

Risk factors affecting the construction projects in the developing countries

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Abstract. This review focused on the identification of critical risk factors that influence the construction projects conducting in the developing countries. In order to attain this goal, a comprehensive literature review on risk management of the construction projects, particularly emphasizing on the developing countries was carried out. The identified risk factors can be a lead to achieve the goals of the project which includes time, cost and quality. This review used specific criteria to extract the risks factors based on the main purpose of the study. A sum total of 111 risk factors were figured out from the previous studies. Based on the criteria used for the classifications, 56 risk factors were observed as the most crucial risk factors influencing the construction projects of developing countries.

1.0 Introduction

In recent years, construction projects are riskier and complex because of the various forms of the activities involved [1-3]. It encounters different challenges referring to as risks [4]. Thus, managing the risk can be an essential portion of decision-making in any construction projects [5]. Based on the construction approach, risks are commonly categorized as the occurrences that affect the main goals of any particular project (in terms of quality, time and cost) [6]. Risk assessment in The risk in construction projects has been assessed in differs of projects to investigate the effect in a particular part of the project [4]. Over the past four decades, outstanding developments had been recorded on the management of construction projects [1]. However, construction projects are prone to several unknown factors in the developing countries. The application of productive risk management is being used to avoid challenges in several projects [2]. Risk identification has been defined as the means of recognizing and saving information of the corresponding risks. Although, it is difficult to control all the prospective risks in any construction project, nevertheless, it is essential to pay attention to compelling risks. Identifying all the risks might be counterproductive and time waste [7]. Construction projects have been categorized to either be bared to risk or possess apparently assumed risk because of the involvement of different stakeholders [1].

A lot of notable developments have been recorded in the management of construction projects over the past few decades [1]. Several unknown risk factors can influence construction projects [2]. World Bank 2012 had defined the developing countries as nations with a reduced Gross National Income of about US\$11,905 or less per annum. In approximate, 80% of the world's population has been



classified by the International Statistical Institute (2015) to possess inadequate capital investments and infrastructures, lower level of industrialization, inadequate advanced living standards, lack of sophisticated technology, and a higher level of illiteracy. These developing countries cover about 20% of the global economy.

Several construction projects that are done in the developing countries are suffering from the inadequacy which includes quality challenges, cost overruns and not completing the construction project at the given duration. These problems are mostly accountable for the projects turning out to be non-profitable [8]. Findings of studies on the risk involved in construction projects conducted within the developed countries are not necessarily applicable to the context of developing countries. This implies that matters regarding the risks involving in the projects are prone to unique sociocultural, economic, environmental, and political situations of the nation [9].

2.0 Research methodology and design

The main objective of this review is to pinpoint the essential risk factors applied to construction projects in the developing countries. To achieve this, past studies on risk management of construction projects in the developing countries of the world have been reviewed. This review was carried out by summarizing the risk analysis, project and construction management reported in the previously published articles. The academic articles reviewed were obtained from the Web of Science, Science Direct and Google Scholar. The enlisted keywords were employed for the search, they are risk management, risk analysis, project risk, and risk identification. From the search, about 234 published articles were used and summarized. One 45 articles were seen relevant to the objective of this review article. Taroun (2014) [10] had employed a similar approach for the same purpose. The factors are extracted based on the following criteria previously used by Wymer2005[11] and Alsharafi2017 [12].

- All the recognized factors extracted from the research articles were outlined and studied.
- Factors were then re-arranged and combined to remove similar factors with varied terminologies.
- The combined factors were recognized by the information of the authors that studied individual factor.
- The cited factors mostly found in the articles were selected, these factors were 57 in numbers. They are mostly cited more than 6 times.

Firstly, the factors are identified and listed based on the reported factors in several studies. A total number of 111 factors (Table 1) are obtained from 45 different studies. Next, the factors were filtered through reorganization, alphabetization, consolidation, and elimination of factors from studies that identified similar factors with varied nomenclature. Thereafter, the combined factors were evaluated and charted to information from every study with similar findings. Finally, a total number of 57 factors were grouped depending on the frequency in which the factors were reported in the research findings and literature and the research findings reported the relative advantages.

3.0 Findings

The review findings are illustrated in this section. The inadequate total understanding of risks factors that affect construction projects which must employ the risk management in achieving the projects objectives, cost, time, and quality. The most crucial risk factors that influence construction projects in the developing countries are provided in this section. After the analyses and reviews of past studies, a total number of 111 risk factors were obtained from past studies. Table 1 outlines the mostly used risk factors. It shows that fifty-seven risk factors are the main risk factors that influence construction projects of the developing countries.

Table1. Risk factors affecting the construction projects in the developing countries

Factors	Fr	Factors	Fr	Factors	Fr
Inflation/price fluctuation	34	Technology issues	16	Incomplete design scope	9
Accidents /safety	31	Owner demand changes & intervention	16	Damage to structure	9
Requirement or delay for permits & approval	31	Inadequate specifications	15	Change order negotiations	9
Changes in laws and regulations	30	Exchange rate fluctuation	15	culture difference	9
Labour & equipment productivity	30	Contractor competence	14	Taxes and tax burdens	8
Client's financial failure	28	inaccurate cost estimate	14	Delayed dispute resolutions	8
Adverse weather conditions	26	Inadequate program scheduling	14	Conflict of document	8
Insufficient resource availability	25	War and civil disorder	14	Economic instability	8
Different site conditions	25	Difficulty to access the site	14	Lower work quality in the existence of time constraints	8
Defective design	24	Damage to equipment	13	Design complexity	7
Poor communication between involved parties	24	Political instability	13	criminal acts	7
Delayed payment on contract	24	Unavailability or Turnover of skilled labour	13	Public relationship	7
Lack of Scope of work definition	23	Legal disputes	12	Construction Methods	7
Design changes	23	Defective work	12	Poor project planning & control	6

Force majeure	21	Poor site management and supervision	12	Environmental hazards of the project	6
Labour disputes and strikes	21	corruption and bribery	12	Contractors competition in bids	6
Government acts and intervention	19	unqualified designers	10	High performance or quality expectations	6
Defective materials	18	Financial default of contractor	10	Late handing over Of the site	6
Environment Regulations Procedures	18	Tight project schedule	10		

The main factors in the table are accidents/safety and requirement or delay for permits and approvals. Several findings employed various terminologies to explain the same factors. For example, the Force majeure utilized the factors to illustrate the act of God such as flood, earthquake, but other studies separated the factors while others called them a national disaster.

The finds of this review can be considered as the main risk factors influencing the construction industry in the developing countries because all the factors presented in Table 1 were extracted from the past studies conducted in the different developing countries. So these factors will be as a guide for researchers who are interested in this field to save time and resources, they only need to add the new factors or specific factors for a specific project.

4.0 Conclusion

This review on risk management can assist researchers in the identification of previously published risk factors in construction projects and the extent to which they have been investigated. The risk management of construction projects, especially factors influencing the developing countries. These factors can act as guidelines needed by project participants for the comprehensive and successful and implementation of risk management to achieve projects objectives. This review employed Wymer2005 and Alsharafi2017 criteria [27]. A total number of 111 factors have been obtained whereby 57 risk factors are the mostly affect construction projects in the developing countries.

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