



International Journal of Intellectual Advancements and Research in Engineering Computations

Analysis of factors causing delay in highway construction projects in Kerala

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ABSTRACT

The construction industry is one of the main sectors that provide important ingredients for the development of an economy in a nation. It is creating large number of job opportunities, innovating ideas and knowledge. Highway construction is one the important sector in this. In any case, numerous ventures experience broad postponements and in this manner surpass beginning time and quotes. Development delay is viewed as one of the most repeating issues in the development business and it adverse effects venture achievement as far as time, cost, quality and security.

The purpose of this study is to investigate the factors causing delays in Highway road construction projects because investigating the reasons for delay is a must do factor and contribution for an improved construction process. This examination is directed to explore the exhibition of street development venture in kerala and to distinguish the reasons for delay and their seriousness as indicated by temporary workers and specialists through a poll study. The top five causes of project delays were observed and ranked. Proper recommendations to minimize the delays were listed

Index terms: Highway construction, Delay factors, RII, Performance indicators

INTRODUCTION

The development business is one of the fundamental areas that give significant fixing to the advancement of an economy. An ordinary development venture experiences high danger related with plan deferrals and time sensitive questions, since time is the primary factor of the pith of the development contract. Many projects experience extensive delays and thereby exceed initial time and cost estimates even after with the introduction of advanced construction technologies and more effective management techniques in our country. Construction delays are considered to be one of project success in term of time, cost, quality, and safety. Delays in construction projects are still very common in most parts of the world, For example, the unique nature of construction

makes the work susceptible to unforeseen site conditions and severe weather changes. What's more, a development plan made for a task depends on the presentation of proprietors, planners, contractual workers, subcontractors, and providers, just as the co-appointment among them. A solitary occasion that goes amiss from the arrangement, for example, an adjustment in the extent of the venture, can upset the general exhibition and can make disturbance among the gatherings, Delay in development can have various results in an undertaking, for example, late finishing, lost efficiency, speeding up, weighty harms, expanded expense and agreement end. Subsequently it is critical to analyse the postponements and discover a few answers for conquer these deferrals. Finishing ventures on time is a pointer of proficiency, yet the development cycle is

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dependent upon numerous factors and unusual variables, which result from numerous sources. These sources incorporate the exhibition of gatherings, assets accessibility, ecological conditions, contribution of different gatherings, and authoritative relations. In any case, it is once in a while happen that a task is finished inside the predefined time.

AIMS AND OBJECTIVES

The main aim of the project is to analyse the number of factors disturbing the project schedule and suitable measures that can be occupied to reduce the tendency of delay. The main objective behind this is to identify the actual delays in road construction projects, by conducting field survey in the construction project

- To identify the major cause of delays in construction project
- To identify the effect of delays in construction project
- To rank the top 5 causative factor by RII method of statistical data evaluation
- To recommend strategies for minimizing delay in the project based on the findings of the study

DELAYS

In development, deferral could be characterized as the time invade either past consummation date determined in an agreement, or past the date that the gatherings settled upon for conveyance of an undertaking. Deferral in government development ventures, particularly the street segment, has significantly affected monetary exercises in the nation [1-5]. Above all, postponements can be

found in these four significant classifications as clarified by Theodore.

- Critical or noncritical
- Excusable or non-excusable
- Compensable or non-compensable
- Concurrent or non-concurrent

METHODOLOGY

The methodology selected for this research paper is questionnaire survey .The form is made contains 26 factors which cause the delay in schedule of project on the basis of detailed literature survey. After this, generated the survey form. For this purpose, took a definite number of persons which are related to construction industry for collecting essential data record. Total 30 questionnaires have collected after meeting professionals (i.e.) Project manager, Owner's, Project engineers and Site Engineers) [6-8]. In these forms, they tick for ranking the factors 1 to 6

Data was evaluated by using formula of Relative Importance Index (RII) method as given below:

$$R.I.I. = \frac{5(p5) + 4(p4) + 3(p3) + 2(p2) + 1(p1)}{5(p1 + p2 + p3 + p4 + p5)}$$

Here,

p1 = total persons who ticked for no delay for each factor

p2 = total persons who ticked for little delay for each factor

p3 = total persons who ticked for moderate delay for each factor

p4 = total persons who ticked for large delay for each factor

p5 = total persons who ticked for very large delay for each factor

*RII values always lies between 0 to 1.

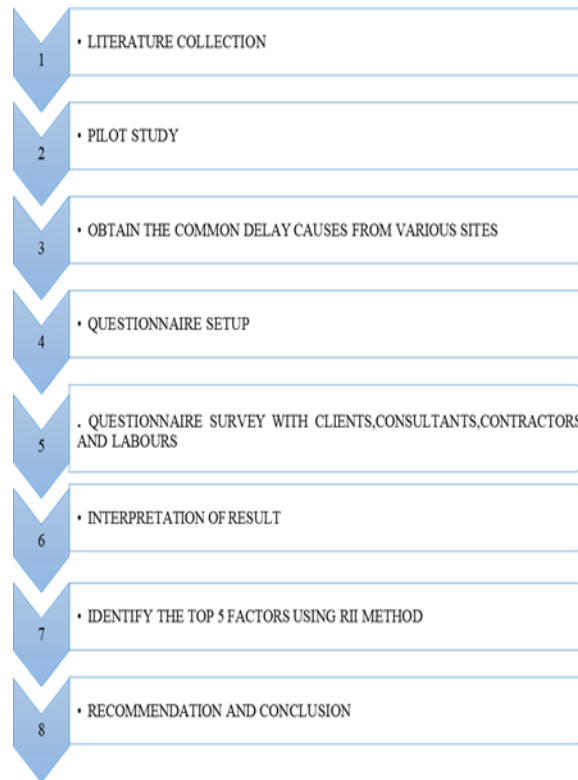


Fig1.Chart showing the methodology

DATA COLLECTION

The study was carried out by preparing the questionnaire for survey. The questionnaire contains several factors which cause the delay in

construction. A total of 30 questionnaires were distributed and the response received were analysed.

ANALYSIS AND RESULTS

After collecting the data the relative importance index (R.I.I) was calculated for every single reason to detect greatest and smallest momentous delay factors in on-going national highway project.

These factors were ranked according to the computed RII values of each factor. On the basis of the rank the top 5 most vital factors affecting the project were presented.

Table -1: Ordinary Scale Used For Data Measurement

Effect of factor for schedule delay					
Level of delay	No delay	Little delay	Moderate delay	Large delay	Very large delay
Scale	1	2	3	4	5
Factors	p1	p2	p3	p4	p5

Table -2: Ranking scale of factors

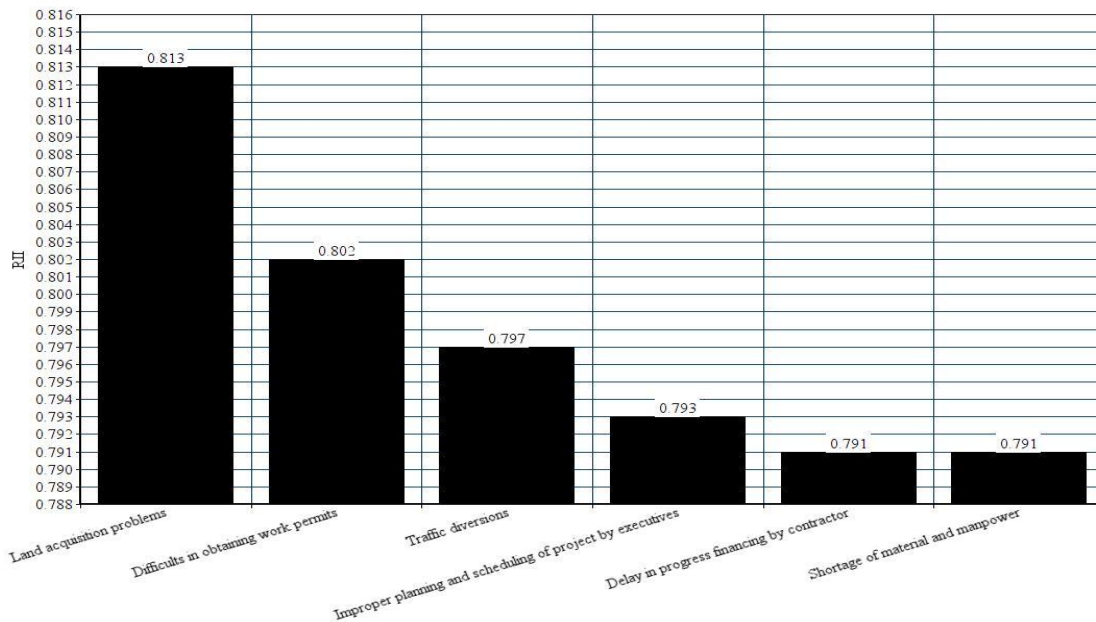
SI No	Factors causing delay	RII VALUE	RANK
1	Design Problems	0.790	7
2	Traffic diversions	0.797	3
3	Labour Availability	0.791	6
4	Subcontractors Problems	0.787	10
5	Contractual Issues	0.787	10
6	Politics issue	0.789	8
7	Financial/ Economic Problems	0.791	6
8	Materials Availability	0.791	6
9	Permits/Licenses	0.802	2
10	Weather Conditions	0.787	10
11	Equipment Availability	0.788	9
12	Drawings	0.782	14
13	Industrial Relations Disputes	0.789	8
14	Improper planning and scheduling of project by executives	0.793	4
15	Working Environment	0.788	9
16	Testing of materials	0.789	8
17	Proximity to Required Resources	0.785	11
18	Client Problems Slow decision making and bureaucracy in Client organization	0.790	7
19	Underground Services	0.784	12
20	Variations	0.787	10
21	Accidents	0.783	13
22	Transportation of material	0.787	10
23	Site Layout	0.784	12
24	Natural Hazards	0.783	13
25	Supervision / Management Staff Availability	0.788	9
26	Land acquisition issues	0.813	1

Table 3: Top 5 most significant factors affecting the schedule

SI No.	Top 5 most significant factors affecting schedule	Group of factor	R.I.I	Rank
1	Land acquisition problem	Project related	0.813	1
2	Difficulties in obtaining work permits	Project related	0.802	2
3	Traffic diversions	External related	0.797	3
4	Improper planning and scheduling of project by executives	Contractor related	0.793	4

5	Delay in progress financing by contractor	Contractor related	0.791	5
6	Shortage of material and manpower	Material and labour related	0.791	6

Graph between top 6 most significant factors and their RII value



DISCUSSION

After calculating highest RII value of 0.813 Land acquisition problem is ranked as no. 1 factor which affect the construction. One reason is that the extent of land to be acquired is not possible to be identified because of the outdate land records and poor quality of designs. Sometimes additional land requirements become necessary to take care of the designed right of way.

According to the new Act of the Central Government, land acquisition can be done only after social impact assessment and now all acquisition in the State is according to the new Act, says an official of the Revenue Department However, some of the land owners say that the opposition comes because of two or three factors. The compensation paid is not adequate; there is no transparency in the acquisition process; and there is no viable alternative for the land owner when fertile agricultural lands are taken over. It is most important thing needed high attention when

the project is going to schedule .For this contractors are require give proper attention on the time of project planning and scheduling stage.

Difficulties in obtaining work permits ranked as factor no. 2 after getting RII value 0.802, without the proper permit, there are multiple issues that the contractor may experience through malfunctions and issues that appear through inferior work or a lack of understanding about certain items.it create chances of schedule delay in project. It is important to pay attention to obtain all relevant documents required by the responsible individual

Traffic diversions ranked as factor no 3 on the basis of RII value 0.797 to ensure safety of all, there is a need to adopt an efficient and effective plan for management of traffic in work zones. It is equally important to ensure the safety of workers in Work Zones, who perform the varied tasks within the work space.

Improper planning and scheduling of project by executives ranking as factor no 4 on the basis of RII value 0.793.

One of the most common delay factors that were mentioned is "Improper planning and scheduling of project by executives improper planning and scheduling are frequently responsible of transforming productive ventures into losing projects. The advantages of pre-project planning incorporate expanded benefit, higher quality and decreased hazard. so The capable individual should deal with the accompanying said measures, for example, applying aptitudes, procedures, instruments, information to extend undertakings and furthermore a few strategies and cycle including cost the board, time the executives, hazard the executives, quality administration and different cycles that are required so as to control and screen cost, time, extension and nature of tasks. Information and experience is one of the key variables in development since absence of experience of can cause plan delay in ventures.

CONCLUSION AND RECOMMENDATIONS

In this paper, the causes of delay in road construction projects are researched. A questionnaire and personal interviews through project engineer have formed the basis of this paper. The study reveals that the 5 top factors affecting road construction delays are:

- Land acquisition problem
- Difficulties in obtaining work permits
- Traffic diversions
- Improper planning and scheduling of project by executives
- Delay in progress financing by contractor
- Shortage of material and manpower.

REFERENCES

- [1]. Abd Majid, M. Z., and McCaffer, R. "Factors of non-excusable delays that influence contractors' performance." *J. Manage. Eng.*, 14(3), 1998, 42-49.
- [2]. Ahmed, S., Azhar, S., Kappagantula, P., and Gollapudi, D., "Delays in construction: A brief study of the Florida construction industry." *Proc.*, 39th Annual Conf. of the Associated Schools of Construction, Clemson Univ., Clemson, SC., 2003.
- [3]. Aibinu, A. A., and Jagboro, G. O., "The effects of construction delays on project delivery in Nigerian

The advantage of this examination will teach venture engineer the significant of encompassing these defer components to give the fulfilment of Highways development venture on schedule. Anyway this examination that has a populace requirement then later on work could be concentrate in more extensive degree.

This examination was distinguished classes of top five most basic factors in Kerala parkway development ventures. An absolute eighty 30 development experts from Highway development industry were partaken and imparted their master insight as their reaction by finishing the poll review. The undertaking members ought to be acquainted with these noteworthy reasons for delays in asset related and plan to keep away from or if nothing else to relieve their effect on venture achievement. A few suggestions are as per the following:

Delays in development tasks can be diminished through the joint endeavours of members in the development business i.e. Clients, designers, contractors, suppliers, finance sources, educational institutions, manufactures, and the legislature ought to collaborate to give the framework important to proficient administration

All gatherings engaged with venture concurred that deferral happens generally during the development stage. In this way, in settling those issues, proposal to expand development efficiency, trailed by improving the mastery and aptitude of HR, and directed site gatherings all the more habitually.

A key perspective on taking care of postpone issues ought to be considered as a significance of the board viewpoints, the impacts of information and data stream between the association levels, and significance of top administration commitment in tackling the issue.

- construction industry.” *Int. J. Proj. Manage*, 20(8), 2002, 593– 599.
- [4]. Alaghbari, W., Kadir, M. R., & Salim, A., The significant factors causing delay of building construction projects in Malaysia. *Engineering construction and architectural management journal*, 14(2), 2007, 192 – 206.
- [5]. Alinaitwe, H., Apolot R., & Tindiwensi, D. Investigation into the Causes of Delays and Cost Overruns in Uganda's Public Sector Construction Projects. *Journal of Construction a. in Developing Countries*, 18(2), 2013, 33–47.
- [6]. Al-Tabtabai, H. M., Causes for Delays in Construction Projects in Kuwait. *Engineering i. Journal of the University of Qatar*, 15, 2002, 19 – 37.
- [7]. Andi, A., Lalitan, D. & Loanata, V. R., Owner and Contractor Perceptions toward factors causing Delays in Structural and Finishing Works. *Civil Engineering Dimension Journal*, 12(1), 2010, 8 – 17.
- [8]. Asiamah, A. D. A., & Asiamah, O. K. A., Management of Government Funded Construction Projects in Ghana: Stakeholders' Perspective of Causes of Delays in Construction of Public Buildings. *Journal of International Institute for Science, Technology and Education*, 3(12), 2013, 149 – 156.