

# A Qualitative approach for analyzing Causes and Effects of Construction Risks

R.Sakthiganesh<sup>1</sup>, Dr.S.Suchithra<sup>2</sup>

<sup>1</sup>PostGraduate student, Department of Civil Engineering, kongu Engineering college ,perundurai ,India

<sup>2</sup>Associate Professor, Department of Civil Engineering kongu Engineering college ,perundurai ,India

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**ABSTRACT:** Construction is a complex and challenging process. Among other things, it requires interpretation of and compliance with many laws, codes, and regulations; gathering of considerable resources, including labour, equipment, and material; and communications with and coordination among multiple parties, such as the owner, the design professional, other contractors and subcontractors, and suppliers, all of whom may have differing purposes and goals. Managing risks in construction projects has been recognized as a very important management process in order to achieve the project objectives in terms of time, cost, quality and scope. the aim of the qualitative approach is to identify both the negative and positive impacts of risk, making these impacts a strategic factor for success; and allow for the creation of response plans and strategies to transform the risk into competitive advantages in the market. The paper presents the cause and effect analysis for each project phases by brainstorming.

**Keywords**— interpretation, compliance, time, cost, quality, scope. qualitative approach, laws, codes, and regulations

## 1. INTRODUCTION

### 1.1 General

A construction risk is defined as any exposure to possible loss. Every construction project is different each offers a multitude of varying risks. To ensure the success of a project, a contractor starting on a construction project must be able to recognize and assess those risks. And then the contractor must be able to manage those risks. Risk conditions could include aspects of the project's or organization's environment that may contribute to project risk, such as poor project management practices, or dependency on external participants who cannot be controlled. In project management terms, the most serious effects of risk can be summarized as Failure to keep within the cost estimate, Failure to achieve the required completion date. Failure to achieve the required quality and operational requirements.

### 1.2 Risk management process

The overall risk management process can be summarized into the following four categories such as Risk Identification, Risk quantification, Risk response, Risk response control.

Risk identification is the first step of risk management process, in which potential risks associated with a construction projects are, identified. Determination of most likely risks affecting the project and documentation of characteristics of each risk is the main task in risk identification. Assessment of risks and the possible interactions of risks with project activities to evaluate the possible outcomes of the project. Actually risk can be avoided by not doing part of the project which contains risk or otherwise changing the strategy so as to minimize the risk. Risk response is defined as response steps for opportunities and threats associated with risks. Risk can be monitored by employing a predictive indicator to watch the project as it approaches a risky point. The risk strategy is to monitor the risk by being part of the test team.

## 2.OBJECTIVE

The objective of The paper is to identify the risk factors and to analyze the various causes and effects of various construction risks using fish bone diagrams.

## 3. DATA ACQUISITION

The general methodology of this study relies largely on the data acquisition which will be collected from the various multi project construction contractors and project manager of different sizes by mail or by personnel meeting. A thorough literature review was initially conducted to identify the risk factors that affect the performance of construction industry as a whole. Also brainstorming with industrial practitioners were conducted to produce the data gathered.

### 3.1 Brainstorming sessions

Brainstorming is a strategy used to generate a number of ideas to help solve a particular problem. The technique has been around for over 70 years and is still used today solve a range of problems. Discussion of these ideas takes place.. Each idea will be discussed and considered, some ideas will be eliminated, and a final list will be ranked for possible use

as a solution toward solving the problem. The identification of risks, their causes, effects and current controls were enlisted by using brainstorming sessions.

### 3.2 Fish bone diagram

The Fishbone diagram is also known as the cause and effect diagram, the root cause analysis, and the Ishikawa diagram. It is generally called the Fishbone diagram because the diagram resembles that of a fishbone. In simple terms, Fishbone is brainstorming in a structured format. The technique uses graphical means to relate the causes of a problem to the problem itself, in other words, to determine cause and effect. The diagram focuses on the causes rather than the effect.

## 4. CAUSE AND EFFECT ANALYSIS

The cause and effect of various risk factors at various stages of construction projects such as conceptual stage , design stage , bidding stage, construction stage and closure stage affecting the construction industry were represented by using fishbone diagrams.

### 4.1 Conceptual stage

The cause and effect analysis of risks in conceptual stages are represented using fishbone diagram shown in the figure 4.1

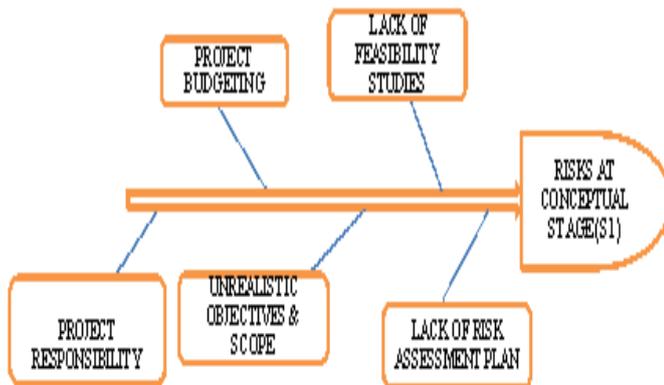


Fig 4.1 Causes of risks at conceptual stage

### 4.2 Design stage

The cause and effect analysis of risks in design stages are represented using fishbone diagram as shown in the figure 4.2

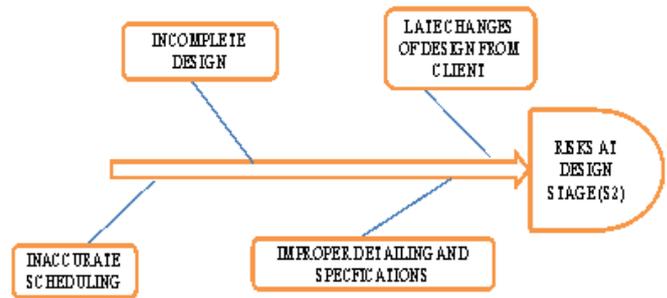


Fig 4.2 Causes of risks at design stage

### 4.3 Biding stage

The cause and effect analysis of risks in bidding stages are represented using fishbone diagram shown in the figure 4.3

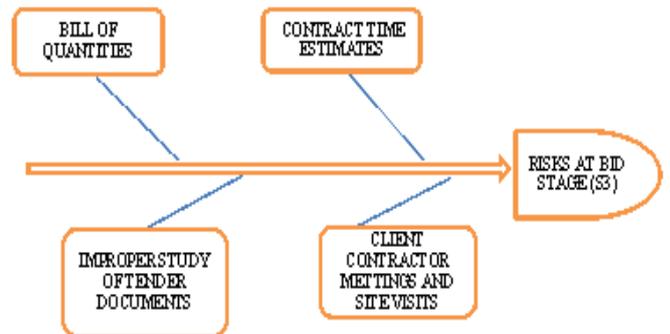


Fig 4.3 Causes of risks at bidding stage

### 4.4 Construction stage

The cause and effect analysis of risks in construction stages are represented using fishbone diagram as shown in the figure 4.4

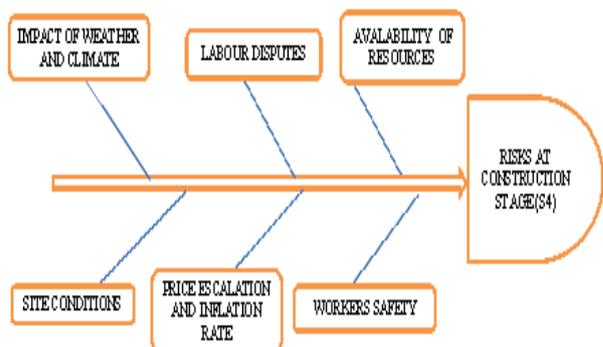


Fig 4.4 Causes of risks at construction stage

#### 4.5 Closure stage

The cause and effect analysis of risks in closure stages are represented using fishbone diagram and it is shown in the figure 4.5

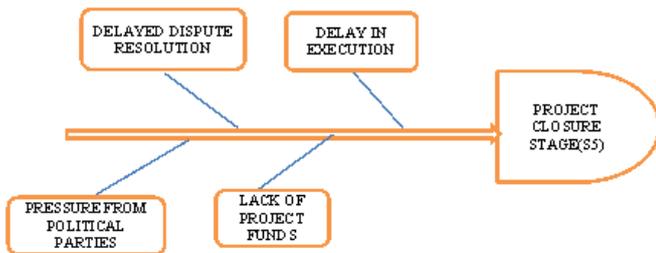


Fig 4.5: Causes of risks at project closure stage.

#### 5. CONCLUSION

From the inference made from cause and effect analysis the following are the suggestions and recommendations for improving the construction project stages are reported.

- The suggestions for decreasing risks in conceptual stages are better understanding of objectives and scope, conduct of feasibility studies, risk planning, allocation of responsibilities to each task.
- The recommendations for improving design stages are to have Integrated design and construction process accurate financial budgeting, WBS scheduling, proper design, detailing, specifications. soil investigation.
- The suggestions for decreasing risks in bidding stages are detailed study of tender documents, conduct of client-contractor meetings. accurate bill of quantities. Conduct of site visit, defining work tasks ,estimating resource requirements for each activities .
- The suggestions for decreasing risks in closure stages are faster decision making process, crashing, control of project cash flows, legal actions for corruption by political party.

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