

Critical Review on Risk Management in PPP Based Infrastructure Projects

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Abstract—Infrastructure has been an inspiring strength for economic growth and development in India. However, the Infrastructure in India is still in the developing phase. In context of the PPP based infrastructure projects, it is generally observed that such projects cannot meet the target and requirements as the Indian companies lack scientific management technology to challenge the risks. The purpose of this research is to distinguish the major problems of risk management in the Indian companies and seek for its resolutions. This paper gives a brief overview of framework for risk management in PPP based infrastructure sector through critical literature review, finding the critical risks associated with the infrastructure projects as it is very essential to take decision regarding the risk management in the infrastructure projects by the decision makers.

Index Terms— Risk Management, PPP, Infrastructure Projects.

I. INTRODUCTION

No project is risk free. However, the important of work and capital involved in the infrastructure projects leads to complex risk. Also the uncertainties and dynamics of each step in the public private partnership infrastructure projects demand for laborious risk management at various phases, from pre-bid evaluation to contract closure. As a fact risk cannot be disregarded but It can be managed, minimized, shared, transferred or accepted. The construction projects are generally multifarious and have often with significant financial statement, and this necessitates lessening the risks associated should be an importance for each project manager. The proposed work comprises an application of risk management during the whole life cycle of infrastructure projects.

The function of construction industry is very uncertain in terms of environmental factors where circumstances can be strictly rigid due to the complexity of each project, delay due to lacking in resources, supervision and poor planning, facing technical related issues, difficulty in dealing with the personality of the stakeholders involved in PPP mode project. Barring 3 M's i.e. man, material and money, PPP project depends on government policies and public interest. This makes risk management essential for successful project. However, it should be emphasized that risk management is not a tool which ensures success but rather a tool which promotes increasing probability of accomplishing the chosen target. Risk management, is therefore, a proactive rather than a reactive concept. With the growth in Indian economy, major infrastructure development initiatives have been undertaken by the Government at central, state and local body levels. These projects are more susceptible to approval delays because they require various statutory and non-statutory uncertainties and clearances during the development stage and project specific approvals throughout the implementation stage. The recognized risks will benefit the developers and project managers of the infrastructure projects. The planning, scheduling, organizing, controlling of such infrastructural projects will be more efficient & effective along with known risks. Infrastructure projects taking into account influence of these risks and how to mitigate the same.

II. NEED AND OBJECTIVE OF RESEARCH

Construction industry has several complications in its nature because it consists of large number of groups including clients, contractors, consultants, regulators and many others. PPP projects writhe from many difficulties and multifarious concerns in performance because of several reasons and factors. Thus, it is very important to recognize and to evaluate the effect of risk factors in Indian infrastructure projects. The practices regarding with time, cost, project owner gratification will be analyzed in order to know the foremost practical problems of projects performance and then to express recommendations to improve performance.

Various literature based research works are carried out on PPP based infrastructure projects. The main objective of this paper review is to identify and evaluate the influence of risk factors in Indian infrastructure projects for further study.

III. METHODOLOGY

The review of related literature can be divided in two stages i.e. Primary literature review and Secondary literature review. Primary literature review related to Indian Infrastructure projects includes number of journals, articles, theses, magazines, research papers Secondary literature review was carried out by relating various risk factors to Indian infrastructure projects.

The primary literature review of the papers related to Indian infrastructure projects are shown as follows.

Craciun (2011) conducted survey on recent economic calamity had sparked a new consideration about the risks that infrastructure projects were unprotected to. With the use of numerous typologies identified along the last thirty years by several

authors, looking both at project finance funding procedures and to more traditional direct investment framework, in that current financial bedlam on global capital markets (2008 - 2010) reveals a new type of risk financier related. [15]

Visvanathan et al. (2012) evaluated that with the development in Indian economy, major infrastructure development initiatives had been undertaken by the Governments at the central, state and local body levels. Transportation infrastructure projects recently undertaken in India had experienced large cost and time overruns as they were more vulnerable to approval delays because they require various statutory and non-statutory approvals and clearance. [1]

Ngoma et al. (2014) specified that as per research carried out in Zambia, like many other countries, had embraced public private partnerships (PPPs) as a project delivery method. The country faces financial restrictions, which has affected the conservation and provision of new infrastructures to be a challenge. [21]

John Black (2014) explained the role of the state in infrastructure development and distribution and why have Australian state governments been keen to embrace the PPP model of procurement for roads, bridges and tunnels. It was concluded about toll road traffic risks. [10]

Jayasudha et al. (2014) indicated that Construction of bridge projects were initiated in complex and dynamic problems resulting in circumstances of high hesitation and risk, which were compounded by demanding time and cost constraints. [11]

Chris Harty et al. (2014) found that large multifaceted projects should be accomplished in order to lessen uncertainty and increase certainty is not new. They questioned both assumptions by addressing a more fundamental question about the role of knowledge in recent risk management performs. Investigations into the predominant methodologies to risk management in huge infrastructure and construction projects disclose their expectations about knowledge and they deliberated the consequences those had for project and construction management. [4]

M. S. Khan et al. (2015) explained that Government both at National level & State level absorbed to implement their Projects through PPP Model which improves the expected economic growth. PPP in future is like a shining star for India having some challenges like limpidity, time concern objects, deficiency of current technology and machinery, project costing, use of materials etc. Which occasionally make PPP projects more difficult in sense of quality measurement. [5]

Buckberg et al. (2015) examined the potential taxpayer reimbursements of public-private partnerships (PPPs) in infrastructure investment, including advanced quality per dollar and faster project delivery, depends on allotting project risks to the carousing best able to manage them. It presents three substitute incentive structures for PPP contracts that can possibly benefit both public sector sponsors, by delivering higher quality per dollar, and private investors by producing attractive returns. [8]

Yadav et al. (2015) indicated that infrastructure projects were going through a lot of technical hitches, mostly connected with non-standard traditional financing in country. The risk management outline proposed by this project will be easier to put on than others. It integrates the findings from this research and delivers step-by-step guidelines for foreign companies who intend to invest in India's infrastructure projects in the future. It is suggested that to improve the communication and management links between different levels of government. [23]

Yadav et al. (2015) conducted research on PPP indicated that an objective, reliable, and practical risk assessment model for PPP projects and a reasonable risk distribution mechanism among different parties was dangerous to the efficacious application of these PPP projects. [17]

Ruchi Sharma (2015) indicated that PPPs as an important tool for constructing an augmented and larger chain of infrastructure investments, that controls the infrastructure insufficiency in the country. It has been reviewed that India's

Finance Minister and Planning Commission Deputy Chairperson had both emphasized that capitalizing in infrastructure can be responsible for vital development of road networks and this will result into making it a world class service catering to the needs of the rapidly growing business and economy. [19]

Jagdale (2016) in the survey conducted tagged the importance of Public Private Partnerships as one of the modern and successful means of success for building and rebuilding infrastructure framework in developed and developing countries. PPP projects right from the inception have the risk of failure. Hence, they attempted to prepare general framework for risk management identifying the risk events and finally risk mitigation measures will be done. [20]

Tomja et al. (2016) evaluated that strategy makers view Public Private Partnerships as a way of reducing the governments financial burden. But government guarantees provided as a part of the privatization process often expose governments to substantial risk which is rarely reflected on the governments balance sheet. It was determined that the use of integrated risk management systems will significantly improve governments capability to manage and control risk. [9]

Makovšek et al. (2016) stated that there was a drive in the direction of delivered and operated public infrastructure through public-private partnerships as opposed to traditional approaches. The consequence of the finding is that the efficiency gains from a PPP need to be much sophisticated than previously understood to deliver better value for money than under a traditional approach. [7]

Carbonara et al. conducted Delphi survey among a list of experts, they provided a recommendation for both public and private parties in defining a list of substantial risks in PPP motorway projects, preparing a practical risk allocation framework to identify the most suitable mitigation strategies. [15]

The secondary literature review related to various risk to Indian infrastructure projects are discussed as follows.

Bing et al. (2001) explained that the application of Public Private Partnerships (PPPs) had become progressively important in the enlargement and delivery of public projects and developed a framework to evaluate and manage risk factors dangerous to PPPs that affect construction projects. The better understanding of project risks by all PPP participants, a three tier structure of risks were proposed for the analysis of risk factors in PPP projects. This structure was made up of micro, macro and meson (level) risks. [13]

Pohle et al. (2007) reviewed that the public sector aims to increase the efficiency of public procurement and services through implementing Public Private Partnerships (PPPs). The development is driven by challenging requirements: on one hand it demands

for high quality service to maintain the attractiveness for industry and dwellers and on the other hand it focuses on budget constraints. A methodical assessment tool was utilized for systematically analyzing and evaluating the risk potential to ensure the optimal distribution of risk among the PPP partners and the long-term economic efficiency of PPP. [22]

Gupta et al. (2013) were evaluated that Private sector participation and private investment had become the mainstay of the Government of India's policy toward infrastructural development. The success of the ongoing twelfth five-year plan critically depends on the success of Public Private Partnerships (PPPs) in infrastructure. The major risk factors of ongoing PPP highway projects (under NHAI and MPRDC) had been identified by questionnaire survey. Through findings, it is suggested to set up Regulator to the PPP Road projects which could oversee the fast changing overall socio economic environment and suggest measures to lessen risk and create win-win situation to all stakeholders. [3]

Ezeldin et al. (2013) reviewed that public Private Partnerships (PPP) started to be used in Egypt and there were several projects under study for future implementation. The two key success factors for PPP projects are a proper risk allocation and a suitable contract so that the risks are adequately covered and are properly assigned to the party who is the best at managing them. The results of the survey showed that the top 26 risks. Finally, the top risks are compared to the critical risks obtained from previous studies conducted in China, India and Singapore. [1]

Rajkumar et al. (2013) introduced to PPP and a comprehensive review of literatures in regards to Public Private Partnership projects was included. They observed from contextual analyses and the literature studies were used to identify the critical factors influencing the infrastructure development projects under public private partnership organization. The data for this study will be gathered through a survey by a detailed questionnaire which consists of fifty critical factors that influence the infrastructure development projects under Public Private Partnership. The most frequent factors are Change in law, Delay in Project Approval and Permits, Land Acquisition & Operation Cost Overrun. [12]

Rajkumar et al. (2016) studied the major critical success factors in public private partnership in India: Their scope of the study was to find which factor influences the public private partnership in infrastructure development in India. Hence, for collecting data, the researcher provided a questionnaire to many construction companies. [18]

X.W. Zou et al. Stated that Managing risks in construction projects had been recognized as a very important management process in order to achieve the project objectives in terms of time, cost, quality, safety and environmental sustainability. They found that these risks spread through the whole project life cycle and many risks occur at more than one phase, with the construction stage as the riskiest phase, followed by the feasibility stage. It was concluded that clients, designers and government bodies must work cooperatively from the feasibility phase onwards to address potential risks in time, and contractors and subcontractors with robust construction and management knowledge must be employed early to make sound preparation for carrying out safe, efficient and quality construction activities. [6]

Rashed explained that infrastructure was the key for sustained economic growth as inadequate infrastructure can limit the growth prospect of an economy. Worldwide governments were promoted Public Private Partnership (PPP) for implementing Private Infrastructure Projects (PIP) to ensure greater efficiency and possible cost reductions with the involvement of private sector. For developing countries, it was important to allocate infrastructure project risks efficiently and limit private agent 's ability to shift additional losses to the government. [14]

IV. MAJOR FINDINGS

The entrepreneurs and investors have to deal with all kinds of risks and still there is no proper risk management technique and still if we don't determine the solution for this the investors from Infrastructure will be fatigued. Such disturbance will influence the correct investment decision making. The Indian infrastructure industry changes their business environment which produces huge amount of new risks in industry. Hence it is required for Indian Infrastructure projects to manage the risks in a more methodical and structured way. Therefore, it is important to identify how to integrate risk management and how to make the effective use of the risk management into Indian Infrastructure, for improving the Indian Infrastructure industry competitive edge and persist in such a transformational period. The most frequent factors are Change in law, Delay in Project Approval and Permits, Land Acquisition & Operation Cost Overrun. PPP needs to be reinterpreted much formerly to deliver better value for money than following a traditional approach. The use of integrated risk management systems will greatly improve governments' ability to manage and control risk.

V. CONCLUSION

Indian Infrastructure sector is one of the most vital sector in the country. Be it employment, activities or the contribution towards the growth of country, the Infrastructure sector in India gives away a virtuous part to the government as well as the commercial sector. Control the identified bouts effectively, require further research. Hence it is important to identify how to participate risk management and how to make the effective use of the risk management into Indian Infrastructure Projects, for enhancing the Indian Infrastructure sector economical edge and survive in such a transformational period.

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