

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **2.1. Construction Project**

A project is a series of related tasks which when they are carried in the correct order will lead to the completion of the project. Projects are temporary, generally resulting in the creation of a tangible product or outcome. This is as opposed to a program, which is a series of interrelated projects that may be carried out repeatedly or continuously in order to support an ongoing process.

A construction project is the organized process of constructing, renovating, refurbishing, etc. a building, structure or infrastructure. The project process typically starts with an overarching requirement which is developed through the creation of a brief, feasibility studies, option studies, design, financing, and construction.

Construction projects are typically one of a project team, brief and financing are put together to produce a unique design that delivers a single project. Once the project is complete the team is disbanded and sometimes will not work together again. This can make it difficult to develop ideas or relationships, and so lessons learned are often not carried forward to the next project. The exceptions to this are repeat developers such as supermarket chains, housebuilders, and so on.

Typically, a construction project comprises many smaller projects which require a wide range of different disciplines working in collaboration. Large

numbers of people are involved on a typical construction project, with the structure and composition of the project team usually changing through its duration. Projects may be coordinated by a project manager (or by a lead consultant) who is supported by professionals such as an architect, engineer, cost consultant and so on.

## **2.2. Safety Control in Construction Projects**

Construction accidents cause many human tragedies, de-motivate workers, disrupt sites, delay project progress, and adversely affect the overall cost, productivity and reputation of the construction industry. The deteriorating conditions of workplace health and safety, as well as the emergence of new regulations and international standards, have driven organizations to improve their safety performance. Both developed and developing countries have recognized the necessity of improving occupational safety and health management on construction sites, particularly to reduce the number of occupational accidents. As a result, organizations have, to some extent, shifted from a reactive to a proactive approach toward safety.

Many construction industries around the world are showing an increasing interest in the concept of construction safety management as a means of reducing the potential for large-scale disasters, as well as accidents associated with routine tasks. The causes of the accidents are not only the carelessness of the workers; sometimes accidents happen due to the failure of control, which is the responsibility

of management. Thus, the shift of the focus on the accidents has been driven by the awareness that organizational, managerial and human factors, rather than purely technical failures, are prime cause of accidents.

### **2.3. Classification of Work Accidents**

Based on International Labor Organization (ILO), there are four classifications of work accident, they are:

1. Classification according to kind of accident
  - a. Falls from height
  - b. Being struck by falling objects, materials, or tools
  - c. Pounded by falling objects, materials, or tools
  - d. Impacted by materials
  - e. Influence of high temperature
  - f. Electrocutions
  - g. Radiation by dangerous materials
2. Classification according to the causes
  - a. Machine
  - b. Transportation
  - c. Materials
  - d. Work environment
3. Classification according to kind of injury
  - a. Be sprained

- b. Broken bones
  - c. Be bruised
  - d. Be crushed
  - e. Burned injury
  - f. Radiation influence
4. Classification according to location of injury
- a. Head
  - b. Neck
  - c. Body
  - d. Many location

#### **2.4. Construction Delays**

The construction delays may be defined as “the time overrun either beyond completion date specified in a contract, or beyond the project delivery date as agreed by parties” (Assaf and Al-Hejji, 2006). Delay defined as an “act or event which extends required time to perform or complete work of the contract manifests itself as additional days of work”.

Delay in government construction projects, has had a significant impact on economic activities in the country. Several construction projects have littered the length and breadth of the country for which government has commenced that has yet to be completed. Unfortunately, the timeline for these projects is unknown to

the citizens of the country. This has led to an increased number of uncompleted construction projects by government.

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 projects, as well as on the projects where a schedule is being used to plan work, it is not uncommon for delays to occur.

#### **2.4.1. Types of Construction Delays**

Delays in construction projects have been put in various classifications by several authors but most of these classifications have a lot in common in terms of their fundamentals. Although various types of in several studies, they are somewhat linked to one another. These class have been elaborated in the arguments below.

Most importantly, delays can be seen in these four major categories as explained by Theodore Jr;

1. Critical or Non-Critical
2. Excusable or Non-Excusable
3. Compensable or Non-Compensable
4. Concurrent or Non-Concurrent

#### **2.4.2. Causes of Construction Delays**

Based on some studies from the other surveyors, the main factors that cause a delay in construction projects have been classified into 6 groups, there are:

1. Tools and Materials
2. Labors
3. Contractor
4. Owner
5. Consultant
6. Local Circumstances

Garry D. Creedy, Martin Skitmore, and Johnny K. W. Wong found that the reasons of highway project have overrun and evidences of the most important risks on which highway agencies need to focus their efforts. Particularly concerning changes in project designs and scopes during project development.

SP Narayanan and Arazi B. Idrus, has surveyed the delay factors and classified them into groups. Which has categorized the causes responsible for time delays and cost overruns in projects. They identified in a list 113 causes of delay in total 18 categories of causes from various report in the literature.

The similar problem was study once in Indonesia by Peter F. Kaming, Paul O. Olomolainye, Gary D. Holt, and Frank C Harris. In factors influencing construction time and overruns on high-rise project in Indonesia 1997. They found that the predominant factors influencing time overruns/delays are design changes, poor labor productivity, inadequate planning, and resource shortages. In the case of

cost overruns, the most important factors are material cost increases due to inflation, inaccurate materials estimating and degree of project complexity.

From Hamidreza Afshari, Shahrzad Khosvari, Abbas Ghorbanali, Mahdi Borzabadi, and Mahbod Valipour, they said that the most important cause of non-excusable delay, at least in the scope of this research, is “not selecting competent subcontractors”. And they identified 20 other non-excusable delays of construction project.

#### **2.4.3. Effects of Construction Delays**

The effect of construction delays carries a rippling effect on the contracting parties and the citizens in an economy. Unlike the causes that may have some geographical restrictions, the impact is universal in nature. In the survey conducted by Sambasivan and Scon, they ranked the feedback from the respondents in terms of the frequency of responses received for individual effects identified. It turned out that all the respondents chose time and cost overrun giving it the highest ranking.

Cost overrun will be the cost in excess of the estimated project cost. This excess cost is an inconvenience to the parties to the construction project. In the case of government, tax pays are not getting value for money as a result of the cost overrun. Similar for the contractors, they experience abnormal losses and sometimes a cash flow crisis. To the consultants, it remains a dent in their reputation as clients lose confidence in their execution plan (Nkado, 2005).

Another effect of construction delay is the total abandonment of projects. Delays in construction projects can lead to the parties abandoning the project entirely. If a construction project gets abandoned, it reduces employment opportunities, slows down economic activities, government loses revenue and foreign investors get deterred from funding construction projects in the economy. Aside these, there is a serious damage to the reputation of the parties to the construction contract.

