

# DELAY IN CONSTRUCTION PROJECT

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## ABSTRACT

Construction delay is a time exceeds either after the contract date or after the date that the components involved have agreed upon for the delivery of the project. In both cases, a delay is usually a costly situation or the period of amount of time during which something is delayed. There is various types of definition of delay are made in construction industry such as to wait until later to do something or to take longer than expected or planned or the amount of time that you must wait for something that is late. Delay are the major source of claim and disputes in construction industry in India. Various delayed analysis methods have been developed, there is a lot of debate was arranged on national and international level for how to minimize delays. This paper has intended to identify the causes of delays, the effects of delays and methods of minimizing construction delays. This paper study has carried out based on literature review and a questionnaire survey. The eighty-three questionnaire has been made on the basis of pilot study, which has been distributed on various construction site. Interview has been taken on each construction sites, also take photos of any ongoing activity on that site. Then ranked on their importance index by the data collection in India. For major factor analysis has used to reduce all factors divided into nine groups: project, clients, consultants, contractors, designer, equipment, labour, external and material.

Recommendation has been made for improve project management, improve cash flow by client so as to reduce payment delays and also more some suggestions are made by top ten major factors, which has been included on report. The result of this paper should help construction practitioners, policy makers and researchers in construction field.

Key Words: Construction Management, Causes of Delays, Effects of Delays, Construction Industry, India.

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## CHAPTER- 1

### INTRODUCTION

#### 1:1 General

The construction industry is one of the main sectors that provide important ingredient for the development of an economy. However, many projects experience extensive delays and thereby exceed initial time and cost estimates. Construction delays are considered to be one of project success in term of time, cost, quality, and safety Projects are underway around the country, and motorists are experiencing delays and detours at construction zones. And many areas have begun building booms that are supposed to ease our Congestion woes by adding new capacity to existing roads. But ironically, the construction projects themselves can create significant congestion and delay. The wealth of any nation is gauged by its performance in infrastructure provision through its construction industry. The construction industry is large, volatile, and requires tremendous capital outlays. For developing economies, road construction constitutes a major component of the construction industry. This means that much of the national budget on infrastructure development is channeled to road construction projects. Inflation and local government pressures were the major causes of cost escalation in Kurdistan Region's road construction projects. On the other hand, delayed payments, financial processes and difficulties on the part of contractors and clients, contract modification, economic problems, materials procurement, changes in drawings, staffing problems, equipment unavailability, poor supervision, construction mistakes, and poor coordination on site, changes in specifications and labor disputes and strikes were found to be the major causes of schedule delays in road construction projects. Appropriate project management practices are thus required to curb the causes and effects of cost escalation and schedule delays in road construction projects. The Construction delay is a universal evident reality not only in Kurdistan region however all the countries faced this global fact.

#### 1:2 WHAT IS DELAYS?

Delay in government construction projects, especially the road sector, has had a significant impact on economic activities in the country. Several road construction projects have littered the length and breadth of the country for which government has commenced that has yet to be completed. Unfortunately the time line for these projects is unknown to the citizens of the country. This has led to an increased number of uncompleted road construction projects by government and has further compounded the woes of Kurdistan Region's Citizens.

The cost of a construction project is one of the most important factors in the construction industry. Due to many reasons, the total cost of a project can significantly vary from the initial estimated cost. The reasons could be changes in scope of work, specifications, or any other contract documents. In the construction industry, variation orders are created when changes occur. It is an official document that states the changes made into the original agreement between the client and the contractor. When a variation order is created, it brings several negative effects to both the client and the contractor.

The construction industry is the tool through which a society achieves its goals of urban and rural development [5]. It is one of the sectors that provide important ingredients for the development of an economy.

The construction industry tends to fluctuate with the general economy, and it has quick response to the changes in the economy. According to Chitkara, the construction industry in many countries accounts for 9 % of the Gross Domestic Product (GDP). However, it is becoming more complex because of the sophistications of the construction process itself and the large number of parties involved in the construction process

Delay has been defined severally by many researchers often times with some bias towards the central theme of their research work. That notwithstanding, there are some definitions that explain the concept of delays with precision. There are number of definitions for delay:

To make something happen later than expected; to cause something to be performed later than planned; or to not act timely each of these definitions can be describe a delay to an activity of work in a schedule. On construction project s, as well as on the projects where a schedule is being used to plan work, it is not uncommon for delays to occur

### 1:3 Type of Delay

Delays generally fall into four categories. Delay is considered a major cause of construction claim. The four types of delay namely

- i. excusable delays
- ii. non-excusable
- iii. delays compensable delays
- iv. concurrent delays

#### i. Excusable delays

Excusable delays are those not attributable to the contractor's actions or inactions, and typically include unforeseen events. It's allow the contractor to obtain a time extension to complete the contract without being penalized. However, this type of a delay normally does not entitle the contractor to any damages caused by the delay.

The examples of excusable delays to a contractor's action are differing site conditions, design problems, changes to the work, inclement weather, and strikes. This type of clause sometimes called a "force majeure" clause, lists excusable delays. As this list implies, when unanticipated outside 'forces delay completion of the contractor's work, the delay is generally considered as excusable.

#### ii. Non-Excusable Delays

The examples of excusable delays to a contractor's action are differing site conditions, design problems, changes to the work, inclement weather, and strikes. This type of clause sometimes called a "force majeure" clause, lists excusable delays. As this list implies, when unanticipated outside 'forces delay completion of the contractor's work, the delay is generally considered as excusable. This type of delay presents no entitlement to a time extension or delay damages for the contractor if the delay can be proved to have affected the whole project. The owner however could be the liquidator to the damages. For instance, a non-excusable delay would be when a contractor fails to provide sufficient manpower to complete the job on time. Client can claim their loss if had in the contract agreement. The factor that contribute to the non-excusable delay:

- The usual weather and as expected whether,
- Delay cause by subcontractor,
- The inefficiency of contractor to manage the construction site.
- The financial of contractor.
- The lack of labour.
- Failure to manage their work according to the contract schedule.
- Always make mistake or failure to fulfil of owner specification.

### iii. **Compensable Delays**

Basically, compensable delay is when the contractor will be receives payment due to the additional cost of delay and as well as addition to a time extention for contract performance if there is any change inscope of work, late supply of owner materials or information, impeded site access, differing site conditions and failure to provide timely and review shop drawings. Furthermore, this type of delay is for which the innocent party is entitled to both a time extension and additional compensation for the resulting costs

### iv. **ConcurrenDelay**

Alkass said that, concurrent delays refer to delay situations when two or more delays occur at the same time or overlap to some degree. Forexample, if an owner denies access to a project site for two weeks, and a severe storm prevents the contractor from working on the project for one of those two weeks as well, there will be a concurrent delay of one week. The contractor will be able to recover for delay damages for one week, as a severe storm is not a cause of delay that is compensable and would have prevented the contractor from performing even if the owner did not deny access to the site. However, if there two concurrent causes of delay, one of which is a relevant event, and the other is not, then the contractor is entitle to an extension of time for the period of delay caused by the relevant event not with standing the concurrent effect of the other event.

## **1:4 CAUSES AND EFFECTS OF DELAYS**

The literature review found that there were delays of 8 different participants (contractors, owners, consultants, and others) in the construction industry in India, with 8 delays.

Here are 8 different reasons given:

### **i. The owner**

The owner of the project is the party that owns, manages, and funds the project; the owner assigns either a firm or individual representing him to overseeing the implementation of one phase or more of the phases of the project. Owner representatives takes the responsibilities of critical decision- making on the project, and choose other parties such as consultant and contractor to implement the project. "The owner is responsible for setting the operational criteria for the completed Project, owner is also responsible for setting parameters on total cost, payment of costs, major milestones, and the project completion date

### **ii. Weak Organisation by Contractors**

According to Bramble and Callahan in 1987 contractor's responsibility is related to methods, technics, procedures, stages and coordinations are continuous challenges to management sources. Due to financial constraints, even though contractor managed to get new projects but them could not afford to bear the additional staffs. In this situation will put contractor into condition that contractors 10 could not implement the projects smoothly and will lead to problem in fixing sufficient staffs into new project site.

Arditi et al in 1985 found that most of contractors quite slow in improving the good practices with relate to change of times and number of projects obtained. Most of contractors also 'did not interest to take the competent technical and management staffs. This was due to they were not aware of the potential benefits that they would be obtained. Also there are unable to analyse the job requirement, risk management, marketing, financial control, work organization, quality control and preparation of reasonable tender.

Imbert in 1990 studied issues related weak of organizational management found that the problems happened due to weak of plan, instable organization, bueracracy, not relevant regulations, slow in making decision and low productivity. According to Kirmani in 1988 turn over of staffs in company also gave an impact to the effectiveness of organizational management in project completion. This means that construction organization need mangers not only controller but also someone that can manage risks to the minimum.

### **iii. Poor of Site Management**

Dlakwa and Culpin in 1990 found that delay in project completion gave a big effect to construction industry and economy. According to Mansfield et al in 1994 lack of contract and site management can contribute to contractors' work plan, cost control and overall project management. These were due to lack of experiences management staffs and lack of technical staffs, low productivity, lack of short and long term financial funds and lack of experts.

Simms in 1984 found that most of construction staffs did not have sufficient knowledges in term of site management and quality control and also do not expert in moderm management practice. Moderm management techniques can improves the Process and function of sources under his/her control by change the optimum usage Of related components which involved in the process.

#### **Iv. Lack in Planning Management**

Oglesby et al in 1989 found that lack of planning and lack of knowledge in project contra and also lack of record keeping contribute to delay of project completion. Most of contractor did not familiar with the moderm practice to arrange works, plan, critical-path analysis and control technique. Contractors sometimes have resources, but due to lack of planning will cause them fail to achieve scheduled target.

According to Oglesby et al again, construction was making the ideas in drawings and specifications into completed structure by installing their components. To ensure that ideas being implemented effectively and satisfy the required time and quality, so it need a proper planning. Contractor seldom prepare detail plan for their work activities. Furthermore, they always carry out works as their previous works. They oftenly rely on verbal communication and hand over the planning of activities to the foremen who will carry out the works. Although the works can be constructed but very much ineffective compared to if detail planning were being prepared. Most of construction managers ignored planning with reason that they do not have enough time.

Abdelhalim and Duff in 1991 found that normally condition of contract require detail work planning before works can be carried out at site. However, seldom actual works being carried out as per detail work planning. This is due to incompetent contractor's technical and management.

According to Laufer and Tucker in 1987 detail works programme only being Prepared after they were delay and sometimes as evidence to obtain additional time to complete projects. Effective project management not only require project objective, but more than that such as planning and effective control to achieve target. In construction time and activity duration always relate to each other. If there were delay in any activity will effect the related activities.

#### **v. Consultant**

Consultant is the party assigned by the owner to prepare studies, designs, and documents for the project. (Bosneneh, 2010).

The consultant role may even extends to the execution phase if some problems appears and an adjustment of the designs needed.

#### **vi. Designer**

#### **vii. Worker**

#### **viii. Material**

#### **ix. Equipment**

#### **x. External factors.**

#### **Xi. Lack in Construction Materials and Equipment Management**

Category of material related to delays was identified as one of causes of delays in construction projects. Okpala and Aniekwu in 1988 found that lack in construction materials in market always became an excuse for delay in project completion. The insufficient COflStflCtiOfI materials in the market were due to:

- Not enough statistical datas related to construction materials in current market.
- Rise and fall price of construction materials in market.
- Waiting period quite long and uncertain delivery of ordered construction materials.
- Not enough financial sources to pay the order.
- Not enough transportation for construction materials.

According to Fugar et al. (2010), material group delay factors were ranked the second most important factors responsible for construction delay in Ghana. The shortage of material problem was related to the ability of client to honour certificate. This caused of unavailability of materials on site at right time was due to the suppliers were reluctant

to supply materials on credit because contractors could only pay them once the contractor had received the payment from the client.

Related to Manavazhia and Adhikarib survey, they found that material and equipment procurement delays in highway projects in Nepal. Delay in the delivery of materials and equipment to construction sites is often become a contributor to the cause of delay and make the cost overruns in construction projects. The main causes of material and equipment procurement delays were found to be organizational weaknesses, suppliers' defaults, governmental regulations and transportation delays.

The 8 Effects of Delays are given below:

1. Time overrun.
2. The contractor's profit has been greatly reduced due to cost overruns.
3. Non-productivity losses of the owners due to long-term stay during the construction phase.
4. Do not trust the contractor, damaging the reputation of the company.
5. Do not trust the owner to delay the payment that led to the contractor's cash flow.
6. Project participants are in dispute, arbitration or litigation.
7. Exit the project.
8. It is difficult to improve the market value of the contractor's business

### 1:5 Effects of Delay



## CHAPTER– 2

### LITERATURE REVIEW

#### 2:1 General

Based on the research objectives identified in the earlier chapter, this chapter reviews the previous studies and the research done in the field of project management by identifying the factors affecting delays in the construction industry. It discusses the basic concepts of a project and project management, moving forward to the models for assessing a project and carrying out the process of completing a project, thus forming a framework for the factors that cause delays in the Indian construction industry. Most of the research work included in the literature is also based on other South Asian countries like Malaysia, Singapore, etc and also some middle-eastern countries, as their findings also apply in the Indian context.

The literature review highlights the research work already done in this field, explaining the key factors in detail. This is an important element of the dissertation as it is the first step towards identifying the problems that the firms engaged in construction activities face in India.

Scientists have analyzed many reasons for postponement in the development business.

Table 1 summarizes several reviews conducted from 1971 to 1994.

**Table 1** Outline of Past Investigation of the Origin of Delays in Construction Project.

Researcher	Critical postpone variables	Country
Baldwin et al. (1971)	Meteorological changes, deficiencies of manual drive supply, subcontracting framework	United States
Arditi et al. (1985)	Delays in instalments to temporary workers,	Turkey
Assaf et al. (1995)	deficiencies of work supply, poor workmanship, changes in requests	Saudi Arabia
Okpala and Aniekwu (1998)	Inability to pay for finished works, poor contract administration	Nigeria
Dlakwa and Culpin ,1990	Delays in instalments by organizations to temporary workers	Nigeria
Semple et al.(1994)	Increases in the extent of work, harsh climate, inadequate resources	Canada

Sambasivan and Soon (2007) identify and evaluate the most significant causes of project delay in Malaysian construction industry, which are improper planning, poor site management, inadequate experience of the contractor, inadequate finance of the client and payments for completed work, problems related to subcontractors, material shortage, labour supply, availability and failure of equipment, lack of communication between parties and mistakes during the construction stage.

**Al-Kharashi and Skitmore (2009)** identify leading causes of construction project delay in Saudi Arabia by conducting a questionnaire survey administered to contractors, consultants and clients. They conclude that the most two significant causes of project delay are lack of finance to complete the work by the client and delay in progress payments by the owner.

**Haseeb et al. (2011)** conduct a research on the causes of delay in large construction projects in Pakistan, where the following factors are reported to be the most influential: natural disaster; financial and payment problems; improper planning; poor site management; insufficient experience; shortage of materials and equipment. **Doloi et al. (2012)** report the factors affecting project delays in Indian construction projects by surveying construction professionals in India. After the factor analysis, the most influential factors of project delay were identified as follows: lack of commitment; inefficient site management; poor site coordination; improper planning; lack of clarity in project scope; lack of communication; and substandard contract.

**J.Raj Bharath & Prof Siddesh K Pai (2013)** have mentioned that recently commissioned, Bandra-worli sea link amply demonstrates the state of project delivery system in the country. It was planned as Rs300 crore project to be completed by 2004, but had actually cost of Rs1600 crores with the delay of five years. **Ruth apolot, henry alinaitwe & dan tindiwensi (2013)** made a case study and concluded that the stakeholders in the construction industry are advised to minimize the change in scope of work as it has the most effect on cost and time overrun and recommended there should be change from the traditional contract type to the design-build type and improved cash flow on the part of the client so as to reduce payment delays.

**Ibrahim Mahamid (2013)** conducted a survey on time performance of different types of construction projects in Saudi Arabia to determine the causes of delay and their importance according to each of the project participants, i.e, the owner, consultant and the contractor. Then finally he concluded that 76% of the contractors and 56% of the consultants indicated that average of time overrun is between 10% and 30% of the original duration and also found 70% of the projects experienced time overrun in Saudi

**Anu V. Thomas and J. Sudhakumar (2014)** mentioned that low productivity leads to delays in construction and reported the results of questionnaire survey made to identify the factors influencing construction labour productivity with the project managers, site engineers, supervisors and craftsmen, in the state of Kerala, India, and

also mentioned timely availability of materials at the worksite, delayed material delivery by the supplier, strikes called by political parties or hartals, frequent revisions of drawings/design, resulting in additional work/rework and timely availability of drawings at the worksite as a significant impact on labour productivity. Nitin Chaphalkar and K. C. Iyer (2014) said, in some cases disputes may raise b/w the stakeholders during the construction phase, in which if it's not handled properly, tend to consume time and money of the parties disputing, which leads the project to extended stay

**Ghulam Abbas Niazi and Kassim Gidado (2013)** reported that contract with less than 12 months highly contributes to delays. They concluded that two causes of delay are common between all parties, which are 'security' and 'corruption'. Poor security is the most difficult challenges that stakeholders face in implementing construction projects. It has delayed projects and increased costs. Corruption constitutes a serious threat to Afghanistan Construction Industry improvement as it has significant effects on construction delays. There is an urgent need for developing a legal framework for fighting corruption, whereas the current framework has been outdated and unclear.

## 2:2.OBJECTIVE

This is conducted to identify the major causes of delays and effect of delays in construction projects industry. To achieve this aim, the following objectives have been identified:

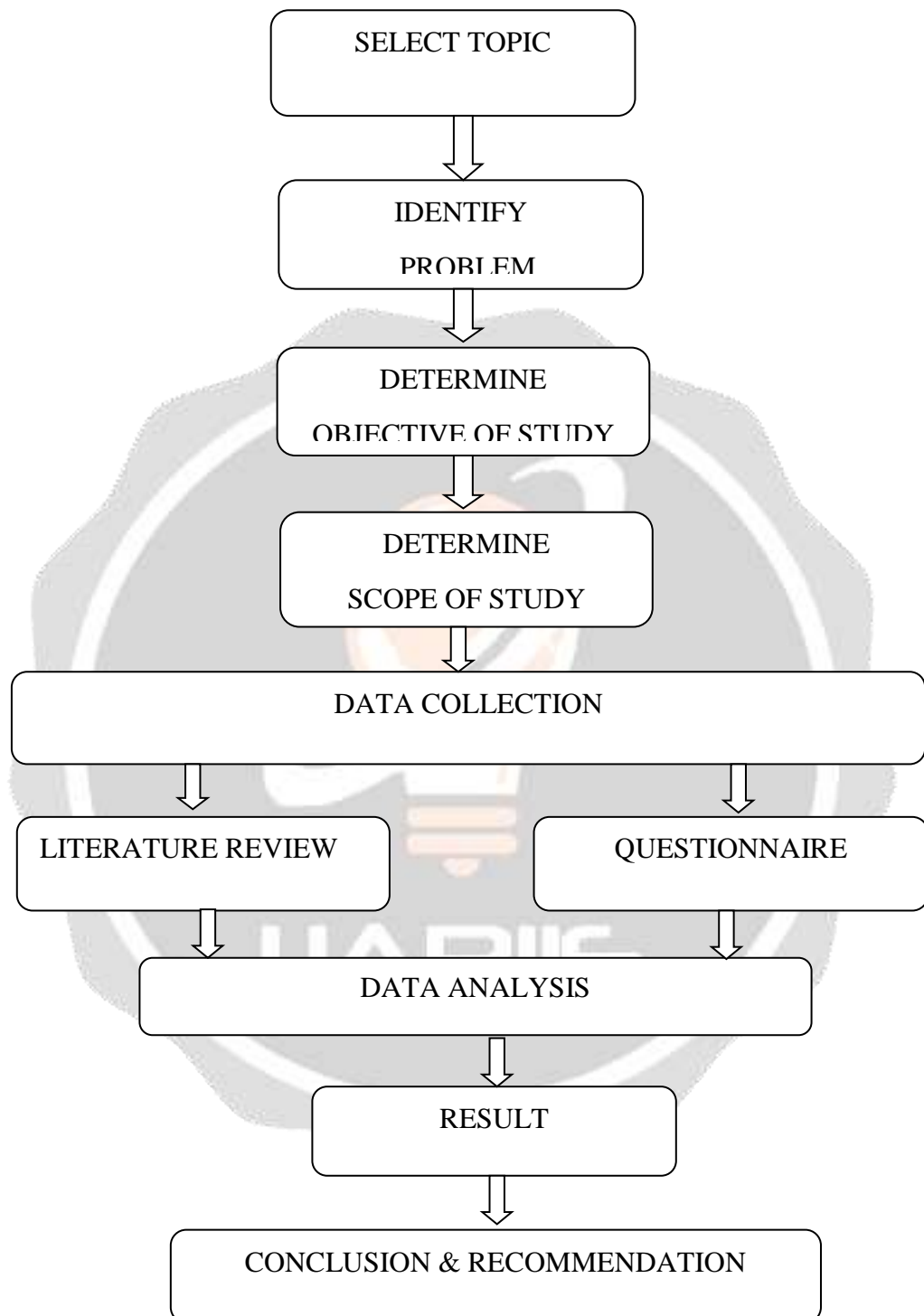
- i. To identify the major factors that contributes to the delay in construction project.
- ii. To identify the effect of delays in construction project.
- iii. To find out construction-phase related factors due to which a construction project delays in delivery.
- iv. Analyse and prioritise the construction-factors.
- v. To give recommendations to improve the situation.

## CHAPTER– 3

### METHODOLOGY

In achieving these objectives, a research methodology is required. Figure .highlights the critical stages of conducting this study. This figure comprises four essential stages of conducting the study which includes the following:

- Identify problem
- Determine objective of study
- Determine scope of study
- Data collection
- Literature review
- Questionnaire
- Data analysis
- Result

**3:1 METHODOLOGY OF STUDY****Figure 3:1** Methodology of Study**3:2 DATA COLLECTION**

Data was gathered from secondary sources as well as primary sources. Data collected through questionnaire and interviews is primary data, while the factors causing delay were identified with the help of literature which is secondary source of information. Various reports, publications and through internet research, 26 factors were



identified for survey. Both primary and secondary methods have advantages and disadvantages. The advantages of primary data are that it is recent and is aligned along the intended survey but it has disadvantage of being expensive. However, secondary data is easy to get and is relatively cheap but may be out of date. This raw data was analysed using quantitative approach. With the help of literature, various possible factors are identified. In addition, various other factors are also added as recommended by local experts. Initially, all factors causing delay to a residential project are identified and then they were sorted out to get only construction-related factors. Various studies and reports were studied to get right factors which are applicable to this study. Total 26 factors are selected at last. All these factors are arranged in a sequence according to the work done during construction phase and a questionnaire is formed.

### 3:3 Questionnaires

A good questionnaire constitutes of three important facts that makes it more effective for getting response and then analysis, i.e.

- Introduction: To define the objectives clearly
- Instructions: To make questionnaire easy to understand
- User-friendly: To avoid any ambiguity

Keeping in mind all the necessary components of questionnaire finally, a Questionnaire is formed using Likert scale in which each construction factor .

### 3:4 Research Questionnaires

- The delay in the completion of the project is due to administrative and technical matter.
- The delay in the completion of the project is due to financial matter.
- The delay in the completion of the project is due to equipment and materials.
- The delay in the completion of the project is due to human resources.
- The delay in the completion of the project is due to contractor.
- The delay in the completion of the project is due to the project nature.
- The delay in the completion of the project is due to other causes (external resource).
- What are the effect of delay in construction project.
- Do the cost of the project is affected by the delay.
- What are the problem which are faced by delay.

## CHAPTER-4

### DELAY ANALYSIS METHOD

#### 4:1 Introduction

This chapter describes the results and discussion of questionnaire survey concerning time exceed from contractors, consultants and owner viewpoints . The main aim of the current study of is to assess the causes of delay in construction projects. This chapter focuses on describing questionnaire sample characteristics analysis.

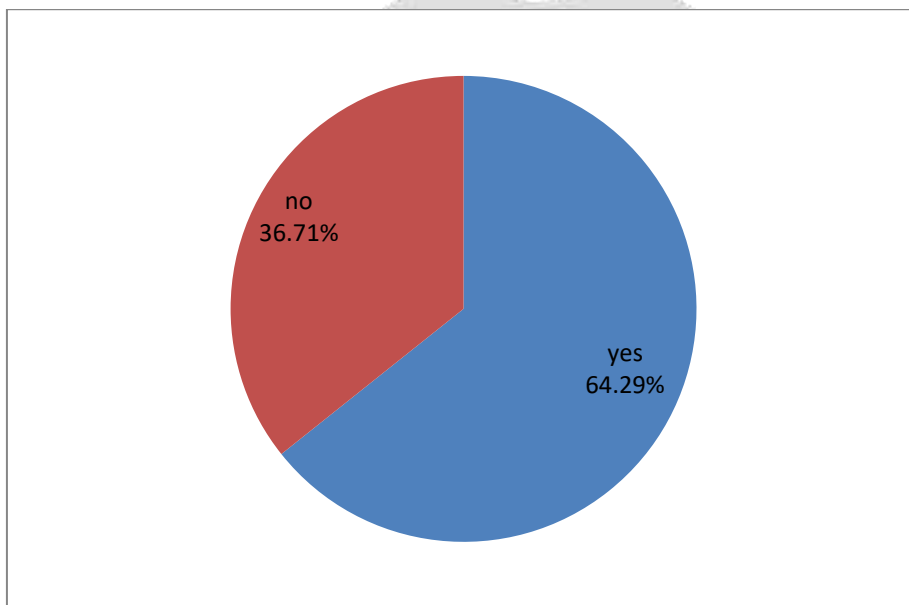
## 4:2 Discussion of Result

### 4:2:1 Questionnaire Characteristics Analysis

It is divided to ten questions including information about the respondent and about the institution. The topics of questions are:

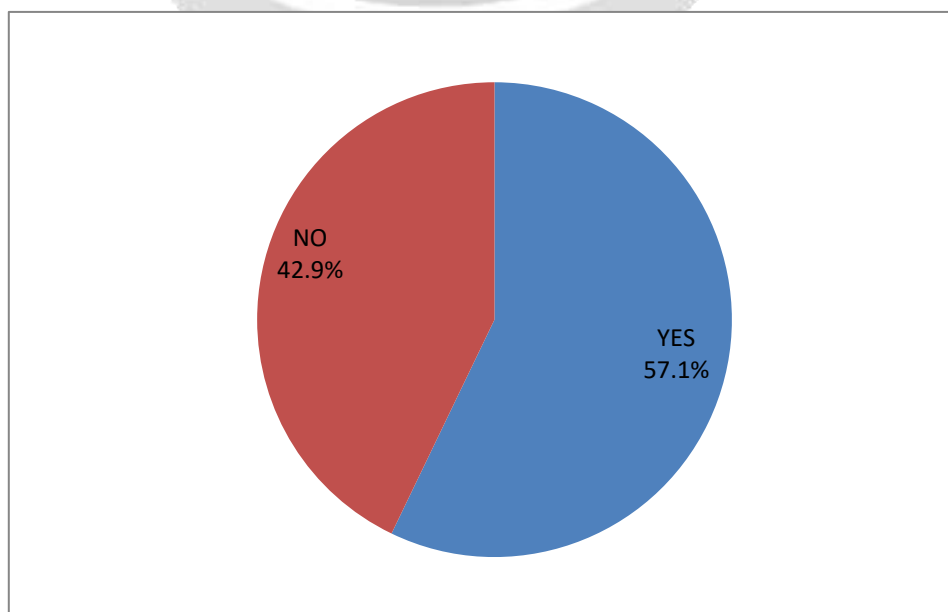
#### 4:2:1:1 The project is due to administrative and technical matter

BY the survey we got to no that Yes , the delay in the completion of the project is due to administrative and technical matter in which a total of 14 survey was conducted which got a 9 persons who said yes and 5 said no and got a percentage rating of 64.29% in the survey.



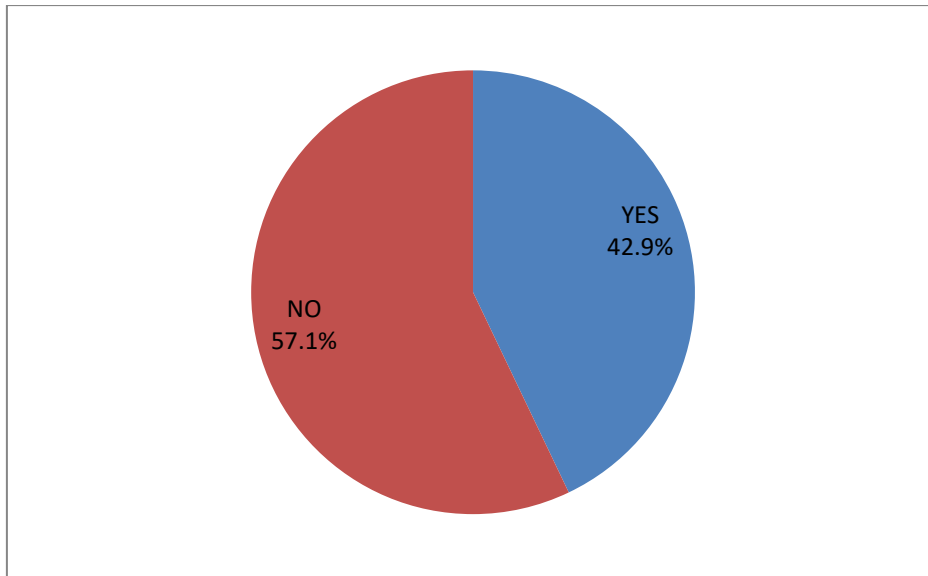
#### 4:2:1:2 Project is due to financial matter

By the survey we got to no that Yes , the delay in the completion of project is due to financial matter in which a total of 14 survey was conducted which got a 8 person who said yes and 6 said no and got a percentage rating of 57.1% in the survey.



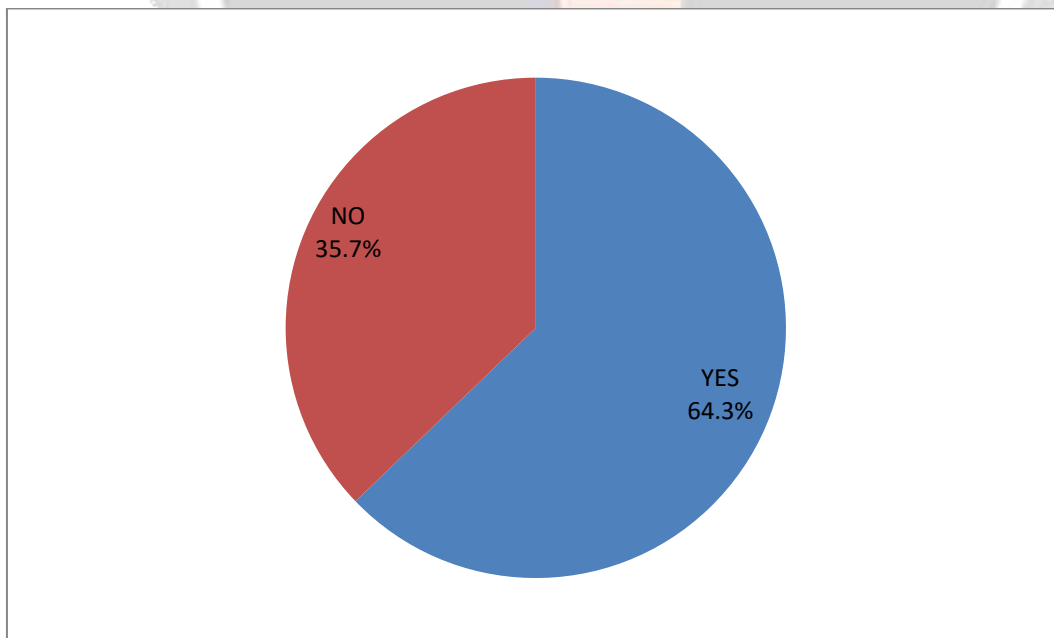
**4:1:1:3 Project is due to equipment and materials**

By the survey we got to no that Yes , the delay in the completion of project is due to equipment and materials matter in which a total of 14 survey was conducted which got a 6 person who said yes and 8 said no and got a percentage rating of 42.1% in the survey.



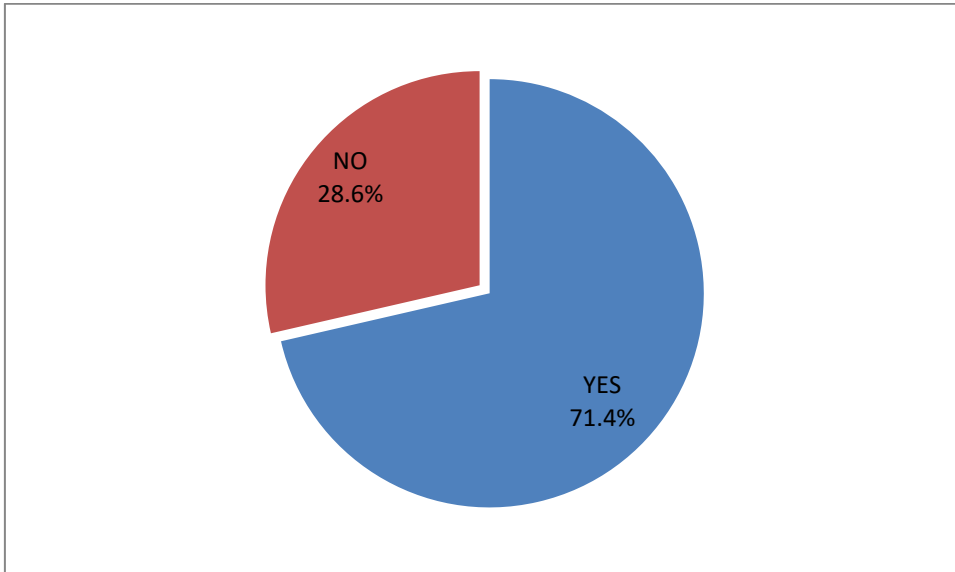
**4:1:1:4 Project is due to human resources**

By the survey we got to no that Yes , the delay in the completion of project is due to human resources matter in which a total of 14 survey was conducted which got a 9 person who said yes and 5 said no and got a percentage rating of 64.3% in the survey



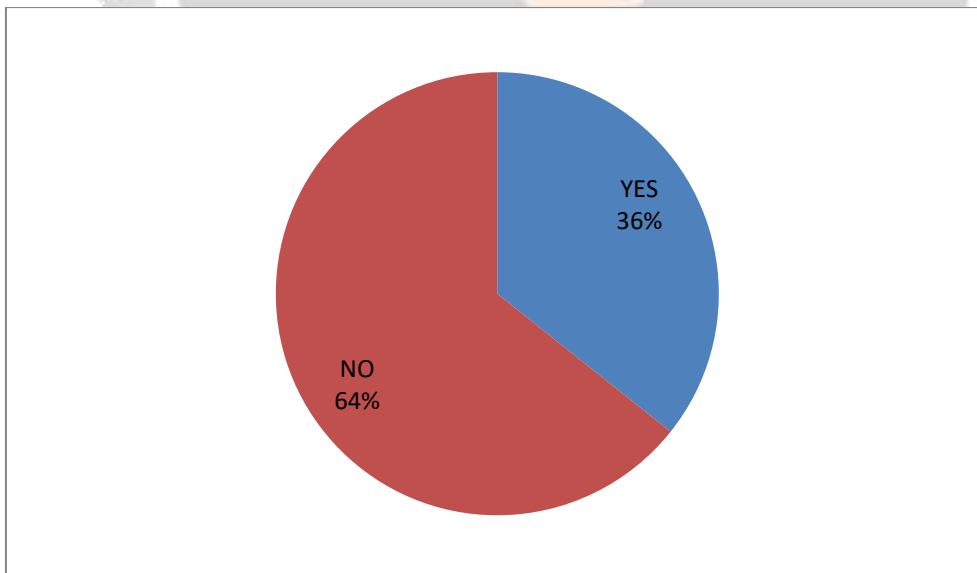
**4:1:1:5 Project is due to contractor**

By the survey we got to no that Yes , the delay in the completion of project is due to contractor matter in which a total of 14 survey was conducted which got a 10 person who said yes and 4 said no and got a percentage rating of 71.4% in the survey



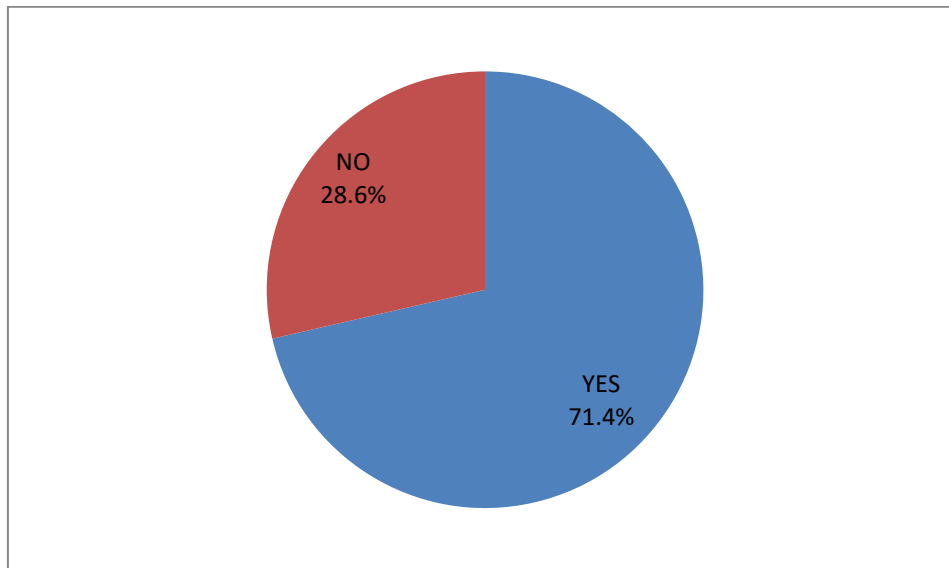
**4:1:1:6 project is due to the project nature**

By the survey we got to no that Yes , the delay in the completion of project is due to project nature matter in which a total of 14 survey was conducted which got a 5 person who said yes and 9 said no and got a percentage rating of 36% in the survey

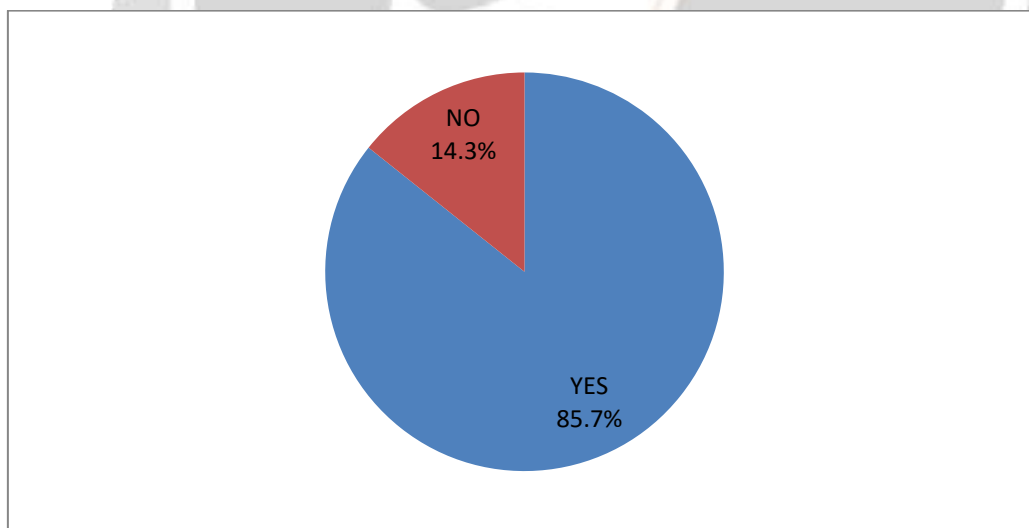


**4:1:1:7 project is due to other causes (external resource)**

By the survey we got to no that Yes , the delay in the completion of project is due to other causes matter in which a total of 14 survey was conducted which got a 10 person who said yes and 4 said no and got a percentage rating of 71.4% in the survey

**4:1:1:8 The cost of the project is affected by the delay**

By the survey we got to no that Yes , the delay in the completion of project is due to the cost of the project is affected by the delay matter in which a total of 12 survey was conducted which got a person who said yes and 8 said no and got a percentage rating of 85.7% in the survey

**4:1:1:9 The effect of delays in the construction project**

The effect of delays in the construction project are :

- In residential redevelopment projects in Mumbai the project delay cause less profit to the builder. Because the more the project gets delayed the builder has to give more rent to the tenants. Unless he didn't get the profit on expected time he can't invest that money in other projects
- Ultimate increase in cost..
- construction cost will be increased, project duration is increased
- The completion time may be shifted for number of days.

- Late everything sucks then

#### 4:1:1:10 The problems which are faced by the delay

The problems which are faced by the delay are:

- Construction material those who are wooden and plywood gets damaged by the weather.
- Profit of project gets affected.
- Chain of workers gets broken
- Buyer doesn't gets his flat on given time
- construction cost will be increased, project duration is increased
- We faced different types of problems of client
- The scheduling of the project is lacking from the original plan.
- Its increase the lackness of the human resource carpenter, fitter and labour
- It affects the salaries of workers, increases the project time, eventually increases the cost, tenants creating problem

#### 4:2 General factors reduce the delay of the project

NO	Factors	%	Rank
1	The project is Due to contractor matter	71.43	1
2	The project is due to Other causes matter	71.43	2
3	The project is due to administrative and Technical	64.29	3
4	The project is due to human resources matter	64.29	4
5	The project is due to financial matter	57.14	5
6	The project is due to equipment And material matter	42.86	6
7	The project is due to project nature matter	35.71	7

## CHAPTER-5

### CONCLUSION & RECOMMENDATION

#### 5:1 Introduction

From the previous chapters, we have concluded many causes for delay in construction projects, few years ago; most construction projects in the Mumbai were exposed to delay, so the continuation of this phenomenon affects the progress of the construction industry, as it may expose some relevant institutions to collapse.

Thus, this chapter will present a review to the summary and conclusions of this research and recommendations, recommendations will be presented to help in enhancing the India construction sector performance.

## 5:2 Summary and conclusions

The construction sector is one of the most important economic sectors in India; this research discussed the importance of studying the construction sector through the identification of gaps between theory and practice associated with delays in the completion of construction projects. The main purpose of this study is to identify the most important factors that delay the completion of projects, by taking a representative sample from each of the engineering offices, the owners, and the contractors by distribution questionnaire contain 10 causes of delay to a representative sample to know delays causes in Palestinian construction projects from the opinion of project participant, and then analyze the results. Whenever a delay occur, its implications on the future performance of the project can be immediately determined and corrective action can be taken to minimize any negative impact on project performance. This research will help to discover the causes of delay in construction projects and then reduce their effects.

The top five causes contributed to delays in India construction projects from the viewpoint of project participant are: Referral of bids to the lowest price, incorrect and inappropriate bid pricing, lack of sufficient Cash for project implementation (financial difficulties), Contractor failure to regulate the cash flow of the project, Irregular cash flow for the project on owner's side, delay of due payments (according to progress), unavailability of required equipment when demanded or delayed availability behind schedule, the kind of tenders in which the selection process to negotiate lower prices or other criteria, the introduction of significant changes to the project by the owner after starting the implementation phase of the project (additional work, modifications to the design), and Mistakes during the process of implementation (intentionally or unintentionally) which require readjustment. The most impacts expected to occur is Delay in delivery of the project, an increase in the cost, the large number of delayed projects affect the community, Low productivity, lack of revenue, and Disputes / Trials/ prosecution.

Proposed solutions and procedures for solving and avoiding these causes. A framework to illustrate the steps and procedures recommended for action to resolve the problem of delay and avoid or minimize them, an aide to all parties to understand the current situation and how to solve or prevent it. Projects pass through different stages during their life cycle can be summarized and categorized in the following four main phases, each phase involve three main steps:

1. Planning phase divided to develop plan, Estimation required time and cost, and manage resources.
2. Design phase divided to put alternatives designs, Use of appropriate design systems, and use of monitoring and follow-up system.
3. Contracting phase divided to work by specialist, Preparation contract documents, and available ethics and regulars.
4. Implement phase divided to use of appropriate construction systems, good manage by use control and follow-up system, and use suitable documentation system.

This paper analysed causes of construction delays . The feedback of construction experts was obtained through interviews and questionnaire surveys. Pie chart is calculated according to the highest values of them the top ten delay causes of construction projects are determined.

## 5:3 General recommendation to the different parties

The following points are recommended to be taken into account by all parties in order to minimize and control delays in construction projects:

### 5.3.1 Recommendations to the owner

Owners should be given special attention due to a contractor who does not fit their financial and technical capacity submission of the tender, and make sure when the tender evaluation of the experience of the contractor and the financial and technical ability to implement the project.

### 6.3.2 Recommendations to the contractor

- A. Developing an action plan by the owner for the success of the project since phase the emergence of the idea of the project plan include the following:
  1. Organize payment and structured finance for the stages of work on the project.

2. Prepare (team work) with qualifications to work in the project and appoint project manager for the development of an action plan through which to regulate, control, supervision and adjust things for the project, to avoid problems in the implementation or problems between workers or employees, and complete project on time.
  3. Develop a plan for the provision of materials, samples and machinery required on time.
  4. 7- Minimizing follow the centralized decision-making and procedures with respect to projects because they hamper the proceedings and cause delays.
- B. Site management and supervision: administrative and technical staff should be assigned as soon as project is awarded to arrange to achieve completion within specified time with the required quality, and estimated cost.

### 5.3.3 Recommendations to the consultant

The consultants play a very important role in Design-Related Delays. Consultants should look to the following points:

- A. Reviewing and approving design documents: any delay caused by the consultant engineer in checking, reviewing and approving the design submittals prior to construction phase, could delay the progress of the work.
- B. Inflexibility: Consultants should be flexible in evaluating contractor works. Compromising between the cost and high quality should be considered.

### 6.3.6 Recommendations for future studies

- 1- Another study about a specific type of construction projects, such as utility projects, road project, water and sanitation projects, etc.
- 2- Another study about evaluate the involvement and effect of a specific party or resource of construction project to the delay in construction projects.
- 3- Another study about investigate the effect of financing and cash flow problems on delays in the construction projects.

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