

# Impact of Cost Overrun Factors in Constructing Apartments in Tamil Nadu



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**Abstract:** Construction industry is more planned and resource driven industry in the world. As this industry is vast, it offers more commercial facilities projects, residential projects, and industrial projects. In addition to the infrastructure sector, there are also other areas which require growth as well. According to Working Group of Planning Commission 2012, the present housing scarcity is anticipated as 18.58 million houses. Usually, construction industries visages cost overrun when implemented and this issue generate immediate impact on country's economy and construction stakeholders. Hence this study aims to examine the most significant factors that affect cost overrun in constructing apartments in Tamil Nadu. The study found that from the perspective of civil workers, inadequate number of equipment's, contractors faces financial complexities and cash flow at site factor, labour absenteeism, alteration in material specification, lack of dexterity between parties, and retardation in decision making are the most significant factors that influences cost overrun in construction projects.

**Keywords:** Industrial Projects, Residential Projects, Cost Overrun, Construction Projects, Labour Absenteeism

## I. INTRODUCTION

For any country, construction industry is one of the most important sector for ameliorating the standard of life. The industry has large impact on overall economic enlargement of India. Also it is the second largest employer of labour in India and it is the second largest in terms of economic activity and headed by agriculture. In general, the Indian construction industry is increasing at a normal rate of 9-11%. But Foreign Direct Investment (FDI) of 100% is permitted by Indian government in the infrastructure sectors and real estate has encouraged construction all over the country [1].

Nowadays construction industry is visages chronic issues like retardation in finishing the product, low quality and productivity, and cost overrun etc. Among these issues, cost overrun is the most important problem in construction industry. In Pune, late in making progress payment, improper planning and arrangements by contractor, rainy weather, lack of experienced technical staff, excessive works for contractor,

lack of labors, deprived liquidity of contractors, dragging to approve the difference and extra work, deprived supervision and site management of contractors, contractor lacks in productive time management are the factors that influences cost overrun in construction projects [2]. Also, the industry also visages other issues like time overrun which is a form of retardation that happens ahead of the baseline construction plan. The main target of any construction company is to mitigate cost overrun in construction projects. Hence the study intends to examine the most significant factors that affect cost overrun in constructing apartments in Tamil Nadu.

## II. LITERATURE REVIEW

The author [3] conducted a study in Peninsular Malaysia to evaluate the influence of resource-oriented factors on project cost. The study found that money-oriented factor is the most critical factor in driving the cost of the project. Also, effective control in financial management could increase the cost performance of the construction project. The researcher [4] investigated the influence of construction resources on cost overrun of the project. The results indicated that resources such as material, manpower, and money significantly influence cost overrun and among these factors construction material is the most dominant factor influencing cost overrun in construction projects. Therefore, the organization should effectively plan and manage the materials to enhance the cost overrun of the construction projects.

The author [5] spotted out the reasons for cost overruns in large construction projects. The study identified that deprived schedule management, rise in the prices of machine/materials, sluggish in decision making, retards in offering design or deprived design, land acquisition issues, lengthy duration between preparing blueprint and time of tendering or bidding, reworking on the project due to commitment of mistakes, incorrect estimation method are the causes for occurrence of cost overruns in large construction projects.

The researcher [6] identified the factors that affect the cost overrun in constructions projects in Saudi Arabia. The study found the top cost overrun causes in construction projects in Saudi Arabia from contractors' perspective are: bid award for lowest price, frequent changes in design, improper planning, long period between design and time of implementation, and payments delay. The statistical analyses showed that the data has good compactness, indicating a good data consistency and agreement between the respondents on the severity and frequency of occurrence of the identified cost overrun causes.

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The researcher can extend their work in identifying the factors of cost overrun in construction projects in other countries and in contractors' perspective in future. The author [7] employed case study method to determine the factors impacting cost overrun and project delay and its mitigation measures in Ghana, Malaysia, and Australia.

The study found that in Australia, improper planning and arrangements, efficient supervising and feedback process, and construction methods influences cost overrun and project delay. Project difficulty, retardation in payment certificates, and underrating of the cost of the project are the most vital factors that affects cost overrun and project delay in Ghana. In Malaysia, the factors such as inappropriate planning by the contractor, lack of experience of the contractor, and deprived site management significantly affects cost overrun and project delay.

### III. METHODOLOGY

The study espoused Descriptive Research Design to fulfill the purpose of the study. Descriptive Research Design is adopted to build and validate items measuring cost overrun construct. The survey is administered to civil workers employed in constructing apartments in Tamil Nadu. The type of sampling employed for this study is purposive sampling as it measures cost overrun factors from the perspective of civil workers involved in constructing apartments in Tamil Nadu. A total of 500 civil workers were contacted and questionnaires were self-administered to those civil workers for obtaining responses. Out of 500 samples, 460 samples were taken for further analysis after eliminating the response bias. The instrument encompasses of four parts such as 1. Cost overrun factors (a) machinery related factors (b) material related factors (c) manpower related factors (d) money or finance related factors and these constructs are obtained from the study [3]. Once after confirming the factors, the Relative Importance Index (RII) analysis is performed to find out the items that carries a higher prominence in constructing apartments in Tamil Nadu. The ranking is done for each and every factor, to find out which item of that particular construct influences the cost overrun in construction projects in Tamil Nadu.

### IV. ANALYSIS AND RESULTS

The factors are ranked to know the importance of each and every factor and the impact it has on cost overrun in construction projects (i.e. apartments) in Tamil Nadu. The Relative Importance Index (RII) is calculated as follows

$$\text{Relative Importance Index (RII)} = \frac{\sum w}{A * N}$$

$$= \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{A * N}$$

Where w = Weighting given to every factor by the civil workers

A = Highest weight (A=5)

N = Total number of civil workers (N=460)

n<sub>1</sub> = Number of respondents for not significant

n<sub>2</sub> = Number of respondents for slightly significant

n<sub>3</sub> = Number of respondents for moderately significant

n<sub>4</sub> = Number of respondents for very significant

n<sub>5</sub> = Number of respondents for extremely significant

#### A. Ranking for Machinery Related Factors

Table -I: Ranking for Machinery related factors

Factors	RII	RANK
Insufficient Numbers of equipment.	0.866957	1
Equipment availability and failure.	0.785217	3
High cost of machinery and maintenance.	0.827391	2

The table I shows the ranking of machinery related factors influencing cost overrun in constructing apartments in Tamil Nadu. As displayed from the table, topmost ranking is given to inadequate number of equipments at the site factor (0.866957-Rank 1), followed by increased price of machinery and maintenance factor (0.827391-Rank 2), and equipment accessibility and breakdown factor (0.785217-Rank 3) are the factors that impacts cost overrun in constructing apartments in Tamil Nadu.

#### B. Ranking for Money or Finance Related Factors

Table -II: Ranking for Money or finance related factors

Factors	RII	RANK
Delay payment to supplier /subcontractor	0.804348	5
Delay in progress payment by owner	0.908696	2
Poor financial control on site	0.806522	4
Cash flow and financial difficulties faced by contractors	0.913913	1
Mode of financing, bonds and payments	0.833043	3
Financial difficulties of owner	0.452174	6

The table II shows the ranking of money or finance related factors influencing cost overrun in constructing apartments in Tamil Nadu. As displayed from the table, topmost ranking is given to contractors face financial complexities and cash flow at site factor (0.913913-Rank 1), followed by owner delays in making progress payment to the contractor factor (0.908696-Rank 2), means of financing payments and bonds factor (0.833043-Rank 3), deprived financial control at location factor (0.806522-Rank 4), retarded payment to subcontractor/supplier factor (0.804348-Rank 5), financial complexities of owner factor (0.452174-Rank 6) are the factors that influences cost overrun in constructing apartments in Tamil Nadu.

#### C. Ranking for Manpower Related Factors

Table -III: Ranking for Manpower related factors

Factors	RII	RANK
Shortage of technical personnel.	0.79913	3

High cost of labour.	0.79	4
Shortage of site workers.	0.787826	5
Labour Absenteeism.	0.817826	1
Severe overtime.	0.815217	2

The table III shows the ranking of manpower related factors influencing cost overrun in constructing apartments in Tamil Nadu. As displayed from the table, topmost ranking is given to labour absenteeism factor (0.817826-Rank 1), followed by severe overtime factor (0.815217-Rank 2), inadequate technical personnel factor (0.79913-Rank 3), greater labour cost factor (0.79-Rank 4), and insufficient site workers factor (0.787826-Rank 5) are the factors that persuades cost overrun in constructing apartments in Tamil Nadu.

#### D. Ranking for Material Related Factors

Table -IV: Ranking for Material related factors

Factors	RII	RANK
Fluctuation of prices of materials.	0.828696	3
Shortages of materials.	0.830435	2
Late delivery of materials.	0.807826	4
Changes in material Specification.	0.863913	1

The table IV shows the ranking of material related factors influencing cost overrun in constructing apartments in Tamil Nadu. As displayed from the table, topmost ranking is given to alteration in material specification factor (0.863913-Rank 1), followed by inadequate materials factor (0.830435-Rank 2), variation in material prices factor (0.828696-Rank 3), and delay in materials delivery factor (0.807826-Rank 4) are the factors that influences cost overrun in constructing apartments in Tamil Nadu.

#### V. DISCUSSIONS

The study also found the most important machinery related factors affecting cost overrun in constructing apartments in India. From the findings it is obvious that, topmost ranking is given to inadequate number of equipment's at the site factor, followed by increased price of machinery and maintenance factor, and equipment accessibility and breakdown factor are the factors that impacts cost overrun in constructing apartments in Tamil Nadu. Also the study also found the most important money or finance related factors affecting cost overrun in constructing apartments in India. From the findings it is obvious that, topmost ranking is given to contractors face financial complexities and cash flow at site factor, followed by owner delays in making progress payment to the contractor factor, means of financing payments and bonds factor, deprived financial control at location factor, retarded payment to subcontractor/supplier factor, financial complexities of owner factor are the factors that influences cost overrun in constructing apartments in Tamil Nadu.

The study also spotted out the most important manpower related factors affecting cost overrun in constructing apartments in India. From the findings it is obvious that,

topmost ranking is given to labour absenteeism factor, followed by severe overtime factor, inadequate technical personnel factor, greater labour cost factor, and insufficient site workers factor are the factors that persuades cost overrun in constructing apartments in Tamil Nadu. Also the study identified the most important material related factors affecting cost overrun in constructing apartments in India. From the findings it is obvious that, topmost ranking is given to alteration in material specification factor, followed by inadequate materials factor, variation in material prices factor, and delay in materials delivery factor are the factors that influences cost overrun in constructing apartments in Tamil Nadu.

#### VI. CONCLUSIONS

The results obtained from the study are same as the findings of previous studies. Civil workers stated that the most of the projects gets delayed due to cost overrun issues. There are factors that affect cost overrun problems. Factors affecting cost overrun are material related factors, machinery related factors, money or finance related factors, manpower related factors, project management and contract administration related factors, and information and communication related factors. From the perspective of civil workers, inadequate number of equipments, contractors faces financial complexities and cash flow at site factor, labour absenteeism, alteration in material specification, lack of dexterity between parties, and retardation in decision making are the most significant factors that influences cost overrun in construction projects.

#### VII. MANAGERIAL IMPLICATIONS

The study provides information and data to the project managers and contractors to focus on the most influencing factor of cost overrun in construction projects. Before giving the contract to the contractor, the project requirements should be framed correctly with appropriate qualification criteria such as sufficient number of equipment's and high cost machinery etc. for constructing apartments. Once after meeting the criteria, the project should be handed over to the contractor. As contractors have more than one assignment, it is impossible for them to finance and manage the projects. Hence the construction companies and project managers should ensure that the contractor should not have any projects and also should assess whether the contractor is capable enough to finance and manage the projects. The project managers should also assess whether the owner could make timely progress payment to the contractor. Based upon all these considerations and assessments, the contract should be handed over to the contractor.

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