FactorsAffectingTimelyCompletionofConstructionProjectsinNepal

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Abstract

It is common to experience delays during construction projects. Delays can cause substantial damages to an owner as well as contractors and is the sources of frequent disputes and claims. Many studies have been carried out to assess the causes of delays in construction projects. They are found to be almost similar, except some prevailed local condition. Most of the common construction delay factors are attributed to design faults, incompetent contractor, lack of team accountability etc. To minimize or eliminate the delay we have to follow the recognized fundamental principles of management such as: cost-time relationship, time priority, accountability, rewards, innovative thinking etc. The root causes of delays found out in this paper are not so much different than other previous study. If the implementing agencies properly followed the fundamental management principles and some other related corrections as recommended in the paper, much construction delays can be avoided.

Key Word: Constructionprojects,Delayfactors,Delayclaims,Timelycompletion

1. Introduction

May I correct to write this statement "All construction projects (or any project) in the world are completed with time overrun"? Some Project Managers may disagree with this statement, but this is a fact. Many projects implemented in Nepal are found to be delayed by significant length of time. To prove this statement, we can take an example of one of the Asian Development Bank financed projects in Nepal, which was called successful and had got 'Outstanding Award' from the donor agency in 1998, still completed 9 months delaying.

The goal of a construction project is simple-it is to build some thing. What differentiates the construction industry from other industries is that its projects are large, built on site and generally unique (Gould, PP 16). The construction projects usually need more time extending from one year to several years as per set objectives. There are no any projects in the world, which do not have any problem and had completed within its set out schedule. Delays on construction projects are a universal phenomenon. But the question is its length of time. Some projects are only a few days behind the schedule: some are delayed over a year. So it is essential to see the actual causes of delays in order to minimize and avoid the delays in any construction project.

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The aim of this paper is to examine the delay factors, which have been affecting the timely completion of the construction projects in Nepal, taking ADB financed TEVT construction project in Nepal as a case study. The data for this study has been gathered through detail study of TEVT project documents and working experience in the project as a Chief of Engineering Unit. The second part of the paper reviews the literatures collected from books, journals and Internet . The third part of the paper discusses the delay factors with the fundamental principles that are relevant to timely completion proposed by the Ellis and Thomas (2002). The final part of the paper offers recommendations for further work and conclusion.

2. Delay in construction projects

Construction Delay is generally acknowledged as the most common, costly, complex and risky problem encountered in construction projects. Because of the overriding importance of time for both the owner and the contractor, it is the source of frequent disputes and claims leading to lawsuits (Ahmad et.al, 2003). Delays do not always result from a single catastrophic event. They frequently develop slowly during the course of work. To determine the critical delay, we have to compare as planned and as-built schedules (Last, 1997). Delays can cause substantial damages to an owner. This has motivated the owners to devise contract provisions and project processes to anticipate, manage and compensate for such delays (Brennan, 2002). The successful execution of construction

projects and keeping them within estimated cost and prescribed schedules depend on a methodology that requires sound engineering judgment.

Many studies were carried out to assess the causes of delays in construction projects. Mansfield et.al. (1994) studied the causes of delay and cost overrun in construction projects in Nigeria. The findings of the study are financing and payment for completed works, poor contract management, changes in site conditions, shortage of material and improper planning.

There is a dilemma about the citing reasons for delays. During construction of Olympic village in 1996, the construction was lagging behind. The contractor's laxity was more to blame for this delay than anything else. But the contractor reported several of the factors that caused delay (www.cyberbuzz.gatech.edu). The delay in public construction works has immensely affected the cost of the project. Sjoberg (2000) estimates a 14-18 month delay would generate an additional cost of $261 million to $344 million to state and local governments in USA.

Table 1. Projects Showing Delay in Completion

S/N	Project	Effective Date	Closing Date		Delay
			Original	Final	Y/M
1	Second Hill Irrigation	24/11/83	31/12/90	30/06/94	3/6
2	Feeder Roads	14/03/84	31/12/90	31/08/95	4/8
3	Sixth Power	15/04/86	30/06/89	30/06/95	6/0
4	Cotton Development	20/03/86	30/06/91	30/06/94	3/0
5	Seti Zone Rural Development	16/04/86	31/12/93	31/12/95	2/0
6	Second Tribhuman Inter. Airport	11/02/87	30/06/90	31/12/92	2/6
7	Road Improvement	15/05/87	31/12/90	30/09/95	4/9
8	East Rapti Irrigation	19/09/88	31/05/95	31/05/98	3/0
9	Second Water Supply Sector	23/06/89	30/06/94	31/12/95	1/6
10	Technical Edu. & Voc. Tr. Dev.	26/02/90	31/12/96	30/09/97	0/9
11	Second Road Improvement	26/02/90	31/12/94	30/06/98	3/6
12	Seventh Power	18/09/90	31/08/95	31/12/98	3/4
13	Rajapur Irrigation Rehabilitation	21/04/92	30/06/98	31/12/00	1/6
14	Upper Sagamatha Ag. Dev.	05/05/92	30/06/00	30/06/02	2/0
15	Primary Edu. Development	18/05/92	30/06/98	31/03/00	/19
16	Secondary Edu. Development	10/03/93	30/06/99	30/06/00	1/0
17	Kathmandu Urban Dev. Proj.	24/02/94	31/12/98	31/10/99	0/10

In 2002, Thomas and Ellis studied problem of delays in highway construction in Florida , USA. Out of many factors, most important causes found are i) construction work taking as business as usual, ii) lacking team accountability for timely project completion, iii) utilities are unidentified or incorrectly located iv) delays in relocation of utilities v) differing or unseen site vi) inadequate planning by contractor vii) design errors and omissions.

Sometime, unusual cause results the delay in construction. News in a web site (www.cyberbuzz.gatech.edu) states that lack of cooperation on behalf of students to avoid parking in lots designated as construction zones has created to contractors, being reluctant to begin construction". Besides the reasons mentioned above, there are other reasons too prevailed for delaying project activities in Nepali context. According to Asian Development Bank (ADB) report (1998), the projects in Nepal are lagging behind three years in average. See Table 1 for detail of delays in the projects carried out under ADB loan in Nepal.

3. TEVT Project and delay factors

The Technical Education and Vocational Training (TEVT) Development Project aimed to develop the institutional capabilities of the Council for Technical Education and Vocational Training (CTEVT), a government undertaking organization responsible to develop middle level technicians. The project was executed during 1989-1997 through a loan $21.6 M of Asian Development Bank (ADB) along with SWISS Government grant and the OPEC fund with a 9-month extension period. Out of the loan amount about $ 8.4 million was spent for civil works. The civil works consisted of the construction of four new technical schools (TS) and HQ of CTEVT and upgrading of one technical school. See Figure 1 (map) for location of project sites through out Nepal. From the map, we can see one project (Dhaulagiri TS) is in Himalayan mountain region, three school projects (Seti TS, Pokhara TS, HQ) in hilly region and three projects (Bheri TS, Rapti TS, Lahan TS) in terai (plain) region.

Considerable delay occurred right at the start of the implementation of the project owing to political system changes in Nepal in 1990, which resulted in i) a freeze in hiring of the project staff; and ii) inadequate budget provision to carry out the necessary activities. As per the appraisal of the project, the construction works were to start in September 1989 in all schools including HQ. Later, the schedule was revised, even though, first project could be started only in STS project in June 1992 causing a delay of two years (24 months) and then HQ I in March 1993 having 12 months delay. The construction works in only RTS project has been found to be contracted as per the revised schedule. The civil works in other three projects BTS, DTS, and LTS started only in February 1994 causing a delay of further one year on and above the initial delay described earlier.

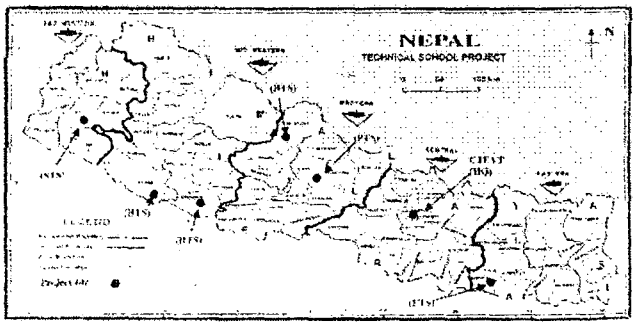

Figure 1. Location of Project Schools

As we can see in Table 2, the construction time for each major contract (BTS, RTS, STS, DTS and HQ) varied between 27 and 29 months except for two STS contracts, which were completed in 23 and 24 months, respectively. Figure 2 presented here distinguishes the amount of delays comparing construction activities

proposed in appraisal document and then revised with the actually carried out dates. From the study of related documents submitted in Project Implementation Unit (PIU) as evidences of construction delay, following reasons have been found significantly cited for the extension of construction time period, these are also pertinent to all construction projects in Nepal in either way.

Table 2. Construction Delays in TEVT Project

S/N	Project School	Appraisal		Revised(APP)		Construction		APD	Delay accounted for		
		SD	FD	SD	FD	SD	FD		APP (9-4)	Revised (9-6)	Actual (9-8)
1	2	3	4	5	6	7	8	9	10	11	12
1	STS-I	9-'89	6-'94	6-'90	6-'95	6-'92	11-'94	6-'95	12M	0M	7M
2	STS-II	-	-	1-'95	3-'96	1-'95	12-'95	4-'96	-	1M	4M
3	RTS	9-'89	6-'94	3-'93	9-'95	3-'93	9-'94	6-'95	12M	(-)3M	9M
4	BTS	9-'89	6-'94	9-'92	3-'96	4-'94	9-'95	9-'96	27M	6M	12M
5	DTS	9-'89	12-'94	9-'92	3-'96	4-'94	9-'95	9-'96	21M	6M	12M
6	PTS	-	-	9-'94	9-'96	7-'95	12-'96	6-'97	-	9M	6M
7	LTS	9-'89	9-'93	3-'94	9-'95	4-'94	3-'95	9-'95	24M	0M	6M
8	HQ I	9-'89	3-'93	3-'93	12-'95	4-'93	6-'94	9-'95	30M	(-)3M	15M
9	HQ II	-	-	3-'95	3-'96	4-'95	4-'96	6-'97	-	15M	14M

M=Month, SD=Start Date, FD=Original Finished Date, APD=Actual Project Completed Date

APP=Appraisal (Project Proposal document), (-)Denotes early finish

- Political instability
- Remoteness of the site
- Unavailability required quantity and quality of construction materials
- Heavy monsoon and extreme weather condition
- Frequent change in design
- Excess quantity of work beyond the BOQ
- Hard nature of soil encountered in earth cutting
- Poor management of contractors and.
- Low bidding by contractors

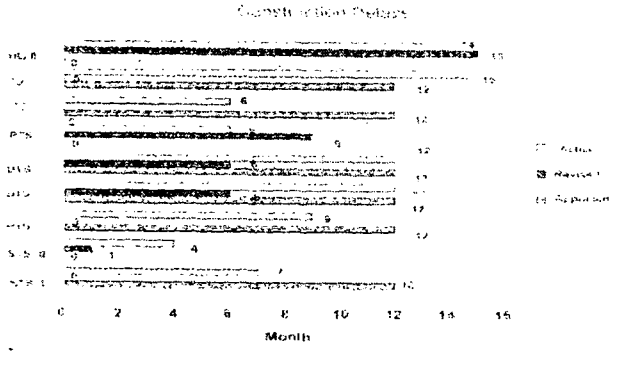

Figure 2. Diagram Showing Delays in Each Project School

From analysis, it shows that, except STS II, each project had faced more than five delay factors, which forced contractors for claiming extension of construction time period. See table 3. PIU has accepted the excuse of contractors for the delay reason and extended construction time period as non-compensable accordingly (Project archive, 1989-97). At the same time, it has been found that PIU has also levied 6 months and 3 months liquidated damages to HQ I and HQ II contractors respectively for extra delays.

For the analysis purpose, above reasons for construction delay in the case study project has been analyzed through the fundamental principles of management stated in Thomas and Ellis (2002) research work.

Table 3. Delays Attributed for Different Project Schools

S/N	Delay Factors	Project Schools								
		STS I	STS II	RTS	BTS	DTS	PTS	LTS	HQ I	HQ II
1	Political Instability	√	×	√	√	√	×	√	√	√
2	Remoteness of the site	√	√	×	×	√	×	×	×	×
3	Construction Matrials	√	×	√	×	√	×	√	√	×
4	Weather/Climate	√	√	√	√	√	√	√	√	√
5	Change in Design	×	×	√	√	×	√	√	√	√
6	Excess quality	√	×	√	√	×	√	√	√	√
7	Soil condition change	√	×	×	×	×	√	×	×	×
8	Poor management of Contractor	√	×	×	√	×	√	√	√	√
9	Low bidding	×	√	×	√	√	√	√	×	√
10	Total Count	7	3	5	6	5	6	7	6	6

Note : (√)denotes delay factor prevailed, (×)denotes delay factor not prevailed

Cost-time relationship:

A widely recognized principle is that spending more monies during planning and design will reduce the time and cost required for construction by avoiding unforeseen conditions reducing to a minimum design errors and omissions, and developing schemes that will support the most efficient approach. In this project too, change in design and excess quantity of work beyond the BOQ was resulted, which impacted directly on the project cost and completion time.

Time priority:

Timely completion of projects must be made a priority. Critical resources should be applied to projects based on the importance of the project. But in this case, over ambitious time plan was created due to the initial delay. Allotted project duration for the civil works and procurement of equipment of all the sites were squeezed keeping total project completion deadline intact, whatsoever the project size in terms of cost and scope. This strategy ultimately had resulted construction delay in every site.

Accountability:

The project team must be accountable for their performance. In a project, for the quality management perspective, teamwork among collaborators is necessary and it has profound impact on construction management. Therefore, project officials, consultants, contractors, government line agencies etc. are equally responsible for the success of the project. To achieve timely completion of a project, both the owner and the contractor must understand how the contractor plans to sequence the work (Brennan, 2002).

Rewards:

Reward systems must reward superior performance. There should be also negative reward system, i.e. liquidated damages. This reward system approach has not been found done any more in this TEVT project. Albeit, there is a reward clause in the contract.

Knowledge:

Superior knowledge and skills must be available at all steps in the project development and delivery. . In this project, uses of construction management techniques were almost nothing. This project was lead by non-technical persons. Modern construction knowledge was not found to be incorporated into the design. The contractors were incompetent, so they could not apply any new construction techniques too.

Efficiency:

Sound and timely decisions are essential to reduce delays. The organizational structure with regard to communications, decision authority, and process must support the earliest possible resolution of project problems. The organization needs to be efficient and provide for rapid responses to technical and managerial problems. Though the project managers were non-technical persons. the official decisions were found to be very prompt and no any time delay have been occurred from the project office side.

Innovative thinking:

Stagnant thinking is an important axiom to risk aversion. Many organizations posses a large degree of inertia with regard to doing things the same way. Though, the project implementation office consisted of young engineers and supervisors, but due to the traditional working habit of contractor, no any modern techniques could be applied in the entire project sites. Major time-consuming form work activities were done through wooden planks and post rather steel poles in many sites. Concrete pouring was done by workers carrying steel pan or basket on their head even to the top of five-storey building.

4. Conclusion

Several developing countries have been facing problems in implementing projects due to unclear policy, lack of appropriate project design and lack of institutional capacities. More to this, projects in Nepal are delayed due to other reasons too. Delay in construction projects is a fundamental phenomenon. So, this project under study was also came within the grip of construction delays.

Particularly, in this TEVT project, various causes identified as the reason of construction delays are: remoteness of site, unavailability and required quality and quantity of construction materials, heavy monsoon, frequent changes in design, excess quantity of work, hard nature of soil, poor management of contractor and low bidding. These are associated in one and another way with other fields' construction projects too. These causes were arisen due to ineffective planning of client, incompetent consultants and mismanagement of contractors, that is all the three parties are equally responsible for delaying the construction work. To eliminate or reduce the construction delays, we have to plan the projects effectively following construction management principles. If we think the project in a way as suggested in the paper, considerable delays in construction project could be eliminated and project will be completed without having any disputes.

From the analysis of this TEVT project, it can be inferred that most of the causes mentioned in the projects could have been well anticipated and planned accordingly to accomplish the project within the targeted time. Therefore, it is always important to find delay and its eventual causation discovered as early as possible and that its consequences be terminated as soon as reasonably practicable.

5. Recommendations

For the best apply of the principles above discussed and to minimize the construction delays in Nepal, following works should be carried out:

- Administrative decisions and contract awarding mechanism should be made transparent and effective.
- Project duration shall not be ambitious due to any circumstances.
- The contractor shall behave as a professional organization to accomplish the task they get,
- The contractor shall be motivated to work by using modern construction technology.
- The A/E consultant shall be competent and should carry on the design through innovative thinking,
- Project managers and engineers shall be involved right from the project planning and design
- Contractors' licensing system shall be reviewed. so that only competent contractor could compete in the construction industry.

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