

A Study on Identification of Risks at Various Phases of Road Construction

Mr. Shelar V.E.¹, Mrs. Wadalkar Shruti²

¹Student, Dept. of Civil Engineering, Dr. D.Y.Patil Institute of Technology, Pimpri, Pune, MH, India

²Assistant Professor, Dept. of Civil Engineering, Dr. D.Y.Patil Institute of Technology, Pimpri, Pune, MH, India

Abstract - Risk in a road construction project is an occurrence of difficulty in completion of project on time with estimated quality. Risk management mainly deals with the risk identification, assessment and mitigation techniques to provide a solution. Risk in the road construction is considered to be a combination of activities, which highly affect the project objectives of time, cost and quality. Some risks in construction processes can be easily predicted or readily identified; still some cannot be identified until they occur. Road Construction risks can be related to political, environmental, social, financial, technical or socio-environmental aspects or can be related to natural disasters. To avoid the critical effects of risks such as failure to achieve the required quality, non-completion of the project within stipulated time and estimated cost risk management is adopted. In this paper various risk factors associated with road construction are studied.

Key Words: Risk Management, Risk Categorization, Road Construction, Risk Identification, Phases of Construction, Risk Ranking

1. INTRODUCTION

A risk may be a potential problem which might occur or might not.

Risk contains following terms:

- Risk includes future happenings
- Risk concerns about change in mind, opinion, actions, places, etc.
- Risk is a choice and the uncertainty that choice entails.

Whereas risk management can be defined on the following terms:

- Identify possible risks; recognize things which can go wrong.
- Assess each risks on the basis of probability of its occurrence and its impact.
- Rank the risks by probability and impact, Impact may be very low, moderate and very high.

- Initiate a mitigation plan to manage those risks having high impact and high probability.

As a developing nation our country is building a huge network of roads all over the country for the better transportation which will help in growth of manufacturing industry indirectly creating more jobs and development of Indian economy. For a better road network it should be kept in mind that there will be very complex uncertainties lying at each and every stage. Road construction has number of activities which are beyond our control. There are various ways to find the uncertainties and their probabilities in order to mitigate the risks involved in the construction process. There are several different tools and techniques which have already been developed. However, there is a gap between risk management techniques and their practical application by contractor. In our country there is a need to study various methods for the identification of risk, types of risks associated with road construction projects and different risk mitigation techniques to ease the complex planning and management of road construction process.

The objective of this paper is to identify various risk factors associated with road construction projects.

2. LITERATURE REVIEW

An overview of past study about the various researchers has discussed major issues of Risks associated with the Road construction project and various management methods in their studies are given below;

Mr. N. V. Patil, Dr. P. G. Gaikwad;2015[1] used expected value method (EVM) to measure risk quantitatively. Risk management in road project deals with risks occurrence with each activity and its possible effect on time and cost. Possibilities of risk are sometimes defined by same terms such as likelihood, impact and severity. The measurement and assessment of risk parameters associated with the present and same type of projects was based on the response of experts working on. This data was analyzed further to determine risk severity of various events at different stages in road project. Schedule prepared and contract value gives us base time and base cost respectively.

Katkar M.B., Dr.Khandekar S.D.;2015[2] a solution was provided by author the problem of decision making of budget allocation, to allocate funds to deserving and competing

organizations by using integrated Fuzzy, Analytical Hierarchy Process techniques. Fuzzy set theory and AHP was used to calculate weights. Fuzzy set takes subjective values like agree, strongly agree etc. and AHP technique evaluates relative importance of factors by creating comparison matrix. This study focuses on the minimizing risk occurrence by taking better decisions by using different techniques together. Decision making makes a great impact on solving many problems way before their occurrence.

Rinaj Pathan, Prof. Dr. S. S. Pimplikar;2013;[3] assessed the risks involved in BOT by studying a specific case of BOT road Projects. A BOT project involves the participation of two or more Governing bodies, which increases likelihood of political risks in this type of projects which will delay the projects or even stop permanently. To avoid these issues there should be multiple action plans which will enable us to mitigate these kind of risks occurring in similar type of projects. There are many aspects which affects the BOT road projects such as toll collections, grant from government, time period of concession which should be taken into consideration in order to avoid these risks in the planning stage itself. Concession period affects the financial viability of a BOT project is suggested by the author. By studying similar kind of projects carefully and listing out the commonly occurred risks and their impact we can easily mitigate the risks associated with present project.

Mr. Satish K. Kamane, Mr. Sandip A. Mahadik [4]

characterized construction projects as very complex projects, where uncertainty comes from various sources. Construction projects are made up of hundreds of stakeholders, which makes it difficult to study a network as a whole. But this makes these projects offer an ideal environment for risk management research. Additionally, management researches frequently uses construction projects and many different tools and techniques have already been developed. But, there is a lack of knowledge of risk management techniques and their practical application by construction contractor. This study deals with the identification of risk by different methods, types of risks associated with construction project and different risk mitigation techniques.

Kinnaresh Patel;2013[5] This study identifies the process for risk identification, management and its views from the Indian construction industry. Cost and time management need to be fully integrated with the identification process. Time constraints are critical even for project managers with sufficient experience when identifying the level of risk for large and/or complex projects. This study suggests a method of risk mitigation which includes a well-documented procedure which provides one-time solution to all the risks that would occur in the future.

Patel Ankit Mahendra, Jayeshkumar R. Pitroda, J. J. Bhavsar;2013[6] Risks have a huge impact on any construction projects way before its completion. Construction projects which are highly complex in nature, uncertainty and

risks may occur at same place but from varying sources. Previous records of the Indian construction industry are not that good in terms of coping up with risks in projects. In India Construction sector is the largest economy contributor. Risk Management is a process which involves identification of risks, quantitative and qualitative assessment, and then providing a solution by mitigation technique. The aim of this study is to suggest application of the risk management technique to the construction sector in a developing country like India.

Sharmila Mane, Dr. S.S.Pimplikar;2013[7] In this study the risk impacts accounted for to the BOT M model and risk concession model is provided to the addition. Author have suggested to consider concession period for which both the investor and government will be benefitted as we are a developing country we don't have enough funds that government can build infrastructure at its own. Monte Cralo simulation Technique was used for the study of a hypothetical case for formulating a model about concession period.

3. STUDY OF RISK MANAGEMENT IN ROAD CONSTRUCTION:

Here we are going to categorize the risks on the basis of occurrences at specific stage of construction. Some of the risks are highly influential and some of them hardly occur over a long time period. Following risks are identified which can be assessed and analysed by using Relative Importance Index.

3.1 Types of Risks at Various Phases of Road Construction

3.1.1 Initial Phase (Concept Phase)

- 1) Feasibility w.r.t. specific area where the project is proposed
- 2) Constructability of Project concept not in line w.r.t. Design & Engineering capabilities in your Organization
- 3) Lack of Clarity about legal framework and restriction under which Project is to be implemented
- 4) Uncertainty about Political policy changes adversely affecting the project at the later stages of Execution
- 5) Rejection of proposal by concerned authority

3.1.2 Fund Raising and Financial Stability Phase

- 1) Delay due to budget approvals from concerned authority
- 2) Various permissions to be obtained from Authorities are not clearly identified

- 3) Mobilization of finance
- 4) Lack of clarity in specifications and cost estimates

3.1.3 Tendering and Contracting of Project Phase

- 1) Non-availability of correct details of scope of work without any obscurity along with necessary drawings
- 2) Properly prequalified contractors participating in the competitive bidding process is not assured
- 3) Availability of Professional Consultant for Designing and Project monitoring at Client's side is not established
- 4) Various permissions to be obtained from Authorities are not clearly identified
- 5) The environmental Impact Assessment is not available or clearances to be obtained as per provisions of the Law are not made clear

3.1.4 Project Planning Phase

- 1) Site is not made available to contractor with suitable access without encumbrances
- 2) Basic layout designs are not available and detailed drawing is not approved in time
- 3) Government's decision on technical issues not available in time
- 4) Mechanism for Dispute settlement in case of claims is not clearly established
- 5) Time constraint for project is not fixed initially & varies according to government policies

3.1.5 Contract Execution, Monitoring and Control Phase

- 1) Lack of specifications and estimate
- 2) Non-availability of correct details of scope of work
- 3) Lack of detailed design and drawings

3.1.6 Finishing Work and Closure of Project Phase

- 1) Non Settlement of dispute about reasons of time and delays extension needed to complete the project
- 2) Delays in settlement of pending claims and contract closer with final payments.
- 3) Support of local and state level bodies in smooth functioning of the infrastructure assets, is not available

- 4) Support of law and order authority for the maintaining peace and smooth working is not provided

- 5) Cost overruns of maintenance expenses reducing the income margins for the contractor

- 6) Delay in payment

4. CONCLUSION

On the basis of literature survey and discussions with the public and private authorities, this study has systematically examined major risks affecting the road construction projects. In this study various risk factors associated at different stages or period of road construction work have been studied and categorized. To minimize the chances of failure or under-performance, risk management policy must be implemented and evaluated regularly into the construction project. This study provides useful references to any road construction projects in India.

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