

## International Journal of Innovative Research in Science, Engineering and Technology

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# Time Delay and Cost Overrun in Construction Industry of India

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**ABSTRACT:** Now a day's delay and cost overruns are the major problems of any construction projects in India. These issues are causing the negative impact aftermath on the development of country prosperity and economic growth. To reduce these problems, the paper is aimed to discover the most influence factors causing the project delay and cost overruns and recommend the possible measures by investigating final report of project in three different regions in the country such as east region (West Bengal and Orissa State), south region (Karnataka and Tamilnadu State) and west region (Maharashtra and Gujarat State). Each region's quantitative data from the past studies was selected to analyses and recommend the effective measures. The reason of selecting three regions is to outline the compare analysis of delay reasons and to classify why different delay factors have different priority level of influence in project delay from one region to another region. The findings from the case studies exposed that the most influential factors in India are (1) Lack of planning and scheduling, (2) effective monitoring and feedback process, (3) Poor methods of construction, (4) underestimating of project cost, (5) delay in payment (6) improper site management (7) inadequate contractor experience are the most influential factors. This paper has also analyzed the average and least impact of the delay factors causing project delay and cost overruns in those regions.

**KEYWORDS:** Construction, Delay, Overrun, Management, Project,

## I. INTRODUCTION

Construction industry plays a vital role in contributing on national economy and overall development of country. The construction industry also impacts the rate of GDP and employment in country, and for this reason, the construction industry is considered to be resource for the economic growth of a country. Because of this construction industry need more material than other any industries in country. The cost overrun is one of the critical problem in now a days so requires a lot of research and exploration to overcome or reduce the delay and less variation in budget for the future projects. A cost overrun is defined as a cost rises or budget overrun, involves unexpected cost incurred in excess of the budget amount due to an underestimation of the actual cost budgeting of construction projects. Most construction projects in India are influenced by overrun in cost and delay in time.

## II. LITERATURE REVIEW

Many researchers have studied the reasons of and the factors affecting time delay and cost overrun in construction works. However, there is not such deep studies related with the time delay and cost overrun in the implementation of public infrastructure projects in India. This study aims at investigating the most influencing factors of construction work which are reason behind time delay and cost overrun of public infrastructure projects in India by scrutiny of final reports of some projects.

**Rathi et al.** studied different literatures related to cost overruns and its causes found that inaccurate estimates and design changes lead project to detain and also affect the cost at the time of construction. This will help the owner or agency to take decision regarding procurement of materials at correct time and complete the project within lapsed time

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**Amandin et al.** in their research on Construction Projects illustrated that when project costs are efficiently supervised while the other conditions kept constant, as construction project progresses, a proportionate increment in their costs or value is recorded. In addition, when construction project's expected or planned cost is increased, a simultaneous increase in their relative real cost must take place. However, though monitoring can efficiently reduce the project's cost overruns, the longer construction projects delay become the higher cost overruns.

**Alhomidan** made a survey of contractors' viewpoint was conducted to investigate the main reasons behind the cost overrun at the infrastructure projects in Saudi Arabia. A list of 41 factors of cost overrun causes was considered during his analysis. Among these factors, it was clearly seen that according to opinions of the working contractors the top causes of cost overrun in infrastructure projects in Saudi Arabia are internal administrative problems, delay of payments, language barrier between construction parties and delays in decision-taking.

**Mr. Singh's** research concluded that the main causes responsible for delays of construction projects in India include: the implementation processes, inadequacy in project plans, contracts and procedures.

**Vidalis and Najafi** found that the factors causing cost and time overrun in Florida Department of Transportation highway projects are alterations in designs and lack of project coordination.

### III. RESEARCH METHODOLOGY

The below table shows 20 major causes that were identified as causes of cost overrun and delay in time. Through discussion with some industry persons and study of final reports of projects. Final reports of 15 public infrastructure projects in India in the period of 2007-2017 were collected. The causes of projects' delay were the actual causes which are documented through paper work and correspondences between the contractors and clients.

Sr. No.	Ranked Factors	Percentage
1.	Terrain conditions	22.20%
2.	Weather conditions	15.30%
3.	Variation orders	10.20%
4.	Availability of labor	7.70%
5.	Mistakes in design	6.10%
6.	Planned cost for project construction	5.90%
7.	Market conditions (availability of resources)	5.90%
8.	Material price fluctuations	4.60%
9.	Planned time for project construction	4.30%
10.	Emergency works	3.20%
11.	quality of equipment and raw materials	2.80%
12.	Payment delay	2.20%
13.	Cost of variation orders	9.00%
14.	Government requirements	1.40%
15.	Rework from poor materials quality	1.30%
16.	Delay in decision	1.00%
17.	Management – labor relationship	1.10%
18.	Sequencing of work according to schedule	0.50%
19.	Poor project management	0.80%
20.	Delav in decision making	1.10%

Table 1. Shows the ranking for each factor arranged according to their percentage and importance.

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The pie chart illustrates the occupancy of each factor which deals with the cost overrun and time delay in the completion various construction projects`

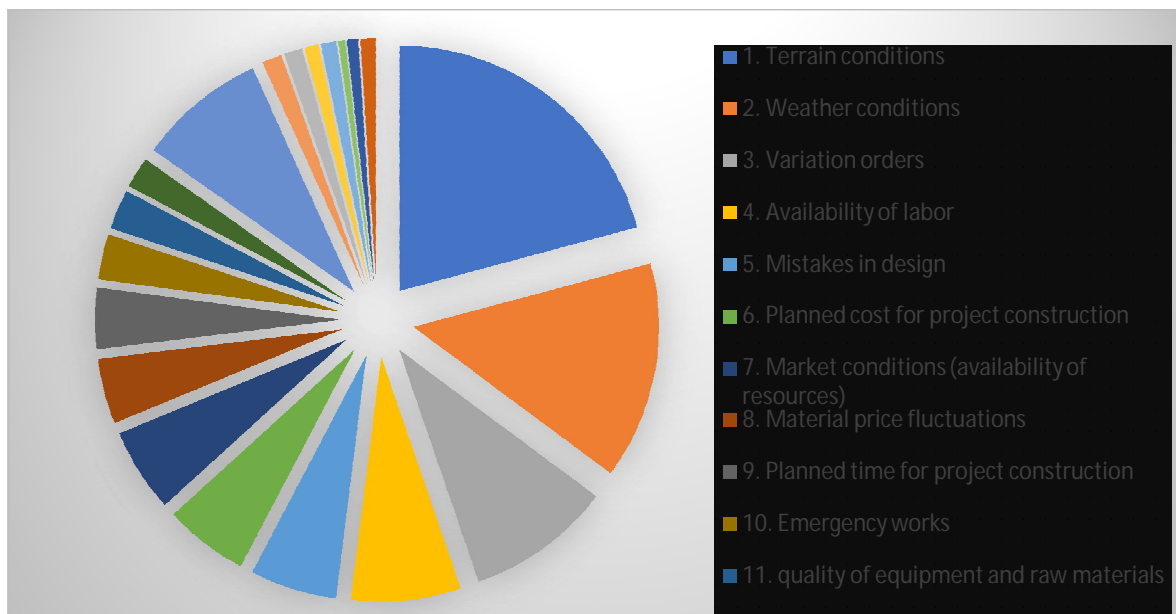


Fig. 1. Shows the graphical representation of such factors.

## IV. RESULTS AND DISCUSSION

Table 2 shows the planned – actual time and cost for 10 sample projects. The average percentage overrun time is 209 and the average percentage overrun cost is 143

Project	Time Planned (Day)	Time Actual (Day)	Time Overrun %	Cost Planned (INR)	Cost Actual (INR)	Cost Overrun %
1	715	946	132	5035780	7565455	150
2	160	280	175	1860150	2097456	112
3	90	210	233	190963	205750	107
4	290	720	248	1589752	1785600	112
5	165	695	421	486958	1001298	205
6	370	810	219	2387456	3287945	137
7	930	1809	194	4978258	10332756	207
8	1020	1965	192	14158790	18718125	132
9	860	1260	153	3207550	5224670	162
10	690	910	131	1476100	1612750	109

Table 2 Percentage cost and time overrun

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The bar chart shows the variation in planned time and time overrun due to the above mentioned causes. The bar chart includes the information regarding ten different projects with variable planned durations.

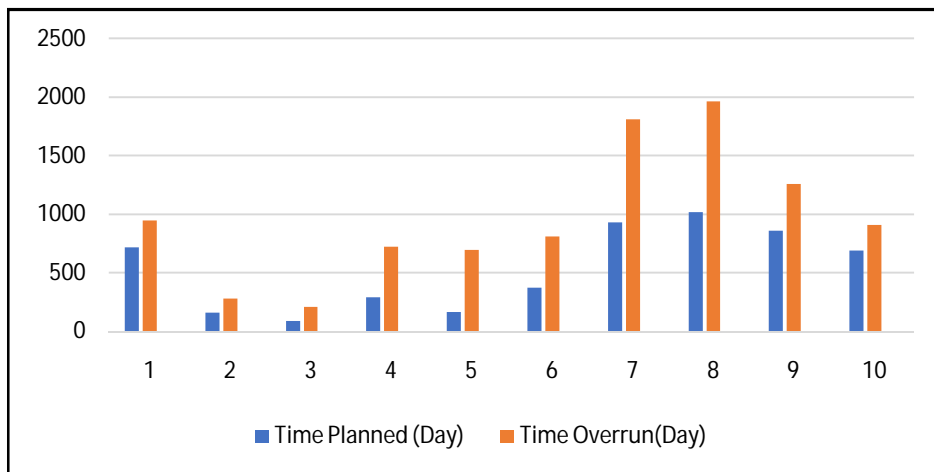


Fig. 2. Shows the planned and actual duration for 10 sample projects.

The bar chart shows the variation in planned cost and cost overrun due to the above-mentioned causes. The bar chart includes the information regarding ten different projects with variable planned costs.

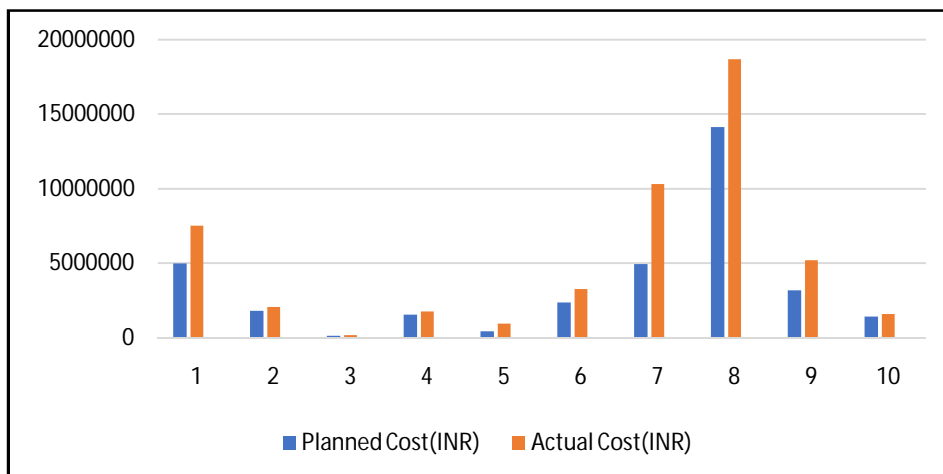


Fig. 3. Shows the planned and actual cost for 10 sample projects

The bar chart shows the percentage time overrun due to the above-mentioned causes. The bar chart includes the information regarding ten different projects with variable planned time. The percentage fluctuations shown by every project is with accordance to the cost of respective task.

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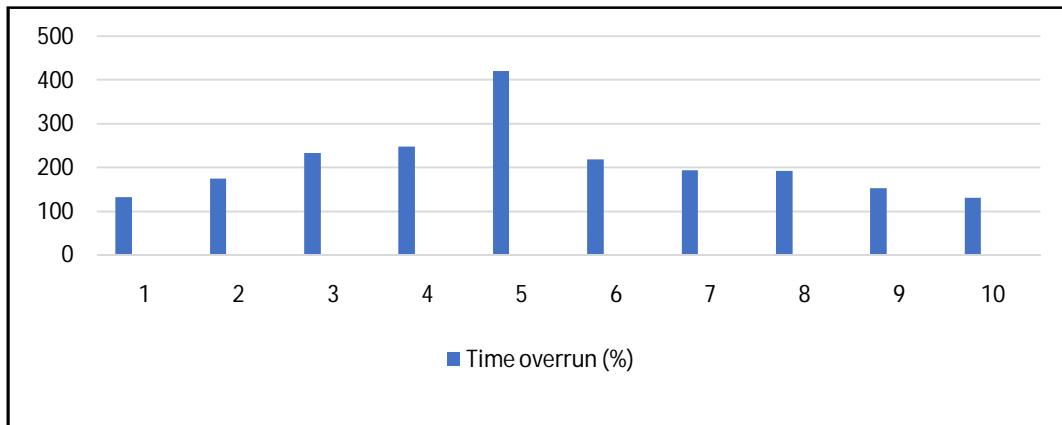


Fig. 4. Shows the time overrun for 10 sample projects.

The bar chart shows the percentage cost overrun due to the above-mentioned causes. The bar chart includes the information regarding ten different projects with variable planned costs. The percentage fluctuations shown by every project is with accordance to the time of respective task.

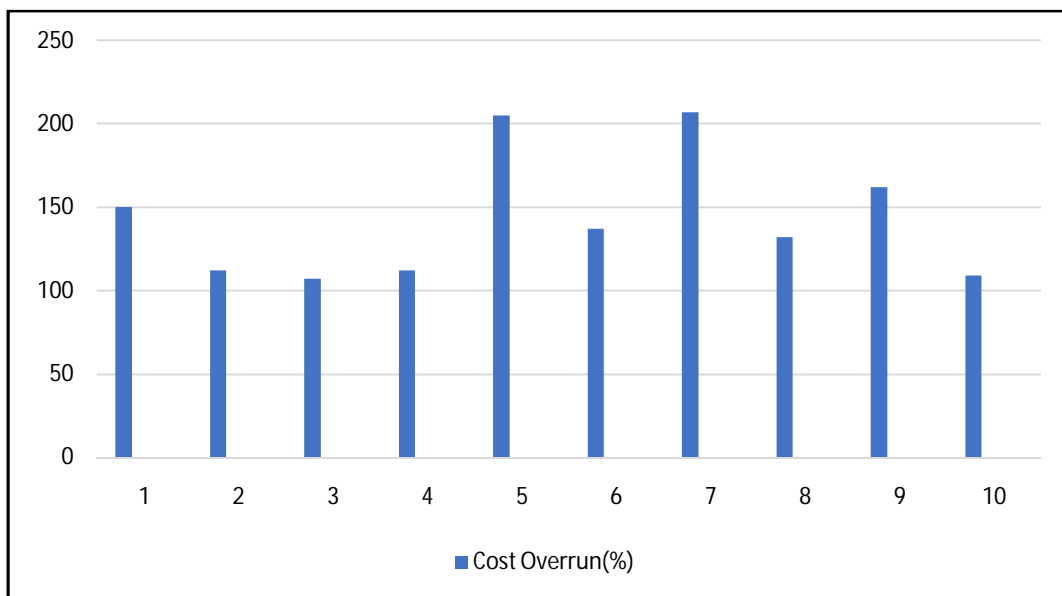


Fig. 5. Shows the cost overrun for 14 sample projects.

The most important reason because of that cost and time overrun was terrain conditions that are occurred in 22.20% of the studied area. These conditions include difficulties in reaching the work site, land acquisition issues, delay in relocating utilities, difficulties of the work type, and the lack of civil services near the work site which were not included in the work plan and cost estimation. Besides Weather conditions is reason that occurred in 15.3% of the projects of the study sample. Those two reasons were the main reasons that leads to cost overrun and time delay. Other factors that caused cost and time overrun are: new variation orders (10.2% of the sample), mistakes in design (6.1%),

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Poor planning of cost (4.3%) emergency working (3.2%), poor scheduling of time (5.9%), and cost of variation orders (1.9%) for the projects in India at three studied regions.

## V. CONCLUSIONS

Most public infrastructure construction projects in India are influenced by delay and overrun in cost. Many documents and final reports for several projects were analyzed. The Terrain conditions, weather conditions, variation of order, and availability of labor are most affecting factors as result shows. A very big diversification between estimated and final cost ranging from 107% to 205% with an average of 143%. On the other side, the delay time ranging from 131% to 421% with an average of 209%. In order to validate these findings, further research is recommended with projects from different geographical locations or states and different owners.

Finally, the authors recommend that in the planning stage of any construction project, more efforts should be exerted on the planning preparation, scheduling and cost evaluation to reduce the risk of delay and cost overrun of the project implementation. Similarly, during the construction stage of projects careful organization and management processes should be applied to complete the requirements of the projects' plans. Successful management of construction projects may need to adopt procedures to avoid problems and to adopt contingency plans to reduce the effects of problems when they occurred on site.

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