

A Project On Comparative Analysis Of Cost Overrun And Time Delay In Road Construction

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Abstract - — Now a days delay and cost overrun are the major problems of any construction project in India. These issues are causing the negative impact aftermath on the development of country prosperity and economic growth. This study aims to identify the most important factors that cause delay in road construction project in wakan - khopoli road, which results in cost and time overrun allocated for these types of engineering project and causes critical problems for both the developer and the contractor. Present study work comparing cost overrun and time delay between two highway construction work which is, WAKAN – KHOPOLI road and INDAPUR - AGARDANDA road to finding out causes and factor for overrun. In the first stage, a questionnaire was developed and survey was carried out expert who were working with contractor in highway project.

Key Words: Time Delay, Cost Overrun, Construction, Project, Data collection.

1.INTRODUCTION

A cost overrun is also known as a cost increase or budget overrun, involves unexcepted incurred cost. The objective of this qualitative project was to explore strategies that use to reduce cost overruns and schedule delay. The cost overrun is one of the critical problems in now a day so requires a lot of research and exploration to overcome or reduce the delay and less variation in budget for the future projects. Macroeconomic factor that affects the cost of the construction project are most severally. Time overrun can be defined as the time required to complete the project work beyond the contract time. In highway construction, the delay in construction is one of the major problems that brought the department of highway concern. This caused the essential of research on construction delay in this study.

- (1) Examine the extent of cost overrun and schedule delays in infrastructure projects.
- (2) Investigate the risk factors leading to both challenges.
- (3) Provide comprehensive critical recommended actions and practical implications to curb the problems imposed by

potential cost overrun and schedule delays in construction projects.

2. LITERATURE REVIEW

2.1 General

When there is growth or increase in cost or increase in the budget for a construction project, it is said that there is a cost overrun and vice versa is referred to as cost underrun. However, cost overrun must not be misinterpreted as cost escalation which is an increase in the budget due to inflation. Cost overrun / underrun can be assessed in different forms looking at the base value it is evaluated from. It can be assessed by finding the difference between the preliminary construction estimate and the actual construction cost. It can also be assessed by finding the deviation of the actual construction cost from the contract award value. It is a general view that cost overrun is more experienced in construction projects compared to cost underrun. This has been attributed mostly to underestimation which was presented at the decision-making phase of construction projects and has thus affected proper budgeting for construction projects. It has also been attributed to decisionmakers not considering the future value of a project during project viability examination.

3.METHODOLOGY

3.1 General

3.1.1 Preliminary data In the survey of site selection for road construction project for cost overrun and time delay and data collected is as follows. The site location wakan to khopoli SH-92 is about 41 Km is length the sanctioned amount is 376 crores with complete duration of 30 month from 2016. The road is WBM from wakan to khopoli and above from Pali. It is concrete till khopoli road is having several drainage culvert and bridges and two major bridges from wakan to Pali the width of road differs from Pali to khopoli road due to aggregate land and forest area the wide of road is not possible as it is wide ahead from Pali. The construction of road was taken by total tree company from

BBC, Varaha infra limited. These company failed to complete the work of road in given time.

3.1.2 To find the causes of cost overrun and time delay:

The main causes of cost overrun of road project is miscommunication between MSRDC authority and the contractor working on project due to which the running of cost is continuous which leads to time delay also in improper implementation of design head towards the cost overrun in project. As the lead for material is more the time required also more which means time delay for further work many of time the labour consumption is less from contractor which also gradually take time to complete the day schedule task due to insufficient funding from government authority to the payment which automatically lower down the speed of work out the point labour deny to work.

3.1.3 Analysis and interpretation collected data: By selecting various site of road construction, the data collected is in graphical form which helps to understand the total time required and cost overrun in various project. Thall data collected interpretate that managed by fixing the problems at the moment when it occurs. The execution of work is to be seen by the authorize person in every format as like designing, financial status, accommodation of baren land, agricultural field and forest area where the road construction is to be held. The lead for material can be managed by finding out nearest material contractor deals with minimum rate for road construction material as aggregate muroom soil, steel, sand, cement and other material required during project. This efficient person should bargain with high profile tools and machinery company for road construction which make construction easier.

3.1.4 Strategies to reduce cost overrun: Implementation of work is to be done in given time schedule. The arrangement tools material consumption and work done to be record. the book by engineers of the responsible person. The activity going on should be safe. The wastage of material should not take place are the material management should as per required on site. Proper estimate can neglect the cost overrun while construction of road. The payment of labour should be done monthly or weekly as per decided by contractor. Monthly or weekly maintenance to reduce the cost.

3.2 Cost Overrun:

A cost overrun, also known as a cost increase or budget overrun, involve unexpected incurred cost. OR, is the phenomenon in which the client has to spend more money of the completion of project than the originally estimated i.e., the project goes over the budget.

When these costs are in excess of budget amount due to a value engineering underestimation of the actual cost

during budgeting, they are known by this term. Cost overrun are common in infrastructure, building and technology project. Many major construction projects have incurred cost overrun; cost estimate used to decide whether important transportation infrastructure should be built can misled grossly and systematically. Cost overrun is distinguished from cost escalation, which is an anticipated growth in a budgeted cost due to factor such as inflation.

Cost Overrun in Construction Projects. In the context of construction projects, cost overruns can be expressed as the excess of actual project completion cost over contract budget amount. Cost overrun is computed by the initial estimated cost, and total completion cost incurred decommissioning of the project. The difference between estimated and completion cost is termed as the magnitude of the cost overrun. In relation to this, cost overrun can be obtained by the positive difference between the completion cost of a construction project during commissioning and the contract amount agreed by the major parties during the contract signing and commencement of projects. The difference between agreed contract sum and final project cost can be expressed as,

$$\text{Cost Ratio (CR)} = \frac{\text{Completion Cost}}{\text{Contract Amount}}$$

The ideal CR is 1.0, so, any value above this can be considered as a cost overrun.

$$\% \text{ Cost Overrun} = \frac{(\text{Actual Expenses} - \text{Budgeted ammount})}{\text{Budgeted ammount}} \times 100$$

This calculation can be converted to a percentage for ease of comparison.

It is important to denote that delivering a construction project within the planned contract budget is one of the main success criteria in construction projects.

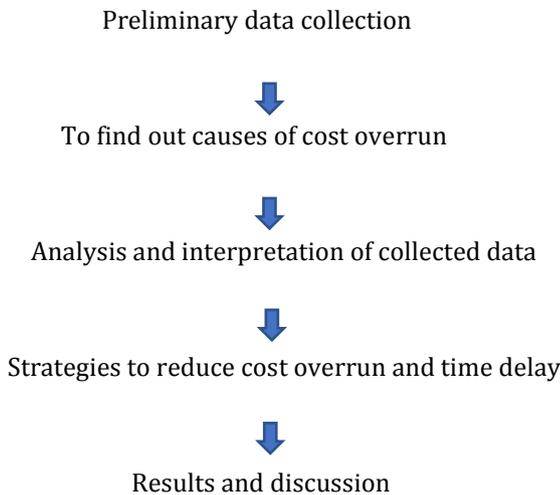
3.2.1 Risk Factors Leading to Cost Overrun:

Several factors affect the extent of cost overrun and schedule delays in the construction sector. These risk factors could be classified as factors related to consultant, contractor, design parameters, and information, factors related to market conditions (external factors), and factors related to project characteristic.

3.3 Time Delay:

Time overrun is the phenomenon in which the project gets delayed beyond its expected completion time due to certain difficulties. More time is required to finish the project than initially planned.

Times delay refers to the late completion or late delivery, from the time specified or agreed by parties of the construction project. The main causes of the schedule overrun are financial problems late ongoing work, change order, organizational changes, etc.



4. DATA COLLECTION

The various factor to be consider for the selection of data like a fuel price, cement price, steel price, labour price there is factor to be considered for the data collection and to the actual price to be calculated in percentage of that market price and various years that material market price as follows.

[A] 4.1 Fuel price hike:

In 2017 fuel price were 62 Rs / lit and currently in 2022 fuel price were 94 Rs / lit. After that as growing price of fuel indirectly it affected the cost of road.

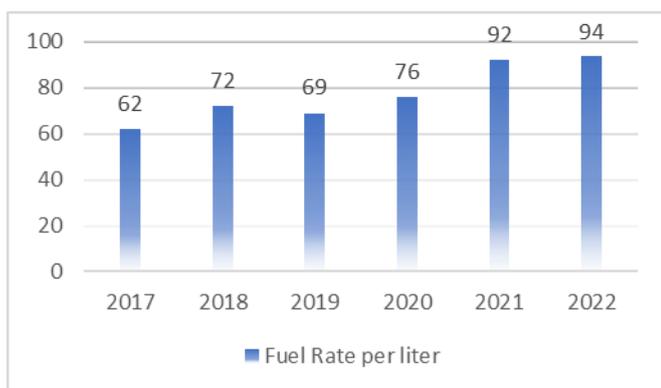


Chart. 4.1 Fuel price hike

4.2] Cement price hike:

Looking from 2017 as project started fluctuation in cement prices are visible. Due to raw material required for cement production comes from different places so the

transportation charges hike the raw material cost which affect the price project overall cost.

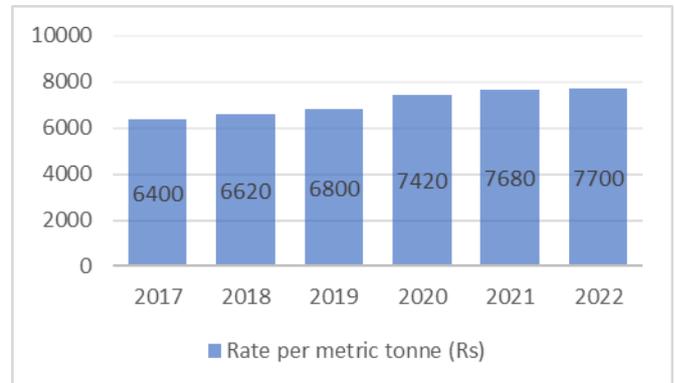


Chart. 4.2 Cement price hike

4.3] Material price hike:

Material coming to RMC plant from quarry the lead for the material is more. Whereas the material required for base of road like Aggregate no.2, Aggregate no.3, Aggregate no.4 and crushed sand for concrete purpose was to lead from quarry so due to fuel rates and commercial electricity rate increased automatically it differs the change in rate.

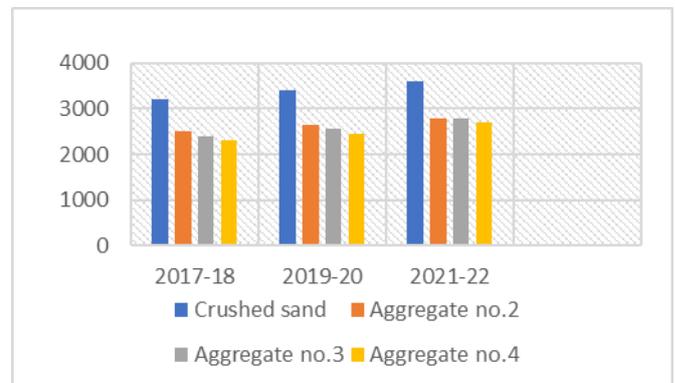


Chart.4.3 Material price hike

4.4] Steel price hike:

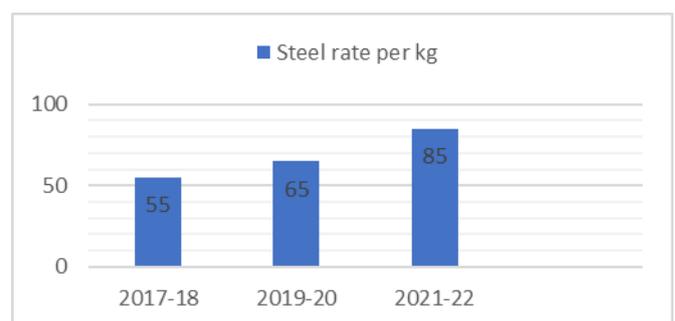


Chart.4.4 Steel price hike

Consecutively increase in rate of steel purchasing it got hard. Sudden shoot in price dislocated the cost margin which radically affected the work upon. Calculating the back years rate, it financially created a gap to manage over the cost of it. Neglecting the steel is not possible but to find negotiable value for it is the way.

4.5] Labour price hike:

Workers are not negligible factors for cost overrun. As their rates gets high more the cost of project. Living accessories puts their rate high even a unskilled labour i.e. men coolie work on 500 Rs per day which motion the increase in cost.

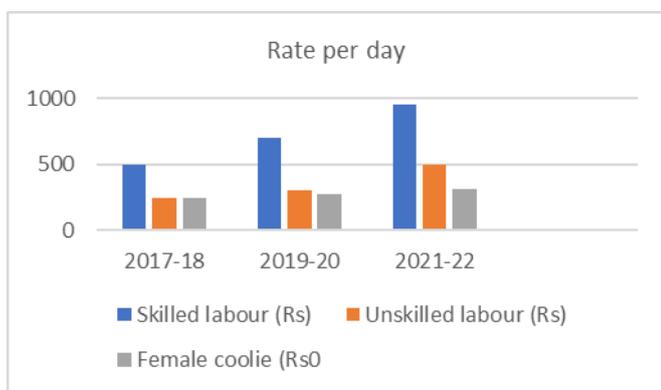


Chart.4.5 Labour price hikes

4.5.1] Calculations for labour Expenditure increase during project

Total prize – 376crore

Total delay – 205 days

If we take Rs. 700 labour rate for 205 days

Total numbers of labour – 600 on site

$$700 \times 600 = 420000$$

Delay time x labour cost

$$= 205 \times 420000$$

$$= 86100000 \text{ Rs.}$$

Percentage of increase for 205 days

$$= 86100000 + 500000 \text{ (Equipment charges)}$$

$$= 86600000 \text{ Rs.}$$

$$= 86600000 / 3760000000 \times 100$$

$$= 2.30 \%$$



Chart.4.5.1 Labour price overrun

B] Questionnaire Survey:

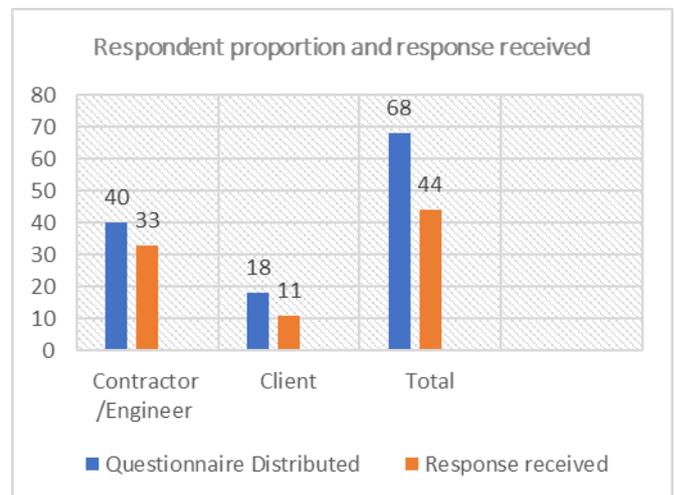


Chart. [B] 4.1 Respondent proportion and response received

5. RESULTS AND DISCUSSION

- ❖ The factor responsible for cost overrun in road construction project were held by taking initiative for every mode of work.
- ❖ By studying the existing case study of the road concludes that the road project is getting delay in time and escalation for cost due to mis management. The study evaluates the total time required for completion of project which results automatically increasing cost.
- ❖ After reviewing the data collected from site come to know that the process of road construction is different from other construction which leads to time delay and cost overrun. Analysing the process and management of the road construction by the indigenous contractors held during the project.

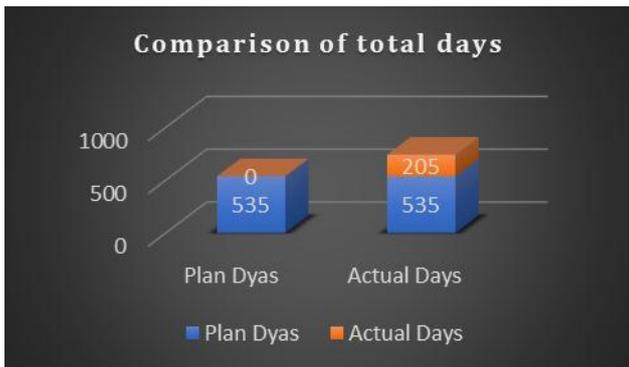


Chart.5 Comparison Of total Days

[6] Sunil Kage, Mahendra mane, Arjun Chougule, Abhishek kadam, Rushikesh Majale, "Time delay and cost overrun in construction industry of India." 2018.

[7] Poonam Raykar, Ghadge A.N. "Analyzing the Critical Factors Influencing the Time Overrun and Cost Overrun in Construction Project." 2016.

[8] Nabil hazim, Zaydoun abusalem, "Delay and cost overrun in road construction project in Jordan." 2015.

[9] Ibrahim Mahamid, Amund Bruland, "Cost overrun causes in road construction project Consultant Project 2011.

6. CONCLUSIONS

- Land acquisition made delay in road construction work.
- Due to Pandemic situation construction stopped for 8 months which held the reason for delay. Working method & change in routine after pandemic results the slower the progress of road. Working during pandemic caused transportation mode disable for workers & if any then it charged higher than before.
- Material cost, Fuel charges & labour rates got hike which unexpectedly increased in execution cost of road. Unavailability of fuels due to hikes in rates caused delay.
- Consecutively switch in contractor delayed work of road, Mismanagement & no pre-scheduling of contractors is responsible for failure in completion in sanction period of time. Discussion making process took too much time for further works.

REFERENCES

- [1] Jose Matos "Analysis of Cost Overrun and Schedule Delay of Infrastructure Projects in Low Income Economies: Case Study in Ethiopia" 2021.
- [2] Douglas Aghimien, "Comparative analysis of cost overrun on road construction project executed by indigenous and expatriate contractors." 2020.
- [3] A.R.Vishweshwar, S. Janani, M.C.Akilarasu, "Study and analysis of time and cost overrun in construction sector." 2020.
- [4] Zaynab belel ahmad, "Peculiarities of road project cost overrun." 2018.
- [5] Pranav K. Lende, Aaradhana D. Rathod, "Study of factor affecting cost overrun in road construction project." 2018.