

# **PROJECT COST OVERRUN in INFRASTRUCTURE**

## **PROJECT: INDIAN SCENARIO**

**Shivam Srivastava**

*Graduate Student, Department of Civil Engineering,  
Shri Ramdeobaba college of Engineering & Management, Nagpur, Maharashtra, (India)*

### **ABSTRACT**

*Cost overrun is the inherent part of most infrastructure projects despite of much acquired knowledge in project management. Cost overrun has become an almost natural part of infrastructure projects. Historical data over the last several decades indicates that cost performance has not improved over time no significant learning has occurred. This paper examines this phenomenon as a worldwide problem, identifies its cause. The objective of this research is to propose a theoretical framework for cost overrun and corresponding management approach in the infrastructure project. This paper is based on a wide literature survey on previous research work done in the field It is therefore much appreciated to look at some reasons of cost overrun in project, so as to increase the perception of project success.*

**Keywords:** *Cost overrun, Infrastructure projects*

### **I. INTRODUCTION**

The Construction industry is one of the key economic industries in India and is the main motivating force in Indian national economy. The Indian construction industry is an integral part of country's economy and its growth and a conduit for a substantial part of India's development investment. The construction sector employs approximately 31 million people, accounts for some 6-9% of GDP and, after agriculture, is the largest employment sector in the country. In general, it has been growing at 911% year on year, primarily due to the strength of increased domestic and international manufacturing activities and industrial growth (Harris, 2011). Construction sector accounts for nearly 45% of the total investment in infrastructure and is expected to be the prime beneficiary of the surge in infrastructure investment in the near to medium term. Development of adequate infrastructure to achieve/sustain high GDP growth is a priority for the Government of India. Despite slippages from targets, investments in infrastructure reported a compounded annual growth rate (CAGR) of 18% over the last three years, with the spending increasing to Rs. 4.0 lakh crore in FY 2009-10 from 2.4 lakh crore in 2006-07 ( ICRA, 2011).

Successful management of construction projects is based on three major factors i.e. time, cost and quality. Time and cost are the lifelines of any and every project. It is shown from previous studies (Abd Majid and McCraffer (1998), Alwi and Hampson (2003), Assaf and Al-Hejji (2006), Assaf, Al-khalif and Al-Hazmi (1995)) that the failure of any project is mainly related to the problems and failure in performance (contractor, owner) of project which causes delay or time overrun and cost overrun in project. The success or failure of any project depends largely on cost and time apart from its quality. Construction industry now-a-days is facing severe problem of poor cost management resulting in huge amount of cost overrun. Socio-economic growth of a country highly depends on construction industry as it provides necessary infrastructure such as roads, hospitals, schools and other basic and enhances facilities [3].

Cost overruns are very common in the construction industry. Hardly few projects get completed within original costs. According to the reply, Statistics Minister Srikant Kumar Jena gave to the Rajya Sabha, as on March 31, 2012, 555 projects (worth Rs 150 crore and above) were on-going, out of which 179 projects reported cost overruns. According to the statement laid in the House by the minister, total cost overrun of these 179 projects was Rs 1.23 lakh crore. The minister said, "The major reasons for cost overruns are under estimation of original cost, change in rates of foreign exchange and statutory duties, escalation in cost of land, high cost of environmental safeguards and rehabilitation measures, inflation and delay in projects." The details provided by the minister reveal that the cost overrun of projects in railways sector was Rs 69,551.81 crore followed by Rs 15,886.71 crore and Rs 15,113.80 crore in petroleum and power sectors. The cost of projects escalated by Rs 6,187.54 crore, Rs 5,272.90 crore, 4,838 crore in steel, urban development's and atomic energy sectors respectively" (The Economic Times, 8 March 2013). To measure the performance of projects, number of projects who achieved their goal and number of projects who doesn't are analyzed. This paper studies the performance of year 2016 ongoing and also completed mega projects and also studies the frequency and magnitude of extensive cost overruns of infrastructure projects.

## **II. LITERATURE STUDY**

### **2.1. General**

Projects can be delivered on budget but that requires a good starting estimate, project management discipline and an awareness of factors that can cause cost escalation (Shane et al., 2009).

T.Subramani, P S Sruthi, M.Kavitha (June 2014) identified major causes of cost overrun, such as slow decision making, poor schedule management, increase in material, machine prices, poor contract management, poor design, delay in providing design, rework due to wrong work, problems in land acquisition, wrong estimation and estimation method, long period between design and time of bidding, tendering are the major causes of cost overrun. Cost overrun in construction is a worldwide phenomenon, and its effects are normally a source of friction between owners, project managers, and contractors (Creedy et al., 2010).

Akinci & Fischer, (1998) found that Organizations face a major challenge in controlling project budgets over the time span between project initiation and the completion of construction. The development of cost estimates that accurately reflect project scope, economic conditions, are attuned to community interest and the macroeconomic conditions provide a baseline cost that management can use to impart discipline into the design process.

Azhar and Farouqui (2008) observed that the trend of cost overrun is more severe in developing countries. As the construction industry continues to grow in size, so do planning and budgeting problems. This is because it is common for projects not to be completed on time and within the initial project budget. Nowadays, even a marginal cost overburden can sweep away the profit of a job, and continuous cost overburdens in most of the projects of a firm can lead to bankruptcy (Apolot et al., 2012).

Azhar, Farooqui, & Ahmed 2008 discussed that cost is amongst the major considerations throughout the various phases of construction life cycle (shown in fig:1) and is considered as prime factor of success. However, it is uncommon to see project completed within the estimated cost. In a study on 8000 projects, (Frame, 1997) found that only 16% of the projects satisfied the three fundamental criteria of project success i.e. completing project on time, meeting the budgeted cost, and meeting quality standard, while in a global study on cost overrun issue in transport infrastructure projects covering 258 projects in 20 nations, Flyvbjerg, Holm, & Buhl, concluded that 9 out of 10 projects faced cost overrun [4]. However, (Memon, Rahman, Asmi, and Azis, 2012) states that in order to find measures of minimizing these overruns, the very first and most important step is to identify and understand the factors responsible for the overruns. Hence, this paper examines previous literature on causes and effects of construction projects cost and schedule overrun.



**Fig.1:** Construction phases

## **2.2. Definitions**

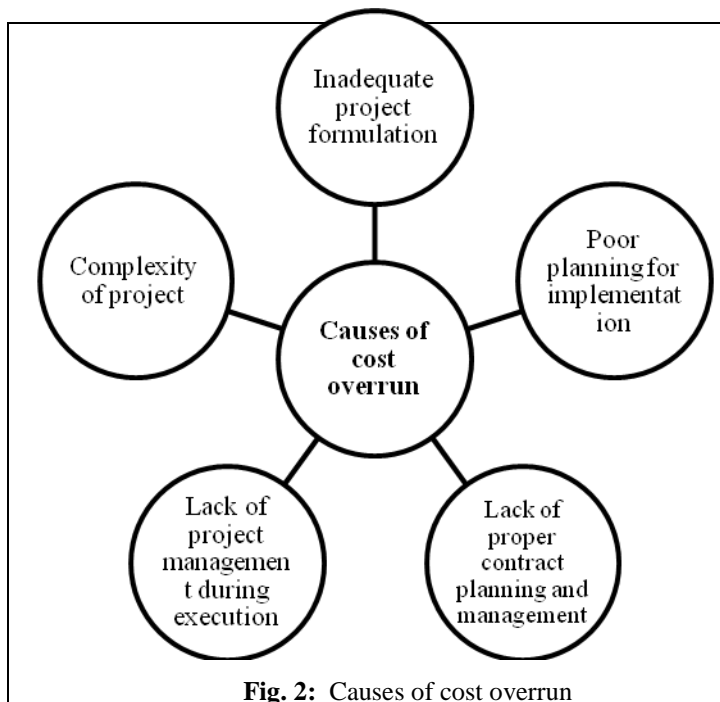
- 2.2.1 *Cost:* Cost is the budgeted expenditure, which the client has agreed to commit for creating/acquiring the desired construction facility (Chitkara, 2011).
- 2.2.2 *Cost Overrun:* Cost overrun, also known as a cost increase or budget overrun, involves unexpected costs incurred in excess of budgeted amounts due to an underestimation of the actual cost during budgeting. Cost overrun is also defined as the difference between the actual and estimated costs as a percentage of the estimated cost, with all costs calculated in constant prices (Chitkara, 2011).
- 2.2.3 *Actual costs:* Actual costs are defined as the accounted costs actually spent, as determined at the time of project completion (Chitkara, 2011).

2.2.4 *Estimated costs:* Estimated costs are defined as the budgeted or forecasted costs at the time of project approval, which are typically similar to costs presented in the business case for a project (Lee, 2008).

2.2.5 *Construction Cost Overrun:* Construction cost overrun is defined as the difference between forecasted and actual construction costs. Every construction company can be affected by cost overrun if it happens in their projects. However, the most affected company type is micro-scaled construction companies because they have limited capitals and they are more vulnerable to risks (Lee, 2008).

### 2.3. Causes of cost overrun

T.Subramani , P S Sruthi, M.Kavitha (June2014) identified major causes of cost overrun, such as slow decision making, poor schedule management, increase in material, machine prices, poor contract management, poor design, delay in providing design, rework due to wrong work, problems in land acquisition, wrong estimation and estimation method, long period between design and time of bidding, tendering are the major causes of cost overrun.



**Fig. 2:** Causes of cost overrun

- i. Inadequate project formulation: Poor field investigation, inadequate project information, bad cost estimates, lack of experience, inadequate project formulation and feasibility analysis, poor project appraisal leading to incorrect investment decisions.
- ii. Poor planning for implementation: Inadequate time plan, inadequate resource plan, inadequate equipment supply plan, inter-linking not anticipated, poor organization poor cost planning.

- iii. Lack of proper contract planning and management: Improper pre-contract actions, poor post-award contract management.
- iv. Lack of project management during execution: Insufficient and ineffective working, delays, changes in scope of work and location, law and order.

### III. FINDINGS AND SUMMARY STATISTICS

A study conducted by Infrastructure and Project Monitoring Division of Ministry of Statistics and Programme Implementation ([http://www.cspm.gov.in/english/mp/MP\\_May\\_2016.pdf](http://www.cspm.gov.in/english/mp/MP_May_2016.pdf)) reports on ongoing projects. According to the reports published by programme implementation division of the MOSPI May 2016, total original cost of implementation of 86 projects when sanctioned, was of the order of Rs. 179120.81 crore but this was subsequently anticipated to Rs. 230344.92 crore implying a cost overrun of 28.6%. The expenditure incurred on these projects till May, 2016 is Rs. 30149.3 crore, which is 13.1% of the revised cost of the projects. In which 10 projects which are experiencing maximum cost expenditure in percentage is shown in following table 2.

**Table-1:** Projects with maximum cost overruns (as on 31-05-2016)

Sr No	Name	Sector	Date of commissioning		Cost of project (Rs. crore)		Cost overrun in %
			Original	Anticipated	Original	Anticipated	
1.	NEW BG RLY LINE FROM EKLAKHI-BALURGHAT INCLUDING GAZOLEITAHAR(NL),NEFR	Railway	-	03/2019	3 36.80	1336.57	3531.98
2.	BANKURA - DAMODAR (GC) (SER) - [220100277	Railway	03/2005	12/20019	111.90	2,371.85	2,019.62
3.	LALITPUR-SATNA-REWASINGRULI NL, (NCR)	Railway	05/2008	-	247.66	3500.00	1313.23
4.	AKOLA-KHANDWA GC AKOLA AKOT	Railway	03/2012	-	184.26	2000.00	985.42
5.	BANGLORE - SATYAMANGALAM (NL)(SWR)	Railway	-	-	138.00	1382.78	902.01

# 11<sup>th</sup> International Conference on Recent Trends in Engineering, Science and Management

(IETE) Institution of Electronics and Telecommunication Engineers, Osmania University Campus, Hyderabad, India

22<sup>nd</sup> October 2017, [www.conferenceworld.in](http://www.conferenceworld.in)

(ICRTE SM-17) ISBN: 978-93-86171-72-6

6.	LUMDING-SILCHAR JIRIBAM, BADARPUR-BARAIGRAM KUMARGHAT NATIONAL PROJECT - [N22000127]	Railway	03/2009	03/2016	1,676.31	5,500.00	228.10
7.	PANIPAT-JALANDHAR 6 LANE(KM 96 TO 387.1 KM) - [N24000133]	Road Transport and Highways	11/2011	12/2016	1,108.00	2,288.00	106.50
8.	BANGALORE METRO RAIL PROJECT - [N28000008]	Urban Development	06/2011	11/2016	6,395.00	14,405.01	125.25
9.	CONSTRUCTION OF MEDICAL COLLEGE AND HOSPITAL AT GULBARGA	Urban Development	02/2014	03/2016	768.88	1,070.97	39.29
10.	REDEVELOPMENT OF EAST KIDWAI NAGAR	Urban Development	11/2019	11/2019	4264.00	5298.00	24.25

Source Data: MOSPI May 2016

## IV. CONCLUSION

Construction industry is one of the main contributors to the economic development of a country. The Indian construction industry is an integral part of country's economy and its growth and a conduit for a substantial part of India's development investment. The basic goal is to achieve the completion of project within time and stipulated cost budget. Study of previous literature revealed that cost overrun is a very common phenomenon and it affects infrastructure projects greatly. The government owned projects are the least cost efficient. Major causes of cost overrun was found to be slow decision making, poor schedule management, increase in material, machine prices, poor contract management, poor design, delay in providing design, rework due to wrong work, problems in land acquisition, wrong estimation and estimation method. Further, literature revealed that there are corresponding negative effects of construction project cost overruns that can eventually lead total project to abandonment.

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# 11<sup>th</sup> International Conference on Recent Trends in Engineering, Science and Management

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22<sup>nd</sup> October 2017, [www.conferenceworld.in](http://www.conferenceworld.in)

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