

# “CAUSES OF DELAY AND ITS EFFECT IN BUILDING CONSTRUCTION PROJECT”

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**Abstract:** It has been a general observation that the real estate construction projects get delayed and thus have substantial time over-runs. Currently, the Building construction sector contribute share of around 6.0 % in the growth of India's GDP in 2018 which is 20% growth from the 2005-2006. Such is the gravity of the problem that delays alone cause shelving of major projects even before they are actually executed. Real estate projects in India are currently worth around US \$135 Billion in 2019. Also a huge number of these projects are getting delayed invariably. This is indicative of the fact that the causes of delays and their implications on the cost and time overruns warrant the need of studying. This study covers the various causes of delays in detail, as well as delays which are caused at various stages of the project. The study basically carries a qualitative and quantitative assessment of the causes of the delays. It establishes a link to the analysis of the delays in order to quantify the severity of each type of delay with respect to the time over run.

**Keywords:** construction management, construction delay, Relative Important Index.

## 1. INTRODUCTION

Delays are an integral part of any construction project; they may be insignificant or otherwise. However considering the Indian scenario, the later i.e. the significant delays are almost universally associated with the word 'delay'. India being a rapidly developing country needs an equally rapidly developing construction project. The constructional development is indeed the backbone of the country's economic progress and constitutes a great extent of the fiscal spending. India is no different to this exception and the government has duly increased spending on the construction projects. Hence there is a need of concentrating on the causes of the delays. The various types of delays, caused in the various stages of work need to be studied. There has been a great deal of study in this respect. However, an in depth study about the various causes of delays occurring at the different stages of the project life cycle has seldom been carried out. The aim at carrying out a quantitative study of the various causes of delays and trying to rank them in general based on some identified parameters. Also a brief sector wise study highlighting the most prevalent causes of delays in that particular sector would also be carried out.

## 2 TYPES OF DELAY

There are four basic ways to categorize type of delays:

- A. Critical or noncritical
- B. Excusable or non-excusable
- C. Compensable or non-compensable
- D. Concurrent or non-concurrent

### 3 OBJECTIVES

The main objectives of this study basically as follows:

1. Identify the fundamentals of Relative Important Index.(RII)
2. Application of RII in various complex activities of building construction project by considering all tangible and intangible factors providing a comparative statement.
3. To study the differences in perceptions of the two major parties in any building constructions project namely owners and contractors.
4. To give the rating to the causes of delay
5. To find out the critical causes.

The ranking of the projects would help the project management to concentrate more on how to avoid the most salient causes of delays. The study would also give us an idea about the stages in a project which are most likely to get delayed.

### 4 SCOPE

The scope of the project basically consists of achieving the objectives which are mentioned in the previous section. However this project is one which is done for academic reasons and hence its scope is limited in a sense to roughly understand the various causes of delays occurring in the building construction project in general. We would be collecting the data through a questionnaire form and hence the ranking of causes would be done based on this data. The questionnaire study is one in which the respondents have expressed their own views and hence these may not be totally accurate. But the survey would help us in ranking the causes of delays. However the results may vary with the number of respondents. It is helpful to project manager to identify effects of critical causes of delays in building construction project.

### 5 PROBLEM STATEMENTS

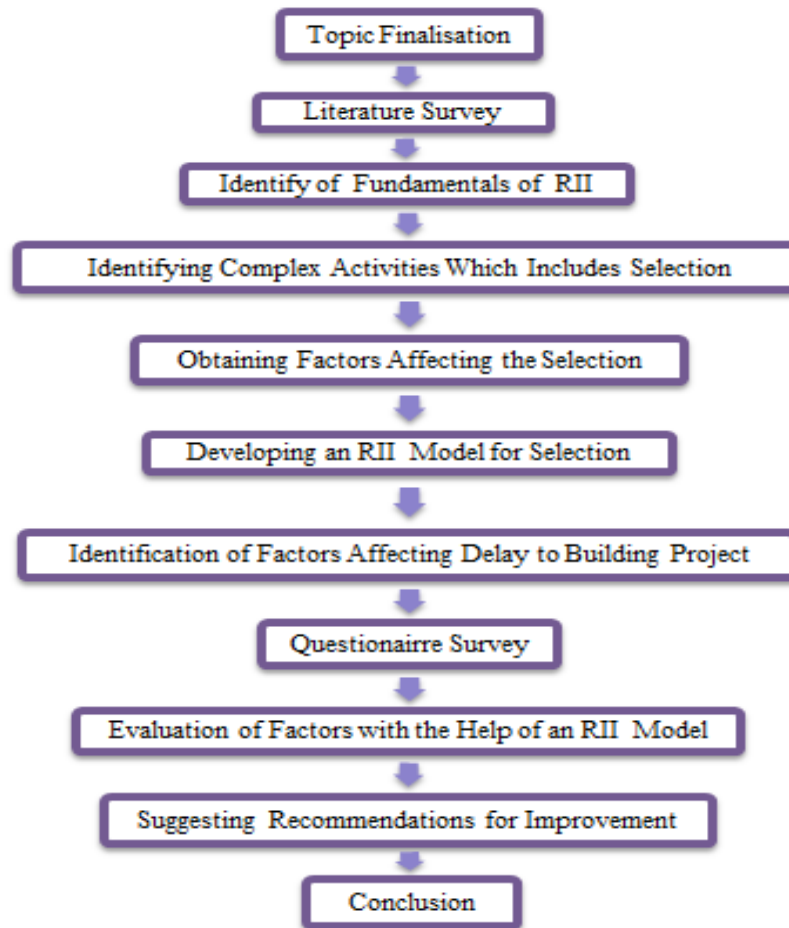
Most of the construction projects in India get delayed because of one reason or other. This causes time overrun, cost overrun, and customer dissatisfaction and creates dispute between owner & contractor. A lot of incomplete projects are held as inventory due to such problems. Construction industry has a great hand for economic growth of country but the product has not been delivered as it should be. It has an adverse impact on FDI also, due to such image of Indian construction industry.

### 6 LIMITATIONS

Then study has been carried out for the completion of Post-Graduation in Construction Management from Sandip University and as such has some limitations. These are mentioned as follows:

- a. The study is primarily based on questionnaire analysis and hence the feedback from respondents. However the views of the respondents can be inaccurate.
- b. The case study was conducted from information available from various sources such media reports, journals, and internet sources. No information could be gathered from personnel working on actual project.

## 7 METHODOLOGY



**Figure 1. Flow Chart of Project Work**

## 8 DATA COLLECTION

For the purpose of data collection, we have carried out a survey of building projects, which are in various stages of completion. This data will be then assorted to present concise information regarding the survey. The objective of this project as mentioned earlier is to find out the implications of various different causes on the time and cost of the projects in form of overruns. Hence it would be of convenience for further analysis to categorize the various causes in form of 'groups'. This would make it possible to assign the effect on the overruns, caused by various 'groups', respectively.

The sources of data are as follows:

1. Collection of data through questionnaire survey.
2. The collection of data from scholarly articles, research papers and academic studies.
3. The collection of primary data from sources like Ministry of Statistics and Programme Implementation (MoSPI)
4. The collection of data from media reports.

## 9 ANALYSES

In this project work, the causes of delays would be analyzed by

**Relative Importance Index method (RII)**

Relative Importance Index method to determine the relative importance of the various causes and effects of delays. The same method is going to be adopted in this study within various groups (i.e. clients, consultants or contractors). The four-point scale ranged from 1 (not important) to 4 (extremely important) will be adopted and will be transformed to relative importance indices (RII) for each factor as follows:

$$\text{RII} = \text{Sum of weights (W1+W2+W3+.....+Wn)} / A*N$$

**Table 1. Summary of RII for various causes of delay (owner side)**

Sr. No.	Causes of delay	Relative Importance Index(RII)
1	Delay in progress payments	0.9167
2	Delay to furnish and deliver the site to the contractor	0.8333
3	Change orders during construction	0.4667
4	Late in revising and approving design documents	0.8500
5	Delay in approving drawings and sample materials	0.5333
6	Poor communication and coordination with other parties	0.8000
7	Slowness in decision making process	0.5833
8	Unavailability of incentives for contractor for finishing ahead of schedule	0.7833
9	Suspension of work	0.6000
10	Changes in material types and specifications during construction	0.7333
11	Delay in material delivery by the supplier	0.7167
12	Low productivity and efficiency of Equipment/labour of contractor	0.8167
13	Effects of political factor	0.6500
14	Impacts on environmental condition	0.5000

**Table2. Summary of RII for various causes of delay (contractor side)**

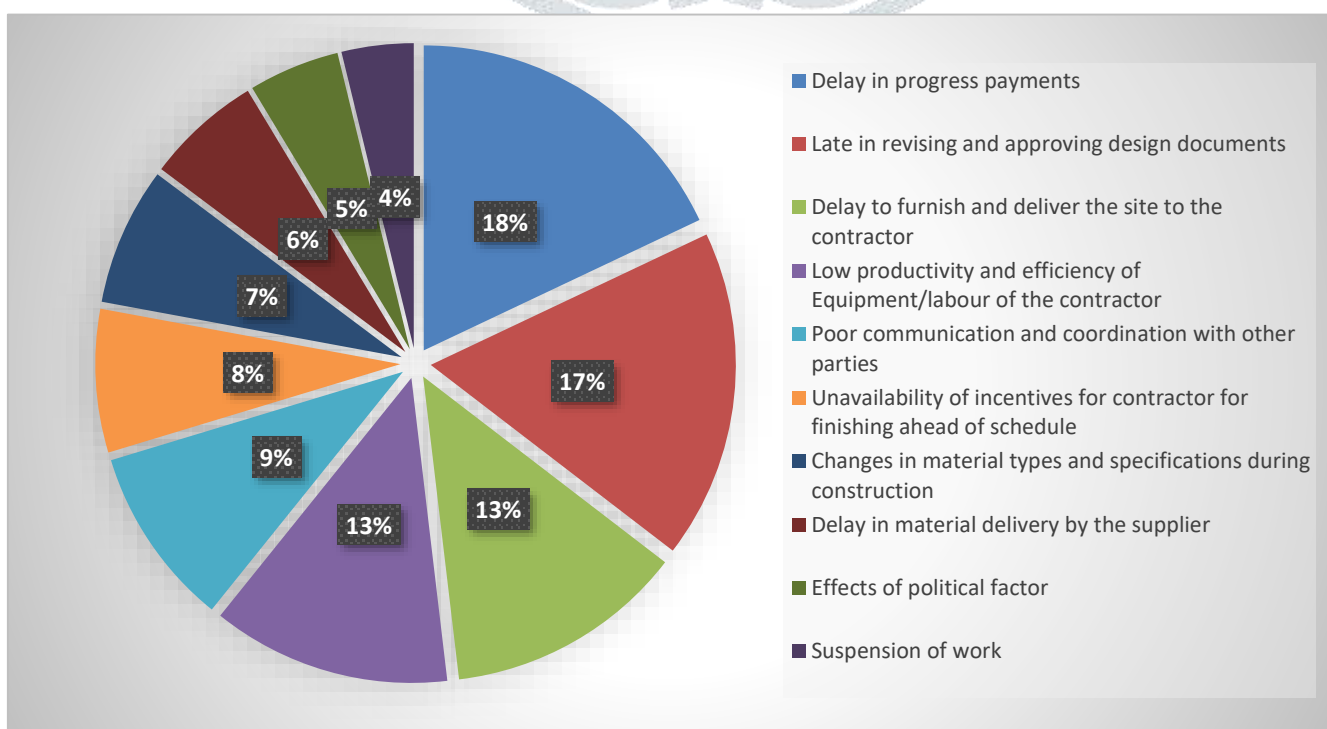
Sr. No.	Causes of delay	Relative Importance Index(RII)
1	Difficulties in financing project	0.8382
2	Rework due to errors during construction	0.5294
3	Conflicts with other parties (consultant & owner)	0.6618
4	Poor site management and supervision	0.8971
5	Poor communication and coordination with other parties	0.5588
6	Ineffective planning and scheduling of project	0.9118
7	Improper construction methods implemented	0.4853
8	Delay in material delivery	0.7206
9	Damage of sorted material while they are needed urgently	0.6176
10	Late procurement of materials	0.7500
11	Equipment breakdowns	0.4412
12	Shortage of equipment	0.6765
13	Low productivity and efficiency of Equipment	0.7059
14	Shortage of labours	0.7941
15	Low productivity level of labours	0.8088
16	Unavailability of utilities in site (such as,water electricity, telephone, etc.)	0.5882
17	Effect of social and cultural factors	0.7794

**Table 3. Ten most important causes of delay (owner side)**

Sr. No.	Causes of delay in Road construction projects	Relative Importance Index	Rank
1	Delay in progress payments	0.9167	1
2	Late in revising and approving design documents	0.8500	2
3	Delay to furnish and deliver the site to the contractor	0.8333	3
4	Low productivity and efficiency of Equipment/labour of contractor	0.8167	4
5	Poor communication and coordination with other parties	0.8000	5
6	Unavailability of incentives for contractor for finishing ahead of schedule	0.7833	6
7	Changes in material types and specifications during construction	0.7333	7
8	Delay in material delivery by the supplier	0.7167	8
9	Effects of political factor	0.6500	9
10	Suspension of work	0.6000	10

**Table 4. Ten most important causes of delay (contractor side)**

Sr. No.	Causes of delay in Road construction projects	Relative Importance Index	Rank
1	Ineffective planning and scheduling of project	0.9118	1
2	Poor site management and supervision	0.8971	2
3	Difficulties in financing project	0.8382	3
4	Low productivity level of labours	0.8088	4
5	Shortage of labours	0.7941	5
6	Effect of social and cultural factors	0.7794	6
7	Late procurement of materials	0.7500	7
8	Delay in material delivery	0.7206	8
9	Low productivity and efficiency of Equipment	0.7059	9
10	Shortage of equipment	0.6765	10

**Figure 1. Overall weightage of top ten most important causes of delay (owner side) in %**

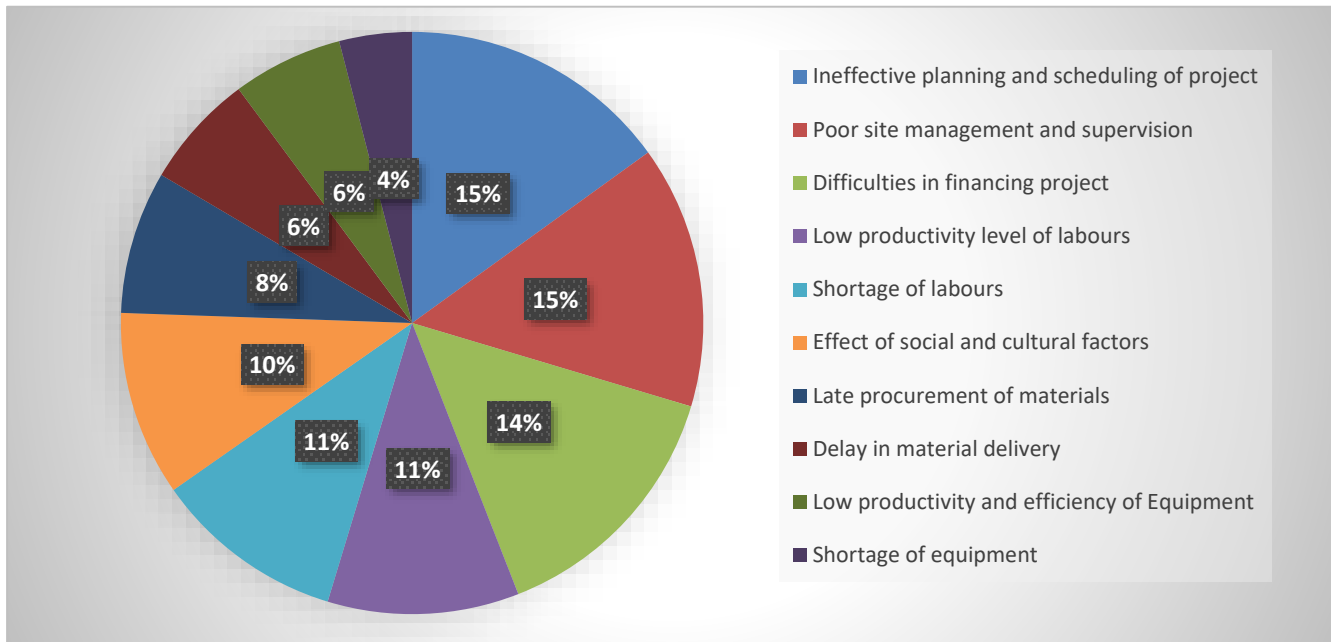


Figure 2. Overall weightage of top ten most important causes of delay (contractor side) in %

## 10. RESULT AND CONCLUSION

The all ranking indices explained earlier were used to rank delay causes from viewpoints of the contractors. The Relative Importance Index (RII) was computed for each cause to identify the most significant causes. From the ranking assigned to each cause of delays. It was possible to identify the most important factors or causes of delays in road construction industry. Many Indian contractors in some cases have not been able to cope up with this rapid change in the nature of the projects. However, there are some contracting firms which have adopted themselves to the changed scenario and this augurs well for the future. There should be frequent arrangement of training programmers to cope with the changing environment of construction industry to improve their managerial techniques. It should be mandatory for those contracting firms which are new in the infrastructure projects or mega projects. This training should be in coordination with firms which have successfully completed the infra projects in our country and also at abroad. In India unfortunately we have taken for granted that delays in transport projects are a certainty. This attitude within the construction fraternity must change. We have shining examples of projects like the Delhi metro, Hyderabad airport and Konkan railway which have been completed on time. This means that it is a question of will and determination which if present can achieve great results. With India well on the march to achieve greatness, it will be slowly but surely wake up to these challenges and emerge stronger. This study has highlighted factors and the need to reduce delays by owner and contractors. Owner should make progress in payments to contractors on time, recruit competent project manager and on time preparation and procurement of needed materials to the contractors. Contractors need to available source of finance during construction project, proper materials procurement.

## 11. RECOMMENDATION

The following points can be recommended to owners and contractors in order to minimize and control delay in road construction projects:

Owner's Should Give Special Attention to the Following Factors:

- Pay progress payment to the contractor on time because it impairs the contractor's ability to finance the work.
- Minimize change orders during construction to avoid delays.
- Avoid delay in reviewing and approving of design documents than the anticipated.
- Check for resources and capabilities before awarding the contract to the lowest bidder.

Contractors Should Consider the Following Factors:

- Shortage and low productivity of labor: enough number of labours should be assigned and motivated to improve productivity.
- Financial and cash flow problems: contractor should manage his financial resources and plan cash flow by utilizing progress payment.

- Planning and scheduling: they are continuing process during construction and match with the resources and time to develop the work to avoid cost overrun and disputes.
- Site management and supervision: administrative and technical staff should be assigned as soon as project is awarded to make arrangements to achieve completion within specified time with the required quality and estimated cost.

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