Identification of Risk Factors in Government Housing Project
A Review

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Abstract- *Risk is a measurable part of uncertainty, for which we are able to estimate the occurrence probability and the size of damage. This paper covers the concepts of identification of risk factors to be used for the one stop solution for all types of hazards most likely to occur during any housing projects.*

Keywords-*Risk management; Risk assessment; Risk evolution; Risk identification; Housing projects*

I. INTRODUCTION

 The development of infrastructure is one of the most important activities that can boost up the business of various industries, thereby increasing the gross domestic product (GDP) of the country. Gujarat government will provide pucca house to every slum dwelling family and family belonging to economically weaker sections. Existing slums in metropolitan, municipal and development authority areas will be rehabilitated by constructing houses in the same place. Here are some of the popular housing schemes in India:

1) Pradhan mantri awas yojana:
The Pradhan Mantri awas yojana was launched by PM Narendra Modi in 2015. Also known as the Housing for all scheme, the mission is to provide shelters to the homeless by 2022. Under the scheme, the Centre would be providing assistance to states to provide homes to every citizen within seven years.

2) Pradhan mantri gramin awas yojana:
Earlier known as Indira awas yojna, the scheme focuses on providing pucca houses with basic amenities to homeless families. The objective is to build one crore homes of 25 sqm by 2022.
People who can get benefit are:
1) Households without shelter
2) Destitute/living on alms
3) Manual scavengers
4) Tribal groups
5) Legally released bonded labour

3) Rajiv awas yojana:
Launched in 2009, the Rajiv awas yojana (RAY) envisages a slum-free India and encourages state and union territories to bring all illegal constructions within a formal system. To increase the affordable housing stock under the scheme. Execution of construction projects in metropolitan areas is very appealing but it is highly risky, competitive, and dynamic due to the complicated surrounding environments such as heavy traffic, transportation. The risks associated with such construction projects May eventually in adverse consequences in terms of project delays and budget overruns. The term 'risk' can be understood by the potential for complications and problems with respect to the completion of a project task and the achievement of project goal. Risks can be viewed as threats. Following general classification of risks Field-based and Property-based. Field-based types include financial risk (market risk, credit risk, operational risk, and liquidity risk) as well as non-financial risk (political risks, reputational risks, and disaster risks). Risks in the construction industry are more than other industries. The process of planning, executing and maintaining all project activities is complex and time-consuming. The whole process requires people with diverse skill sets and the coordination of a vast amount of complex and interrelated activities. The situation is made complex by many external factors. The track record of construction industry is very poor in terms of coping with risks, resulting in the failure of many projects to meet time schedules, targets of budget and sometimes even the scope of work. As a result, a lot of suffering is inflicted to the clients and contractors of such projects and also to the general public. Risk in the construction industry is perceived to be a combination of activities, which adversely affect the project objectives of time, cost, scope and quality.

II.OBJECTIVE

The main objective of this review is to identify the risk factors involved in government housing projects.

III.DETAIL OVERVIEW OF VARIOUS LITERATURE REVIEWS

Agnieszka Dziadosz (2015) conclude The character and specifics of the construction industry makes that the analysis of the impact of risk factors on a construction project is more often taken, despite the major difficulties of their quantification. The problem of risk management is not only current but it is essential for the efficient planning and realization of a construction project. *Following Factors*: Lack of acceptance by investor of design proposal, Delay and difficulties in obtaining opinions and permit, incorrect information, Design error.

Jiayuan Wang (2011) conclude Risk attitudes are influenced and determined by many factors in construction practice. It is neither practical nor necessary to identify and understand all related factors for minimizing their influence on contractors' risk attitudes. *Following Factors*: Educational background, Engineering experience, Social experience, Scope of knowledge, Physical health, Social status.

Akintola S Akintoye (1997) conclude Risk elements associated with construction projects influence the time, cost and quality performance of the project. Risk management therefore becomes a continuing activity in project development, from inception and throughout the life of the project.*Following Factors*: Environmental, Social, Political, Economic, Finance.

Irem Dikmen (2007) stated Risk assessment provides a promising tool to quantify risk ratings where the risk impacts are vague and defined by subjective judgments rather than objective data. *Following Factors*: Technical Risk, Managerial risk, Resource risk, Productivity risk, Design risk, Payment risk, Client risk, Sub-contractor risk

Srinath Perera (2017) stated identification and allocation of risk are of paramount importance for the successful implementation of the transport infrastructure projects. *Following Factors*: Loss due to adverse government decisions/policies, Loss due to resistance to pay, politically motivated resistance, unacceptably high toll rate, Alteration in toll structure, Increase in income tax, Poor interdepartmental co-ordination.

Pejman Rezakhani (2012) stated risk management is an important step in project success. It is the process of identifying, classifying, analyzing and assessing of inherent risks in a project. *Following Factors*: Management, Change in technology, Market risk, Contractor.

Usama Hamed Issa (2013) conclude the construction projects involve various risk factors which have various impacts on time objective that may lead to time-overrun. *Following Factors*: Contractor problems and inadequate experience , Change in material prices or price escalation , Unskilled workers and poor labor productivity , Inefficient use of equipment's , Delay in running bill payments to the contractor , Delay in material procurement
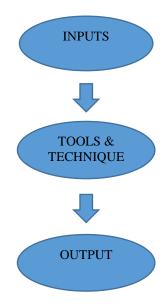
Bon-gang Hwang Ming Shan Nur Nadiah Binte Supa'at (2016-17) stated poor construction quality for less criticality than their traditional counterparts, but that the adoptions of green ideas, materials, and technologies had posed additional risks to green commercial building projects. *Following Factors*: Technical risk, Labour risk, Management risk, financial risk, Legal risk, Environmental risk, Political risk

Jungeun Park (2016) stated the risks are becoming increasingly diverse in the process of progress on construction *projects. Following Factors*: Cost overrun, Schedule delay, Error of business process, Lack of risk management expert, Design error

Yongwoon Cha (2016) stated Risk factors with great impacts are managed based on the analysis results, they are expectedly applied as index to support the successful execution of a construction project.
Following Factors: ,Inconsistency and Change in law, Institution and Policy ,Schedule Delay Caused by Change Orders, Conflicts between Government Agencies and Local Governments ,Delay of Contract Implementation.

IV.RISK IDENTIFICATION PROCEDURE

INPUTS

TOOLS & TECHNIQUE

OUTPUT

Risk identification involves determining which risks affect the project. Participants in risk identification generally include the following: Project team, risk management team, subject matter experts from other parts of the company, customers, other project managers, stakeholders, and outside experts.Risk identification is iterative process. The first iteration may be performed by part of the project team, or by the risk management team. The entire project team and primary stakeholder may make a second iteration. To achieve an unbiased analysis, person who are not involved in the project may perform the final iteration.

A) INPUTS:
1. The risk management: plan describe how risk identification, qualitative and quantitative analysis, response planning, monitoring, and control will be structured and performed during the project.

2. Project planning output: risk identification requires an understanding of the project's mission, scope, and objectives of the owner, sponsor, or stakeholders. Output of the other process can reviewed to identify possible risks across the entire project. That may include
-Project character.
-WBS.
-Product description.
-Schedule and cost estimates.
-Resource plan.
-Procurement plan.

3. Risk categories: Risk that may affect the project for better or worse can be identified and organized into risk categories. Risk categories should be well defined and should reflect common source of risk for the industry or application are.

3.1 Technical risk: Complex technology, unrealistic performance goals, changes to the technology used during the project.

3.2 Project management risk: Allocation of resources, inadequate quality of project plan, and poor use of management strategy.

3.3 Organizational risk: Cost, time, and scope of project, inadequacy of funding, resource conflicts with other project.

3.4 External risk: Environment, labour issues, changing owner priorities, country risk.

4. Historical information: information on prior projects may be available.

B) TOOLS AND TECHNIQUES:

1. Documentation reviews: Review of project plans, prior project files and initial step taken by project team.

2. Information gathering techniques:

2.1 Brainstorming: Brainstorming is the most frequently used identification technique. The goal is to obtain list of risks that can be addressed later in qualitative and quantitative risk analysis processes.

2.2 Delphi technique: A facilitator uses a questionnaire to solicit ideas about the important project risks. The response are submitted and then circulated to the experts for comments.

2.3 Interviewing: Risk can be identified by interviewer of experienced experts. The person responsible for risk identification.

3. Checklists: Checklists for the identification can be developed based on past information and knowledge that has been accumulated from previous similar projects. Advantage of using checklists is that risk identification is quick and simple.

4. Assumption analysis: Project is developed based on scenarios and assumptions. It identifies risks for project from inaccuracy or incompleteness of assumptions.

(C) OUTPUTS FROM RISK IDENTIFICATION:

1. Risks: A risk is an uncertain event or condition that if occur it has a positive or negative effect on a project objective.

2. Triggers: Triggers sometimes called risk symptoms or warning signs, that indicate a risk has occurred or about to occur.

V.IDENTIFIED FACTORS

NO	RISK FACTORS
(A)	**SITE CONDITION**
(1)	**Environment**
A11	Flood
A12	Unpredicted Weather Condition
A13	Pollution
(2)	**Sub-Surface**
A21	Topographical Surface
A22	Geo-Technical Investigation
(3)	**Site Condition**
A31	Unexpected Surface Condition
A32	Access Condition
A33	On-Site Congestion
A34	Delay In Permit & License
A35	Security Requirement
A36	Safety Regulation
A37	Differing Site Condition
(B)	**RESOURCES**
(1)	**Labour**
B11	Labour Skill Level
B12	Availability
B13	Drop In Productivity

B14	Accident
B15	Human Resources Planning
(2)	**Equipment**
B21	Availability
B22	Quality
B23	Breakdown
B24	Productivity &Efficiency
(3)	**Material**
B31	Material Availability & Delivery
B32	Material Storage
B33	Material Theft & Damage
B34	Quality Of Material
B35	Material Supplies Problem
(C)	**PROJECT PARTIES**
(1)	**Design**
C11	Clarity Of Document & Drawing
C12	Team Experience
C13	Data Collection And Survey Before Design
C14	Experience
C15	Qualification
(2)	**Contractor**
C21	Qualification
C22	Experience
C23	Defective Work
C24	Rework
C25	No Of Current Project
C26	Professional Knowledge
C27	Scope Of Knowledge
C28	Physical Health
(3)	**Project Management**
C31	Type Of Contract
C32	Design Making Process
C33	Decision Making Process
C34	Availability Of Team
C35	Experience Of Team
C36	Quality Assurance
C37	Quality Control
(D)	**PROJECT FEATURES**
(1)	**Financial**
D11	Type Of Fund
D12	Fluctuation In Prices
D13	Change In Currency Rate
D14	Payment Of Complete Work
D15	Cost Estimation Accuracy
D16	Financing Project By Contractor

(2)	**Technical Risk**
D21	Alteration And Variation With The Design During Construction
D22	Insufficient And Incorrect Design Information
D23	Poor Definition Of Scope And Change In Scope
D24	Selection Of Construction Technique And Sequence
(3)	**Management Risk**
D31	Inadequate Insurance
D32	Poor Communication Among Stakeholders
D33	Improper Project Planning
D34	Difficulty In Comprehending Specification In Contract Detail
D35	Limited Availability And Reliability Of Suppliers

VI.CONCLUSION

Risk cannot be fully controlled in reality. However by taking adequate and timely precaution it can be reduced to some extent.This review analyzing and finding the possible measures to the housing projects in order to avoid the identified factors in the future projects.

In this paper, various risk factors in every housing project has been analyzed to avoid this in the future housing projects.

VII.ACKNOWLEDGEMENT

VIII.REFERENCES

[1] A. S. Akintoye and M. J. Macleod, "Risk analysis and management in construction" 1997.

[2] T.E. Uher and A.R. Toakely, "Risk management in conceptual phase of a project,"1999.

[3] L. Bing and R. L.K Tiong, "Risk management model for international construction joint ventures,"1999.

[4] M. Hastak and Shaked, "ICRAM-1 Model for internationalconstruction risk management,"2000.

[5] S. Q. Wang and M. F. Dulami, "Risk management frame work for construction projects in developing countries,"2004.

[6] F. Y. Y. Ling and L. Hoi, "Risks faced by Singapore firms when taking construction projects in India," 2006.

[7] A. S. Akintoye and M. J. Macleod, "Risk analysis and management in construction" 1997.

[8] T.E. Uher and A.R. Toakely, "Risk management in conceptual phase of a project,"1999.

[9] L. Bing and R. L.K Tiong, "Risk management model for international construction joint ventures,"1999.

[10] M. Hastak and Shaked, "ICRAM-1 Model for international construction risk management,"2000.

[11] S. Q. Wang and M. F. Dulami, "Risk management frame work for construction projects in developing countries,"2004.

[12] F. Y. Y. Ling and L. Hoi, "Risks faced by Singapore firms when taking construction projects in India," 2006