

# RISK MANAGEMENT IN PUBLIC PRIVATE PARTNERSHIP PROJECT

N.Dhivyasri<sup>1</sup>, J.Jayashree<sup>2</sup>

<sup>1</sup>Pursuing ME Construction Engineering and Management, Sri Ramakrishna Institute of Technology Coimbatore, Tamil Nadu, India

<sup>2</sup>Assistant Professor, Department of Civil Engineering, Sri Ramakrishna Institute of Technology, Coimbatore, Tamil Nadu, India

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**ABSTRACT:** A contract agreement is mandatory for all construction projects it is also important in public and private sectors for establish effective risk allocation strategies in Public-Private Partnership (PPP) projects. The Public private partnership infrastructure projects that leads to the value for money and balance of interests between public and end users. The Public private partnership project arrangements have been used in huge sectors such as transport, technology, water, prisons, health, welfare, and urban regeneration. On an average around 26 percent of construction projects are failed or delayed due to risks in construction contracts. There is no proper framework for managing risks in contracts. This paper found that properly assessing risk. The following risk are (planning and designing risk, construction risk, financial risk, environmental risk and political risk) for a successful Public private partnership project, risks should be managed carefully, this study focused on the managing risk in PPP relations between public and private entities to achieve success in PPP projects. The major objective of this research is analysis the risk using SPSS analysis software and provide effective risk mitigation measures for major risk occurred in PPP project.

**Index terms - value for money, urban regeneration, strategies, frame work, assessing risk, risk in contract, SPSS analysis, mitigation measures.**

## 1. INTRODUCTION

In India the number of public-private partnership (PPPs) opportunities is increasing. The private sector Entities provide public sector goods and services such as utilities, social services, public real estate and infrastructure. The success of Public private partnership depends on the successful identification, allocation, mitigation, and management of risks.

Political risks, design and planning risk, construction risk, financial risk and legal risk are key risks in the public-private relationship. Some political risks are currency inconvertibility and transfer restriction (CI/TR) Expropriation, Breach of contract, Political violence, Legal, regulatory, and bureaucratic risks. The respondents were asked to indicate their perception by using likelihood functions from “extremely low” to “extremely high”.

## 1.1 NEED FOR THE STUDY

- The Ministry of Statistics and Programmed Implementation, Government of India has reported
- The report has to out of 782 construction projects in India monitored by it,
- A total of 215 projects are delayed with the time over-run ranging from 1 to 61 months.
- The primary causes which are noted are delay in tendering and contractual issues.
- On average around 26 percent of construction projects are failed or delayed due to the risks in construction contracts.
- Hence there is a need for risk management in construction contracts to reduce delay in the construction projects.to find out the risk and to provide proper mitigation measures for overcome the issues is the basic need of this study.

## 2 LITERATURE REVIEW

**Patrick X.W. Zou (2010)** This paper discussed that the purpose of ppp is to develop a life cycle risk management framework. The infrastructure projects that lead to the realization of the value for money and balance of interests between public and end users. The ppp arrangements have been used in different sectors such as transport, technology, water, prisons,

health, welfare, and urban regeneration. It may be an extensive as privatizing facilities and services, or may be an simply obtaining management or financing techniques from the private sector as PPP arrangements are project specific and dependent on many factors such as public and private partners' skills, capabilities, limitations Each participant brings something of value to the partnership; Sharing of risks and responsibilities for the outcomes or activities between parties involved, is essential The financial risk requiring analysis at feasibility study stage and a risk management mechanism should be developed to monitor this risk.

**BelizOzorhona (2015)** This paper identified the PPP is one of the most widely used means of financing large-scale public projects. The PPP agreements involve public and private sector were resources and risks are appropriately allocated. There has been a vast amount of research on the PPPs recently focusing on different aspects including the financing, critical success factors, risks, and concession periods. PPPs bring a number of benefits such as efficient use of resources, reduction in project costs and durations, and increase in the quality of public services. Depending on the complexity of the projects and the procurement process, Public private partnership inherit a high number of risks. In this research is to investigate the risk management process in a Public private partnership project. This paper first identifies the risks in this project, then presents the risk analysis, and finally mentions the risk response strategies. This paper provides recommendations on how to better allocate risks among the participants of a PPP scheme. Then the study suggest that the most significant risks are the political, legal and regulatory, financial, and construction risks.

**Adama Johnathan, fabunmi foluke et al (2016)** This study examines risk management in Public Private Partnership (PPP) projects carried out in the federal capital city of Nigeria. A questionnaire survey approached was adopted in acquiring the data required for the analysis. A total of 155 copies of questionnaire were administered. Both parties are preferred to share the economic risks and market risks. This findings indicate that PPP is a good approach in building construction projects and also, the findings show that adequate allocation of risk is

necessary for the smooth implementation of any PPP model. In This paper provides investors a better understanding of risk preferences among the stakeholders in the Nigerian construction industry so that they could better adjust and plan their strategies the specific risk factors achieve better value for money when executing PPP projects.

**Shaunak Singh Monga (2018)** This paper briefly discussed that The Public Private Partnerships (PPPs) have emerged as a very feasible, reliable, viable, and growing mode of creating infrastructure for developing country like India. The public sector plays a dominant role in building of infrastructure, the PPPs have enabled us to channelize private sector investment in infrastructure. In India is still starved of infrastructure required for high level development, and the opportunities for the growth of joint venture between both the sectors are huge and desirable. The anticipated percentage of participation the private sector is twelfth plan in much higher than the earlier plans. The Indian Public private partnership scenario as it stands an optimistic picture. Some of the major challenges is to relate the regulation and availability of finance for private sectors. The Government of India fully aware of the benefits that such partnerships can offer to the country and has been taking steps to remove some of these problems. thus the public and private sectors has certain strategies to overcome the issues in construction contract.

**Ulrika badenfelt (2011)** The paper examines to increase our understanding of collective outcomes by exploring both micro and macro level strategies for dealing with problems in incomplete contracts. Case studies regarding Swedish inter organizational from both construction and IT industries are used as examples. Investigation of those projects are done using semi-structured interviews in which the data were categorized using qualitative analysis method then the selection of financial incentives and type of change clauses are examined in empirical analysis. Finally the results suggest that it identified four strategies for incomplete contract in construction industries such as financial incentives, change clauses, contract duration and long-term relationships.

## 2.1 METHODOLOGY

With reference of literature review and experts interview the risk factors identified are to be analyzed by spss analysis software. The proper framework of risk matrix will be provided for identification of major risk in public private partnership project and also provided the mitigation measures to overcome the risk.

### METHODOLOGY

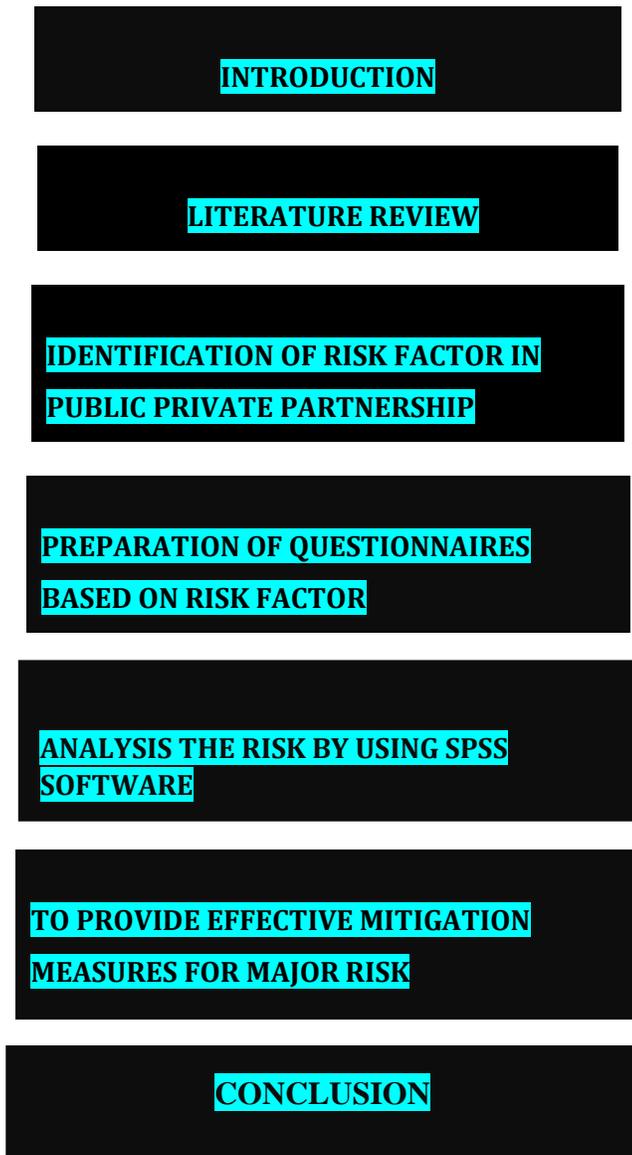


Chart 1 Flow chart methodology

Chart 1 Flow chart methodology

## 2.2 ANALYSIS AND RESULTS

There are five risk are Planning and designing risk, Construction risk, financial risk, Environmental risk, and Political risk. These risks are identified by the expert interview. Questionnaire survey from experts has been conducted to get the value of probability and severity parameters of risks. The **construction** and **financial risk** plays the major role to affect the construction contract. The risk assessment matrix were identified the main objective of risk matrix tool is getting a RRN (Risk Rating Number) which is obtained by two factors viz.

### 2.2.1 OVERALL PERCENTAGE OF RISK IN PPP

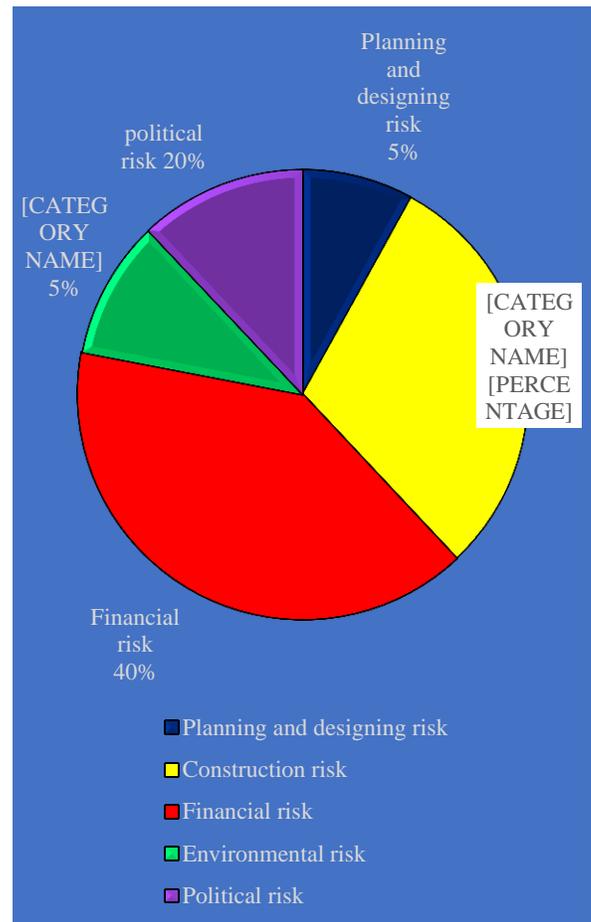


Chart 2 overall percentage of risk

**2.2.2 MITIGATION MEASURES FOR RISK FACTOR  
BY USING FEDIC BOOK**

S.N	RISK FACTOR	MITIGATION
1	<b>DELAY OF PAYMENT</b>	Under the clause 14.8 says the contractor shall be entitled to receive financing charges compounded monthly on an amount, unpaid during the period of delay.
2	<b>COST OVERRUN</b>	Under the clause 8.2 state that to allocate adequate contingency fund and sufficient time and to develops good monitoring and controlling system.
3	<b>CHANGES IN GOVERNMENT REGULATION AND LAWS</b>	Clause 13.7 states that the contractor shall give notice to the engineer. Then the contractor rise to claim the law but the notice shall not be later than 28 days after the law as passed.
4	<b>LACK OF CONTRACTOR EXPERIENCE</b>	Clause 4.3 says if the contractors representative is to be temporarily absent from the site during the execution of works a suitable replacement person shall be appointed.
5	<b>IMPROPER</b>	Under the clause

	<b>DOCUMENTATION</b>	1.5 says if an ambiguity or discrepancy is found in document the engineer has authority to issue any instruction with he considers necessity to resolve an ambiguity or discrepancy.
6	<b>POOR FINANCIAL STRENGTH</b>	The clause 13.8 says in case of price adjustment the amount will be added or deducted determined by the formulae <b><math>P_n = a + b L_n/L_o + c E_n/E_o + d M_n/M_o</math></b>
7	<b>IMPROPER PROJECT COST ESTIMATION IN TENDER QUANTITIES</b>	According to clause 1.8, if there is any error in estimation one party shall promptly give notice to the other party.
8	<b>FORCE MAJEURE</b>	Under the clause 19.4 states that the contractor shall be entitled a subject to extension of time for such delay if completion is or it will be delayed then the engineer has to determine these matter.
9	<b>SAFETY PROCEDURE</b>	Clause 4.8 says if the contractor is sharing occupation onsite

		with others. It may be appropriate for him to provide some of the listed items in these circumstance and the employer obligation should be specified.
10	<b>DESIGN CHANGES BY OWNER</b>	Under the clause 4.6 says the design manager should be adequately updated, highlighted and also capturing all design changes on a register.
11	<b>POLITICAL VIOLENCE</b>	Clause 18.1 says get the site ensured to avoid political violence.

### 3. CONCLUSION

This study involves identification of risk factor in ppp (public private partnership) project located in Tamil Nadu. There are five different type of risk were identified are 1, planning and designing, 2, construction 3, financial 4, environmental 5, political risk mainly Financial and Construction risk pays the major role to affect construction. Out of 100 samples 70 samples were responded by engineer and contractor and totally 46 risk factors are identified with the help of expert interview. Finally to get the value of probability and severity parameters of risk then analysis the risk using SPSS analysis software it is very useful for survey companies, marketing organizations, health researchers, government entities and data miners hence to find the major risk factor by using spss analysis software. The risk assessment matrix were used to identify critical factor in a pictorial form. The probability has been rated as low, very low, medium, high and very high and this study involves developing mitigation measures for major risk with the help of guidelines

provided in “FEDIC RED BOOK” this will help to manage the construction risk It is a tool that plays an important role in Risk management and helps to track issues and problems as they arise.

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