

Major Factors of Budget Overrun in Construction of Road Project of Sindh, Pakistan

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Abstract: Budget is positive fluctuation of the cost of the project or budget of the project increased from approved and allocated budget. Cost overrun or budget overrun is critical issue in construction industry globally. Developing countries including Pakistan is also facing this issue in construction of road projects. The main aim of this study is to identify the major factors of budget overrun in construction of road projects of Sindh province. A questionnaire was established and established questionnaire was consisting of 51 factors of budget overrun or cost overrun which were identified from deep literature review. Established questionnaire were distributed among stakeholders of road projects which includes contractors, client and consultant. Stakeholders were asked to rank each factor according to their experiences. Gathered data was analyzed and results showed that client interference, payment problems faced by contractor, delay in taking decisions, payment problems faced by client from government, client interference, change in projects scope, changes in design and inexperienced contractor were found as major factors of budget overrun in construction of road projects. This study will help stakeholders to control major factors of budget overrun in construction of road projects in Sindh province.

Keywords: Budget of the project road projects, budget overrun, stakeholders, payment problems.

1. Introduction

Developed and developing countries are focusing on development of construction industry [1]. Economy of any country increased because of construction industry but it is true and fact that this construction industry is facing so many challenges and problems, budget overrun is also one of them problem[16]. According to project management life cycle that cost is most important parameter of successful construction projects [20].According to [2] that budget overrun is critical problem which is faced globally and number of projects are not finished in approved budget of project.

Pakistan construction industry is also facing this problem of budget overrun when the cost of construction projects exceeds 100 times from approved budget of the project [8]. Budget overrun defined as it is increase of budget of project from the approval budget of the construction project [21]. Budget overrun is when the construction project is completed and total cost of project exceeded the actual and approved budget of project [7]. According to [4], that budget overrun is a debilitating effect on contractors, client and also on consultant. Budget overrun creates the issue of mistrust, litigation, cash flow issues and arbitration in projects.

2. Previous studies

Many researchers have work done on findings major and serious causes and factors of cost overrun or budget overrun globally and few researchers has done research in Pakistan. As per research done by [10] that most common factors of budget overrun were change in scope and design, poor site investment, land issues and environment impact in construction of road projects. Another study conducted by [19] that land acquisition, delay in supply of materials and internal issues between government were found as major factors of budget overrun. Additional assignments and changes in design and scope, no clear policy of government were found as major factors of budget overrun in construction of international projects [3]. Similarly, research carried by [13] that poor management and supervision at site, financial issue faced by client and contractor, changes in design and poor management were found as major factors of budget overrun in mega projects of Vietnam. According to Choudhry et al. [9] that major and serious factors and causes of cost overrun were mistakes in drawings and design, mistakes in estimation, financial problems by both client and contractor, no planning and increase in price of materials in Pakistan construction projects. Another research conducted by Ejaz et al. [11] that unavailability of materials at site, tendering at lower bid rate, late payment to builder/contractor, cost

control problem and reconstruction were identified as major factors of budget overrun in construction projects. Furthermore, study carried by Azhar *et al.* [8] in which main critical causes and factors of cost overrun were found by adopting quantitative method from investors of construction industry. Major critical factors of budget or cost overrun were rise in price of materials, maintenance cost of machinery, bidding at lower rate, late in approval of designs, errors in budget estimates, more addition assignments by contractors and rapid changes were used in construction of road projects of Pakistan.

Transport system is known as fourth biggest sector among all sectors of Pakistan which is contributing 10% of GDP (Gross Domestic Production) and more than 17% to GCF (Gross Capital Formation). Government of Pakistan is trying best to improve road network and make life standard easy. Road sector is carrying 96% of inland freight as well as 92 % of passenger traffic (ESP 2013-14) [17].

3. Research Methodology

This study included quantitative technique to understand the view of stakeholders of road projects towards major factors contributing budget overrun in construction of road projects in Sindh province. To achieve object of this study, investigation was made up in two parts. First part comprised of literature work and interviews from experts. From this part 51 common factors of budget overrun or cost overrun were found. In second part a questionnaire was established which consist of two phases. Phase A consists of demography of respondents (bio-data, experience, contact details, academic qualification), phase B includes factors of budget overrun in construction industry globally. Respondents were asked to give rank each factor according to their experience and knowledge.

4. Data Collection and analysis

Before data collection process the preliminary survey was conducted from 6 well experienced experts who were involving in construction of road projects only. The main objective of this survey was to validate the questionnaire for its relevancy in road projects in Sindh province. Data collection process was done from experts of road projects in Sindh province.

Table. 1. Demography of Interviewed Experts

Organization	Position	Experience (Years)
Contractor	Construction Manager	32
Client	General Manager	31
Consultant	Resident Engineer	26
Client	Project Director	25
Consultant	Design Engineer	20

Table. 1 shows that interviewed experts have wide experience in handling of road projects ranging from 32 years to 23 years. Total experience of 6 experts was 163 years (with average of 27 years' experience of each experts). Interviewed experts were having in top position in organization. Therefore, it can be summarized that experts have enough experience to validate the established questionnaire.

Questionnaire survey was carried out by establishing a well-designed questionnaire in on based of Likerts scale. Likert scale is an approach which is used for rating scale with agree or disagree. Established questionnaire was designed with five ordinal score from one to five (1 & 5) as per level of confidence.

Measurement of scale indicates the as follows:

- (1)= Very low effective;
- (2) = Low effective;
- (3) = Medium effective;
- (4) = High effective;
- (5) = Very high Effective.

Established questionnaire was distributed among 82 respondents from client, contractor and consultant of road projects in Sindh province. From 82 questionnaires 79 received back correctly from respondents. From 79 questionnaires 3 questionnaires having incomplete information and data. Therefore total 76 questionnaires were analysed and shown in Table 2.

Table. 2. Summary of Gathered Data

Description	Qty
Total number of questionnaires distributed	82
Number of questionnaires received back	79
Incomplete questionnaires	3
Number of Valid questionnaires	76
Percentage of received questionnaires	96
Percentage of valid received questionnaires	96

Gathered data was analyzed by using RIW method. RIW method is found as best and accurate method for analysis. Calculation was done with following formula of RIW.

$$RIW = \frac{\sum a_i x_i}{\sum x_i} \quad (1)$$

Where a_i represents a constant which expresses the weight specified to I , x_i is a variable denoting the frequency of the response for, I is 1,2,3,4 and verified as x_1 is least important and corresponding to a_1 is 1, x_2 is less important and illustrated as, a_2 is 2. X_3 is important and demonstrated as, a_3 is 3, x_4 is very important and

corresponding to as, a4 is 4, while x5 is most important and illustrated as a5 is 5. After analysis of gathered data, the factors whose score is more than 3.6 are selected as major factors. Reliability test conducted to check the consistency of gathered data. If the value of Cronbach's alpha is more less than 0.3 is considered as not accepted data and not reliable and if the value of Cronbach's alpha more than 0.7 is acceptable and data is reliable [14]. In this study SPSS 20.0 were used and reliability test was conducted and value of Cronbach's alpha was 0.871 which indicates that gathered data is reliable.

The Results showed that client interference, payment problems faced by contractor, delay in taking decisions, payment problems faced by client from government, change in projects scope, changes in design and inexperienced contractor with score of 4.18, 4.11, 4.05, 3.92, 3.85, 3.71 and 3.62 respectively were found as major factor of budget overrun in construction of road projects. Results of major factors are shown in Table 3.

Table 3: Critical Factors of Delay

Rank	Identified Critical Factors	Score
i.	Client interference	4.180
ii.	Payment problems faced by contractor	4.110
iii.	Delay in taking decisions	4.050
iv.	Payment problems faced by client from government	3.922
v.	Change in projects scope	3.851
vi.	Changes in design	3.712
vii.	Inexperienced contractor	3.625

i. Client interference

Client interference was found as major factor of cost overrun in construction of road projects with score of 4.180. Experts of road construction mentioned that client interference in construction of any projects leads to cost overrun because once project is started with any policy but client interference in construction phases leads to budget overrun. Changes in top management and selection of favored contractors and consultants by client causes the cost overrun in construction projects [15].

ii. Payment problems faced by contractor

Contractor plays vital role from starting to completion of any project but because of payment problem faced by contractor slow down the construction at the site which leads to cost overrun. Mostly projects has faced problems of budget overrun due to lack of funds faced by contractor. Many projects has faced cost overrun issue because of this payment problem faced by contractor [18].

iii. Delay in taking decisions

Decision of drawings, designs, construction procedures should be taken on proper time but unfortunately decisions are not taken on proper time. Delay in taking decision on right time is major factor of cost overrun in construction of road projects. Mostly approvals of designs and other

activities are delayed on the part of client which leads the projects to cost overrun [5].

iv. Payment problems faced by client from government

Payment problems faced by client from government was found as common as major problem in construction of road projects in Sindh province. Client faced this financial issue because of government transferred amount of projects from one project to another project on political approach. Construction of road projects has faced budget overrun issue because of lack of funds of projects even the projects construction activities remains suspended more than 5 years. Mostly construction projects have faced cost overrun issue because of financial issues faced by client [6].

v. Change in projects scope

Scope of the project is finalized before tendering but unfortunately the scope of road projects sometimes no clear or changes from approved one which lead to budget overrun has faced this issue because of Construction activities are delayed and rework process takes place. Client suddenly changes the scope of project by political approach or due to other issue and then many construction plans changed which born the issue of budget overrun. Sudden changes in projects scope which causes the problem of budget overrun [12].

vi. Changes in design

Designs of any projects finalized at the time of tender and tender documents are handed over to contractor for execution process. Many construction activities of road projects effected if sudden changes are made in designs of project. Changes in design and drawings by client and consultant causes the factor of cost overrun in construction of road projects. Construction projects has faced cost overrun issue because of changes in designs because construction activities remain suspended till approval and final draft of design [13].

vii. Inexperienced contractor

Appointment of inexperienced contractor or selected contractor by client causes the major problem of budget overrun in construction of road projects. Inexperienced contractor has no any experience to complete project on approved budget and cost. Inexperience contractor has no any competent staff and labor to complete project in approved budget of the project. It is fact that many construction projects has faced budget overrun issue because of appointment of inexperienced contractor [18].

5. Conclusion

This research was carried out to findout major factors of budget overrun in construction of road projects in Sindh province. Budget overrun is serious issue in construction of road projects especially in province of Sindh in Pakistan. Total number of 51 factors were identified from deep study of literature review and interviews. After analysis of each factor, factors whose score was above 3.6 were selected as major factors of budget overrun. Major factors of budget overrun were client interference, payment problems faced

by contractor, delay in taking decisions, payment problems faced by client from government, client interference, change in projects scope, changes in design and inexperienced contractor in construction of road projects in Sindh province.

6. Future Recommendations

This research identified that budget overrun or cost overrun is big issue in construction of road projects of Sindh province so mitigation and remedial measures can be researched to bring down the issue of budget overrun in field of road construction.

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