

# Identification of Risk of Different Road Projects in Infrastructure Segment

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## *Abstract –*

Growth is being substantial of the economic and manufacturing sectors across countries like India in comparison to Infrastructure projects overall .Infrastructure lacking in energy, road, port, aviation along with health infrastructure needs serious improvement else it will cost heavily for the economic development. There is a huge scope for investments in Infrastructure segment which can be restore the need through foreign and Indian national market. India as country is lagging at initiation and execution of infrastructure projects which causes various risk associated in form issues as a result of huge gap in system, market fluctuations and dynamic cultural problems. It is imperative from the foreign and domestic investor point of view to spot it out and manage risks associated with Investment in Infrastructure projects. To sort it is relevant to highlight the risk assessment relating to infrastructure segment which come in country like India.

*Keywords: Infrastructure Projects, Risk Assessment, Infrastructure Segment*

## **I. INRODUCTION**

India as a country has shown great growth over the decades, so it attracts foreign nationals as natives' investors. Many reasons outlined below for the aforesaid statement:-

- (a) India being treated as safest country for investment in major international events.
- (b) Reasonable manpower with accessibility of those.
- (c) Socioeconomic infrastructure revolution is being dynamic in recent years.
- (d) Economy of Republic of India shows rapid growth over post decades on a median annual rate of 5%.

On examining the opportunities in India for engineering and construction industry in India which is absolutely right in the good sense as India is topping the chart one of the fastest growing economies in the world. There are opportunities and challenges which overseas participants face

during their investment in Infrastructure projects in India. It is hard to find or minimal restriction on Foreign direct Investment (FDI) for Infrastructure projects. Tax holidays are being allowed for developers of most types of Infrastructure projects. Opening of Infrastructure sector through PPP's, one of the fastest growing economy and growth expected further is 7.5%.Overall the opportunity to develop significant growth in business in India looks promising with strong local partners.

## **II. LITERATURE REVIEW**

Identification consists of listing and categorizing of risk which is associated with infrastructure projects and analysis of their sources with reliability. Majorly two classes of rises in infrastructure projects are being considered to be lethal one is, special project risks and the other one is country risk.

There are risks like delay in approval cost conversion, financial failure, legal issues in land acquisition, enforceability of contracts, environmental risk and technical failure so on. The risk interpretation among corporation in infrastructure segment may vary and they interpreted and place those risks differently. Danger identification approaches are commissioned in this paper. The approach is vouch safe which as a part of interview process for a better reach and key tools are being used to analyse and categorized the dangers which can give better results later on.

Some of the important articles pertain to risk associated with various infrastructure projects.

Beliz Ozorhon, Sevilan Demirlesen, Department of Civil Engineering Istanbul in their study assessed that PPP arrangement significantly and largely risks which hit infrastructure segments are financial, legal regulatory and political engineering, safety, quality assurance, demand and revenue so on. The finding of the study is to develop a starter to increase the efficiency of PPP arrangements to control risk in an effective manner.

Laila M Khodeir and Mohammad Nabawy in Sep,19 in their assessment the risk which is registered as the output of the process. The register of risk reveals that the results are obtained from the checklist. The results derived are based on the expert's response on risk factors which are ranked based on most agreed percentage.

Ashwin R Patel and Keshav B Rao Aug, 2019 found in their research article which was published on the basis of case study on Pune metro that the firms to be maintained a common discussion in construction through which risk can be properly ascertained. Team is efficient and has the ability to adjudge the contract and the site details understand risk. Identification of risk at primary stage is to take necessary steps at the time of emergency.

Kinnaresh Patel August,2013 research article published in American Journal of Engineering reveals that in context of Indian construction industry which includes financial risk, construction risk and demand production risk. Due to informal approach being more practised in

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Indian Infrastructure companies so it fall in to disaster in end. There is absolute indeed a systematic approach in identification of risk in a formal way to be adopted before analysing risk pattern to thoroughly understand and effectively closure to avoid any future disruption.

Anil K Gupta, Dr M K Trivedi and Dr R Kansal, published in International Journal of Science Technology and Environment, that the crucial factor is to identify risk in BOT projects which are more prone to it. PPP mode suffers heavy risk during its life time. Thus project manager has to empowered take action and negotiate the ailing projects to safeguard risk associated with the projects and can be a win-win situation to all stake holders associated with the projects.

Sevilay Demirlesen Fakir Gebze Technical university reveals in his article that the most significant risk associated with the projects are legal, regulatory and political and engineering and construction risk, their probability of occurrences are relatively higher hence they are marked as high risk level. Hence to curtail risk many strategies are developed to control risks in very effective and efficient manner which the study guides professional who are involved in PPP based projects.

### III. OBJECTIVE OF THE STUDY

The objective of the study is to identification of risk in different projects in Infrastructure Finance

1. To analyse the risk associated especially with BOT projects (Build Own Transfer)
2. To analyze and evaluate the risk categorically based on rating which are critical in nature.

### IV. METHODOLOGY

#### A. Adoption of procedure: -

The study of risk associated with infrastructure project we have incorporated five stages out the literature review which was done earlier, which has been studied earlier, especially in BOT project the risks are being associated with many infrastructure project. Appended risk has found to be major and occurs at different stages of the projects from planning till execution of project and the intensity associated with each stages in the infrastructure projects.

- Approval risk
- Contract risk
- Cost overrun risk
- Law risk
- Dispatch constrain risk

The above mentioned risks are being generated and picked on the basis of the data published the different journals which throws some lights on the subject matter and past experience of

the BOT project in infrastructure sector segment involved.

On further evaluating of above risks in detail a detailed survey with the help of questionnaires to subject related experts was conducted to evaluate the criticality and complexity provide detailed information to supplement that obtained from the survey.

#### B. Conducted Survey - Risks rating in degree of criticality

So as to achieve the reliable results from the survey the six degree rating system has been adopted in which the risks are rated varying from "Not applicable" to "Very much critical" in degree of criticality ranging "1 to 6"

| Rating | Risk criticality       |
|--------|------------------------|
| 1      | Not applicable         |
| 2      | Not at all critical    |
| 3      | Only slightly critical |
| 4      | Critical               |
| 5      | Very critical          |
| 6      | Very much critical     |

#### C. Collection of Data

- i) Data collection we have manage to pick 11 risks associated with it and meticulous effort is being put to prepare questionnaire for the same to which the respondents had to reply accordingly.
- ii) This survey is being conducted to mainly focused on the infrastructure sector and further concentrated on following industries under BOT model, a) Toll road project b) Port & Harbour projects c) Telecommunication d) Rural Electrification and Aviation and ancillary projects,
- iii) Questionnaire has been sent to 30 respondents from industry specialist and academicians who

have professional knowledge on subject matter, who are also engaged with different positions such as Project managers, Construction managers, site engineers and professors of the engineering faculty.

## **V. EMPIRICAL RESULT**

### **A. Data analysis**

Utmost care has been taken for the respondents to understand the terms to validate their feedback and interpret it in the same manner for a conclusive result. Data are collected from

Proper care has taken while considering data's in prescribed format and its pattern to restrict loss of data's during the activity.

| Critical risk↓                    | Not considered | Nil Critical | Minimal Critical | Critical | Highly critical | Very highly critical | Score | Ranking |
|-----------------------------------|----------------|--------------|------------------|----------|-----------------|----------------------|-------|---------|
| Score →                           | 1              | 2            | 3                | 4        | 5               | 6                    |       |         |
| Deferred approval                 | 0              | I            | II               | IV       | X               | XIII                 | 152   | 1       |
| Local law changes                 | 0              | I            | IV               | VII      | VI              | XII                  | 144   | 2       |
| Cost overrun                      | I              | III          | II               | V        | IX              | X                    | 138   | 3       |
| Lack of dispatch                  | 0              | V            | VII              | I        | X               | VII                  | 127   | 4       |
| Compensation and Land Acquisition | I              | II           | X                | III      | VIII            | VI                   | 123   | 5       |
| Contracts enforceability          | 0              | VII          | VIII             | VI       | IV              | V                    | 112   | 6       |
| Schedule of Construction          | I              | VI           | XIV              | V        | VI              | I                    | 96    | 7       |
| Financial closure                 | V              | XI           | IX               | III      | II              | 0                    | 76    | 8       |
| Adjustments in tariffs            | VI             | XV           | IV               | III      | I               | I                    | 71    | 9       |
| Environmental risk                | VII            | XIV          | V                | III      | I               | 0                    | 63    | 10      |
| Conversion and Exchange rate      | XII            | VIII         | IX               | I        | 0               | 0                    | 59    | 11      |

C. Forming valid conclusions:

Data's which are being analysed, the conclusion is derived. The respondents had to give the ratings are in the range of 1 to 6 assigned to it. The averages of all respondents were calculated and the rankings were sought attached to the risks. The risks with the highest mean score would be ranked 1 to 6.

**VI. CONCLUSIONS**

From the above tabular format overall risks occurring in the infrastructure projects are being highlighted and sorted. It has been observed that these risks use to occur at different stages of construction project. It is recommended further evaluate these risks for further value addition to this.

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