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Risk Assesment In High-rise Construction Industry

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Abstract - Risk management is a very crucial process. High-Rise Building (HRB) construction project has complicated structural design, complexity of work and potential risks in project work. Project risk can obstruct the project activities and achievement. This can affect the cost, scope and time in managing high rise building projects. To encounter this the objectives are to identify the risks of technical and construction management, allocate the risk to appropriate parties, namely owner, contractor, and shared (owner and contractor), and assign the risk response to dominant risk in the HRB project. Identification of risk was conducted through onsite brainstorming with professionals and through literature study and validation of the preliminary survey.
Keywords - High-Rise Building (HRB), Risk analysis, Risk Assesment,

Introduction –

Risk analysis in the high-rise construction industry in Nashik plays a crucial role in ensuring the safety, success, and compliance of projects. This introduction provides a concise overview of the importance of risk analysis in Nashik's high-rise construction sector. It emphasizes the need to identify and assess risks specific to the local context, including structural integrity, safety hazards, financial uncertainties, regulatory compliance, and environmental impact. Effective risk analysis involves utilizing advanced technologies, interdisciplinary collaboration, and adherence to local regulations and building codes. By implementing comprehensive risk management strategies, stakeholders in Nashik can mitigate potential risks, enhance project outcomes, and ensure the sustainable development of high-rise constructions.

Literature Review –

- A number of studies have been carried out to determine the factors of risk in construction project:

P.J.Edwards (1998) conducted research on risk and risk management in construction. They primarily classify risk into two main categories natural risk and human risk. Natural risk occurs outside human system, while human risks arise within humanly organized system. The sub categories of human risk relating to construction and project risks include social, political, economical, financial, legal, health, managerial, technical and cultural risks.

Patel Kinnaresh (2013) conducted study on Risk assessment and its management in India according to them it is safe to say that the majority of construction projects in India have no systematic procedure to deal with risks from the obtained results. It is also found out that financial, construction, and quality risks were associated with construction projects in India. Indian construction projects generally have been practiced with an informal approach of risk management. Hence there is a thriving need to have a well-documented procedure which should be a one stop solution to all the risks that are likely to be faced during project life cycle.

Pejman Rezakhani (2012) classify construction project risks into external, operational, project management, engineering and financial in their study of classifying risk factors in construction projects.

Pinkerton and Federation of Indian Chambers of Commerce and Industry (FICCI) 2013 generate Indian Risk Survey 2013 according to them Strikes, Closures and Unrest' emerged as the number one risk In the year 2012.

Shen (1997) identified eight major risks accounting for project delay and ranked them based on a questionnaire survey with industry practitioners. Shen also proposed risk management actions to cope with these risks and validated their effectiveness through individual interview surveys.

According to Prof. Shakil S. Malek, (2013) Risk management ultimately minimizes the project losses & increase the likelihood that the project in completed on schedule & within the budget. Risk management is a proactive management tool used for early visibility of potential problem areas & possible mitigation measures. Risk management includes the entire project, including the design, engineering, business, contracts, finance, purchasing, estimating, & project management.

Bhandari M.G. (2014) conducted study on management of risk in construction. Thy classify risk into technical risk, logistical risk, management related risk, Environmental risks, Financial risks, socio-political risks.

OBJECTIVES

The primary objective of this research paper is to analyze the risk factors associated with the high rise buildings. To evaluate the risk involved in each activity of high rise. The secondary objective is to measure the severity and rank the probability of the most likely risks in the construction process. To compare the relationship between the different variables of data collected.

NEED OF STUDY

Risk management is a very crucial process that is essential to be carried out to control the outcomes of a project and for a smooth execution. With the increasing rate of high rise projects from the past 5 years in nashik city in maharashtra state risk management becomes more important. The majority of current high rise building projects in nashik consists of height more than 30 m reaching up to 90 m height. With buildings reaching such range of heights the no. of risk factors becomes high and risk management becomes top priority

RESEARCH METHODOLOGY

For data collection qualitative approach is adopted where risk factors are selected by discussions and informal meetings and past research papers. For risk factors appropriate research papers were reviewed. From the selected risk factors risks from each activity are bifurcated into the selected risk factors. Questioner is prepared in google forms and the responses are taken according to the sample size decided. For analysis of data qualitative and quantitative methods are used.

RISK MANAGEMENT PROCESS -

1. Risk Identification- Risk management always starts with risk identification, which may be considered the most important phase of the risk management process (Baker, Ponniah and Smith, 1998). Its purpose is to compile a list of risks important for a particular project. To form this list, it is first necessary to research the potential sources of risk, adverse events that include risk, and the unfavourable effects of an undesirable scenario. For example, weather is a source of risk, extremely bad weather is an adverse event, and its effect is work running behind schedule due to extremely bad weather conditions. Risk identification greatly depends on the manager's experience. If his experience with particular methods and techniques of risk identification is good he will continue to use them, whereas bad experience leads to avoiding approaches prepared earlier. Managers use various techniques for risk identification, the best known of which are:

- Brainstorming
- Interviews
- Questionnaires
- Risk execution
- Risk analysis

2. RISK ANALYSIS - Risk analysis, a component of the risk management process, deals with the causes and effects of events which cause harm. The aim behind such analysis is a precise and objective calculation of risk. To the extent that this is possible, it allows the decision making process to be more certain. The essence of risk analysis is that it attempts to capture all feasible options and to analyze the various outcomes of any decision.

Risk analysis involves assessing the identified risks. This first requires that the risks are quantified in terms of their effect on cost, time or revenue. They can be analyzed by measuring their effects on the economic parameters of the project or process. The use of risk analysis gives an insight into what happens if the project does not proceed according to plan.

3. RISK RESPONSE PLANNING

Risk Response Planning process is the third stage in the risk management process.

- Action is taken to deal with the risks. Higher priority risks need more attention.
- Risk Response Planning covers both preventive actions to prevent the risk from occurring as well as a suitable response in case the risk actually occurs.
- At times, responding to a risk can give rise to a new or "secondary" risk so care should be taken when choosing a risk response.
- The five most common responses that are used to deal with risks are:

➢ Risk Avoidance
➢ Risk Transfer
➢ Risk Mitigation (reduction)
➢ Risk Share
➢ Risk Acceptance

4. RISK CONTROL

- This is the last process of risk management and it involves the implementation of risk response to the risk.
- All responses that are made to risks must be monitored and reviewed to ensure they are effective.
- Responses taken to risks should also be fully documented for future reference and project plans need to be updated accordingly. Any changes required in schedule, budget etc. due to the risk should be documented and updated in the project plans.
- Risk Control should be an on-going process in which the impact of the risk is again evaluated and assessed.

❖ BENEFITS WITH RISK MANAGEMENT

➢ Risk management contributes to a better view of possible consequences resulting from unmanaged risks and how to avoid them.
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➢ Different attitudes towards risk can be explained as cultural differences between organizations, where the approach depends on the company's policy and their internal procedures.

5. METHODOLOGY

➢ The work methodology included a literature search and interviews.

➢ The literature review was conducted through book, internet and journals. As the outcome of this, 47 risk factors for building construction projects were identified.

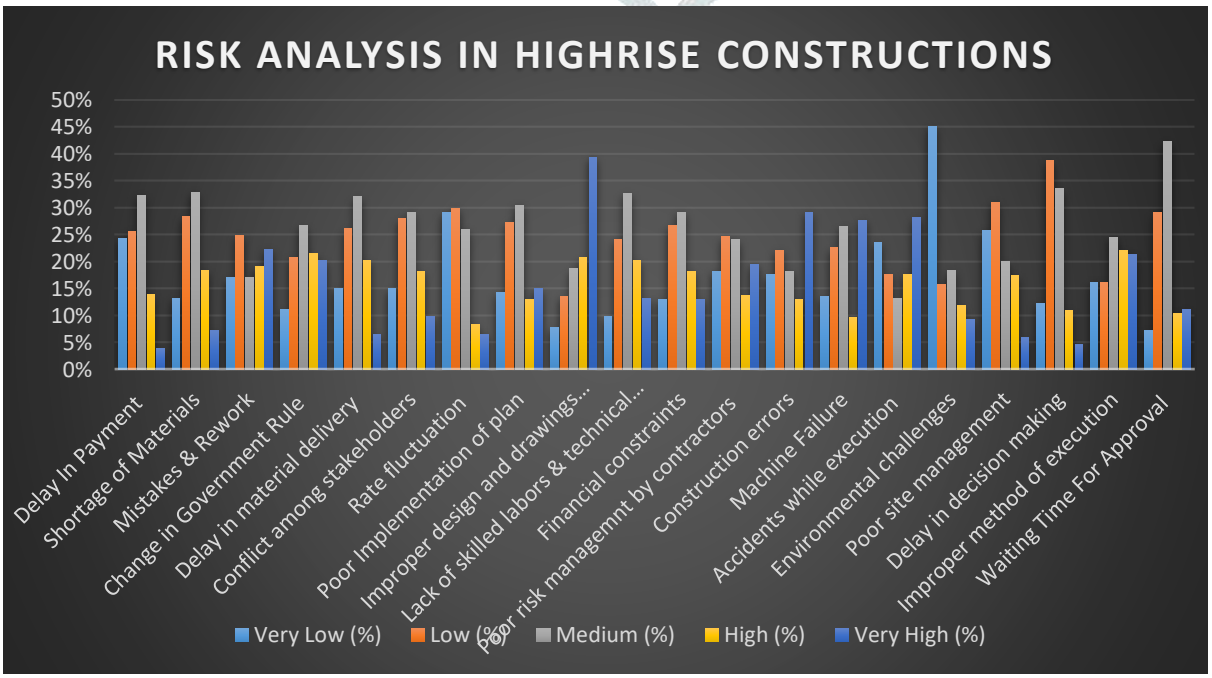
➢ These factors were categorized in ten main groups such as: design, physical, logistics, legal, environmental, management, cultural, financial, construction and political.

➢ Framework of the factors is given in table below

Risks	Very Low (%)	Low (%)	Medium (%)	High (%)	Very High (%)
Delay In Payment	24%	26%	32%	14%	4%
Shortage of Materials	13%	28%	33%	18%	7%
Mistakes & Rework	17%	25%	17%	19%	22%
Change in Government Rule	11%	21%	27%	21%	20%
Delay in material delivery	15%	26%	32%	20%	7%
Conflict among stakeholders	15%	28%	29%	18%	10%
Rate fluctuation	29%	30%	26%	8%	6%
Poor Implementation of plan	14%	27%	31%	13%	15%
Improper design and drawings provided by consultant	8%	14%	19%	21%	39%
Lack of skilled labors & technical staff	10%	24%	33%	20%	13%
Financial constraints	13%	27%	29%	18%	13%
Poor risk managemnt by contractors	18%	25%	24%	14%	19%
Construction errors	18%	22%	18%	13%	29%
Machine Failure	14%	23%	26%	10%	28%
Accidents while execution	24%	18%	13%	18%	28%
Environmental challenges	45%	16%	18%	12%	9%
Poor site management	26%	31%	20%	17%	6%
Delay in decision making	12%	39%	34%	11%	5%
Improper method of execution	16%	16%	25%	22%	21%
Waiting Time For Approval	7%	29%	42%	10%	11%

6. CONCLUSION

Risk management is rarely used by the participants in construction projects. The participants generally use to handle the risks with an informal approach. This technique is not employed because of less knowledge and awareness among the construction industry. The risk management technique should be applied into any construction project at the initial stage of the project to get maximum benefit of the technique. Hence, there is thriving need to have a well-documented procedure which should be a one stop solution to all hazards that are likely to occur during project life cycle. This study was carried out particularly to identify construction project risk and outcome is a list of 47 number of risk factors under the category of design, physical, logistics, legal, environmental, management, cultural, financial, construction and political. Based on above factors analysis future study can be carried out to understand criticality of each factor. That kind of study will help the construction industry to work on certain important and most critical factors so that risk can be properly managed.



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