

Financial Mismanagement: A Leading Cause of Time and Cost Overrun in Mega Construction Projects in Pakistan

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Abstract—One important and well-known issue for the majority of construction projects such as buildings, roads, bridges, airports and many more projects all over the world is time and cost overrun. Project pricing and time period delay are also major issues. The current investigation is taking into consideration the mega construction projects in the provinces of Pakistan, looking into various components controlling and dominating time and cost overrun. A total of 29 factors were identified from literature work and one questionnaire was designed and distributed among 160 respondents. All collected data were analyzed by the average index method. Factors having value more than 3.6 were selected as main factors of cost and time overrun, and five factors were revealed to surpass this barrier. Time and cost overrun are of the leading financial mismanagement issues of the economy of Pakistan. This study will be helpful for stakeholders to control both cost and time overrun in the mega construction projects of Pakistan.

Keywords—cost overrun; time overrun, Pakistan; finance management; factors

I. INTRODUCTION

In an emergent state such as Pakistan, numerous mega projects have been completed or are under construction with the prop up from the government. Cost and time surplus had provoked lags and debts, for the parties involved in many new projects, as in numerous fresh construction projects [1]. It is important for all parties who are concerned in the construction of a project to finish it within the agreed time and budget without compromising the quality of the work [2]. The construction industries of almost every Asian country suffer from several major drawbacks despite the rapidity of the project development. Pakistan is one of the countries facing these problems. These drawbacks are low quality and productivity, cost surplus, low construction ravage administration, time overrun, and low protection achievements [3-6]. Cost overrun has a main burden on the whole development of a country [7]. It was discussed [8] that these factors were inadequate events for any construction project to be completed at the predicted price and time. Additional considerations [9-11] emphasize on different approaches of particular concerns amongst construction project partners, i.e. contractors, customers, financial consultants and government

organizations. One of the main economic pillars of Pakistan is its construction industry. Due to this, a study on the factors of time and cost overrun is essential, obligatory, noteworthy, and important. Factors of cost and time overrun were identified on particular previous projects. Thus, the main aim of this review is to look at the components causing time and cost overrun during construction, particularly on mega projects in all provinces of Pakistan and to identify the most important factors/causes.

II. TIME AND COST OVERRUN

There are three important components in measuring the achievement of construction projects. These components are time, price, and quantity of the entire project. The above mentioned factors are implanted during project life-cycle: preparation/planning, execution, and relinquish phase. It was not easy to assemble the necessities set up for every factor, as nearly all contractors were unable to complete the work on time. This results in an extra financial plan in order to carry out project completion [12-14]. Some hazard components upset project period and cost planning, for instance casualties, cost variations, short or poor materials, and bad climate circumstances [15]. The main factors of these issues will be elaborated and discussed below.

A. Causes of Constructing Project's Time Overrun

Changes made in designs, labor issues, scarce preparation, and resource shortage are the most important components in a project's time overrun. For instance, the components that affect time and price in projects in Indonesia [8] are shown in Table I. According to [16], there are two cause categories in delaying project construction: internal and external causes. There are four parties involved in internal causes: owners/clients, designers, contractors, and consultants. In comparison to internal causes, the external causes include the government, material suppliers, and weather conditions. Table II shows the factors affecting time and cost overrun according to [17]. In Pakistan, it has been found that deprived place management, construction blunder, delivery delay, and requirement of goods supply management were the main components creating delays in construction projects [18]. Proprietors' monetary concerns are another cause of time overrun. Authors in [19] reported that

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from consultant’s opinion, unskilled or lack of management and the dearth of expert’s acquaintance and skills were the main reasons for time and price overrun.

TABLE I. COMPONENTS AFFECTING COST AND TIME MANAGEMENT [8]

Time and cost controls	Time controls	Cost controls
Environment restrictions	Buildability	Material prices
Knowledge of project site	Labor output	Precise quantity
Accurate prediction	Level of planning	Lift-off
Equipment production rate	Material estimated accuracy	Project experience
Equipment availability	Material availability	Type
Weather conditions	Technicians precision	
Experience of local regulations	Availability of trained labor	
	Project restrictions	

TABLE II. COMPONENTS AFFECTING COST AND TIME MANAGEMENT [17]

Category	Factors
Owner	Financial issues of finished work
	Owner interruptions
	Delay in taking decisions
	Unrealistic imposed contract duration
	Selection of sub-contractor
Contractor	Poor planning
	Improper planning
	Construction method
	Subcontractor
	Site management
	Inexperienced contractor
Materials	Mistakes during construction
	Financial issues faced by contractor
	Material shortage
	Material specification changes
Labor-Equipment	Delay in the supply of material
	Labor productivity
	Labor supply
	Equipment failure
Consultant	Contract management
	Delay for approval of work
	Quality control
	Document preparation
	Poor supervision
Contractual relationships	Disputes
	Communication gap
External	Weather effects
	Other site problems
	Changes in regularity

B. Effects of Construction Project’s Cost Overrun

Authors in [8, 19, 20] reported the following components in cost surplus: design modifications, unskilled and unfinished preparation, doubtful climate conditions, and abnormality and deviation in the cost of project resources. In addition to this, a listing of serious factors like incomplete design at the tendering phase, design alterations at the request of the proprietor, lack of money for the setting up and supervising at the beginning after the contract signing, defective besmirch and location settings, alterations made during construction, transportation charges owing to place locality, and lack of cost information at the development stage. Other critical factors which are usually

ignored are suspension in transmission of data to the builders during project suspensions, practical deterioration during the design period, obligation demands, customary constructive design advancement at the beginning of construction, uncertainty by the probing team in giving final results, limitations in estimate deviations and extra work, breaching and failures of bulk materials, etc. The main events that affect cost are changes in climate, inflation on prices, inexact material assessment, complications and difficulties of the scheme, builder’s incapability to understand the environmental issues, and lack of knowledge of the ruling set of laws [8]. Moreover, authors in [21] studied the budget overrun components in community subdivision schemes establishing that the rise in cost was caused by incompetent original assessments, design delays, modification in opportunities, and inaccuracies. They pointed ten major components causing cost overrun of building projects:

- Construction setback due to limited scheme preparation, setting up and execution at the starting phase.
- Inconsistency and unreliability of the suppliers of unrefined resources including types of equipment etc.
- Modifications of the scheme’s capacity.
- Release of money, overseas exchange, and elements linked by incomplete accessories.
- Judgments made by the establishment and breakdown of precise regulating departments’ and sections.
- Incorrect and unsuitable location.
- Technical lack of skill and ability and penniless managerial composition.
- Labor instability.
- Natural calamities.
- Lack of experience in finding technical consultants, insufficiency of distant association accords.

Authors in [22] reported 26 components of cost overrun during the edifice of underground water projects in Ghana, collected from consumers, contractors, and consultants. From the approach of contractors and consultants, the top factor that increased cost was difficulties in getting monthly expenditure from agencies. On the other hand, the owners’ perception of the project was that contractor management was the most important component affecting cost. In spite of the difference between their viewpoints, they all have agreed upon the ranking of these factors.

III. METHODOLOGY

This study considers the quantitative process toward assessing the project manager’s approach over the components affecting time and cost overrun in building projects. The designed questionnaire was established on the recognized components towards reaching the major ones which affect time and price overrun for building projects as in [8]. The questionnaire provided every participant the chance to spot those variables which he/she thought as probable to add to cost

overrun in a Likert scale ranging from Strongly Agree to Strongly Disagree. Afterwards, on an ordinal scale consisting of High (3), Medium (2), or Low (1), the members graded the density of recurrence of every factor. In this study, the mean value was calculated of each factor and factors having a mean value of more than 3.6 were identified as dominant factors of cost and time overrun in mega projects in Pakistan.

IV. RESULTS AND DISCUSSION

As mentioned above, a questionnaire was circulated for the evaluation of cost and time overrun in mega projects of Pakistan. In total, 160 questionnaires were handed over to project managers, construction managers, and engineers with a 75% response rate of 120 answered questionnaires which deemed adequate because it satisfies the minimum sample requirement for the population [23]. The respondents were highly qualified and experienced.

TABLE III. RESPONSE SUMMARY

Response rate	Questions	Total	Percentage
	Distributed	160	100%
	Received and processed	120	75%
	Non-returned	40	25%

A. Time Overrun

The collected data were graded according to the mean value of each factor. A total of 11 main factors had mean value more than 3.6 and were considered as major factors of time overrun. The summary of the analysis is shown in Table IV.

TABLE IV. TIME OVERRUN FACTORS IN PAKISTAN MEGA PROJECTS

Factor	Mean value	Rank
Financial problems faced by contractor	4.871	1
Fluctuation in price of materials	4.712	2
Poor supervision	4.607	3
Poor project management	4.419	4
Weather conditions	4.318	5
Owner interference	4.127	6
Wrong method of construction	4.092	7
Political approach in projects	3.873	8
Poor estimation	3.801	9
Delay in inspection	3.735	10
Frequent design changes	3.634	11

B. Cost Overrun

The collected data were analyzed and their mean values were calculated.

TABLE V. COST OVERRUN FACTORS IN PAKISTAN MEGA PROJECTS

Factor	Mean value	Rank
Design faults	4.570	1
Improper investigation at site	4.491	2
Political approach	4.370	3
Financial crisis	4.301	4
Weather conditions	4.267	5
Inexperienced contractor	4.187	6
Poor supervision	4.097	7
Wrong method of construction	3.871	8
Shortage of skilled labor	3.838	9
Owner interference	3.781	10
Delay in approval	3.670	11

A total of 11 factors had a mean value larger than 3.6 and were identified as dominant. From Table V we can see that "Financial problems faced by contractor" was found as the main critical factor.

V. CONCLUSION

The initial discussion in the research work at hand involved a literature study considering construction time overrun and cost overrun. Twenty-nine factors of time and cost overrun in mega projects were recognized from the literature review. The dominant factors of cost and time overrun were acknowledged. Eleven factors were identified as dominant for each category. Five main factors were found to be common in causing time and cost overrun in mega projects of Pakistan. These identified main factors are financial issues, weather conditions, political approach, design changes, and owner interference. This work is expected to offer an improved approach in conveying construction projects by minimizing the most important reasons of cost and time overrun and will also help financial management in construction projects of Pakistan.

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