

Identification of Different Risk and Its Factors for Infrastructure Projects – A Review

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Abstract: Risk is always involved in all types of infrastructure projects. Some risk has its high impact value where some of them has its low impact value. That high and low impact of risk is depending on its factors related to it. Different projects have same risk but its factors related to risk make it different from others. This literature study mainly discusses about those different risk and its factors affected for completion of any infrastructure construction projects. Different study shows different risk involved in infrastructure construction projects with its own kind of risk related factors. These risks can be identified with in project with the help of different risk identification methods like questionnaire survey, telephonic interview, and opinions from experts, studying several related case studies. This will help in identifying risk and its factors for occurring it in project. Also after identifying it using risk assessment methods helps in providing recommendation or solutions for risk mitigation or risk reduction from projects.

Keywords - Risk, Risk Assessment, Risk Mitigation, Risk reduction, Factor

I. INTRODUCTION

Risk is an unplanned event, which will happen in any infrastructure project in any construction phase. It will challenge the project to complete in a manner as planned before. These risks can be related to any aspects of project like budget of project, schedule of project, labors, human resources, materials, technology, construction risks and so many others. These risks can be identified with the help of different identification methods like survey, personal interviews, opinions of experts, case studies etc. This will give knowledge of different risks taking place during infrastructure construction. This can be assess with the help of assessment methods like Probability and Impact method, Monte Carlo simulation method, Project evaluation and review technique, Fuzzy logic, Analytical hierarchy process which will help in giving recommendations and solutions for these types of risk occurrence in any project. For finding these risk response actions, assessment of these risk factors are very helpful.

Objective: To study various researches conducted by different Indian author on risk factors and importance on construction projects in India.

II. LITERATURE REVIEW

- 1) Mubin M Shaikh has identified and evaluates risks and uncertainties in the construction through literature survey. In this paper with the help of questionnaires' survey data has been collected from various multi project companies or contractors of project managers. Mostly risks can be eliminated or transfer but during survey respondents replay hat these run-through create problems like delays poor quality work and less productivity of project.
- 2) Kinnaresh Patel have found that risk can create negative effect on time, schedule, cost and quality of work. This study was conducted with new management techniques and surveys methods, which are used in today's construction industry in India. For finding all risk also with some similar risks which can linked with it remotely that also can find with the help of using industrial checklist. Finding risks in early stage of project which can help in reduce the effect of that risk and also use some different risk reduction practice to understand its effect on project. In India risks occur due to lace of mismanagement rather than activities. In this paper analysis has been done with brainstorming, analysis of historical data and help of industrial checklist. There is a need of one stop solution for all related risks in project because it is difficult to collect all different data for identifying all risks.
- 3) Mr. Satish k. Kamane, Mr. Sandip A. Mahadik identify that the risk management is essential in project management. How efficiently and effectively risk management can be done in any construction project it will define the success of project. For avoiding risk in project, review of its objectives can lead to check a project as a whole it depends on how efficiently and effectively uncertainties are handled. For every project risks are different and related solutions are also different. Risk management will help in managing risk effectively from project with the help of its project objectives. Lack of knowledge and expertise in risk management technics they are rarely used in construction industry. As a tool of risk transfer one term joint venture is very much used.
- 4) Greeshma R Krishnan and Minu Anna Johny, has considered a matrix of probability and impact of risk in any project. Various types of risks has various types of impact on project later it is important to manage risk during construction period. In this paper most apparent risk, which occurs, is financial risk, this paper also uncovered design risk which means risk with high impact. So risk occurrence probability is not depend on risk impact and proper risk management should be done to reduce its impact. There are different management techniques used to reduce the impact of risk.

- 5) Chaitali S Pawar, Suman S Jain, Jalinder R Patil has studied a case study of Flyover in Pune city of Maharashtra state of India been referred. For research purpose collection of data, analysis of that collected data, which helps in findings and final result of case study, has been acquire. For gaining better control over project when it depends on time, cost, quality, scope and organization risk management will provides support. For data purpose set of contract documents of infrastructure project has been referred. With the help of questioner survey and open interviews of case study of project cost over run and time overrun are the main factor. Qualitative risk analysis has been done with help of probability and impact method. This study has examined major risk affecting in infrastructure projects. It is concluded that clients, designers, contractors and government must work cooperatively to address risk on time. This data will also help to local construction and government to have depth understanding of construction in Pune.
- 6) Mayank Kumar Singh, Shumank Deep, Rajeev Banerjee have conducted data on risk management as per Indian Scenario. In this paper first step is understanding general concept of risk management, then after create questioners for survey of construction industry then discussion has been done and after that identification and assessment of risk has been done. The most risks are found in construction industry in India are with the perception of contractors and consultants based on their experience. Most effective risk response are risk elimination and risk transfer. Hence these also enlarge that delays in work , low quality work and less productivity has been get with these practices.
- 7) R. janani, P.R. kalyana Chakravarthy and S. Yazhni has done work on investigating major risk in construction industry. In construction industry risk can be arrived from any sources of project. It will affect the success of project. Risk management process has different steps like planning, risk identifying, assessment, and response planning and scheduling and controlling it. Hence risk cannot be stopped but it can control by proper managing technique.
- 8) Mayur Marekar, Rishikesh Sakpal and Tushar Tatiya identifies that in India there is a very exceptional growth in foreign investment in Infrastructure development. But if this infrastructure comes and development being happens then quantity of risk and obstacles to the investors and economy happen. A really beginning of identification consists of listing and categorizing risks likewise as analysis of their sources for liableness. Fundamentally risk management in infrastructure is that the same fashion as different business from the operation of context institution, assessment and treatment of risks. In this paper it is been observed that these risks use to occur at different stages of construction project.
- 9) K. Jayasudha, Dr. B. Vidivelli and E.R. Gokul Surjith studied that risk is an uncertainty, which can affect the business project goals and outlooks of achieving. Risk management can give less uncertainty, achievement of objectives reliability reduction on cost and construction of value. Data, which are collected with help of survey then analyzed by SPSS software and for overcoming risks some suggestion have been provided. Risk management should be considered a primary tool for any project.
- 10) Divya Gupta, Manoj Sharma, Dr. Ashutosh Shankar Trivedi, has concluded that financial saving and greater productivity with better success rate of project and better decision-making can be get only by managing risk effectively and efficiently. To manage risk effectively and efficiently, the contractor must understand risk responsibilities, risk event conditions, risk preference, and risk management capabilities. In construction companies' risk must be integral part of project.
- 11) A Suchith Reddy have studied over synchronized and cost effective way of using material and resources which help in minimizing risk in construction project. Researcher found some different significant risks. Then after he gave some sensible risk management principles. Then he worked on a case study to give a clear picture about risks and risk management. Risk managing is strongly concern with construction phase of project. Better project implementation can be achieved by identifying, allocating and managing risks first stage of project before it takes a bigger problem in project. Some risks and its impact will variable on project life cycle while some risks are constant in all projects.

III. FINDINGS

From literature review here are different risks identified during and after construction of projects and its related factors for occurring these risks on different infrastructure projects.

Table 1 Identified Risks and Its Factors

Risk	Factors
1. Financial Risk	<ol style="list-style-type: none"> a) Client delays b) There will be unrealistic expectations for what can be accomplished within the finance limit c) Unexpected fluctuation in estimated finance d) Unmanaged cash flow and financial incompetence
2. Design Risk	<ol style="list-style-type: none"> a) Complex design of project b) Undefined specifications c) After changes
3. Management Risk	<ol style="list-style-type: none"> a) Unstable top management authorities b) Happen internal management conflicts c) Delay by political influence

4. Construction Risk	<ul style="list-style-type: none"> a) Failire of logistics b) Labor disputes happen c) Labor productivity reduces d) Shaddy work quality
5. Environment Risk	<ul style="list-style-type: none"> a) Inclement weather conditions b) Pollution by construction waste c) Ecosystem impact
6. Procurement Risk	<ul style="list-style-type: none"> a) Increase in price of material due to temporary demand b) Bad outsourcing
7. Sub-Contractor Risk	<ul style="list-style-type: none"> a) Chances of sub contractor walk out b) Work execution delayed by sub contractor
8. Technological Risk	<ul style="list-style-type: none"> a) More complex technology create more problems b) Integration problem between old and new technology c) Difficulty in testing new technology d) Less knowledge of equipment's e) Less experience of new software & hardware
9. Business Operation Risk	<ul style="list-style-type: none"> a) Policy change delay project b) Complex coordination between different departments c) More difficult to reach consensus d) Production, process & productivity e) Business interruption
10. Liquidity Risk	<ul style="list-style-type: none"> a) Financial solvency b) Borrowing limits c) Cash inflow-outflow
11. Sales Market Demand Risk	<ul style="list-style-type: none"> a) Entry of new competitors has direct affect on demand & sales b) Downturn in economy could lead to <ul style="list-style-type: none"> i. A decrease in sales or market rates for residential projects ii. Prospective customers may not be able to obtain housing finance iii. May also run the risk of customer insolvencies c) Shift in customer preference may also have an adverse effect on the business and operating results
12. Human Resource Risk	<ul style="list-style-type: none"> a) Labour Turnover b) Bad training c) Poor skill
13. Legal Risk	<ul style="list-style-type: none"> a) Contract limitations b) Contractual Liability
14. Schedule Risk	<ul style="list-style-type: none"> a) Poor time management b) Delay in pervious work
15. IT System Risk	<ul style="list-style-type: none"> a) System Capability b) System reliability c) Data integrity d) Coordinating and interfacing e) Information Security

IV. CONCLUSION

Risk management is a technique that should be applied within construction to identify different risk inside projects by using different risk assessment methods. Hence, it is necessary to spread awareness and create interest amongst people to use risk management techniques in industry. In this study different risk has been found and different projects share common risk between them but factors related to them are varies with respect to their project background. Not all projects have the same type of risk factors it will change with project to project and its solutions also differ from others too. After studying its factors risk analysis has been done by using different risk assessment techniques which helps in solving and giving good response action against to that occurrence of risk.

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