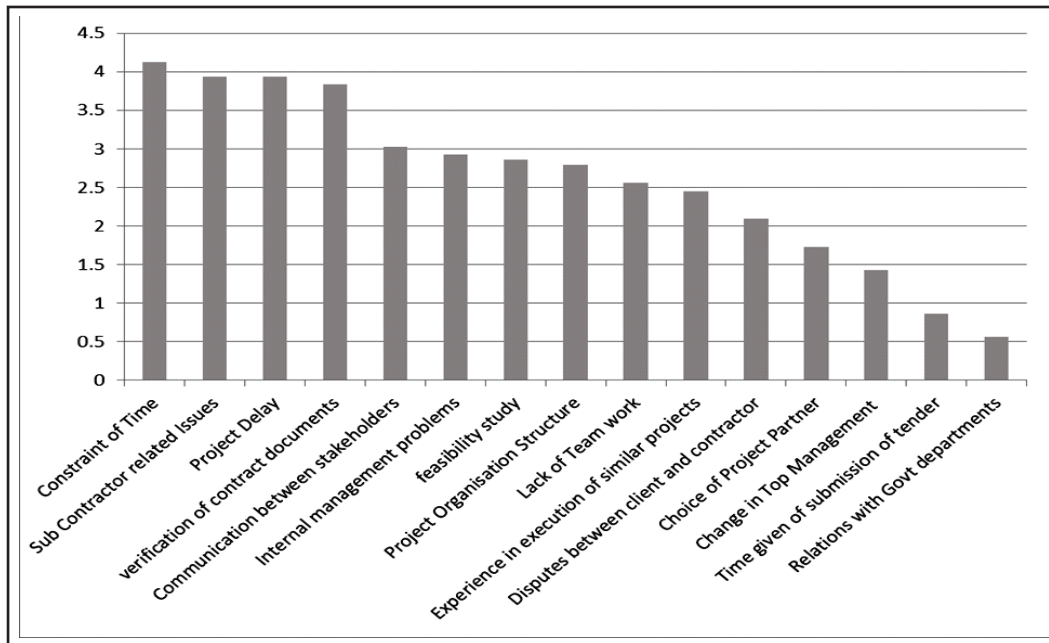
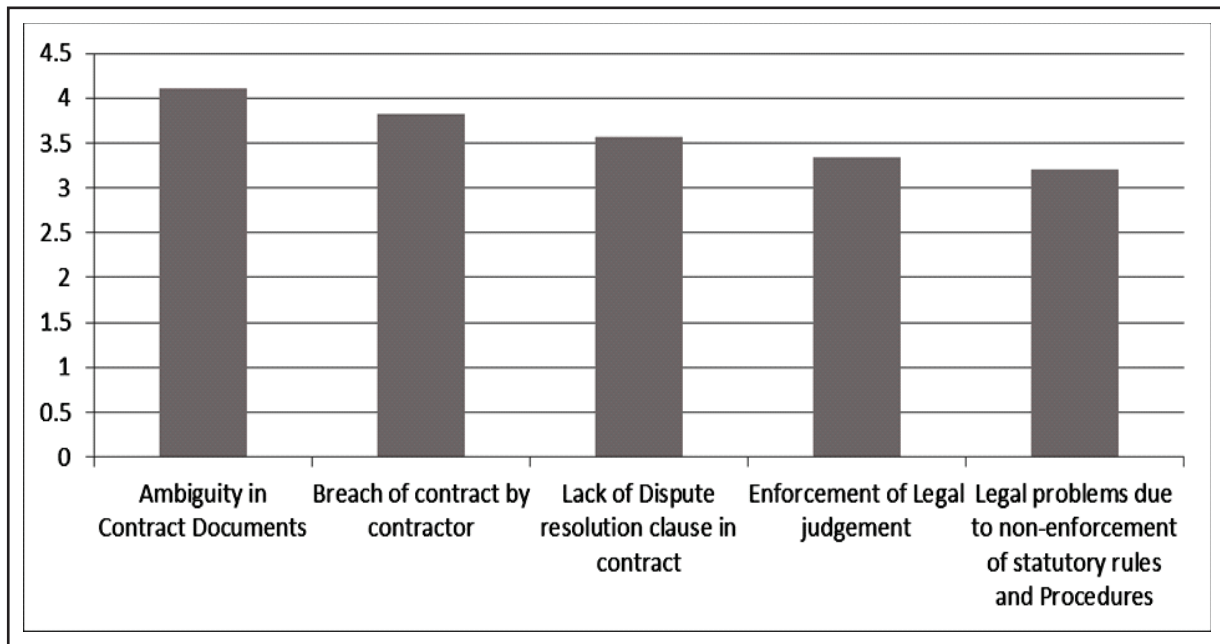


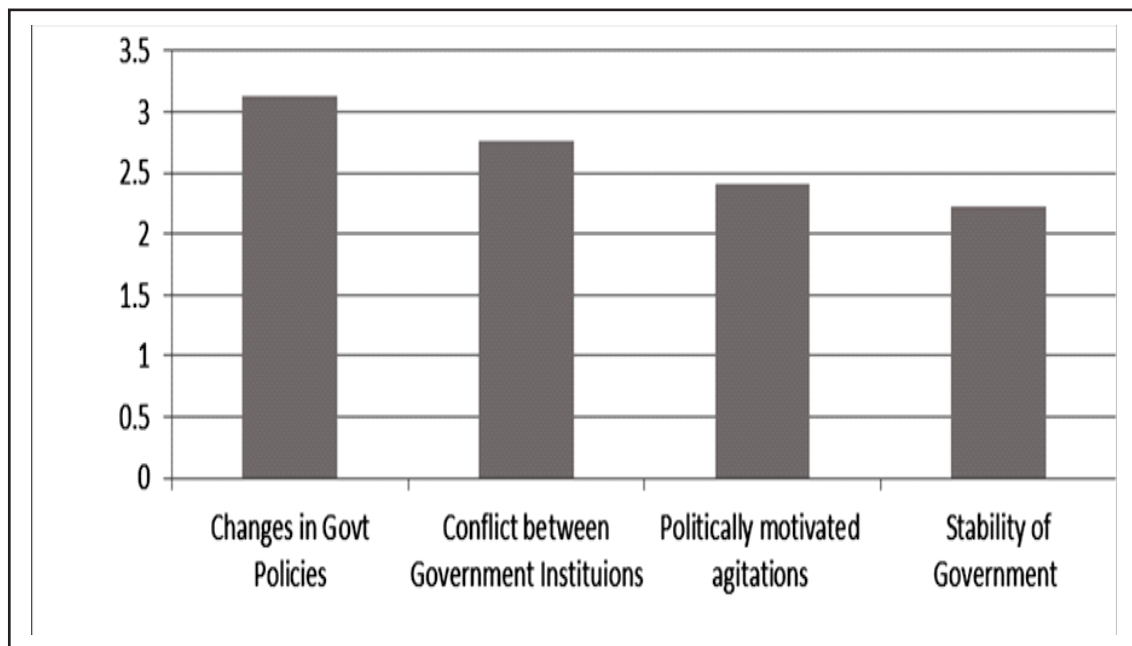
Fig. 3. Mean RSI of Various Sub-Risks Under Technical Risk

#### ***D. Legal Risks***



**Fig. 4. Mean RSI of Various Sub-Risks Under Legal Risk**

#### ***E. Political Risks***



**Fig. 5. Mean RSI of Various Sub-Risks Under Political Risk**

## F. Environmental Risks

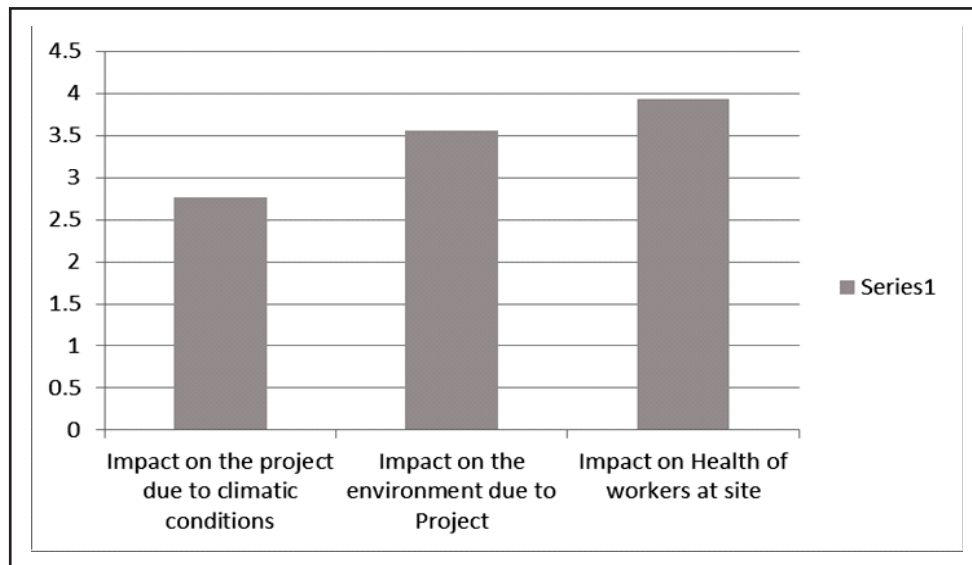


Fig. 6. Mean RSI of Various Sub-Risks Under Environmental Risks

## G. Ranking of Top 10 Risks

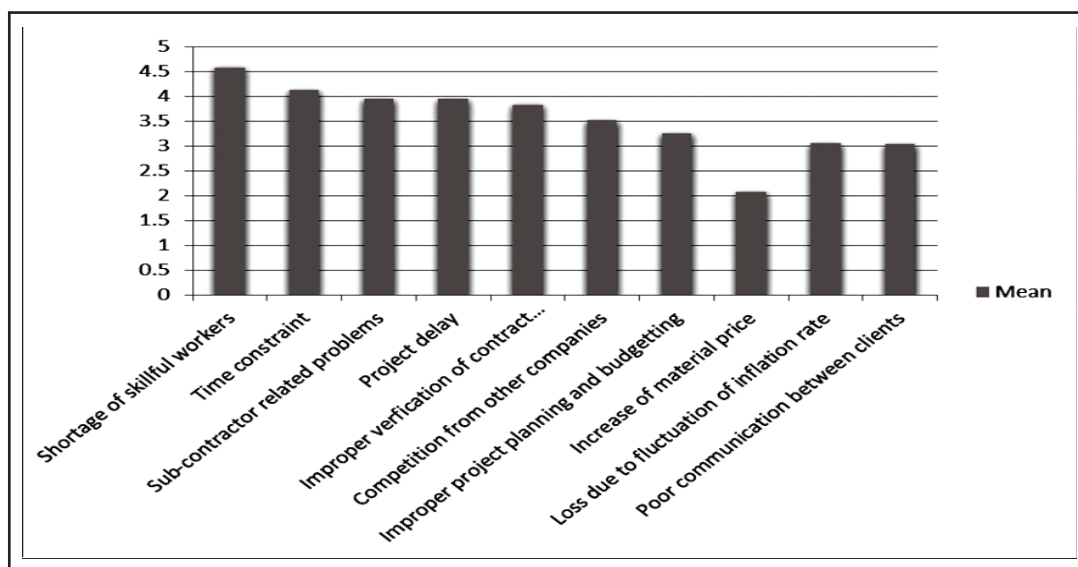


Fig. 7. Mean RSI of Top Ten Sub-Risks



sector, construction companies want to complete their projects at the earliest and this creates tremendous pressure on all the stakeholders to complete projects in a very short span. Thus, time constraint risk prevails in all the companies surveyed.

(3) Risks related to sub-contractor are also high, since most of the sub-contractors are not able to cope up with the standards that are expected from main contractor/client due to their complexity of work. Thus, management risk has been found to be a critical risk from this survey.

(4) Risk of delay in the project is one of the main risks, which is looped with various others factors directly or indirectly.

(5) Small and medium sized companies faced the risk of competition from other companies which constitutes major problem owing to 100% FDI in the construction sector which allowed foreign companies to enter the market. This created stiff competition for local companies both technically and financially.

(6) Inflation rate was very high. This caused increase in prices of materials like cement and steel, which in turn caused financial risk to the land developers and construction firms. Interest rates were also raised by banks for the loan given by them which affected the real estate market. Thus, the financial part of risk is much higher than any other risk.

(7) Legal risk is very low, but the enforcement of statutory rules and procedures is not proper as seen from this survey.

(8) Risk due to environmental factors is very low. It is a global phenomenon, and it cannot be nullified, but it can only be reduced/ minimised.

(9) Overall market, management, and the financial risks are high when compared to other risks.

## VI. SUGGESTIONS FOR RISK MANAGEMENT

Shortage of skilled workers, sub-contractor related problems, improper verification of contract documents,

inadequate project planning and budgeting, and poor communication are primarily responsible for majority of risks that were prevalent in the project. These risks can be mitigated to a very great extent by

✎ Having an in house training programme for workers for upgrading their skills.

✎ Realistic project planning and scheduling.

✎ Thorough study of risks involved in the project and taking mitigation measures for the same which can minimise deviation from the projected cost and time.

✎ In depth study of contract documents and understanding their implications.

✎ Improved communications among stakeholders of the project.

✎ Diligent market/financial study due to which the project can be insulated from major risks.

✎ By going in for mechanisation to the maximum possible extent to minimize dependence on skilled workers.

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## About the Author



**Dr. K. Srinivas** has an industry experience of 17 years with Ministry of Water Resources, Government of India and he has teaching experience of more than 13 years at National Institute of Construction Management and Research. At present, he is the Senior faculty (Incharge of PG Courses) at National Academy of Construction, Hyderabad.