

# Factors influencing Time and Cost Overruns in Road Construction Projects: Addis Ababa, Ethiopian Scenario: Review paper

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**Abstract**—In Ethiopia, number of roads are constructed from time to time. A number of road networks are increased over time. The historical data of completed road projects shows that no one of the projects were completed as planned and within the estimated cost. No considerable improvement had occurred over time. The objective of this study is to assess the existing system and to identify the factors that affect time and cost overrun in Addis Ababa road projects. This is done based on wide literature review. Findings of this journal will help clients, contractors, consultants and any other concerned bodies to consider and give priorities for better road construction performance in the future.

**Key Words:** Time Overrun, Cost Overrun, Influences, Addis Ababa

## 1. INTRODUCTION

Construction industry, the true power of national economy, through which the total of physical development is attained. It is energetic component of country's economy and has a significant effect on other industry sectors efficiency and productivity. It is difficult to think extensive investments like agriculture, manufacturing, fishery, etc. without construction facilities are there.

The Performance and success of projects are measured by the triple project constraints (Cost, time, and quality). Project success is measured by completing on time within the estimated cost and quality. Because the industry is a full of project activities, tasks and constraints that requires additional budget and cost. According to Faridi et al. (2006) [7] delays have impact on success project in its cost, time, safety and quality. The consequences of delay are not restricted to construction industry only, but also impacts the whole country's economy. According to Rajakumar A C (2016) [3], cost and time overruns are common in developing countries and impacts more for developing country than developed once. Ethiopia is a developing country where its construction sector is affected by cost and time overrun. Road projects in Ethiopian are victims of this problem. Road projects, requires huge amount of capital, but it contribute to the total economy by creation job and have wave effect to other business activities. The homogeneity in transportation departments is the failure to finish the projects on time and within estimated budget (Y. Honrao and Prof. D.B.Desai, 2015) [4]. There are many causes that are accountable for delays and cost overruns in the industry, so attention should

be given to such factors as they cause additional expense than initially estimated.

## 1.1 Objectives of the Study

The study has the following objectives:

1. To assess the existing system of time and cost overrun.
2. To identify the factors that affects time and cost overruns in Addis Ababa Road construction Projects.

## 2. LITERATURE REVIEW

### 2.1 Definitions

According to Chitkara (2011) [14] cost is defined as the accounted expenditure, which the owner has agreed to commit for creating/acquiring the desired facility. Cost overrun or over budget is defined as final costs exceed the estimated costs. It is defined as the positive difference between the final cost of a construction project at completion and the contract amount agreed by the client and the contractor during signing of the contract (M. Abubeker J., 2015) [1]. Actual cost is defined as the accounted costs actually spent, as determined at the time of project completion (Chitkara, 2011) [14]. Estimated cost is defined as 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) [13].

According to Lee (2008) [13] construction cost overrun is defined as the difference between forecasted and actual construction costs. Every construction company can be affected by cost overrun. However, micro-scaled construction companies are the most affected company type because they have limited capitals and they are more exposed to risks.

In construction, delay can be defined as the time over run, slipping over its planned schedule either beyond the date that the parties agreed upon for delivery of a project, or beyond completion date specified in a contract and it usual problem in construction projects (M. Abubeker J., 2015). [1]

### 2.2 Causes of Time and Cost Overrun

T. Siraw Y. (2014), in his study 'Analysis of Factors Contributing to time overruns on Road Construction Projects

under Addis Ababa City Administration', he concluded that slow site clearance, contractors' financial problems, Inflation, progress payments delay by owner, inaccurate cost estimation, and delay in commencement were the major causes of time overrun in Addis Ababa Road Construction. [5]

N. Feten (2008) in her study 'Causes and Effects of Cost Overrun on Public Building Construction Projects in Ethiopia', sixty seven out of seventy of completed public building construction projects were investigated and found faced to cost overrun. From her study she concluded that material price inflation, fluctuation in currency exchange rate, change orders and, slow decision making. [9]

B. Ashebir S., M, Wubishet J, and Murad M. (2017), found that material price strike, poor cost estimation, late raw materials delivery, ambiguous contract documents were top source of cost overrun and it ranges from 4.16% to 83.2%. [6]

N. Al-Hazim and Z. Abu Salem (2015), concluded that weather conditions, terrain conditions, availability of labour, and variation of order were the main causes of time and cost overrun in Jordan. Cost overrun ranges from 101% to 600% and time overrun ranging from 125% to 455%. [8]

In 'Study of Delay in Execution of Infrastructure Projects – Highway Construction', Y. Honrao and Prof. D.B.Desai (2015) [4], argue that Payment problems between contractor and his employees, Shortage of materials, ineffective construction method implementation were major causes of delay by contractor. Interference by the owner during execution operation, delay in decision making by the owner, Delay in progress payments by owner were the major causes of delay. Lack of experience in consultants were the major causes of delay. Services and utilities were the most critical factors having high severity means and most the frequent effects of delay were cost and time overruns and disruption of traffic movement.

S. Msafiri A. (2015) studied, 'Investigation into Factors Causing Delays in Road Construction Projects in Kenya'. He identified 141 causes of delay from literature them divided them into 25 broad categories. He concluded that inadequate planning and scheduling, slow decision-making and rain, payment delay by client, claims, and bureaucracy in client organization were the top five sources of delay. [12]

I. Mahamid (2013), conducted a study on 'Frequency of time overrun causes in road construction in Palestine: Contractors' View'. The study was based on 52 factors on case study of 34 contractors. The study was aimed at investigating the frequency of delay based on contractor's point of view. Questionnaire survey was used to collect the data. He concluded that, division of West Bank, lack of equipment efficiency, political condition, limited access area, payments delay by owner, difficulties in financing project by contractor, personal conflicts among labours, conflict of consultant with other parties, conflict between contractor with the other

parties, award to lowest bidder, and contract duration is too short were the top ten frequent factors. [10]

Indian infrastructure projects are known for time and cost overruns. For example, Bandra-Worlisea link project, its planned was Rs 300 crore to be completed by 2004, but its final cost Rs 1,600 crore with a delay of five years. Hardily, very few projects complete on time and cost, but the extent was not studied. Privatization of public service and build operate and transfer (BOT) is also recommended for constructing of national highways to avoid the problem. Technical and natural factors, contractual failures, organisational or institutional failures, time overruns and economic factors were causes of the problem. The study was aimed at investigating the causes of delays and cost overruns in publically funded infrastructure projects in India (Ram Singh, 2010). [2]

K. Vaibhav Y. and Dr. D.M. Ghaitidak (2016), in their study 'Elements of Cost and Schedule Overrun in Construction Projects', time and cost overrun had been a major frequent problem of construction industry. They concluded that, land acquisition, tender cancellation, weak contractor mobilization, equipment erection, fund constraints, law & order problem, delay in supply of equipment, scope change, forest clearance, slow construction progress, cost escalation in were the main source of delay and overruns. [11]

### 3. FINDINGS AND DISCUSSIONS

A desk study was conducted on 10 completed road projects in Addis Ababa (M. Abubeker J., 2015) [1]. According to the reports, 10 of them had experienced time overrun and cost overrun. Thus, they take more time and cost than what had been estimated. The rates are ranging from a minimum of 25% to the maximum of 264.38% time and a minimum of 4.11% to the maximum of 135.06% of cost.

**Table-1:** Time and cost overrun in Addis Ababa Road Projects [1]

No.	Selected Addis Ababa Road Projects name	Contract Time (days)	Actual Completed Time (days)	Time Overrun (%)	Contract Amount (Eth.Birr)	Actual Completed Cost (Eth. Birr)	Cost Overrun (%)
1	Winget Aseco Bridge	330	1048	217.58	154,485,787.41	181,139,826.67	17.25
2	Yekatit 12 square – Afenchober – Semen hotel urban street	365	1330	264.38	3,62,13,579	5,43,34,900	50.04
3	Dama Hotel – Hanamariam	365	1155	216.44	5,42,14,003.00	6,85,63,420.00	26.47
4	Megenagna – Meskel Square – Torhiloch (Lot 1 & Lot 2) Contract 1	550	726	32	1,16,24,48,900.69	1,21,45,86,635.23	4.49
5	Meskel flower – Bole Ruwanda	575	2370	58.42	4,95,87,265.63	7,85,58,144.39	135.06
6	Shola Gebeya – Lemhotel – Anbessa Garage	575	1232	114.26	10,95,12,767.87	14,53,11,625.22	32.69
7	Mekanisa roundabout – Addis	90	270	200	3,65,54,500.46	4,16,54,715.37	13.95
8	Abunepetros square pastuer	224	763	240.63	14,44,40,764.43	15,03,74,645.56	4.11
9	Megenagna – Ayat	420	709	68.81	22,40,55,813.14	26,51,04,212.54	18.32
10	Gotera – Wellosefer	180	225	25	3,00,00,000	3,24,50,000	8.17

#### 4. CONCLUSIONS

Road is the main contributor to the country's economic development that connects one part to the other part. Addis Ababa road network plays great role in the economy of the city and country as well. Road constructions is expected to complete on time and within estimated budget and open for traffic, but all of the road projects are always faced to time overrun and over budget. Different studies in the area shows that as delay and cost overruns are common phenomenon and it affects road projects greatly. Financial problems, improper planning, land acquisition and construction delay, design changes, less materials and equipment supply by contractors, incomplete design are the main sources of delay and cost overrun respectively. So, once identified the main causes it is necessarily to give solutions to complete the projects on time and estimated cost.

#### 5. FUTURE WORKS

All previous research works were based on literature reviews as and based on questionnaire survey. Most surveys were considering contractors, clients and consultants, but they do not include end users. Since the public are end users of the roads, so researchers should include in their study.

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