

# Identification and Assessment of Risk Factors Affecting Construction Project in Oman

**Fatma Mohamed Al-Harathi & Dhikra Ali Al Manwari & Hussin A.M Yahia**

Department of Civil Engineering, Middle East College, Knowledge Oasis Muscat, Sultanate of Oman

## ABSTRACT

Risk management is the process that contains a risk management approach whether these risks are in the area of work, cost, contract, quality, or resources. In Oman, there are many failures in construction projects that are more meet the deadlines, cost, quality of goals and the competitive threat imposed by globalization all put risk management at the more in agenda of advanced thinking organizations. The aim of this study is to investigate the risk factors affecting the performance of construction projects in Oman. The study used qualitative quantitative data, online questionnaire distributed among engineers at selected sites, and interviews with specialists at construction sites. The results confirmed a lack of internal coordination between subprojects within the overall project, lack of an appropriate climate for implementation such as periods of storms that last for a long time, and Lack of specialized human resources for a specific part of the project due to problems in organizing the project or the withdrawal of some individuals with rare competence or modifications to the cadres of the project.

**Keywords:** risk factors, construction project and quality

## Introduction

Risk management is the processes that contain a risk management approach whether these risks are in the area of work, cost, contract, quality or resources. Risk is something that can happen or not happen in the future and can affect the project. Construction projects are of a special nature and the most important features are the length of time that may lead to changing conditions, which poses risks because of the length of the implementation period and the stages from the beginning of the project until the delivery of a project. Which are increased conditions and uncertainty and increased probability of risk. In Oman, risk management is an official procedure that enables systematic identification, analysis and risk management throughout the project life cycle. Risk management is the main issues face the majority of construction companies in the construction sector in Oman today. The idea of risk management is comparatively original and has not yet practiced by most contractors except self-government and expertise; this has meaning of project objective and inadequate cost estimates and hostility between this group and their customer (Faridi, 2016).

## Overview of the Gulf Region

As indicated by the International Hydrographic Organization (IHO), the Gulf is an inland ocean region of 251,000 km<sup>2</sup>; it is 989 kilometers in length. The Gulf States, which begin from the north clockwise, are the Islamic Republic of Iran (covering a large portion of the northern part of the Gulf), the Sultanate of Oman, the United Arab Emirates, Qatar and the Kingdom of Saudi Arabia, Kingdom of Bahrain and the State of Kuwait.



Figure 1: The map of gulf region

The Gulf States have gained critical ground in their advancement since adjustment and usage of their oil wealth, as in the Kingdom of Saudi Arabia, the Kingdom of Bahrain and the State of Kuwait. As appeared in figure 1 above, oil represents 70% of government incomes in the Kingdom of Bahrain, 95% in Kuwait and Saudi Arabia represents 80% of government income. CIA (2013) Figure 2 shows GDP isolated by financial exercises in the GCC nations.

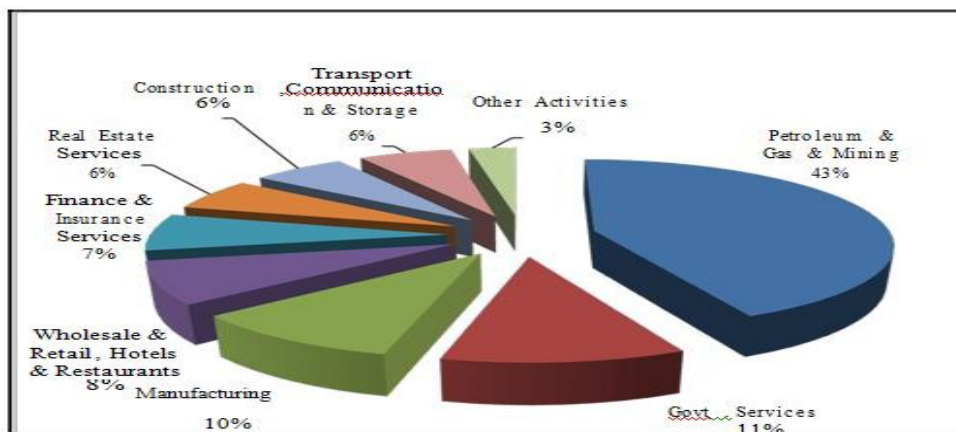


Figure 2: Isolated by financial exercises in the GCC nations

## Project Life Cycle

In 2011, Larsson and Gray (2011) explained four stages of the project life cycle, which include:

- Defining stage
- Planning stage
- Executing stage
- Closing stage

Larson and Gray integrate the monitor and control stage with the implementation stage. PMBOK (2004) and OIT (2005) separated them and presented the project life cycle in five main stages:

- Initiation
- Planning and design
- Execution
- Monitoring and controlling

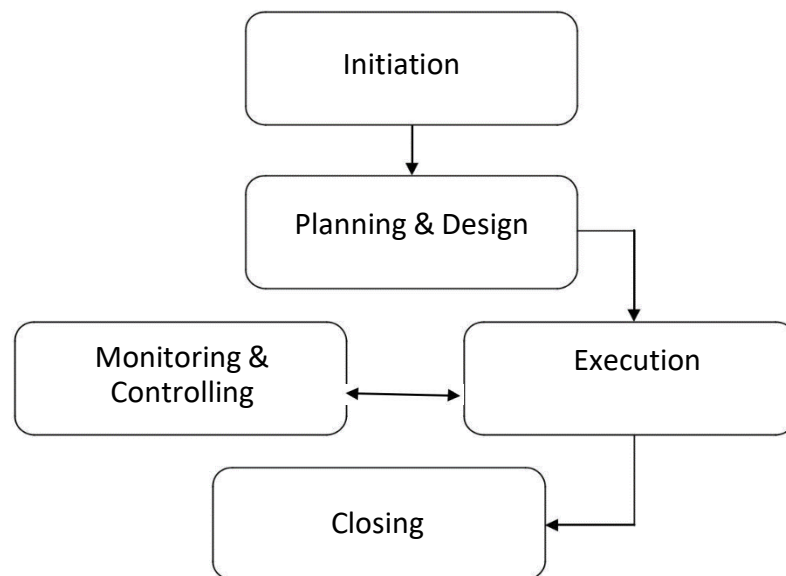


Figure 3: Construction project life cycle

## Risk Management

Managing risk is administration when individuals expected to store their harvests for later use toward the start of human advancement, when individuals assembled strongholds and

wall to ensure their towns and property. Another illustration is the point at which a merchant deals with his risk while moving products starting with one place then onto the next by the purchaser paying the dealer a security store to be returned when the purchaser gets the merchandise in great condition, so if the broker experiences any debacles amid his excursion gets remuneration. From the Babylonian time to the Age of Enlightenment, risk administration was not methodically done, but rather pretty much relied upon "gut feeling". Be that as it may, approach has been seen all the more methodically after analysts and theoreticians have created quantitative strategies for assessing risk. Douglas (2009).

Tang et al. (2007) Risk management is an imperative piece of the basic leadership process in the construction project management, especially as to extend combination, scope, time, cost, quality, interchanges and acquirement. Borge (2001) Risk Management enhances the undertaking's future prospects by distinguishing vulnerabilities and probabilities; it is characterized as a framework went for recognizing and recognizing all risks to the project with the goal that a cognizant choice can be made on the best way to manage the risk. Zou et al. (2007). In development project, risk and vulnerability can be a positive or negative outcome. The danger is the aftereffect of a negative risk and the opportunity is the consequence of positive risks. Accordingly, the peril isn't an awful thing; in any case, it implies that things are dubious. Cretu et al. (2011).

## **2.1 RISK MANAGEMENT PROCESS:**

Most construction projects encounter cost and time overwhelms. As indicated by Cretu et al. (2011), a cost investigation contemplate was directed on open works extends in Europe and North America. The study resulted about the frequency and seriousness of cost overwhelms were essentially high. The round observed 86% of the 258 project cost invades bringing about a real cost of 28% higher than the assessed cost. The principle factors in charge of cost overwhelms are deficient risk examination. Here, amid the early period of the project, the extent of work was frail and all around portrayed at the season of task budget, or impacted by political weights as the project was deferred keeping in mind the end goal to serve the political plans.

Kaplan and Garrick (2011) the idea of risk management is totally unique in relation to the idea of risk assessment, albeit some may use term risk management to depict the risk assessment process. Westland (2007) characterizes risk management as "the process by which project chance is distinguished, measured and overseen". Paek (2009) at the arranging and development organize, distinctive sorts of risk can be recognized, assessed and examined utilizing likelihood hypothesis of relative significance of risk appraisal and control of their effect on the development project. Risk management diminishes deferrals and in this manner lessens legally binding question. As per Braimah and Nadekugri (2009), one of the primary finishes of the current philosophies for analysis delays in development projects from the perspective of customers and specialists is the utilization of straightforward techniques as opposed to complex examination in delay analysis in spite of the fact that it is known as less solid.

## Research design

This study used triangulation to guarantee the legitimacy and unwavering quality of research result. This study pursued utilization of a mix design strategy for method by using qualitative research and additionally quantitative research with the end goal to get better. Mix design strategy is structure of research in which the collect, analysis, and orders both qualitative and quantitative information for a study. The quantitative technique relied upon use an explicit questionnaire. Questionnaire was use for this study to assemble information on proposed foundation in the hypothetical model. These builds incorporate issue of factor affect construction projects in this issue. These structures include the perspective of areas affected by building factors and the reasons, in addition the times of issue happen, and the measures that use to lessen the effect of the issue. Qualitative part used for the interview to research, empowering the researcher to ask more questions that were excluded in the readied interview manual. Quality of interview is that the analyst can dive into the profundity of given situation. Likewise, researcher can clarify or rethink questions if respondents don't comprehend the questions. Qualitative research result can likewise use a manual for additional enhance the quantitative research plan.

Quantitative data were analysis by the SPSS -v25 and the qualitative data by constant comparative method for the reason that easy to use and effective. Constant Comparative Method is an inductive information coding procedure used for arranging and looking at qualitative data for analysis purpose. It is normally connected with the strategy. Theory created use the constant comparison method is considering in light of the fact that it is gotten from regular experience as comprised by the information.

## RESULT & ANALYSIS

Variables	category	Result	
		Frequency	Percent
Job description	Owner	3	4.1
	Contractor	16	21.9
	Consultant	54	74
Education	University level	71	97.3
	Secondary	2	2.7
Project type	Buildings	28	38.4
	Commercial	11	15.1
	Residential	1	1.4
	All above	27	37
	Others	6	8.2
Years of experience	Less than 5 Years	24	32.9
	5 – 10 years	15	20.5

	11 – 15 years	17	23.3
	12 – 20 years	8	11
	More than 20	9	12.3

The frequency analysis is a piece of descriptive statistic. In measurements, the frequency analysis is a critical zone of statistic that bargains with the quantity of events and analysis proportions of focal propensity, scattering, percentiles, the delay in sub-contractors work in management that related risk factor effect on construction project. The results shown in this question that related what the 30 people agree in this part was signification is more with 41.1%. In other hand, the lowest only 8 peoples selected the minimum for this question with 11% and for the answer is moderate with 26% and extensive with 21.9%. That’s mean they agree with the factor of delay in work for management factor as shown in figure 4.

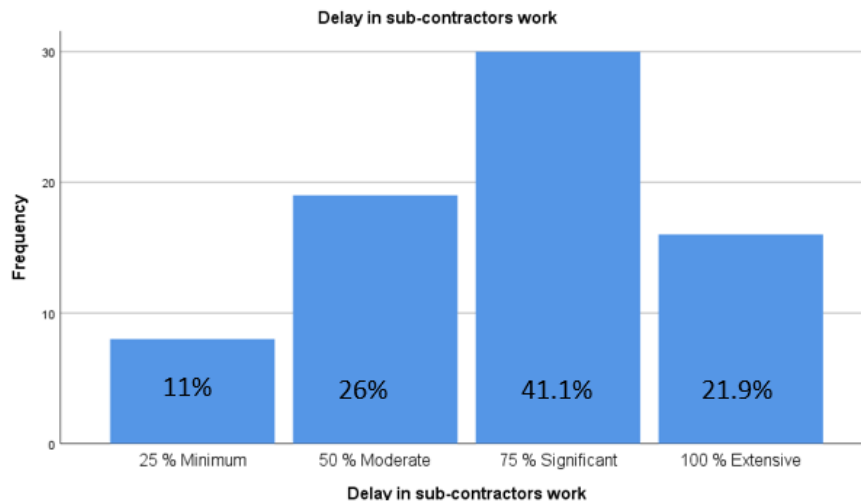


Figure 4 delay in sub-contractor’s work

The financing project by contractor/ client, the results shown that the highest answer for 39 people was significant with 53.4% and lowest answer for one person was minimum with 1.4%. So that’s mean most of them they agree that finance is a factor that effect on construction project. For other answer in extensive are 20 people with 27.4% and moderate for 13 peoples with 17.8% as shown in figure 5. regarding the material types and specifications during construction in material that related risk factor effect on construction project. the results shown the most of the 31 people closed the signification with 42.5% and 2 of the people select no effect with 2.7%, that’s mean during the construct they change the material and they loss time that is the factor that affect in construction. 17 people select extensive with 23.3%, 15 people select moderate with 20.5%, and 8 people selected minimum with 11% as shown in figure 6

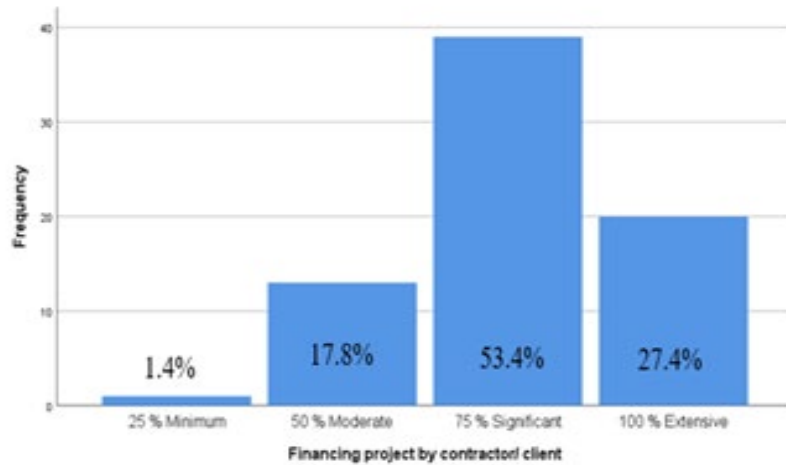


Figure 5 The financing project by contractor/ client,

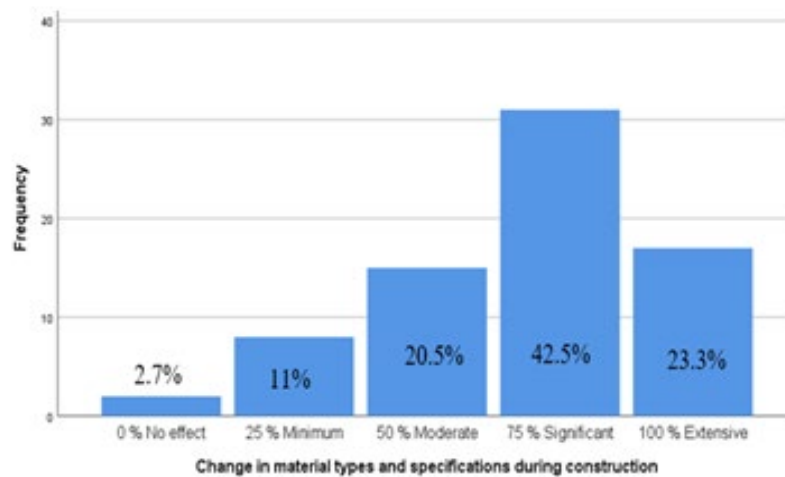


Figure 6 the material types and specifications during construction

**Analyze qualitative data**

Three of the interviews were conducted with experts on Oman Environmental Services Holding Company. The interview it has two parts, the first part for the general information and the second part related to the project for risk factor that effect on construction projects in Oman. The interview was collected by experts to view their opinions in their word; also we know they have experiences of life. The following are the details for the interview and their reasons:

- What is the perception of risk and risk management?

It was discovered that master evaluations of risk were driven to a great extent by the normal number of fatalities. Then again, the general population's view of risk was really more extravagant in that it depended on a far more extensive scope of factors (Gurian, P., 2008).

**Experts 1:** the risk that the company are willing to take as per risk appetite statement and risk tolerance level which should be taken for the company's vision, mission, strategies and objectives against to the actual risk has been identified and mitigated"

**Expert 2:** "The risk or uncertainty should be considered and monitored in all areas of work and business. Risk management is a continuous process which consists of several steps and which is repeated periodically. It includes:

- The determining of the level of protection,
- The defining of the risk criteria, i.e. the risk evaluation,
- The risk identification, analyses and assessment.

### **Expert 3**

- Protect an entity or organization from future risks
- Control the sudden damages
- Reduce the side effects of any risks with smart solution.

### **How is knowledge managed in relation to risk management?**

Knowledge risk management is a rising field which offers an answer for the issues related with traditional risk the board techniques. The issue of ecological multifaceted nature is showed by people not thinking enough about the risk to envision its probability and outcomes (Apgar, D. 2006).

**Expert 3:** we have something we called risk awareness culture where we develop, assess and monitor the cultures: For the example: we have risk awareness sessions for all be'ah staff, in depth training for the risk leaders who are responsible in their departments /functions and also, we have a page in the workplace face book called risk awareness and tips where we shared most of the information related to the risks (trends, standards, forms, template, etc.

### **What is the reason for inadequate Risk Management in your organization?**

As indicated by the Sidorenko (2017). Five basic risk the executive's disappointments:

- Poor administration and "tone at the association
- Heedless risk taking



- Failure to actualize successful ERM
- Nonexistent, incapable or wasteful risk appraisal
- Not coordinating risk, the management with procedure setting and execution.

**Expert 1:** (If any) Willingness of the company staff and management to adopt the changes, communication issues caused by un reviewing the risk reports and the Maturity of the risk management functions”

**Expert 2:** Risk management is important in an organization because without it, a firm cannot possibly define its objectives for the future. If a company defines objectives without taking the risks into consideration, chances are that they will lose direction once any of these risks hit home”

## Conclusion

The countries of the Gulf Cooperation Council are developing countries and are considered high-income countries that have witnessed a sophisticated construction boom in the field of construction and construction. Oman, as a developing country, has witnessed an expansion in the establishment of construction projects, in this study, focus was assessment of Risk Factors Affecting Construction Project in Oman as, the time, client, material type, design, equipment, and delay in construction. Construction projects are exposed to a lot of various internal and external risks. A strict set of codes, laws, and regulations must be followed during the construction process to avoid these risks. The risk is categorized to six categories:

- Technical Risks
- Logistical Risks
- Environmental risks
- Management related risks
- Financial risks
- Socio-political risks

## RECOMMENDATION:

The recommendation that which have the project through quantitative and qualitative results. The recommendation that we have are many because of the problem with the factor that effect on construction project. The following are the recommendations obtain through this project:

- For the future researcher can help this results of research by basic foundation to design standard of risk management for risk factor that affect construction

projects in Oman.

- For the future researcher can follow and found in literature review. Also can be using the label of classification that used standard of contract.
- Identify and assessment negative factor of risk that affect during construction project.
- From the data its conclude that risk factor with the negative factor on project in Oman are:
  - Cost estimation
  - Making process
  - Drawings of projects
  - Data collection before design
  - Contractor experience
  - Material

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