Significant Delaying factors affecting Time overrun in road construction projects in Abbottabad (Pakistan): Contractors Perspective

Muhammad Fayaz Khan

Lecturer, Management Science Department, Abbottabad University of Science and Technology, Pakistan

Assad Khan

Scholar, COMSATS Institute of Information Technology, Virtual Campus, Islamabad, Pakistan

Muhammad Mudassar Khan

Lecturer, Management Science Department, Abbottabad University of Science and Technology, Pakistan

Faheem Zeb

Lecturer, Management Science Department, Abbottabad University of Science and Technology, Pakistan

Muhammad Zulqarnain Safdar,

Lecturer, Management Science Department, Abbottabad University of Science and Technology, Pakistan

Kiran Mustafa

Lecturer, Economics Department, Abbottabad University of Science and Technology, Pakistan

Naseer Shahzada

Lecturer, Economics Department, Postgraduate College No. 01, Abbottabad, Pakistan

Abstract

This study has identified the significant factors causing time overrun in Pakistan Road construction industry in north region. Objectives of this study are to identify the factors causing time overrun in road construction projects in District Abbottaabd. Investigation through questionnaire survey was carried out in north part of Pakistan among the contractor's respondents. The feedback was received from 103 against 210 contractors being contacted. The feedback was analyzed statistically which revealed that time overrun and other difficulties faced by contractors , shortage of materials, shortage of workers, fluctuation of prices , lack of communication between project team , whether conditions are major contributors of tome overrun. The author also recommend that problem of time overrun can be manage through proper planning , competent leadership skills and affective communication system.

Keywords: time overrun, causative factors, Pakistan Construction Industry

Introduction

The construction industry plays a vital role in economic development in a country. It is one of the segments that give imperative fixings to the improvement of an economy. Road construction has a tendency to vary with the general economy, and it has snappy reaction to the adjustments in the economy. As per Creedy, (2010) the development business in several nations represents 9 % of the Gross Domestic Product (GDP). In any case, it is turning out to be more perplexing a direct result of the sophistications of the development procedure itself

and the extensive number of gatherings required in the development procedure (Ibrahim et al, 2010).

In Pakistan, transport is the fourth biggest division which contributes around 10% to the Gross Domestic Product (GDP) and more than 17% to the Gross Capital Formation. The part is beneficiary of 20-25% of the yearly government Public Sector Development Program (PSDP). It is evaluated that 2.3 million individuals (6% of the aggregate utilized work power of Pakistan) gain their jobs from this part (Javied and Hyder 2009). The legislature is attempting to enhance the nature of Roads system and at last enhancing the quality and standard of life of the masses. Road thickness of Pakistan, a pointer of flourishing and advancement level is at present 0.32 km/km2, which is substantially less even from territorial standard. The administration is attempting hard to twofold the street thickness to 0.64 km/km2. Beginning with just around 50,000 km in 1947, current street system is presently more than 260,000 km. This incorporates national interstate system of around 12,000 km, which notwithstanding being simply 4% of the general street system takes 80% of business activity (ESP 2010-11). With crumbling execution of the Pakistan Railways, the street area has logically expanded its offer in the business sector. The dependence on streets has expanded tremendously, where the street segment now continues 96% of inland cargo and 92% of traveler movement when contrasted with that of aggregate 8% in 1947 (ESP 2010-11).

While trying to beat the lacks of foundation part highlighted in World Bank Document (Durrani 2007), which indicated transport division wasteful aspects costing the economy between 4-5 percent of GDP every year, an abnormal state action was done in street development segment of Pakistan vide billion dollars in advances from monetary organizations including World Bank, Asian Development Bank (BMI's Report 2015). Various activities of expressways have been arranged and executed to build the commitment of street part to the GDP of nation. Tragically, goals of auspicious consummation inside expenses are not accomplished in expressway tasks of Pakistan as same postponed seriously with surpassed costs and time. Tribune (2010) a main daily paper of the nation, distributed a news article with respect to endorsement of a $130 million credit by World Bank on the solicitation of government to take care of expense invades and for consummation of takes a shot at street ventures, confronting delays. A few components are in charge of these deferrals and cost invades and few may be entirely unexpected from building ventures.

An extensive variety of studies have been made worldwide with a specific end goal to assess variables that cause time overrun in road construction projects. Correspondingly in Pakistan, various studies were completed to recognize elements creating time overrun in road construction projects for the most part centered on building tasks or construction projects of different kinds, showing a reasonable need to distinguish these elements particularly in roadways segment as most probably, none of the study has been recorded till date.

- To identify the factors responsible for delaying of the road construction project in Abbottabad.
- To examine whether time miss-management affects performance on road construction in Abbottabad District.

Literature Review

In a literature review, this study presents the historical arguments from previous studies to identify the major elements responsible for delaying of road construction projects. Also discuss the relationship between the dependent and independent variable based on previous studies.

The construction industry is one of the primary divisions that give essential fixings to the improvement of an economy. In any case, numerous activities experience broad

postponements and subsequently surpass beginning time and expense gauges. Construction issues are considered to be a standout amongst the most spectacular issues in the construction industry and it has an aggressive impact on undertaking achievement related to time, cost, quality, and security. Many studies have been conducted to identify the factors responsible for delaying of the road construction projects and building construction projects.

Time overrun and delaying of road construction projects: Time components refer to a condition where a construction project does not meet, finishing inside of the arranged period. It is characterized as the augmentation of time past arranged culmination dates traceable to the contractors reasoned that the project performance in term of expense and time has studied since 1960s.These study arrangement from hypothetical work in view of experience of specialist, one end of organized exploration chip away at the flip side. In addition, there have been numerous past studies on task execution as indicated by expense and time elements (Abedi et al. 2011).

Mahamid (2011) said that main considerations of time overrun are poor correspondence between gatherings, asset administration and deferral in beginning. Abedi et al. (2011) recognized 17 variables of time invade among which deficient assets of customers, ill-advised venture plausibility, and absence of able agent, wrong development techniques, insufficient temporary worker experience and inept undertaking group were viewed as main considerations.

Agyakwah-Baah (2010) reported that main ten variables influencing time overrun in Ghana are deferral in respecting declarations, underestimation of the expense of undertaking, underestimation of complexity of task, trouble in getting to bank credit, poor supervision, underestimation of time for completion of projects by contractual workers, deficiency of materials, poor expert administration, vacillation of costs/increasing expense of materials and poor site management.

Ramabathan, (2011) expressed that popularity on the assets, for example, work, material and hardware may cause rare, and this will hamper to the venture execution. In the event that this circumstance drawn out and left unchecked, it might influencing the venture progress. They likewise reasoned that fumble of the undertaking by temporary worker, advisor furthermore, proprietor will prompt time overwhelm. From seven contextual analyses, the danger variable bringing on time overwhelm were found as deficiency and need in quality materials and fitting types of gear in the neighborhood advertise, no material conveyance plan arranged by the contractual worker; delay in materials, drawing and proposition endorsements by expert; Awful climate conditions; variance in crude material costs and fossil energizes; delay in managing area and property obtaining making delay development work; the separation between every venture site postured challenges in logistic wanting to disperse the assets; and revamps because of low quality work principles. For dispensing with the negative effect of these components, these issues ought to be tended to at pre-outline arrange so that the negative effect of these components can be dispensed with.

Mahamid (2011) said that main considerations of time overrun are poor correspondence between gatherings, asset administration and shortage of site workers. Abedi et al. (2011b) recognized 17 components of time invade among which lacking assets of customers, disgraceful venture practicality, and shortage of site workers, wrong development strategies, deficient contractual worker experience and awkward venture group were viewed as central point. Fugar and Agyakwah-Baah (2010) reported that main ten elements influencing time overwhelm in Ghana are postponement in respecting testaments, underestimation of the cost of venture, underestimation of multifaceted nature of venture, trouble in getting to bank credit, poor supervision, underestimation of time for fruition of activities by contractual workers, deficiency of materials, poor expert administration, change of costs/increasing expense of materials and poor site administration.

The work efficiency is measured as proportion of yield per work hour, so if the low nature of work is being involved, it may influence the venture timetable and cause the development time overwhelm. Then again, specialist gathering of respondents' positioned fluctuation of prices of materials as the most significant element causing time overrun in road construction projects (Mahamid, 2011).

According to Hamzah, (2011) late delivery of material has a significant impact on time overrun in road construction project; according to him most of the projects get delayed due to late delivery of material on the particular place.

Ramabathan et al. (2011) expressed that popularity on the assets, for example, work, material and hardware may cause rare, and this will hamper to the venture execution. On the off chance that this circumstance drawn out and left unchecked, it might influencing the venture advance. They likewise presumed that botch of the venture by contractual worker, specialist what's more, proprietor will prompt to time overwhelm. From seven contextual analyses, the hazard consider bringing about time overwhelm were found as deficiency and need in quality materials and suitable supplies in the nearby market, no material conveyance plan arranged by the temporary worker; delay in materials, drawing and proposition endorsements by advisor; Bad weather conditions; vacillation in crude material costs and fossil fills; delay in managing area and property procurement making postpone development work; the separation between every venture site postured challenges in calculated wanting to disseminate the assets; and adjusts because of low quality work models.

Table 1 showing the mapping factors causing time overrun in road construction projects

Factors	**References**
shortage of site workers	Mahamid, (2011), Hamzah, (2011)
Fluctuation of prices of materials conditions	Mahamid (2011), le-Hoai et al. (2008)
Late delivery of materials and equipment	Hamzah et al. (2011), Fugar & Agyakwah‐Baah (2010), Enshassi et al. (2009)
Effect of weather	Mahamid (2011), Abedi et al. (2011a), Hamzah et al. (2011), Alaghbari et al., (2007)
Lack of coordination between parties	Hamzah, (2011), Alaghbari et al., (2007)
Change in the scope of the project	Mahamid (2011), Abedi et al. (2011a), Hamzah et al. (2011), Fugar & Agyakwah‐Baah (2010), Yang & Wei (2010)
Shortages of materials	Mahamid (2011), Fugar & Agyakwah‐Baah (2010), Smbasivan & Soon (2007), Alaghbari et al., (2007), Enshassi et al. (2009), Le-Hoai et al. (2008),
Incomplete design at the time of tender	Mahamid (2011), Alaghbari et al., (2007), Yang & Wei (2010)
Inadequate contractor’s experience	Abedi et al. (2011a), Hamzah et al. (2011), Fugar & Agyakwah‐Baah (2010), Smbasivan & Soon (2007), Alaghbari et al., (2007), Le-Hoai et al. (2008),
Labor productivity	Hamzah, (2011), Alaghbari et al., (2007)
Mistakes during construction	Mahamid (2011), Hamzah et al. (2011), Smbasivan & Soon (2007), Alaghbari et al., (2007), Enshassi et al. (2009),
Owner interference	Abedi et al. (2011a), Smbasivan & Soon (2007), Enshassi et al. (2009)

Methodology

The target groups in this study are contractors. According to Erra, (2009) there are approximately 210 contractors in district Abbottabad. There are 210 contractor organizations. This examination in view of probability sampling, in probability sampling, each component in the population has a known, nonzero probability of choice. The straightforward arbitrary example, in which every individual from the populace has an equivalent likelihood of being chosen, is the best-known likelihood test. Sample size can be defined as number of people or units obtainable to be studied Sample size of this study consist of 150 people out of 210. We use simple random sampling to identify the target sample size for these instead 150 contractors are randomly selected out of 210. Contractors are selected randomly from a target population of 210.

A questionnaire was adapted by (Haseeb, 2011) so as to evaluate the view of distinctive gatherings included in construction projects in the Abbottabad construction segment, for the assessment for the recurrence of an event and the significance of the recognized reasons. We isolated the questionnaire into two main sections. The main piece of the questionnaire, general foundation data about the respondents (sorts of association of the respondents, respondent's years of experience, and sorts of task including by respondents) for distinguishing whether the respondents are suitable targets. Questionnaire acquaints the members with the source, the motivation behind the review. In the second part, we got some information about the most continuous and critical factors affecting the performance of the road construction project in Abbottabd.

A five-point Likert scale ranging from 1(strongly disagree) to 1 (strongly agree) was used to measure the impact of the performance factors. In order to encourage participation of respondents, the questionnaire conveyed that the findings of the study could be shared by the respondents. Data analysis was done calculating frequency and relative important index (RII). SPSS 17 software was used to calculate the frequency while multiple regression was use to determine the affect of variables causing time overrun.

Results and Analysis

Total number of 150 questionnaires were distribute to different contractors related to different construction projects we distributed these to the people working in both government and private contractors. There are 150 questionnaires; 60 questionnaires distributed within government contractors and remaining 90 distributed to different government contractors. Out of 150 questionnaires distributed, 103 (68.18%) were received. There were 13 (60 %) Questionnaires from government contractors related to the construction, and 90 responses collect from private contractors from different construction backgrounds.

4.1 Typical of projects of organization

Table (4.1) percentage of respondent types related to project

Type of project	Government contractor	Private Contractor
Buildings	38.46% (5)	44.44% (40)
Roads and transportation	46.15% (6)	22.22%(20)
Other	15.38% (2)	33.33% (30)

Government contractors related to building projects which frequency is 5 and private contractors related to building projects which frequency is 40. Government contractors related to road and transportation, which frequency is 6 and private contractors related to road and transportation projects which frequency is 20. Government contractors related to other construction projects and 30 private contractors related to different construction project which is almost 33.335.

4.2. Company size :(number of employees)

Average size of contractors working in government is almost 40 people similarly average size of employees working in private sectors as about 12 and average size of people working in other sectors is about 10.

4.3. Number of projects executed in the last five years:

Table (4.2) shows the frequency and percentage of projects executed in last 5 years.

Number of projects executed	**Govt. contractor**		**Private Contractor**	
	Frequency	**Percent%**	**Frequency**	**Percent%**
1 to 5	2	15.38%	35	38.88%
5 to 10	3	23.07%	30	33.33%
10 to 20	5	38.46%	20	22.22%
More than 20	3	23.07%	5	5.55%
Total	**13**	**100%**	**90**	**100%**

We asked different types of questions from government and private contractors. 1 to 5 projects has executed in the last five years by government contractors, whose frequency is 2 and by private contractors whose frequency are 35 during last five years. 5 to 10 projects have executed during five years by government contractors, whose frequency is 3 and by private contractors, whose frequency is 35 during the last five to ten years. 10 to 20 projects have executed in the last five years by government contractors, whose frequency is 3 and by private contractors, whose frequency is 30 during last ten to twenty years. Moreover, twenty projects have been executed in the last five years by government contractors, whose frequency is 3 and by private contractors whose frequency is 5 during last twenty years.

Table 4.3 demonstrates the recurrence and the percent of estimation of undertakings Executed in the most recent five years as indicated by every kind of target gathering:

Cost of projects	**Govt. Contractors**		**Private Contractor**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Less than 2 M	2	15.38%	20	22.22%
Less than 5 M	3	23.07%	33	36.66%
Less than 10 M	4	30.76%	23	25.55%
Less than 10 M	4	30.76%	14	15.55%
Total	**13**	**100%**	**90**	**100%**

Table 4.4 shows the value of project executed in last five years

Number of projects executed, whose cost is two million rupees or less than two million by the government contractor whose frequency is 2 and by the private contractors whose frequency is twenty. Number of projects executed, whose cost is less than 5 million rupees by the government contractor whose frequency is 3 and by the private contractors whose frequency is 33. Number of projects executed, whose cost is less than 10 million by the government contractor whose frequency is 4 and by the private contractors whose frequency is twenty three. Number of projects executed, which costs more than 10 by the government contractors, whose frequency is 4 and by the private contractors, whose frequency is twenty seven during last five years.

4.4. Reliability analysis

Table: 4.5 showing Reliability analyses of the variables

NO	Field	Cranach's Alpha
1	**Time factors**	.881

Table 3.5 shows the values of Chronbach's Alpha for each field of the questionnaire and the entire questionnaire.

In the fields, estimations of Chronbach's Alpha were in the extent from 0.933 and 0.972. This reach is viewed as high; the outcome guarantees the dependability of every field of the poll. From the above table the value of chronbach's alpha is approximately. 881, it is clear that there is good reliability between variables. Along these lines, it can be said that it is demonstrated that the survey is legitimate, solid, and prepared for dissemination for the populace test (Polit and Hunger, 1985).

4.5. Delaying factors causing time overrun

Time overrun	Loading	Mean
shortage of site workers	.898	3.93
Fluctuation of prices of materials conditions	.754	4.05
Late delivery of materials and equipment	.780	3.84
Effect of weather	.763	3.92
Lack of coordination between parties	.747	3.94
Change in the scope of the project	.813	4.12
Shortages of materials	.615	3.90
Incomplete design at the time of tender	817	3.91
Mistakes during construction	.626	3.76
Inadequate contractor's experience	.687	3.74
Labor productivity	.740	3.73
Owner interference	.792	3.88

Table 4.6 showing the delaying factors causing time overrun

From Table 4.6 it can be seen that contractor's representatives agreed that inadequate shortage of materials and fluctuation of prices of material conditions are the most significant factor causing construction time overrun for contractor responsibility category with the mean values 3.93 and 4.05 respectively. Shortage of site workers having mean position 3.93 shows a clear affect on projects. Fluctuation of prices of materials conditions which mean value is 4.05 , Late delivery of materials and equipment having mean value 3.84, Effect of weather which mean value is 3.92, Lack of coordination between parties which mean value is 3.94, Shortages of materials having mean position 3.90, Incomplete design at the time of tender which mean value is 3.91, Unsuitable construction methods which mean value is 3.76, Inadequate contractor's experience which mean value is 3.74, Incompetent project team having mean value 3.73, Owner interference which mean value is 3.88. These factors clearly showing the significant affect on time overrun as a result project get delay and time overrun will occur.

4.6. Rank analysis of factors for over all data

Time overrun	Rank	Mean
Fluctuation of prices of materials conditions	1	4.05
shortage of site workers	2	3.95
Lack of coordination between parties	3	3.94
Effect of weather	4	3.92
Incomplete design at the time of tender	5	3.91
Shortages of materials	6	3.90
Owner interference	7	3.88
Late delivery of materials and equipment	8	3.84
Unsuitable construction methods	9	3.76
Inadequate contractor's experience	10	3.74
Incompetent project team	11	3.73
Change in the scope of the project	12	3.12

Table 4.7 shows the ranking of factors causing time overrun

From the contractors prospective fluctuation of prices of materials is the most significant factors which cause time overrun in road construction project in Abbottabad region. Shortage of material as in the place of rank two which mean value is 3.95 second major factors from contractors prospective. Lack of coordination between project team gets rank 3 which mean value is 3.94 effect of weather put up in rank 4 which mean value is 3.92 from contractor's point of view. Incomplete design at the time of tender at rank 5 with mean

value is 3.91. Form the contractor's prospective shortage of workers at rank 6 with mean value of 3.90. Late delivery of materials and equipment and owner interference are in the rank of 7 and 8 with their mean values of 3.84 and 3.88 respectively. Unsuitable construction methods get rank 9 with mean value of 3.76. Inadequate contractors experience is in number 10 with mean value of 3.74. Incompetent project team puts in rank 11 with mean value of 3.73. Change in the scope of the project having rank 12 with mean value of 3.12.

Regression Analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.346	.349		.993	.323
	Factors	.848	.090	.682	9.375	.000

a. Dependent Variable: Time overrun

Table 1 indicates that all the factors with their Beta value .848, and p=.000 which shows that all the factors have significant impact on time overrun. According to the Beta value every .84 unit increases in independent variables it will change dependent variable by 68%

Correlations

		Time overrun	Factors
Time overrun	Pearson Correlation	1	.682**
	Sig. (2-tailed)		.000
	N	103	103
Factors	Pearson Correlation	.682**	1
	Sig. (2-tailed)	.000	
	N	103	103

**. Correlation is significant at the 0.01 level (2-tailed).

Summery

This study researched the time overrun factors in construction industry of northern part of Pakistan. It included review with adapted questionnaire having 12 regular components of time overrun. An aggregate of 103 finished questionnaire sets were examined and found that the critical elements adding to development time overrun are income and monetary challenges confronted by contractual worker, poor site administration and supervision, inept subcontractor, deficiency of laborers and money related challenges of the proprietor. It is suggested that appropriate arranging of work, submitted initiative and administration, and viable correspondence framework can be extremely accommodating in enhancing time execution.

References

Abedi, M., Fathi, M. S., & Mohammad, M. F. (2011a*). Category and Contractor Category. The First Iranian Students Scientific Conference in Malaysia, 9 & 10 Apr 2011, UPM, Malaysia.*Construction Industry. Benchmarking: An International Journal, 17(2), 294-308.

Abedi, M., Fathi, M. S., & Mohammad, M. F. (2011b). *Major Mitigation Measures for Delays in Construction Projects.* The First Iranian Students Scientific Conference in Malaysia, 9 & 10 Apr 2011, UPM, Malaysia.

Abedi, M., Fathi, M. S., & Mohammad, M. F. (2011b). *Major Mitigation Measures for Delays in Construction Projects.* The First Iranian Students Scientific Conference in Malaysia, 9 & 10 Apr 2011, UPM, Malaysia.

Asian Development bank, (2015*).”Pakistan InfrastructureReport”.BMI.* http://store.bmiresearch.com/pakistan-infrastructure-report.html.

Creedy, G.D., Skitmore, M., and Wong, J.K.W. (2010). “Evaluation of risk factors leading to cost overrun in delivery of highway construction projects.” *Journal of Construction Engineering and Management*, 136(5), 528-536.

Durrani, A.Z. (2007). “*Pakistan Infrastructure Implementation Capacity Assessment*.” World Bank, Pakistan.

Enshassi, A., Al-Najjar, J., & Kumaraswamy, M. (2009). Delays and Cost Overruns in the Construction Projects in the Gaza Strip. *Journal of Financial Management of Property and Construction, 14*(2), 126-151. http://dx.doi.org/10.1108/13664380910977592

Fugar, F. D. K., & Agyakwah-Baah, A. B. (2010). *Delays in Building Construction Projects in Ghana. Major Causes of Construction Delays Under Client Australasian Journal of Construction Economics and Building, 10(1/2), 103-116.*

Fugar, F. D. K., & Agyakwah-Baah, A. B. (2010). Delays in Building Construction Projects in Ghana. *Australasian Journal of Construction Economics and Building, 10*(1/2), 103-116.

Hamzah, N., Khoiry, M. A., Arshada I., Tawil, N. M., & Che Ani, A. I. (2011). *Cause of Construction Delay.* Theoretical Framework. 2nd International Building Control Conference 2011*, Procedia Engineering, 20, 490-495*.

Hamzah, N., Khoiry, M. A., Arshada I., Tawil, N. M., & Che Ani, A. I. (2011). *Cause of Construction Delay - Theoretical Framework*. 2nd International Building Control Conference 2011, *Procedia Engineering, 20,* 490-495.
http://dx.doi.org/10.1108/09699981111180917

Ibrahim, A. R., Roy, M. H., Ahmed, Z., & Imtiaz, G. (2010). An Investigation of the Status of the MalaysianConstruction Industry. *Benchmarking: An International Journal, 17*(2), 294-308.http://dx.doi.org/10.1108/14635771011036357

Javied, Z., and Hyder, A. (2009). “Impact of training on earnings: Evidence from Pakistani industries.” Asian Social Science, 5(11), 76-85.

Le-Hoai, L., Lee, Y. D., & Lee, J. Y. (2008). Delay and cost overruns in vietnam large construction projects: A comparison with other selected countries. *KSCE Journal of Civil Engineering, 12*(6), 367-377. http://dx.doi.org/10.1007/s12205-008-0367-7

Mahamid, I. (2011). Risk matrix for factors affecting time delay in road construction projects: Owners'

Mahamid, I. (2011). Risk matrix for factors affecting time delay in road construction projects: Owners' perspective. *Engineering, Construction and Architectural Management, 18*(6), 609-617. http://dx.doi.org/10.1108/09699981111180917

Ministry of Finance. (2011). *Economic Survey of Pakistan 2010-11*. Government of

*Multiple D&B Projects In Malaysia: A Case Study. Proceedings of the 2011 IEEE IEEM, pp. 854-859.*Pakistan. *perspective. Engineering, Construction and Architectural Management, 18(6), 609-617.*

Ramanathan, C. T., Potty, N. S., & Idrus, A. B. (2011). *Risk Factors Influencing Time and Cost Overrun In perspective. Engineering, Construction and Architectural Management, 18(6), 609-617.*

Sambasivan, M., & Soon, Y. W. (2007). Causes and Effects of Delays in Malaysian Construction Industry. *International Journal of Project Management, 25,* 517–526. http://dx.doi.org/10.1016/j.ijproman.2006.11.007

The Express Tribune. (2010). "WB approves $130m to cover cost overruns", 30 September 2010.

Yang, J., & Wei, P. (2010). Causes of Delay in the Planning and Design Phases for Construction Projects. *Journal of Architectural Engineering, 16*(2), 80–83. (ASCE) 1076-0431(2010)16:2(80) http://dx.doi.org/10.1061/.