NADER AL AGHA
RISK MANAGEMENT IN CONSTRUCTION PROJECTS IN GAZA STRIP BETWEEN THE PERIOD 2006-2015
NEU
2017

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A THESIS SUBMITTED TO THE GRADUATE SCHOOL OF APPLIED SCIENCES OF NEAR EAST UNIVERSITY

By

NADER AL AGHA

In Partial Fulfillment of the Requirements for the Degree of Master of Science in Civil Engineering

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Approval of Director of Graduate School of

Applied Sciences

Prof. Dr. Nadire Çavuş

We certify that, this thesis is satisfactory for the award of the degree of Master of Science

In Civil Engineering

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I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

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To My Parents…

ABSTRACT

The study aimed at identifying the risks that may be encountered during buildings construction projects in Gaza. The researcher followed both descriptive and analytical approach in order to achieve the objectives of the study through illustrating the study subject, analyzing the collected data and demonstrating the relationship between its main components and the

opinions which were gathered in relation to the operations involved and the impact of the results attained. This methodology is considered to be one of the technical and analytical methods to explain a certain phenomenon or problem and describing it quantitatively. This was done through accurate data gathering, classification and analysis after subjecting it to meticulous evaluation. The study relied on the data collected from 120 building construction projects which were under the supervision of the Contractors Union in Gaza. A questionnaire was distributed to the owners of some projects, Contractors, suppliers and clients in Gaza strip. A total of 160 questionnaires were processed identifying only 120 suitable ones by excluding 40 questionnaires (25% of the total). These questionnaires results were used as the main support for the study. The questionnaires contained a wide range of subject areas and components.

The study reached a set of recommendations; some of the more important ones can be summarized as follows: use should be made of the experiences gathered from surrounding countries in the area of construction of projects, particularly the subject of risks management in order to mitigate such risks through holding annual technical conferences to exchange views about risk management, their impediments and the methods used to mitigate them. All this should be done taking into account quality, importance and impact of the project. In addition, the quality of Engineering Design should be attained through Consultancy offices ensuring that a design review is performed by a third party to assure design quality. A team should be formed to manage the risk with all needed resources (manpower and financial) with all necessary authorization that enables them to address risks. This team should be fully qualified academically and technically and to receive all necessary training in order to perform its duties effectively. Continuous and periodic review should be performed through conducting periodic tests in order to establish the efficiency, effectiveness of the construction projects.

Keywords: Gaza strip, risk management, efficiency, effective, construction

ÖZET

Bu çalışma, Gazze şeridindeki inşaat projelerinde risk yönetimini tespit etmek için yapılmıştır. Araştırmacı, çalışmanın hedeflerine ulaşmak için açıklayıcı ve analitik bir yaklaşım kullanmıştır. Ayrıca, verileri tanımlamak ve hakkındaki parça, görüşler ve prosesler arasındaki ilişki beyanını açıklamaktır. Bu, bir fenomen ya da spesifik bir problemi tanımlamak için

bilimsel organizatörlerin analiz ve yorumu şeklinde olan etkileri içerir. Bu ayrıca, sınıflandırılan, analiz edilen ve çalışmanın her detayına tabi tutulan fenomen ya da problemin bilgi ve verilerini toplayarak alınan ölçümleri kaydetmeyi içerir. Bu çalışma, çalışma örnekleminin bazı projelerin sahipleri, Gazze şeridindeki yükleniciler, tedarikçiler ve müşteri olarak dağıldığı, 160 anketten 120'sini tespit etmek için işleme alınmış anketlerin verildiği, Gazze şeridi müteahhitler birliğinde faaliyet gösteren 120 inşaat projesidir. Çalışma araştırmacının anket formunu çalışma için bir araç olarak kullandığı, toplamın %25'i olan 40 anket dahil edilmemiştir. Ayrıca, anketlerde, bir dizi eksen ve paragraf bulunmuştur.

Çalışma, riskle nasıl başa çıkılacağını ve risk yönetimi üzerine yıllık bilimsel konferanslar düzenlemeyi içeren, projelerin inşaatında çevre ülkelerin deneyimlerinden avantajları içeren bir dizi tavsiye bulmuştur. Bu, karşılaşılan riskin yönetilmesiyle ilgili engelleri ve inşaat projelerindeki riski karşılamak için izlenen değerlendirme metot ve araçlarıyla ilgili engelleri ele almak, ayrıca, projenin önem ve etkisine ek olarak kalite faktörünü dikkate almak ve danışmanlık ofislerinde kaliteyi yakalamak ve tasarımcılar dışında diğer ekip tarafından neyin kontrol edilmesinin gerektiğini teyit etmek için mühendislik tasarım sistemlerini uygulamak ve bilimsel ve teknik olarak eğitimli ve kalifiye olmalarını sağlarken, riskle başa çıkmalarını sağlamak için tüm gereken yetkileri vermektir. Bunlar, bu inşaat projelerinin verimlilik ve etkinliği için testleri gerçekleştirerek risk yönetim denetimleri için işlevleri etkin şekilde gerçekleştirmeli ve sürekli periyodik programlar üzerinde çalışmalıdır

Anahtar kelimeler: Gazze şeridi, risk yönetimi, verimlilik, etkin, inşaat

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INTRODUCTION

1. Introduction

Construction projects in the 21st century are facing a large number of variables that demand them to think about the future. This situation is what compels construction companies to adapt, respond and achieve progress or to retreat. The organization would have no way but to adjust and adapt to these changes and that's if they, themselves wanted to survive, progress and improve their overall performance. Otherwise, when they face the construction projects in the 21st century, both internal and external challenges will result in multiple risks. These risks may or may not include political, legislatorial, structural or of an environmental nature dependent on the situation. This is because of the large changes in the internal and external environment in which it operates.

A concept of risk management in construction projects from a widespread model in contemporary societies occur in all kinds of investment projects. This is due to the potential risk of occurrence but never-ending. Any organization, whatever the power of their budgets it can't plan for every possible emergency. Therefore the situation calls for and requires giving adequate attention to the dimensions of the basic elements for selecting subsidized management knowledge and experience, which would undoubtedly affect the degree of readiness of the organization to cope with the risk.

1.1. Research Importance and General Objectives

1.1.1. Importance of Research

Taking into consideration the Palestinian territories in general and Gaza strip in detail, it's a fertile ground for construction projects with the essentials of construction projects in particular, as a result of suffering years of siege. This is because of the risk, tragedies, wars and deprivations of the most basic rights, which in turn led to the impoverishment of a permanent and large segment of Palestinian people.

1.1.1.1. Scientifically

- Through private research sources, the researcher found that the causes stem from the first empirical attempts in Gaza strip which aimed to identify the role of risk management in construction projects in Gaza strip.

- The reason is the lack of local research and literary sources that specialize in this area in Gaza strip. This research will be an important reference for researchers and for people who are interested in this area.

1.1.1.2. Practicality

The construction projects in Gaza strip were damaged during the war on Gaza strip in 2014. This was a loss estimated at $58.7 million, where the damages were centered on the biggest major construction projects, assets, and associated facilities as they were the most affected by the consequences of the aggression.

- Through this research, it will be possible for construction projects in Gaza strip to have numerous probabilities for the scopes of risk management.
- Find out how to reduce the risks in the construction projects in Gaza strip
- To draw the attention of construction projects currently in Gaza strip to the importance of risk management in construction because of the impact on both the local and regional level.

- Providing scientific and practical recommendation for construction projects to help identify the risks in construction projects.
- The study of the nature of the program design and the nature of the interventions throughout a construction project.
- This study will prepare a basic reference for most of the construction projects and donors working in Gaza strip.
- This study provides a new perspective for researchers and workers who have a relationship in an in-depth study which will be of great importance as a reference for researchers and any interested parties.

1.1.2. General Objectives

From the framework of the research problem, the main objective of this research is to identify the risks in construction projects in Gaza strip, in addition to achieving following objectives:

1. To shed light on the mechanisms, policies, and procedure to reduce the risk in construction projects in Gaza strip.
2. To clarify the safeguards and standards that must be followed to reduce risk in construction projects in Gaza strip.
3. In identifying the obstacles, actual and anticipated challenges to reduce risk in the construction projects in Gaza strip.
4. The identification of the strategies proposed for decision makers to reduce risk in construction projects in Gaza strip.
5. A statement relating to the required facilities to be used to reduce the risk in construction projects in Gaza strip.
6. In determining the differences between the averages workers response regarding the role of risk management in construction projects in Gaza.
7. To propose a set of recommendations that contribute to the efficiency and effectiveness of risk management to the municipalities in reducing the major risks involved in construction projects in Gaza strip.

1.2. Research Questions

1. What risk management in construction projects in Gaza strip: a case study of the construction projects during the period 2006 – 2015?
2. What are the methods, mechanisms, policies and procedures followed by the construction projects in Gaza strip?
3. What are the safeguards and standards that are followed for risk management in construction projects in Gaza strip?
4. What the most important strategies proposed to decision makers for the risk management in construction projects in Gaza strip?
5. What the required facilities used for the management of risks in construction projects in Gaza Strip?
6. What are the actual and expected obstacles and challenges of conducting risk management in construction projects in Gaza strip?
7. What are the differences in the sample estimates of risks in construction projects in Gaza strip according to the variables (Duration, Project Type, and Geographical Area)?

1.3. Hypotheses

From the reality of the problem study and its questions, including the objectives, we can formulate a set of hypotheses searchable as follows:

1.3.1. Main Hypothesis

There's a statistically significant relationship between constraints that cause risk in construction projects in Gaza strip.

1.3.2. Sub-Hypotheses

1. There's a statistically significant relationship between averages of the sample members and the methods, mechanisms, policies, procedures followed and risk management in construction projects in Gaza strip.
2. There's a statistically significant relationship between averages of the sample members and the safeguards and standards that are followed and risk management in construction projects in Gaza strip.

3. There's a statistically significant relationship between averages of the sample members and the proposed strategies for decision makers and risk management in construction projects in Gaza strip.
4. There's a statistically significant relationship between averages of the sample members and required facilities used and risk management in construction projects in Gaza strip.
5. There's a statistically significant relationship between averages of the sample members the actual and expected obstacles and challenges and risk management in construction projects in Gaza strip.
6. An estimate of responses vary regarding the risk in construction projects in Gaza strip depending on variables (Duration, Project Type, Geographic Area).

1.4. Research Methodology

1.4.1. Introduction

This part deals with a detailed description of the procedures followed by the researcher in the implementation of the study. The definition of the case study, the methodology and description of the population of the study to identify the study sample and the study tools (questionnaire) which will ensure its authenticity as well as the statement of the conduct of the study including the statistical methods used in the treatment of the result.

1.4.2. The Methodology of the Study

In order to achieve the objectives of the study, the researcher used a descriptive and analytical approach which tries to describe the phenomenon under the study, analyze the data and provide a statement of the relationship between the components and their views around the process. This included the effects of which it is a form of scientific analysis and its interpretation to describe the phenomenon or a specific problem as well as the records measured. This was done by collecting data and information classified as a phenomenon or problem and rated to be analyzed and subjected to the study.

1.4.3. Research Location

The research was carried out in Gaza strip, which consists of five governorates; the North, Gaza, the Middle, Khan-Younus and Rafah. These five areas are considered the southern territories of Palestinian National Authority.

1.4.4. Population of the Study

The study consisted of 120 construction projects, which operates within the contractors union of Gaza strip, in which the study sample was distributed to the owners of some projects, contractors, suppliers and clients in Gaza strip.

1.4.5. The Study Sample

The study sample received the questionnaires that have been processed to identify 120 out of 160. The excluded questionnaires were 40 questionnaires in total which numbered to 25%.

1.4.6. Study Tool

The researcher used the questionnaire as a tool for the study which included the questionnaire on a range of themes and paragraphs. This shows the degree of approval of the paragraphs according to a five grading scale, determining the degree of approval (Agree, Strongly agree, Natural, Disagree, Strongly disagree) and therefore are given grades (1, 2, 3, 4, 5) respectively. The questionnaire is made up of 4 axes of which, the first axis is political mechanisms and procedures for risk management. It consists of one of the seven paragraphs of which, the second axis represents the safeguards and standards needed to manage risks as well as one of the seven paragraphs whilst third axis is of strategies for risk management. Also of the proposed methods of risk management, the fourth axis is the theme which facilities are required to be used to manage risks and is one of the seven paragraphs. These four axes are the sum of the total number of paragraphs in the questionnaire (28) paragraph. Moreover, the data sources in this study are divided into two types namely:

1.4.6.1. The Main Data (Preliminary)

It is data that has been collected using the survey tool (questionnaire), which was specifically designed to identify risks relevant to risk management in construction projects in Gaza strip.

1.4.6.2. Secondary Data

This is represented in literary form, in which is included in libraries of studies, research books and reference in the field of research. Moreover the questionnaire is used as further sustenance for the study which included a range of themes and paragraphs showing a degree of consent according to a 5 digit grading scale of approval (Strongly agree, Agree, Natural, Disagree, Strongly disagree).

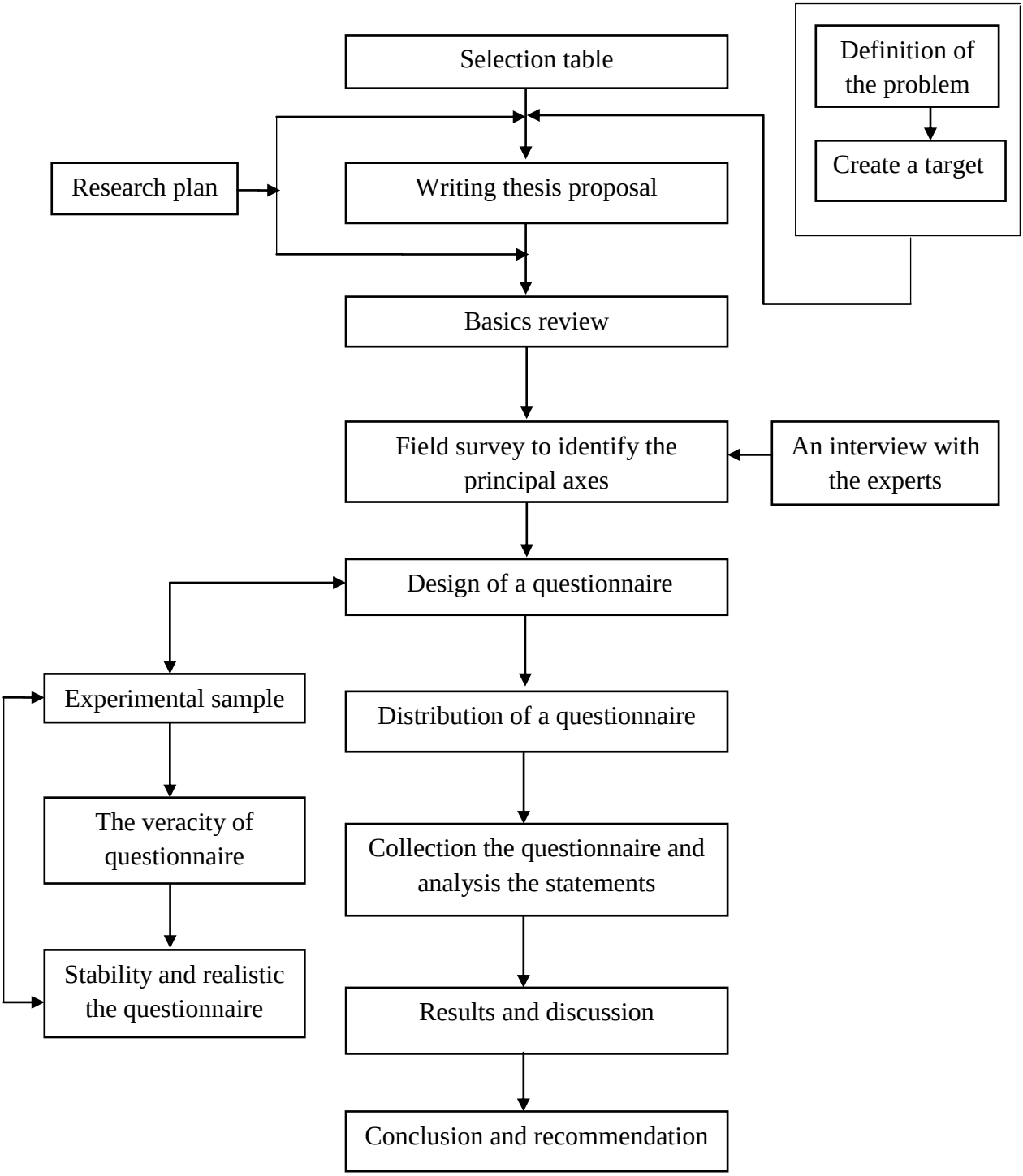

Figure 1.1: Research methodology

1.5. Literature Review

1.5.1. Literature Survey on Risk Identification Considering Cause and Effect Relations

In literature, the word "risk" is used in different meanings with different words such as hazard or uncertainty (Al-Bahar and Crandall, 1990). Jannadi and Almishari (2003) defined risk as a combination of the probability, the severity, and the exposure of all hazards of an activity. Chapman (2001) accepted risk as the "likelihood of occurrence and the degree of impact of a negative event adversely affecting an activity". Barber (2005) defined risk as "a threat to project success, where the final impact upon project success is not certain". As will be introduced in further sections of the paper, in this study risk-related factors are categorized into vulnerability factors, risk sources, risk events and risk consequences, according to their places within the risk paths.

Risk identification is the first step of risk management process, in which potential risks associated with a construction projects are identified (Zou et al. 2007; Akinci and Fischer, 1998). Within literature, several checklists and risk breakdown structures were suggested to identify and classify potential risks which have probability to have adverse effect on project objectives. Azhar et al. (2008) identified 42 cost overrun factors and arranged them into three categories: macro economic factors, management factors, business and regulatory environment. Assaf and Al-Heiji (2006) investigated 73 causes of delays construction projects in Saudi Arabia. Abd El-Razek et al. (2008), proposed 32 causes of delays of construction project in Egypt. Enhassi et al. (2009) suggested 110 delay factors/causes, which were classified into 12 groups, resulting into time overruns and cost overruns in construction projects in the Gaza strip. Aibinu and Odeyinka (2006) identified 44 delay factors related with the client, quantity surveyor, architect, structural engineer, services engineer, contractor, subcontractor, supplier and external factors. Perry and Hayes (1985) identified 29 primary sources of risks in a construction project associated into 9 risk groups: physical, environmental, design, logistics, financial, legal, political, construction and operation.

Chan and Kumaraswamy (1996) identified 83 factors that may cause time delays in Hong Kong construction projects and classified them into eight categories; project-related, client-

related, design team-related, contractor-related, materials, labor, plant and equipment and external factors. Long et al. (2004) presented 62 risk factors in large construction projects in Vietnam related with the financier, owner, contractor, consultant, project attributes, coordination and environment problems. Mustafa and Al-Bahar (1991) identified 32 risks in construction projects and classified them into six groups: acts of god, physical, financial and economical, design and job site-related risks.

Although these checklists, help decision-makers to identify potential risk factors; they "stay at a simple level of details, such as just listing the risks to limit the quantification and prioritization of interrelated risks" (Han et al., 2008) and underemphasize the importance of interdependencies among them (Ward, 1999). On the other hand, identifying risks as individual factors and neglecting the sequences of their occurrence and cause-effect relations will not be a realistic approach. (Eybpoosh et al. 2011). Within this context, authors such as Chapman (2001), Kim et al. (2009), Ashley and Bonner (1987), Dikmen et al. (2007) have discussed the necessity of consideration of risk interdependencies among.

Chapman (2001) proposed studying risk relationships by classifying them as, dependent risks in series and independent risks in parallel and suggested precedence, influence diagrams, knowledge maps or flow charts to represent these relationships. The study of Chapman (2001) is one of the important contributions examining cause-effect relations among risks, risk paths generated from these relationships and graphical representation of these paths. Additionally, Han et al. (2008) analyzed the causality between risk variables, sorted them as risk sources (causes) and events with respect to their hierarchical order and constructed series of risk paths from its source to event, to corporate a scenario-based risk checklist. Ashley and Bonner (1987) utilized influence diagrams to represent interrelationships between macro risks (political source variables) and micro risks (project consequence variables) and their either direct or indirect affect on project cash flow variables (cost of labor, material, overhead costs and project revenues).

Akinci and Fischer (1998) used knowledge maps for demonstration of relationships among uncontrollable risk factors (i.e. economic factors, political risk factors, client related factors and subcontractor related factors) and cost overrun variables (i.e. unit cost, estimated quantity,

and final unit cost). To assess the cost overrun risk rating of an international construction project, Dikmen et al. (2007) incorporated influence diagramming and fuzzy risk rating approach for risk identification and risk assessment purposes. Authors used influence diagrams for representation of hierarchical order and interactions of major sources of country and project risks that relates cost overrun.

1.5.2. Risk Management in Construction Projects from Contractors and Owners in Gaza strip, Eng. Jaser Abu Mousa (2005)

In this paper the main objective is to gain understanding of risk factors that could be in front of building projects in Gaza strip. The study aims also to investigate the effectiveness of risk preventive and mitigation methods. Moreover, the usage of risk analysis techniques is addressed. The objectives of this research have been achieved through a comparative study of closed-ended questionnaires with interviews and a case study in Gaza strip. The results concluded that the most important risk factors are: financial failure of the contractor, working at hot (dangerous) areas, closure, defective design and delayed payments on contract. On the other hand, owner respondents concluded that the most important risk factors are: awarding the design to unqualified designer, Defective design, Occurrence of accidents, Difficulty to access the site, inaccurate quantities.

1.5.3. Risk Analysis in Construction Projects in Gaza strip "Contractor's Perspective", Kotb, M., & Abdullah, M. (2014)

The aim of this paper is to investigate risk analysis techniques used to analyze risks in construction projects in Gaza strip. The findings of this research indicate that the most important risk analysis techniques that contractors use to analyze risk factors to better manage risks of construction projects at the bidding cost estimate stage, are the following: comparative analysis (analyze similar projects), direct judgment using experience, action plan (scenario) analysis with project details, probability analysis using historical data, descriptive analysis, sensitivity analysis and simulation analysis using software programs. The results of this research recommended to the contractors are to select the optimal risk analysis technique to analyze and estimate risks properly and to determine the convenient preventive method to respond risk effects early, at the pricing stage of construction project.

This study has successfully detected the most significant risk analysis techniques to analyze risks in construction projects in Palestine, The findings of this research indicate that the most important risk analysis techniques that contractors use to analyze risk factors to better manage risks of construction projects at the bidding cost estimate stage, are the following:

1. Comparative analysis (analyze similar projects) as the 1st option.
2. Direct judgment using experience as the 2nd option.
3. Action plan (scenario) analysis with project details as the 3rd option.
4. Probability analysis using historical data as the 4th option.
5. Descriptive analysis as the 5th option.
6. Sensitivity analysis as the 6th option
7. Simulation analysis using software programs as the 7th option.

The results of this research recommended contractors to select and use which of the previous risk analysis techniques as the optimal and proper technique, to analyze and estimate risks properly and to determine the convenient preventive method to respond risk effects early, at the pricing stage of construction project.

1.5.4. Risk Management in Building Projects in Palestine: Contractors' Perspective, Enshassi, A., Mohamed, S. and Abu Mosa, J. (2008)

The construction industry is widely associated with a high degree of risk and uncertainty due to the nature of its operating environment. This research study seeks to identify and evaluate key risk factors and their preventive and mitigating measures in building projects in Palestine. It also seeks to investigate the severity and allocation of each identified risk factor according to the contractors' perspective. A questionnaire survey was conducted and a total of forty-four critical risk factors were identified and categorized into nine groups. Research findings identify financial failure of the contractor to be the most important risk factor followed closely by two factors namely, working in dangerous areas and border closure. The results also indicate that close supervision is seen as the most effective risk mitigating method. The paper recommends that contracting companies should identify and adequately quantify project risk factors. Adding a risk premium to quotation and time estimation has to be supported by governmental owner organizations and other agencies in the local construction sector.

Training courses should also be provided to construction professionals on how to deal with and minimize risks in building projects.

Forty four critical risk factors were identified and categorized into nine groups: physical, environmental, design, logistics, financial, legal, management, political, and construction. The top ten sever risk factors according to the current views of contractors.

It is recommended that contracting companies should compute and consider risk factors by adding a risk premium to quotation and time estimation. This trend has to be supported by governmental owner organizations and other agencies in the construction sector. Training courses should also be provided for engineers and project managers on how to deal and minimize risks in building projects. Contractors should endeavor to prevent financial failure by practicing a stern cash flow management and minimizing the dependence on bank loans. Contractors should learn how to share and shift different risks by hiring specialized staff or specialized sub-contractors.

Through the Showing of the previous studies, the researcher can summarize the risks in construction projects in Gaza strip as:

- The encountered construction projects in Gaza strip during the past ten years, from 2006 to 2015, have decreased in their budgets by 31%as a result of the ongoing conflict in the region and the Palestinian division, and the economic fluctuation, In addition the Israeli siege and attacks that led to a significant loss of assets and property in construction projects. It is due to these reasons that majorly impact the ability to provide services to the citizens.
- There are obstacles to construction projects, including the economical financial constraints, low revenues and limited municipals revenues in Gaza strip, this leads to the reliance on external financing. The obstacles of administrative and political risk due to the Israeli authorities practices and targeting the infrastructure of Palestinian society as well as the reality of division and blockade, which greatly impacts negatively on development projects in Gaza strip.
- The existence of legal loopholes in the laws and regulations governing the work of the construction projects and constitute a barrier to development and from which some of

the infiltration and exploitation of corruption and because of the aging of the laws that govern the operation of the projects in Gaza strip.

- Facing construction project in Palestine are significant challenges which impose considerable pressure to adapt to these conditions and meet those challenges that affect the performance of the projects, therefore the projects need to focus on the numerous risks involved.
- Construction projects in Palestine face very significant challenges, especially during the war on Gaza strip in mid-2014, and what faced all management and service crews in these projects from successive risk significantly influenced the assets and property. Whether financially or human capacities-wise and is reflected in the performance of their employees and the performance overall in general.

- Lack of construction projects for the management information system in addition to the weakness of project staff capabilities on how to deal with this system.
- Not having construction projects in Gaza strip for an effective strategy to recruit the funds and marketing of project proposals submitted to serve the citizens as well as the weakness of the diversification of sources of funding for construction projects.
- Construction projects don't measure the impact of projects that offered in addition to failing to set targets and measurable indicators for projects.
- Absence of evidence procedures at construction projects in Gaza strip.
- Non-Matching of the organizational structure and job description with the strategic construction projects in Gaza strip.
- Lack of activation of the neighborhood committees and weak community participation in construction projects.

1.6. Theoretical Approach

1.6.1 Qualitative Approach Through:

- The style used by the researcher in interviews to collect preliminary data.
- Access to preliminary data to achieve the objectives of the research.
- Identifying the role of risk management in construction projects.
- Definition of risk management.
- Risk classification.
- Risk management and its stages.
- Risk management in construction projects.
- Analyzing and managing project risks.
- The benefits of the application of analysis and risk management.
- Risks related to the entrepreneur.
- The financial difficulty for contractors or suppliers.
- The properties of construction projects, size and characteristics.

1.6.2. Quantitative Approach Through:

- The use of a complementary questionnaire as a key to search for relevant data.
- Drafting and preparation of the questionnaire to collect data necessary to serve the purpose of the research sample after testing the reliability and validity of the questionnaire.
- Applying the questionnaire on an exploratory sample of (30) from the population of the study.

CHAPTER 2
HISTORICAL BACKGROUND

2.1. Palestinian Contractors Union

The Palestinian contractors union is a Palestinian institution that is a social, non- profit organization with a membership representing a total of merely the local contractors and classified in the contractors union. It aims to regulate the practice of contracting in Palestine and improve the performance of contractors and protect their interests. Moreover, the union plays a positive role in the national economic development of the country, the Palestinian contractors union is considered as a representative of the main construction sector in Palestine and the backbone of Palestinian construction.

The contractors union was founded in 1994 as a non – profit organization based on membership and registered with the relevant government development. It is considered the 'central nucleus' in the development of the Palestinian construction sector and is best placed to represent this sector which reflects the future image of the importance of the Palestinian constructions sector. The contractors union seeks to achieve the objectives for which it was found, which can be a source of information and knowledge as well as the starting point to keep up with the qualitative and global development in construction technology.

Construction sector considers of the economic sectors and one of the important Palestinian national economy engines and this sector has been a widening remarkably. It has been active since the return of the Palestinian national authority to the Palestinian territories in 1994, which led to the revival of the careers in construction and supporting industries have encouraged investment in the local construction industry, helping create jobs for thousands of Palestinians. The importance of this sector has grown remarkably as a result of its role in construction and rehabilitation of roads and infrastructure in light of the continued siege and Israeli aggression (Activities guide of Palestinian contractors union, 2010).

2.2. Definition of the Contracting Sector

Contracting like other professions are constantly evolving, with the development of science and technology, in a profession where the principles and rules are imposed on those who

practice compliance with these foundations and take action in order to ensure the progress, success, and profit. Contractors are basically complementary profession and inherent to the engineering profession to being a scientific translator in all actions on earth for all engineering ideas and projects intended to be implemented. Contracting is the science and art of management which is not as some think as a risky adventure process, which has uncalculated results and the luck plays the first role in which, it requires a sustained and sophisticated effort continues in full and a commitment to scientific principles through to fruition and bring the contractor materially profit, and the moral reputation that add to the vocational tally. The more committed the contractor to apply the principles and engineering results result in his successful and satisfying objectives in the contracting business. At present many difficulties arise as a result of scientific and technical progress and the requirements of society and its development as well as the complexities of the means of financing. These difficulties necessitate absolute rejection to the adoption of the theory that was called the awarding of categories business, which is prevalent since the launch of the first of the works of construction where the entrepreneur is the one which assigns each of the carpenter and mourning tiles, electro and others, for each of these the implementation of business- related work without there being any prior coordination between feigned group or businesses. (Mazboudi, 2003).

2.3. Contracting Definition

The construction sector did not pass in Palestine under normal conditions such as those that operate in the construction sector in many free-to-develop countries in this world, as a result of the occupation as no one can deny the impact of these circumstances in one way or another on the economic situation in Palestine, but in spite of these limitations the construction sector was able to adapt to these conditions as it was not seen to this situation as force (Rustam, 2004).

The cruelty of the measures that have risen because of the Israeli siege on Gaza since the Jerusalem uprising that added new obstacles tougher than all of those that existed in the past. Therefore it was necessary to discuss this situation individually to demonstrate how to help contractors survive to overcome these measures and in order to not fall apart and abolish the constructions sector (Atallah, 2005).

It has even launched the term ‘contracting business’ in which a contractor is needed to contract with the employer to be implemented, which is often a part of the recipe in construction, which the contractor makes some calls and arrangements for the work required in the construction, according to the provisions of their contract (Levy, 2002).

The word ‘contraction’ in English originally stems from ‘contracted’ which are derived from the word contract meaning “an order with similar exchange”. In a business description it is “the specification, requirements, obligations, rates and the like between the two parties, to contract any employer on one hand and the contractor or obligor (the part for business offered by the specific conditions for the sum of money paid by the first of the second, upon completion of the work (Atallah, 2005).

2.4. Career of the Contractor

According to the statutes of the aforementioned Union, any work to create buildings, roads, construction and projects of construction of various kinds as well as the operation and maintenance requires a contractor to be a member of the Union and is registered with the federation of Palestinian contractors in addition to obtaining the degree classifications according to specific criteria in the instructions classification of contractors and supervised by the National Commission of classification.

The number of registered contractors in the Federation of Palestinian contractors according to the latest statistic in July 2007, consist of 1183 contractor in various Palestinian towns and villages and the number of registered contractors in the west bank are 843 contractor. While the number of registered contractors in Gaza strip reached 340 contractors, the number of members classified in various Palestinian governorates is (453) contractor until July (252) of them in the West Bank, and (201) contractor in Gaza strip (Activities guide of Palestinian contractors union, 2010).

2.5. Support Sector of Construction Projects

The construction support industries represent a complementary role to the task of the contractor as they are an essential part of the construction industry and even of the construction world. Class industries, it is important that the plant construction takes a significant role and live up to the required level, which opens the way towards penetrating the

market competition and suppliers of construction materials are: factories mix concrete, asphalt, aluminum, ceramics, stone marble, suppliers of reinforcing steel, bricks, cement and iron and plastic pipes and concrete, as well as suppliers of water supply and sanitation and electrical equipment.

Construction methods of great achievements, the longer they are used and one of the oldest industries known to man as well as the Arab human altar construction techniques openly allowing understanding. Unlike electronics, computing techniques and other such things that have defined the construction industry came in the book of Arab construction industry as an economic activity technician, mainly in all countries regardless of their level of development. This includes those several chains of events are characterized by a tendency for the public sector and its products predominantly which take a long time to plan (Palestinian contractors union, 2003)

2.6. The Basic Features of the Mechanisms in Construction

Specializes in contracting business acting apart from other businesses properties and the ways and methods to deal with the different situation from the rest of the business, This is the supply of some of those features in this section.

2.6.1. Great Diversity

The contracting in projects will vary depending on the type of project, for example, building a house or a hotel, factory or power plant or constructing a bridge or channel. All the works differ from each other in terms of its requirements and it needs, each of which has its own style of implementation varying on the building, requirements, according to the objective of the establishment and extent of services required to be available where the project is divided into several stages of implementation and requirements of each stage, style. These will all vary per project phases with each other works, the nature of each project, and every stage of imposing style and facilities as well as the procedure that must be followed in the implementation (Aljaalok, 1999).

2.6.2. Time Factor

The factor of time in the contracting business work is of great importance because all contracts containing the terms of doing business during a specific period of time are required to be on

the contractor in the event of bypassing the due date resulting in a pay off fines for the delay(Khudairy, 2003).

2.6.3. Technical Specifications

There is usually general terms and conditions for administrative and financial parts that accompany the book of technical conditions to be adhered to in the implementation of the project. The contractor must adhere to those conditions during the work and that the non-compliance as result of the inability to implement or cost saving or weakness in efficiency resulting in serious refusal bills and fines (Hamalawy, 1997).

2.6.4. Projects Cost

The proper implementation and completion of the project in terms of time and the required specifications is not enough because the project is successful.

For the contractor, as he is bound to accomplish the project at a cost less than the value of the contract concluded with the employer for this, there must be a pre-study of the project in advance by specialists and practitioners in all the technical, financial and legal aspects (Al-Araji and Dqamsh, 2000).

2.6.5. The Legal Conditions

Acquiring a contract containing an agreed set of legal provisions between the parties of those laws shows the consequences of both parties of the obligations of his own (Aljaalok, 1999).

2.7. Rating Role in Improving the Performance and Mastery of Work

Where to get a classification certificate valid is considered one of the basic conditions to allow the contractor in the competition for the implementation of government projects and because the concept of classification is to give an important indicator of the potential contractor, technical, administrative and decision-making, so it can be summed up by the role of classification in improving the performance of contractors in the following points:

1. Contractor put in their prospective place, according to different abilities even in doing his job properly and the requirements of the job in order to protect him from a lot of problems.

2. The implementation of the projects according to the agreed specifications and in the specified period. This is so that the degree of their classification as a result of reports prepared by the beneficiaries is not affected.
3. The development of administrative and accounting methods as well as the careful organization of work at the site and good performance and adherent to the timetable for the implementation of the business. So as to give a good impression of his abilities as well as being in line with the terms of the classification.
4. Contractors keen to raise their performance and develop their potential so as to be classified in a higher grade, thus eligible to compete in the implementation of large projects that yield good material.
5. Providing and developing the necessary technical staff and managing the implementation of projects and ensuring the proper equipment that reflects the capabilities of the contractor and its possibilities (Enabah, 2002).

2.8. Historical Stages of the Construction Sector

2.8.1. Construction Sector in 1968 - 1993

The Palestinian economy works under conditions of Israeli authorities, which has worked to undermine its activities through tax practices or through licensing policies of confiscation of equipment or through control of crossing and other borders. However, despite the difficult conditions of the Palestinian territory, the Palestinian economy witnessed growth rates.

As the average real growth in real GDP of 9.7 per year during the period of 1968-1979 and is due to an opening of the Israeli markets to Palestinian labor. In addition to increasing the flow of settlements of Palestinian workers in the Gulf states.

Over the construction sector were exceptional circumstances caused by the Israeli authorities and the imposition of economic security restrictions. However, the construction sector was among the most growing sectors has increased its contribution to GDP from 10% in 1972 to 21.4% in 1992 (Makhoul and Attiyane, 2003).

2.8.2. Construction Sector in the Period During 1993 - 2000

The Palestinian economy has witnessed radical changes after 1993 as a result of the settlement that took place in the Palestinian territories and created settlement opportunities and great challenges to the Palestinian economy during that period. This increased interest in the contracting sector so as to meet the basic needs of the infrastructure on the one hand and in turn increased the demand for housing on the other hand. This led to the attention of many donor countries in financing construction projects and infrastructure, having a clear impact on the construction sector. As a result of the growing demand for construction work as the value of the direct credit facilities granted has risen to this sector from 11%, with the value of 40.5 million dollar in 1996 to 12.3% with the value of 123.6 million dollar in 1999 (Abdul Karim, 2004).

As for the construction sector, due to its growth, it was able to absorb the operation of the significant labor force as the number of workers in Gaza strip has increased from 13,000 in 1993 to 15,000 in 2000 (Makhoul and Attiyane, 2003).

2.8.3. Construction Sector in the Period During 2000 - 2003

The events that followed the Jerusalem uprising in September 2000 and the siege and the closure of the gorge of Palestinian land policy in addition to the account integration of the land leveling led to the Palestinian economy so far. These events hit the construction sector heavy losses where the contribution of the construction sector decreased in GDP to about just 5% which amounted to the value of the contribution of this sector of 70 million dollars in 2002 compared to about 73 million dollars in 2001 and about 594 million dollars in 1999. The maintained workers in this sector in proportion to their level during June 2001 to 2002 to the number of employers was not more than 9,000 workers but the percentage dropped by about 93% from what it was in 1999 where the number of employees amounted to 135,000 workers .

This is because the low contribution of this sector to stop new construction of houses as well as private and public institutions with the continued bombing and demolitions policy. This is in addition to the international construction projects that were stopped and did not exceed the activity of this sector due to the renovation and repair of dilapidated buildings (Joint Arab Economic Reports, 2003).

2.9. Risk in the Companies

When the company revenue is more than its commitment, meaning that the net capital of more than zero but the company is unable to meet its financial obligations such as payment of interest or essential payment of debts or payment of rent in the sense that the cash flow is incompetent to meet their needs in a timely manner.

In other words, that the problem of maturity where the maturity date of the obligations is faster than the date of maturity for enterprise revenue. This also includes the obligation of the company assets are more than it can handle resulting in the net capital being less than zero (Pringle and Harris, 1990).

Some know it as a process and the status of it in terms of being practical as it is not the product of the moment but the result of many reasons, a chain reaction across a time period varying in length which led to a situation in which the project is unable to repay its obligations and obtain new commitment. In addition to also returning to it what was invested at the very least, to restore fiscal balance monetarily or operationally (Khudairy, 2003).

2.9.1. Economic Failure

In this case, the company can't achieve a reasonable return on their investment, an adequate profit or when the net capital is negative. That's when the book value of liabilities and liabilities of the company will be more than the book value of the company’s assets (Ross and et al, 1999).

2.9.2. Financial Failure

In this case, a company can't pay off its debts to creditors and be solvent, such as not paying bills.

Some have gone to the destination between financial distresses on the grounds that the case of financial distress precedes the financial failure. However, the company may not necessarily lead to and rely on this distinction to the use of standard financial flexibility (Schall and Haley, 2000).

2.9.3. Bankruptcy

It is a case in which the institution cannot pay its debts and be waived on the origin investment. In such a case, it is delivered to the judicial administration on legal action to liquidate or reorganize the business and may end up transferring some or all of the company's assets to creditors (Schall and Haley, 2000).

2.10. Reasons of Risks in Companies

- Lack of capital.
- A glitch in the system cost.
- Weakness in control.
- Lack of participants and contribution.
- Foreign government under the law does not provide protection for foreign companies.
- Fluctuation as cases of integration of technological changes.
- Operations fraud and such decisions in the business (Shaaban, 1998).
- Lack of management for the financial situation since the beginning.
- The project is financially too rich resulting in a loss.
- Management is unable to provide adequate support.
- The definition is unsuitable for tasks and functions that are required.
- Technology and techniques used are inappropriate.
- Final results of the project planned are unreasonable.
- The chosen team has bad teamwork and does not have the flexibility and the ability to change what is wrong in tests.
- Wrong choice for the selection of the managing Director (Avots, 1969).

Research finds that the failure of the construction sector in Gaza strip in companies during the 2006-2015 for the following reasons:

1. The inability to recover amounts quickly and effectively.
2. Frequent closures and blockades of Palestinian areas.
3. Dependence on banks and pay back with high-interest rates.

4. The lack of enough capital.
5. Weak cash flow management.
6. Lack of experience in the field of work.
7. The divide of Gaza strip into regions.
8. The absence of laws and regulations for the construction industry.
9. Low profits due to competition.
10. Awarded the tender to the lowest prices.
11. Lack of experience in the field of contracts.

2.11. Kinds of Risk in Construction Projects

2.11.1. Risk Management

Risk management is the common denominator in most of the troubled companies, where the management is unable to provide adequate support to employees even if the staff is highly efficient. Even if the workforce has excellent skills, they will find it difficult to complete their work without the support of the management as well as testing. The 'sinners', or people in the organization without skill or bad decision making, during the project, may be the cause of the failure of the project, where the leader and organizer have to make decisions based on limited information available (Avots, 1969).

2.11.2. Financial Risk

Financial risk is one of the most important risks that could lead to the faltering of a company and bringing it to bankruptcy, particularly the lack of proportionality between capital and loans, which means an imbalance in the financing structure of the project. This leads to the projects' debts negatively affecting the results of its operations and the emergence of major problems that accumulate with the loss of liquidity and inability for solvency in the different direction. In addition to its creditors being unhappy due to the lack of continuity with the terms of the agreement which does not fit with what is achieved in revenue. These burdens are directed to the assistance of the project technically, administratively prohibiting expenses of board members and the presence of some of the many cases of abuse in the investment cost of the project (Hamzawi, 1997).

2.11.3. Marketing Risk

This is the smaller the size of the market, fooling the market with foreign products and higher marketing costs, as well as the lack of attention to feasibility studies and to block the regulatory process at the facility from the marketing manager to business sales. Rather than monitoring and analysis, the abuse of the stages of development of the commodity and the failure of the business is the estimation of the volume of sales and expected profits (Obeidat, 1993).

2.11.4. Technical and Productivity Risk

There are mistakes in the preparation of the technical feasibility study from the beginning. For example, the presence of defects in materials, in the operation or using technological means inappropriately with the capabilities and skills of labor, thus generating units of goods of low quality and in turn affect the sales volume (Pinto, and Slevin, 1988).

2.11.5. External Risk

- Inflationary trends in the local and global economy, particularly raw materials, production requirements and energy prices, which increases the cost of profitability or losses.
- Sharp fluctuations in exchange rates and multiple other rates that led to the escalation of the value of the debts of many of the borrowers of companies led to an imbalance in the financing structure.
- Successive technological changes accelerated under the explosive industries in progress and its impact on production. Also, changes in terms of markets and different market shares as well as the inability of the administration or labor to deal with those variables.
- Dealing with government administration as problems with the taxes, customs, and import problems. This might be one of the reasons for the delay in the implementation of corporate program time (Pringle and Harris, 1990).

2.12. Risk of Contracting and Construction Sector

The Palestinian economy has suffered over the past years from the subordination of the various markets of the Israeli economy in general and has especially faced obstacles to the

Palestinian economy, Israeli has aimed during the period of occupation to destruction of the Palestinian economy and reduce productivity in all sectors, making it subordinate to the Israeli economy (Makhoul and Attiyane, 2003).

2.12.1. Risks of Raw Materials and Equipment

- Equipment used is old and has not undergone any renewal since 2006. So far they are exhausted and are being consumed continuously, requiring maintenance operations that are increasingly raising the cost.
- Lack of raw materials in the quantities required as well as the high prices.
- Lack of fuel on a permanent basis and regularly required quantities and prices, leading to increased prices and costs (Abdul-Kareem, 2013).

2.12.2. Risk Because of the Israeli Authorities

- Force measures from the siege which results in the closure of crossings and the difficulty of going to the west bank and traveling to neighboring Arab countries as well as other countries around the world. This leads to a lack of access and lack of knowledge of what come new in the construction sector to develop programs, tools, equipment and developments in the technical and vocational aspect of the worker and the contractor.
- The reluctance of investors to invest in the sector, particularly in the construction, due to lack of political stability (Al-Habib, 2015).

2.12.3. Economic Risk

- No margin of profit achieving a high degree of safety because of the availability of the culture bidding a lower price (Crisis of low prices).
- Sharp fluctuations in the exchanges rates, especially the dollar, which led to increased debts of many companies and the disruption of financing structure.
- Non-using (index) system in Gaza strip, which serves to protect the contractor from changes in raw material prices and currency exchange rate of project measurement year, when the signing of the contract. So that the length of the contract period paid will be financial beneficial from the project owner taking into account the change in prices of raw materials, change rate and paying the difference to the contractor.

External causes through inflationary trends on the local and global level, particularly prices of raw materials and energy prices, which increases the cost and reduces the profit or increases the loss.

- Lack of local as well as outside support to set up large development projects in Gaza strip. This is the consequence of the weakness of the development process and the increase of the defeat ratios.
- The problem of erosion of capital in construction companies, the siege, and closure of the gorge, the lack of projects and the period before the trade of tunnels, and expenses, in addition the lack of revenue and the absence of those who compensate them as this led to the current severe crisis in the provision of capital.
- Rejected taxes that rob a company's revenue, losses, and raw material prices differences.
- Complex management procedures regarding the capital using the name of companies and insurance problems and work.
- Delay in the payment of debts by the owners which led to the erosion of capital.
- High-interest rates imposed by banks and the lack of facilities granted.
- Failure has adequate support from government agencies and the lack of compensation for a company through the government agencies that carry its responsibilities towards the contractors. This also includes the crisis-ridden contractors as a result of taxes imposed on the contractor which leads to the erosion of revenues as well as the administrative complexity of the registrar of companies and insurance workers.
- Most of the large projects in the country are specially funded by international institutions but the tax burden borne by the contractor on materials still exists (Zeitouny, 2012).

2.12.4. Administrative Risks

- The absence of a competent leader: This leads to a lack of vision, strategic goal setting, the distribution of roles and the impact on all sectors in the country including the construction sector.
- Complex management procedures relating to the registration of new companies and the renewal and registration of workers.

- Preoccupied managers in the reality of things daily routine (follow-up projects under implementation, tenders and bids etc.).
- Lack of plans, programs and courses for the development of the construction sector in a systematic and thoughtful way to all parties of interest.
- Lack of a dedicated team, qualified to be in charge of the task of planning for the management of the risks faced by this important sector by providing all the needed resources (Equipment, Materials, and Labor).
- Lack of government experience increases the burden of the contractor not to study the economic reality in the country and support contractors that do not increase taxes and hold.
- Foreign competition for domestic companies until it becomes a competition in the small local projects.
- Lack of coordination and cooperation between the west bank and Gaza by the division found that it is limited by the blockade.
- Migration of most of the engineering consulting firms abroad for a big experience.
- The absence of the role of supervision and quality control of raw materials and fixtures for the construction process (Steel and cement and gravel and building supplies) which mostly enter through the tunnels (Dudin, 2013).

2.12.5. Risk of Unemployment Programs

- Mismanagement of coordination and lack of planning between the various sectors opening on the level of the government, international donor institutions and unions are leading to unemployment. This is the systematic study of the needs of the market until unemployment is running under the local market needs.
- Universities do not offer the study of the needs of the domestic market to meet the needs of many where professional discipline is needed but scarce. In contrast, there is overcrowding in many disciplines including the saturated country.
- Unemployment programs that are used for training are old and lacking in the existing training centers to and do not include any modern equipment.

- Courses held abroad are expensive financially and the union can provide adequate financial support. However, they need to be supported by the government and foreign funders (Abdul-Kareem, 2013).

2.12.6. Risk in Skilled Workers

- Loss of skilled workers started since the beginning of the Jerusalem uprising in 2000 and the closure of border crossings, preventing the entry of workers into the occupied territories (Israel), which was considered the main source for expertise and skills through their work at home but then were stopped from working.
- As the contractors union occupies more than 22% of the Palestinian labor force. 30% of GDP however, after five years in the field of reconstruction and construction, due to the blockade urbanism movement beginning in the sector.
- The work of special projects set up by the international institutions or even citizens depending on what goes into building materials through the crossing of Israel or border tunnels with the Egyptian side. This is in order to return to the building revealed to the construction companies, working in the sector decreased in architecture and construction and finishing of residential apartments (Bleacher and paint and electricity) (Shaaban,1998).

For many reasons, including:

- The phenomenon of polarization of the security system and party organization for young people that made them reluctant go to work in the construction field.
- The expertise of skilled workers doesn't transfer in the construction to the younger generation, who does not know anything about this profession.
- Many skilled techniques of the past are no longer available because the users of such techniques have left due to old age, orientation for government jobs or alternative reasons after construction stopped because of the blockade, which led to higher wage prices, an increase by 300%.
- That sector is going to do projects accumulated six years ago and these projects need large numbers of skilled construction workers.

- Lack of experience which is reflected heavily on the delayed delivery dates of projects and lack of product quality work.
- Trained technical labor: the sector, which compromises 80% of the trained technical manpower.
- Lack of vocational training for Palestinian workers preparing them to work, prompting the federation of construction to start vocational training for workers and Palestinian preparation for them to work in the reconstruction process of Gaza strip whilst some abroad to be trained better.
- Lack of prospects of cooperation with external pointers that had supplied contractors with the latest expertise. For example, the Israeli side which had a capacity of most of the former sector employment (AL-Buhaisi, 2006).

2.13. Solutions for Risk Management in Construction Projects

- Create a common vision for contractors that are needed to work for home integrating energy and resources to build. This is because the responsibility for the advancement of the construction sector in Palestine and urban development is a collective responsibility.
- The need for strong relations linking the union government sector at the level of the West Bank and Gaza, especially the ministries of local government, public works and housing as he has to have the formulation of programs, tools. In addition to the laws of the structural work in Palestine, providing adequate support and facilities by government agencies in order to support investment activities in terms of unity and responsibility for everyone in the upgrading of the construction industry(AL-Buhaisi, 2006).

2.13.1. Pressing Demands for Contractors

To be concerned parties taking urgent demands for contractors and taxes is the objective and the problem of fuels and many associated with the encouragement of investment and the introduction of engineering equipment issues (Al-Habib, 2015).

2.13.2. Developing the Relationship between the Engineer and the Contractor

- By working to together in harmony, between the engineer and the contractor, and the need to develop the required engineering equipment as well as upgrading professional contractor tools.
- Development of programs and plans by all relevant parties. As well as the interest to the community and the development of workers who are able to work skillfully to in the construction business.
- Development of unemployment programs in the coordinated manner and plans from various sectors and relevant bodies of representatives from various parties such as the government, local or international organizations and unions.
- The Palestinian contractors union has been under the siege of many obstacles and risk and the main obstacles are the absence of basic essentials for building materials. In addition to the difficulties facing the work of construction companies in Palestine, where the stakes of the companies are still limited and the impact is significant. Where the risk included are poor infrastructure, a lack of organizational structure which is one of the factors influencing the work and effectiveness of the contracting companies to deal with the potential risk and limit their activity, independence and their freedom of movement as well as the mechanism of the decision making which place restrictions on the management of the weakness of the institutional structure. The lack of human ability and lack of personnel, skills, technical experts and management to carry out the required activities which may hinder their development in addition to the lack of planning and development strategies. All of which should be set by those companies for the conduct of their work and the revitalization of its work (Al-Faleet, 2011).

CHAPTER 3

RISK MANAGEMENT IN CONSTRUCTION PROJECTS

3.1. Introduction

There are multiple construction projects worldwide, where it operates from the industrial area. This includes service sectors that deal with goods and services, especially from consumers of goods and service markets which are characterized by the abundance of construction as well as free and full competition and if these projects are of importance to the national economy (The Palestinian information center, 2014).

3.2. Types of Construction Projects

As for the areas in which it operates, projects are divided into the following categories:

3.2.1. Projects in the Industrial Field; the project work in this area includes the work of craftsmen and owner manual professions, who turn raw material into materials that benefit the consumer.

3.2.2. Projects in the Agricultural Field; where the field includes the construction of farms and greenhouses, whether vegetables or flowers, as well as include hives and factories pickles.

3.2.3. Projects in the Commercial Field; this area includes projects that deal with goods and services, brokers and traders, whether they're wholesale or retail dealers.

3.2.4. Projects in the Service Area; in this area projects are based to provide services and features to increase the purchasing power of the consumer.

- The difficulty of gathering information about the projects and characteristics makes the search difficult to find a definition of these construction projects. There are numerous reasons such as the difference in opinion in determining the precise definition of these projects as well as the different possibilities of the capacity, economic and social differences amongst countries.

- The definition varies from state to state depending on the degree of the project, the growth of the project and the development of the country as well as its population. There are certain standards and principles each country has to differentiate between construction projects and such are the following:
    1. Number of employees.
    2. Financial recourses.
    3. Volume production.
    4. Technological equipment used.
    5. Sales volume and the size of the inventory.
    6. The regulations followed.
    7. The quality and quantity used (Khalaf, 2002).

3.3. Risk Management Stages

- **Risk Identification:** Identify any hazards that are likely to affect the project and documentation of the characteristics of these risks.
- **Risk Measurement:** Risk assessment and interaction with the project and its output.
- **Development Responses:** Identify promotional steps for processing the response of these risks.
- **Control of the Response Risks:** Responding to changes in the risk over the duration of the project (Islamic Finance Forum, 2007).

3.4. Risk Management in Construction Projects

1. The intention of analyzing and managing the risks in the project.
2. The process of the analysis and management of project risks which enables the knowledge of the risks involved to be clear. In addition, it should also include the appropriate methods used to eliminate risks or at least reduce its effects.
3. The use of another process that increases the success rate of the completion of the project specifications however, time and cost prospective problems may remain (Halusi, 2009).

3.5. Managing Risks in Construction Projects

4. The risks that exist in the data can be estimated statistically as there cannot be 2 projects which are alike in the same area.
5. Often dealing with risks in the projects varies from one position to another where there is sufficient data to take out the progress and actual knowledge of the risks.
6. Analysis and risk management process has developed from project to project over time with technological development however, there remains several important ways, but not limited to, making decisions such as "Monte Carlo Method" (Khalaf, 2002).

3.6. What the Risks are in Projects?

- The first step is to know the risks that arise as a result of unpredictability.
- There are risks and confusions that arise such as:
    1. The lack of a clear financial and administrative management of the organization.
    2. The techniques or equipment used haven't been verified yet.
    3. The lack of resources to a sufficient level.
    4. Unexpected site conditions risks causing confusion in the project leading it to failure. The failure is the inability to comply with the project budget, schedule for completion or achievement of the goals set (Shaban, 2006).

3.7. Analysis and Management of Project Risks

A process designed to eliminate or mitigate the effects of risks that threaten the achievement of the goals set by the project.

Analyses and specialists in the field of project risks should place different and simplified versions of the processes involved (Al-Awa, 1996).

3.8. Risk Analysis (Risk Measurement)

These steps of the process are divided into 2 phases:

3.8.1. The Qualitative Analysis; which focuses on the induction and objective appreciation of the risk stage.

3.8.2. The Quantitative Analysis; this step focuses on the perspective estimated yield and statistical risk (Dudin, 2013).

3.9. Risk Management

Definition of risk management is the process that containing the style to control the risks whether the risks are in the field of work, scheduling, cost, contracts or the quality and quantity of resources.

This includes the management of the following risks:

- Identify preventative measures to avoid risks or at least mitigate its impact.
- Establish contingency plans to deal with any foreseeable risk when it occur.
- Collect sufficient information to ease any confusion that may occur.
- Decisiveness amongst the decision makers.
- Risk removal project.
- Risk reduction.
- The transfer of these risks being the right insurance.
- Participation of the risk by sub-contractors.
- Acceptance of these risks if it is simple or in the possibility that few would occur (Khalaf, 2002).

3.10. Risk Management in Construction Projects

- Why management and risk analysis are used in projects?
- There are several reasons as to why analysis and risk management is used in projects however; it is mainly because of the great benefits they reap in cost beyond their own borders (Eshteh, 2013).

3.11. The Benefits of Application of Analysis and Risk Management

1. A good understanding of the risks in the project will lead to realistic goals and will also allow for a more accurate estimate of the cost of the project as well as its duration.
2. A good understanding of the risks the project has will allow all parties involve knowing how to deal with the risks appropriately.

3. Having a good understanding of the risks the project has will in turn, help in choosing the most appropriate types of contracts for the project.
4. Knowing the risks of the project will enable a logical estimates to be made thoughtfully and keep away the randomness of spending from emergency reserves, which actually reflects the risk is drawn after encouraging the acceptance of the in-effectively of the project financially.
5. Will contribute to building statistical information that will assist in the risk management of good design for future projects.
6. Facilitates in the taking of big risks sensibly, allowing the interest earned from taking risks to increase in the future.
7. Assists in distinguishing the enactment of luck and good governance from bad luck and bad governance (Hamarsheh, 1999).

3.12. Who Will Benefit IFrom Their Use?

1. The contractor will be interested to know what risks are involved in the project as well as its analysis of its highlighted points such as the correct decisions to make or its status.
2. The owner of the project is interested in knowing the risks involved through the contractor through a logical and scientific way. This is to ensure that the contractor is reliable and not ignorant of certain risks that may arise in the project.
3. Project managers who want to improve the quality of their work and want their projects to be allocated according to the cost and time as well as the specifications required from the project (Hamarsheh, 1999).

3.13. Required Cost to Analysis and Risk Management

1. The cost required to use the analysis and risk management process can be a low, as the cost of one or two days from the time of a person and a maximum of 5% - 10% of the value of the cost of project management. The cost of returning to the precision required and the size and complexity of the project. As a percentage of the total cost of the project, considered relatively low.

2. Target cost is considered as an investment, in the case of risk identification during analysis and management, however, will remain unknown until it becomes too late to redressed (Hamarsheh, 1999).

3.13.1. Required Time to Analysis the Risks

1. The time required for the analysis of risk is dependent on the availability of the information for the project.
2. The time required for the analysis to be completed is at least 1 to 3 months. This is also dependent on the degree of complexity of the project and the extent of the preparation of the plans as well as the funds allocated for analysis
3. The sources required are 1 or 2 persons with sufficient knowledge of risk management and is experienced in the use of technical analysis and risk management methods. In the case the organization lacks such experts then these specialists can be brought from outside, outsourcing such work (Hamarsheh, 1999).

3.14. The Use of Analysis and Risk Management in the Project

- The analysis and risk management in the project is a continuous process that can be started at any stage of the project and can last and continue, becoming a cost that has potential usefulness as it can also be used in future.
- When the project progresses there is less risk and thus the effectiveness of the use and management risk analysis tends to shrink. Therefore it is advisable to be used in the early phases of the project life cycle for risk management in construction projects (Shaaban, 1996).

3.15. Risks Related to the Team Work

1. One of the risks involved is the responsibility to manage and deal with the team and finding appropriate solutions to avoid damaging the project.
2. Project risks that arise naturally.
3. Natural differences in the expected quantities.
4. Natural differences in the variety of seasons of the year.

5. The idealistic differences in the performance of the production workers in the project itself.
6. Any natural variations, whether positive or negative.
7. Typical uncontrolled risks are included as part of the project plan and is therefore the responsibility of the project team.
8. Differences in the cost of raw materials, employment rates as well as the ever changing contract prices.
9. The necessary refinement or modification of the design of the project in the case where it isn't working correctly.
10. Re-doing the work, where observation isn't related to a change in the project (Shaaban, 1996).

3.16. Risks Related to the Owner of the Project

- Typical uncontrolled risks that aren't initially a part of the project plan (this responsibility is for the owner of the project to take note of and not the project management team).
- Any changes in policies, regulations or legislation from the government at all levels, including the environmental, social and safety aspects including any legal expenses, this also includes the compromises concerning contractors and suppliers required for the project.
- Worker strikes as that would lead to the suspension of the work, halting the project without any progress.
- The comfort of the labor force in the workplace.
- Any major changes in the working conditions.
- In the chance of an earthquake occurring.
- Serious accidents affecting the labor force or disasters, natural or manmade, that would temporarily halt construction of the project.
- The unavailability of the liquid capital or investment that was scheduled for the project.

- The lack of resources that were previously agreed upon in the project plan.
- The storage of materials to be used in the project.
- Unforeseen bad weather.
- Any unforeseen delays because of other priorities which take precedence in the project.
- Any unforeseen, major changes in currency exchange rates.
- Any fundamental changes in inflation, interest rates, foreign currency, tax or duties (Shaaban, 1996).

3.17. Characteristics of Building Size and Its Advantages in the Project

3.17.1. Advantages of Construction Projects

The construction project, whether it be individual or collective, must meet with the special circumstances of the Palestinian economy. This is characterized by uncertainty, instability and poor infrastructure, all of which would reduce the opportunity for broad investment as well as the success of large-scale projects. The political and security policy conditions prevent continuity and regularity of production, often resulting in heavy casualties for a large-scale project, which would carry large financial costs as opposed to small project, which usually has sufficient flexibility to accommodate these deteriorating conditions.

The features and general characteristics of the business sector does not deviate structurally in Palestine and other developing countries, but at the same time its peculiarities are what distinguish them from others. This is especially true for the subordination of the Palestinian economy to the dominance of its current state of Israeli authorities as well as its lack of development in addition to the destruction of the development it already had. This is due to the Israeli authorities it has faced for the past 30 years and is still practiced in the Jerusalem uprising however; it can be referred to collectively as follows:

1. The construction sector in Palestine shows a great ability in promoting and facilitating job creation rates. This feature is of great importance to the Palestinian economy.
2. The financial requirements for construction projects are all very low as they are rarely subjected to the constraints of limited capital. It is difficult to have access to financial and capital institutions because of the lack of security and political stability.

Investments in such an area are not encouraged in light of the political and economic conditions of Palestine (Tunaib, 2011).

3. Construction projects are a political necessity as it creates jobs for a wider range of its population, unlike large enterprises that use developmental aid to create jobs through capitalism. In this sense it is a good strategy for the distribution of income as well as the enhancement of independent, small-scale producers.
4. Palestinian construction projects mostly rely on internal sources, unlike large factories which tend to rely more on external sources of experts and funding. In addition to this, Palestinian projects have produced developmental, community-based mechanisms to aid in construction.
5. Palestinian construction projects are less susceptible to economic tremors and impact if compared with large projects to ongoing costs and lack of debts, which allows and enables the construction of various risks during periods of resilience as it does in the Palestinian society. While large enterprises must work regularly with a high pace in order to cover their records and their benefits as the target market of construction projects, enabling them to actually go on sale and marketing in this range, even during long business closures.

However Construction projects are not clear until now and it varies from country to country and varies from within the state of the production sector with another. There are also several criteria to define the most important small projects, which are:

- Standard employment.
- Standard capital.
- Standard sales value.
- Standard value of deposits.
- Standard size of assets.
- Standard cost of work opportunities.
- Technological standards used (Tunaib, 2011).

3.18. Types of Construction Projects

Construction projects can be classified into the following types:

3.18.1. Productivity Projects; it is segregated into 2 types:

1. Projects that produce consumer goods such as the construction industry, production workshops and handicrafts that use local resources.
2. Projects that produce goods for the parts that contribute to other commodities such as large-scale handicraft, ready-made clothes or even products used in car manufacturing.

3.18.2. Service Projects; this is a project which offers customer services such as engineering, auto-repair, medical consultations or computer services.

3.18.3. Commercial Projects; a project which buys a commodity, then sells it to consumers or packages and wraps it with the intent of making a profit , such as wholesale and retail trade(Eshteh, 2013).

3.19. Legal Forms of Construction Projects

This means the legal form of construction projects where the project body, both the corporate as well as the social aspect, seeks to achieve certain goals set for the project.

Even if there's different in construction projects in the legal size, shape, and scope of its work and its objectives, it's specified by the following common characteristics:

1. Each of which seeks to achieve its set goals.
2. Artificial configuration consists of one individual or a several individuals.
3. Each of which will illustrates the structure of the entire organizational aspects that differ in accuracy as well as the clarity and comprehensiveness of one project to another (Alyousefi, 2000).

3.20. Definition of Risk Management

- Dictionary Oxford defined risk management as: "The possibility of risk occurrence or suffering from harm or loss" (Babakir, 1990).
- Babakir defined the risk as: "A variation in the expected results that originate naturally from a particular situation". However, this is but a simple definition (Babakir, 1990).

- According to PMBOK (2004) risk is defined as: “A case or event that is uncertain that can either have a negative or a positive impact on the goals of the project, at the very least. This impact may also affect the projects (schedule, costs, and quality), and this is consistent with the definition of (AL-Bahar and Crandall, 1990).
- Jaafari defined risk as: “The potential of loss or profit occurs after acknowledging their relative importance” (Jaafari, 2001).
- Merna and AL-Thani defined risk in the same context, that the risk of negative results (loss) and positive results (profit) as shown in Figure (4.1) (Merna and AL-Thani, 2005).

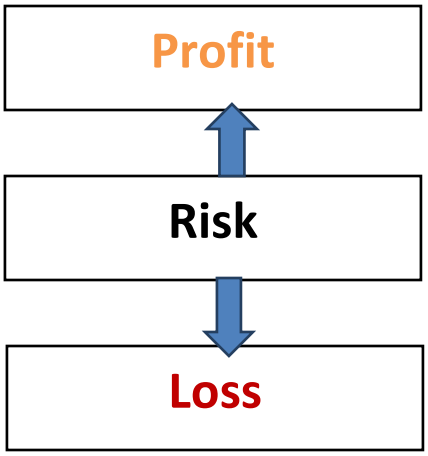

Figure 3.1: The relationship between risks, profit and loss

3.21. Risk Classification

- The classification of risks contributes to an easier understanding of the risks involved in order to facilitate and determine potential harm that may occur as well as strategies to deal with those risks to mitigate the impact it would have on the project.
- Risk categories will vary according to the point of view of the researcher as well as the detailed level adopted for these classifications. This is due to various studies that contain many classifications for risks, including (AL-Bahar and Crandall, 1990).

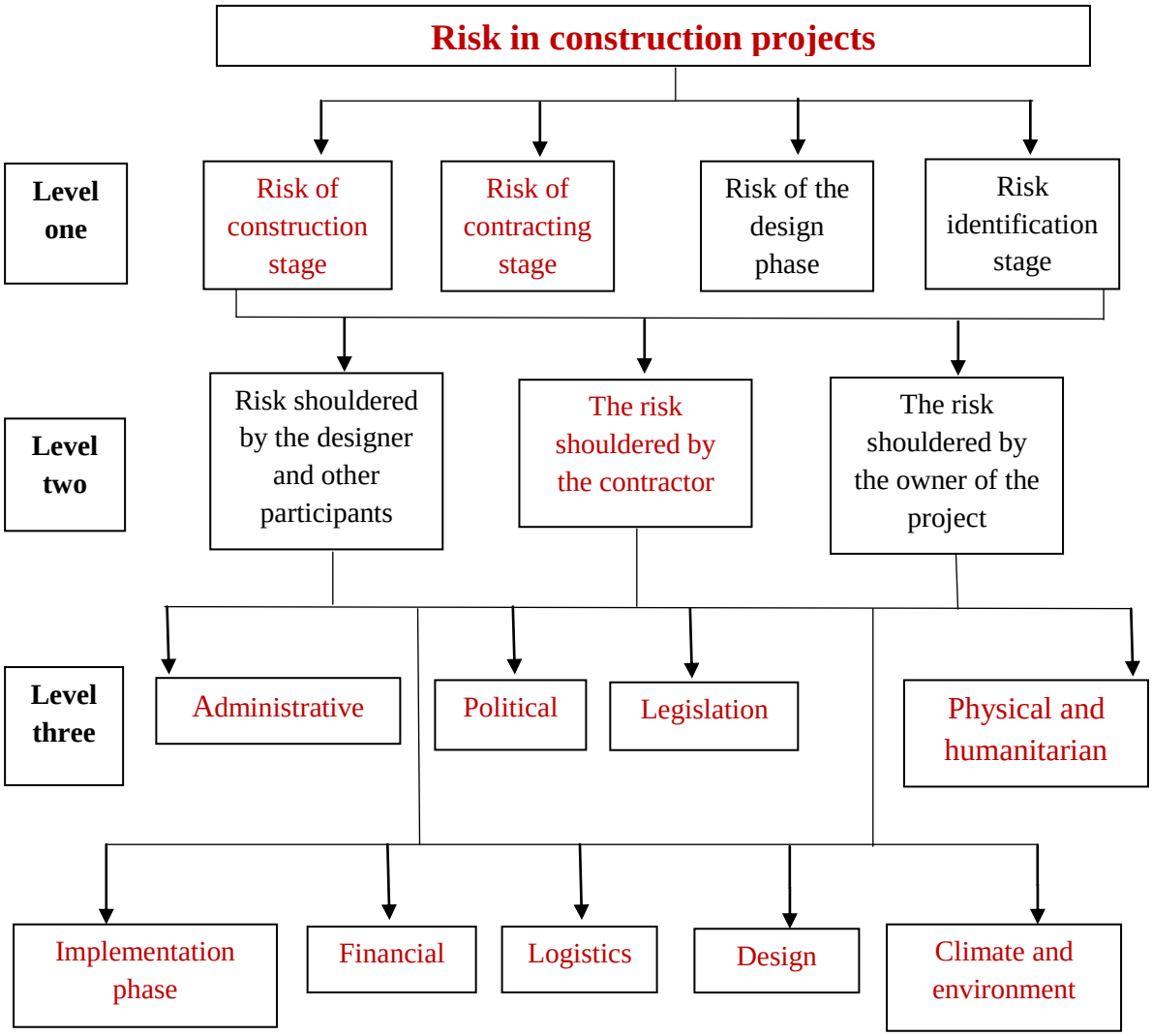

Figure 3.2: Risk in construction projects

3.21.1. The First Level: According to the stage where the risk occurs, as some risks have been repeated in more than one place, therefore it will be taken into account more than once (Zou, Zhang, and Wang, 2007).

3.21.2. The Second Level: According to the party involve in the project, which will bear the results and also have a large capacity to manage and influence the risks involved (Babakir 1990).

3.21.3. The Third Level: Risks in the third level are dependent according to the prior stages (Enshassi, and Abu Mosa, 2008).

3.22. Risk Management

An assessment by (AL-Bahar, and Crandall, 1990) defined risk management as: "A systematic process throughout the project lifecycle, aiming to identify and analyze the risks, then respond to them to achieve the accepted, if not maximum, results as well as to remove, control or adjust the results"

Whereas PMBOK has defined risk management to fully include both the consequences of non-confirmation risk as well as opportunity. In addition, this research study has adopted the following definition of risk management: "The process method applied continuously during the project life cycle", including the effect of the measures that aim to define and determine goals. This includes emphasizing the effect of the goals of risk identification analysis, in addition to evaluating the impact and response in order to achieve a better balance between whether the risk is acceptable as well as the opportunity available (PMBOK, 2004).

A reference study showed three basic stages of risk management:

1. Identification of the risk.
2. An analysis of the risk.
3. Finally a logical response to the risk as well as the progression of the risk management process in a dynamic and continues way (AL-Bahar, and Crandall, 1990).

3.23. Stages of Risk Management

- Risk identification: most risks occur in the construction phase and the contractors will primarily bear the effect, especially the main contractor, as the burden will all fall on their shoulders.
- Risk analysis: adopted in this research are two criteria in risk analysis:
    1. The probability of the risk occurring.
    2. The different degrees of effect the risk will have on goals set for the project (Zou, Zhang, and Wang, 2007).

3.24. Risk Management in Administration

Construction projects during the implementation stage may encounter many difficulties and unexpected problems that’s stem from the design stage. In some cases, these problems are

caused from the design itself. In most cases, the consulting engineer or supervisor must resort to great diligence in solving these problems through the instructions issued to the contractor in the form of [change orders] to change orders simply or largely and comprehensively. In both cases, these problems relate back to the engineer or at least must concern him and this will usually lead further back to the claims of contractor, either physical or time related matters or even both together. This in turn leads to an increase in unforeseen cost of the project as well as its duration for the owner of the project. The research aims to study the types of claims and sources that occur in construction projects as a result of inadequate design or mainly belonging to the general engineer.

The basis of this research is the study of the process of to sample statistical, random risks for projects implemented in the last ten years. As monitoring the claims and their impact on the project, which resulted mainly from design errors, short comings and change orders that were added later during the time the implementation took place, will display the search for the causes and types of claims that are generally related to the engineer. This is brought about through a sample from these projects including a series of recommendations and conclusions that can be taken into consideration in order to avoid the occurrence of such claims in the future (Shaban, 2006).

It's difficult to imagine that the engineering project was carried out without any difficulties and unexpected problems regardless of the size or type of the project or the problems associated with it are. Therefore it is also difficult to imagine that the contractor, whether the contractor is large or small, has performed any previous project without any different claims including claims that have been resolved pleasantly and different difficulties that are present in a distinctively altered nature.

Given the distinctive nature different projects are placed in, various risks are always present and inherently accompanied by the engineering project. In some cases the prognosis or prediction of these problems are difficult to estimate before starting the implementation of the project or during the study and design. The results from these problems, in most cases, will differ in claims pertaining to all parties of the contract or the project and some of these problems are resolved amicably while others find their way to court.

The shortcomings of the design may contain defects or errors related to the engineer and according to the international federation of consulting engineers, FIDIC in “his book”, will guide the engineer in the use of construction contract and applications.

Differences occur in engineering contracts as a result of conflicting views in understanding some of the issues between the group and the parties involved in the contract. These differences can be analyzed in a scientific study and should be classified differently on the basis of diversity of sources as well as being classified geometrically depending on the following sources:

1. Designing engineer, contract documents or binders.
2. Supervising engineer: or quality control of the project and project management contract.
3. Management (the owner).
4. Contractor.
5. Contract.
6. Other sources (Al-Awa, 1996).

3.25. Legal Mistakes in the Specification Include:

- Inaccurate or invalid characterization of materials and methods of implementation as well as any unconventional specifications scientifically.
- Unclear generalization in the specification, for example in the case of incomprehensible phrases, ambiguous terms or giving a vague general concept neglecting the specifics that are of utmost importance such as the point of view, first person or third person.
- Lack of characterization of the information, such as not mentioning all the properties of a particular substance that are necessary to install the required material of a certain quality.
- Inability to practically apply certain specifications required for the project due to numerous different reasons.

- Not clarifying the measurement methods used as well as the incompatibility with what is stated in the rest of the documents of the project such as design schemes, schedules and quantity of materials.
- Lack of ways to test construction materials for the regulators or necessary specification required for characterization.
- Reference to the use of certain brands without giving information regarding the quality or technical characteristics of the material.
- Repeat a specific job description in two different forms or oppose the specifications with the rest of the contract documents.
- The use of standard specification which are unknown leading to misunderstandings (Shaban, 2006).

3.26. Legal Mistakes in Measurement Units Approved in the Specification

The errors in measurement approved in the specification will include the following:

- Variation and differences in the units of measurement considered in various parts of the study. For example; is contained in the special technical conditions that the unit of measurement for an item is not for concrete floor surface, while it is shown in a table estimating the price or in the table of quantities per square meter.
- A statement which lacks to include the implementation of the unit of measurement of the business. For example; when the unit of measurement/lump must clearly show why this unit includes the implementation of different acts and therefore must estimate the price in proportion to the components of this unit.
- Not choosing the appropriate unit of measurement, despite the fact that the engineer can initially choose any unit of measurement, for the implementation of the work of the project. Instead using the custom: “ruled that the modules are used commonly for certain work”. For example; it is wrong that the estimated overall tiles (surface) with which the correct estimated linear (m) method. This is because, firstly the extension/length is much larger than another in such a case and secondly, the norm requires that it be measured in a linear (m) manner where the clearance rate, measurement must be compatible between the contractor and the technical job.

- Typographical errors: the product of not review all the technical requirements and auditing after the recent printing, especially with regards to the ways and units of measurement and punctuation etc (Shaban, 2004).

3.27. Legal Claims Related to the Characterization of the Implementation of Technology and Safety Requirements

It is known that the special technical conditions are not limited to its role in the project on the characterization of construction materials, in addition to the mechanism of testing and measurement, but must go beyond it to an accurate description used in the construction project components impairment structurally or enforce the implementation of technology in the project. The following are some of the problem that can we encounter in such cases:

- Lack of a characterization method way or a method of construction so that the contractor can implement the work in good quality or in the required quality for the project, especially for of non-recurring projects for private enterprises.
- Inability to implement the method contained in the technical condition for either; not providing the project site or for it being impractical because of the absence of expertise, mechanism or the necessary equipment. For example: the characterization of a way to implement the wedges will require a specific mechanism that is not available in the local market.
- Lack of description of the security measures and public safety in regards to implementing some of the structural elements of the project that involve significant risks. Whether the risk will be for the manual labor and automated cadre or for the project itself, especially in the case of maintenance and preservation projects. If we note the absence of a clear description and to characterize the implementation of the technology, security measures and general occupational safety where there is a lack of the statement to address such issues.
- Method of execution is inconsistent or contrary with the rest of the competition and documents from the fact that whether it is a manual method or an automatic one (Shaban, 2006).

3.28. Claims Due to the Mistakes in Appraisal Price or Cost

These errors can fall under other claims such as:

- Disagreement in the prices received in relation to the required specifications.
- The technical price is inadequate or not detailed enough.
- Analysis or estimate of the price in a forecast to the actual price of material or work necessary for implementation.
- A discrepancy or a difference between the unit of measurement used in the pricing, or both the bill of quantities and schedule prices, or in the specifications required for the project.
- Lack of clarity and comprehensiveness in the unit price schedule of rates and lack of compatibility with the technical requirements or specifications.
- Knowing the price or the price lump. For example: the price of some of the equipment or tools to carry out a particular job (System of government procurement insurance, 1977).

3.29. Claims Due to Mistakes in Quantities

It produces all the wrong estimate of the quantities of work for the project by more than percentage of what is permitted or specified in the contract.

3.29.1. Claims for the Owner Originating from the Consulting Supervising Engineer

- Lack of commitment in the implementation specified in the contract details of the project.
- Giving the order to change or make modifications without going back to the administration for approval.
- Failure in auditing or examining the schedule submitted by the contractor as well as following it thoroughly.
- Errors in limited inventory quantities and its calculation. In some projects where it was awarded the final value of the demodulator as negative, meaning that there are errors in the calculation of quantities and totaled in the temporary or previous extracts.

- Not checking the safety procedures and the technology or equipment used in construction by the contractor.
- Severe breach of contract with administration.
- Misuse of the liabilities of the owner.
- Failure to inform the inhabitants and legislators working on the project and follow up with them. Especially those related to the quality of the work that is being carried out for the project (Shaban, 2006).

3.29.2. Claims of the Contractor from the Supervising Engineer

- Supplying necessary photographs of the project assets.
- Repeated application of the amendments without the availability of a legal or official letter from the owner.
- A lot of verbal instructions that affect the cost of the project and its duration.
- Conflicting instruction from time and time again.
- A wronging act, for example: not receiving the business or work in a timely manner. Especially those structural elements that can be covered such as the rules and foundations or business that requires the confirmation of the contractor to ensure dimensions work such as columns, proofs etc.
- The wrong timing for decision making such as requesting changes to an item after the implementation is partially done instead of fully complete.
- Misinterpretation of the terms of the contract and project documentation (El-Haggan and Azzam, 1996).

3.30. The Obstacles Caused by the Israeli Authorities Policy

- The encouragement in political, economic and security climate is not suitable for the development of the economy as well as investment.
- There are difficulties in the sector for the import of raw materials needed.
- Israel prevents the establishment and construction of necessary infrastructure projects such as the construction of roads, electricity networks and the establishment of industrial zones.

- Israeli authorities have a lot of restrictions in administrative and legal ways to obstruct the establishment of construction projects.
- There are also obstacles the Israeli authorities placed in the marketing of construction materials abroad.
- There are also restrictions in the freedom of movement of supplies required such as structural materials for construction projects.
- The lack of purchasing power for entrepreneurs which is impacted negatively.
- Foreign trade stopped because of the siege imposed on the import and export of a majority of goods (Erakat, 2009).

3.30.1. Legal Obstacles in the Financing of Construction Projects

- Difficulty in financing the project begins in the access to money. The amount accessible is small sum as funding elsewhere will have similar detriments.
- It is difficult to build adequate financial reserves and maintain them through the harsh tax systems and low liquidity in the profit of the project.
- It is difficult to obtain shares of regular, long-term capital which does not serve the interests of the project or its wares.
- The business cycle tax system puts an extra burden on the shoulders of construction projects which makes it difficult to build an adequate financial reserve and maintain them for a long time.
- The hindering of entrepreneurs in construction projects and their efforts in obtaining capital. It will increase especially if the income tax is high for the common people which will in turn increase the system in the collection of taxes from companies.
- Government regulations and written paperwork. Government regulations do not differentiate between large construction project and small ones, even when the burden of a small projects hand materials costs are high or the construction time is unfeasible/unrealistic (Al-Sous, 2010).

3.30.2. The Legal Obstacles Related to the Market

- The negligence of the company: marketing problems may lead to the misunderstanding of other problems in the company.

- The non-existence of laws restricting unfair competition.
- High transport costs including the transportation cost of products.
- Lack of services and financial facilities needed by the owner of a construction project.
- The absence of appropriate government pricing for products required.
- The weakness in plans and promotional budgets for products.
- The absence of government support for such projects, not to mention the deteriorating economic situation due to political events taking place in the Palestinian territories.
- The negligence of the company: marketing problems in the company reflects the problem, the biggest marketing problems faced by small businesses, of not preparing plans and a budget for promotions. This in turn increases the marketing problems in construction projects in Gaza city (Denny, Mc, Angela, 2002).

CHAPTER 4

RESULTS and DISCUSSION

4.1. Validity and Reliability Study Tool (Questionnaire)

It was introduced questionnaire on the number of arbitrators with experience and competence, in order to ensure the safety of linguists composition of the questionnaire, and clarity of the questionnaire instructions, and the affiliation of the paragraphs of the dimensions of the questionnaire, and the validity of measurement associated with this study goals this tool, and it has been confirmed the veracity of the arbitrators.

4.2. Trust in Internal Consistency

It was also checked the sincerity of internal consistency, after applying the questionnaire during an exploratory sample (30) of the study population, by finding correlation coefficients, using the (Pearson Correlation Coefficient) for resolution and axes as described in the following tables:

4.3. Results of Study Axes

4.3.1. Results of the First Axis According to Pearson Correlation Coefficient Test: The methods, mechanisms, policies and procedures followed by construction projects in risk management

It can be seen from Table 4.1 that the axis of paragraphs (mechanisms, policies, and procedures for risk management) with the axis as a whole, it has a transactions link confined between (long, 0.527-0.692) which is the statistical significance. This shows that all the paragraphs of the axis involved a great amount of trust.

The p-values (sig.) are less than 0.05, so the correlation coefficients for paragraphs of the first axis are significant at $\alpha = 0.05$.

Table 4.1: Pearson correlation coefficients for the paragraphs of the first axis

No.	Paragraphs of the first axis	Correlation coefficient	p-Values (Sig.)	The level of significant
	Are there clear and fair criteria in construction projects govern the size of the funding?	0.538	0.000	Statistically significant when p-value < 0.05
2	Is there in construction projects any concern among investors because of the complications of the Procedures?	0.624	0.000	Statistically significant when p-value < 0.05
3	Are there in construction projects clear policies to the Contractors Union to encourage the financing of projects financing projects?	0.556	0.000	Statistically significant when p-value < 0.05
4	Is there a legal protection from the government for legal projects?	0.527	0.000	Statistically significant when p-value < 0.05
5	Does Construction projects encouraged to provide long-term obligations with significant limitations?	0.538	0.000	Statistically significant when p-value < 0.05
6	Are construction projects providing the means of transport for workers with into consideration the security standards international safety during the performance of their functions?	0.625	0.000	Statistically significant when p-value < 0.05
7	Are construction projects following clear policies to encourage investors and meet the needs of the various sectors?	0.692	0.000	Statistically significant when p-value < 0.05

4.3.2. Results of the Second Axis According to Pearson Correlation Coefficient Test: The safeguards and standards that are followed for risk management in construction projects

It can be seen from Table 4.2 that the paragraphs of the axis the safeguards and standard needed to manage risk with the axis as a whole enjoy transaction link sandwiched between long (0.501-0.724) statistically significant and this shows that all the photographs of the exes enjoying transaction sincerity high.

The p-values (sig.) are less than 0.05, so the correlation coefficients for paragraphs of the second axis are significant at $\alpha = 0.05$.

Table 4.2: Pearson correlation coefficients for the paragraphs of the second axis

No.	Paragraphs of the second axis	Correlation coefficient	p-Values (Sig.)	The level of significant
1	Does construction projects taking into consideration the availability of the necessary safeguards and bails for construction projects?	0.724	0.001	Statistically significant when p-value < 0.05
2	Does a construction projects identify objectives and priorities of the primary and secondary processes in construction projects?	0.632	0.000	Statistically significant when p-value < 0.05
3	Does a construction projects provide the financial budgets necessary to cover the cost of the required response?	0.527	0.000	Statistically significant when p-value < 0.05
4	Are construction projects as being given all the power and delegation of authority?	0.501	0.000	Statistically significant when p-value < 0.05
5	Does construction projects have the capacity and speed suitable to move the financial and human resources?	0.637	0.000	Statistically significant when p-value < 0.05

6	Does construction projects making plans and alternative scenarios to cope the developments?	0.528	0.000	Statistically significant when p-value < 0.05
7	Does Construction projects preparing an extensive operations room that equipped with modern techniques?	0.511	0.000	Statistically significant when p-value < 0.05

4.3.3. Results of the Third Axis According to Pearson Correlation Coefficient Test: The strategies proposed to decision makers for risk management in construction projects

It can be seen from Table 4.3 that the axis of paragraphs proposed strategies and methods of risk management with the axis as a whole enjoys a correlation coefficient between the confined range (0.527-0.852). This is statistically significant and this shows that all the paragraphs of the axis hold a great deal of trust in its information.

The p-values (sig.) are less than 0.05, so the correlation coefficients for paragraphs of the third axis are significant at $\alpha = 0.05$.

Table 4.3: Pearson correlation coefficients for the paragraphs of the third axis

No.	Paragraphs of the third axis	Correlation coefficient	p-Values (Sig.)	The level of significant
1	Is there in the construction projects clear plan that can be referenced in case of failure or closure of the project?	0.852	0.002	Statistically significant when p-value < 0.05
2	Does a construction projects face obstacles in finding the necessary budgets to cover the costs of emergency response supplies?	0.702	0.000	Statistically significant when p-value < 0.05

3	Does construction project provide a unified system to regulate the mechanisms of the structural sector and the policy of lending and tax incentive policies?	0.638	0.000	Statistically significant when p-value < 0.05
4	Are there in construction projects policies and objectives are clear about the construction projects?	0.824	0.000	Statistically significant when p-value < 0.05
5	Are there in construction projects economic controls that governing the process of selecting the type or nature of the project?	0.759	0.000	Statistically significant when p-value < 0.05
6	Does construction project pay attention by taking into consideration the time factor accurately and appropriately?	0.654	0.000	Statistically significant when p-value < 0.05
7	Does construction project keep taking the necessary procedures to continue the practice of normal activity without delay?	0.527	0.000	Statistically significant when p-value < 0.05

4.3.4. Results of the Fourth Axis According to Pearson Correlation Coefficient Test: The required facilities used for risk management

It can be seen from Table 4.4 that the paragraphs of the axis (The required facilities used for risk management), with the axis as a whole, enjoys transactions links placed in between long (0.427- 0.727). This is a statistical function and shows that all the paragraphs of the axis enjoy transaction contributions.

The p-values (sig.) are less than 0.05, so the correlation coefficients for paragraphs of the fourth axis are significant at $\alpha = 0.05$.

Table 4.4: Pearson correlation coefficients for the paragraphs of the fourth axis

No.	Paragraphs of the forth axis	Correlation coefficient	p-Values (Sig.)	The level of significant
1	Is there economic stability encourages monetary and fiscal policies?	0.527	0.000	Statistically significant, when p-value < 0.05
2	Does construction project work to provide enough information Which obliges for appropriate planning?	0.638	0.000	Statistically significant, when p-value < 0.05
3	Does construction project have a suitable legal environment that adjusts the construction projects?	0.427	0.000	Statistically significant, when p-value < 0.05
4	Does construction project constantly improve procedures to reduce the mistakes of work?	0.577	0.000	Statistically significant, when p-value < 0.05
5	Are siege and closure imposed by Israel on the Palestinian territories significantly affected?	0.631	0.000	Statistically significant, when p-value < 0.05
6	Is there a clear tax defined from investment environment components?	0.727	0.001	Statistically significant when p-value < 0.05
7	Does construction project have a suitable legislative environment regulate construction projects?	0.632	0.000	Statistically significant, when p-value < 0.05

4.4. Reliability of Study Tool (Questionnaire)

4.4.1. Split-Half Method

It was also to ensure the stability of the questionnaire through the transaction account link manner midterm retail hubs resolution and the resolution as a whole and that before the amendment (Pearson test) and after adjustment (Spearman test), as shown in the following table:

Table 4.5: The results of Split-half method for the axes of questionnaire

			Correlation coefficients	
No.	**Axes of study**	**Number of paragraphs**	**Before the amendment**	**After the amendment**
1	First axis: The method, mechanisms, policies and procedure followed for risk management	7	0.741	0.888
2	Second axis: The guarantees and standards that are followed for risk management	7	0.637	0.725
3	Third axis: The strategies proposed to decision makers for risk management	7	0.821	0.957
4	Forth axis: The required facilitates used for risk management	7	0.633	0.752
	Questionnaire as a whole	28	0.708	0.830

What can be seen from Table 4.5 is that the reliability coefficient for the axis of the questionnaire as a whole is higher by (0.830). This is a high stability of transaction and is able to meet the objectives of the study.

4.4.2. Stability in Cronbach's Alpha Method

The emphasis of the stability of the questionnaire through "Cronbach's Alpha coefficients "for the axes of the questionnaire and the questionnaire as a whole as shown in the following table

Table 4.6: The results of Cronbach's Alpha coefficients method for the axes of questionnaire

No.	Axes	Number of paragraphs	Cronbach's Alpha coefficient
1	First axis	The method, mechanisms, policies and procedure followed for risk management	0.857
2	Second axis	The guarantees and standards that are followed for risk management	0.715
3	Third axis	The strategies proposed to decision makers for risk management	0.827
4	Forth axis	The required facilitates used in risk management	0.812
	Questionnaire as a whole		0.823

It can be seen from the above table 4.6 that Cronbach's Alpha coefficient test for the axes of the questionnaire and the questionnaire as whole is higher by (0.823). This shows a high stability of transaction and the ability to meet the objectives of the study.

4.5. Statistical Methods Used

In order to analyze the answers of questionnaire, the researcher used the Statistical Package for the Social Sciences (SPSS), through the following statistical methods:

- Pearson correlation coefficient and spearman correlation coefficient.
- Split-half method and the method of Cronbach's Alpha.
- Repetition and arithmetic mean standard deviation and relative weight.
- Test- one way ANOVA.

4.6. Data Analysis and Test Hypothesis

4.6.1. Characteristics and Characteristic Traits of the Study Sample

As seen from Table 4.7 the distribution of the study sample according to duration of project (less than one year) in percentage (45.7%) which is the highest percentage of the total projects, the reason is lack of funding in Gaza strip, and lack of the materials needed, (1-2 years) yields percentage (24.3%), (1-3 years) yields percentage (18.3%), and (3 years and over) yields percentage (11.7%).

Table 4.7: Distribution of the study sample according to duration of projects

No.	The duration of the projects	The number	Ratio
1	Less than one year	55	45.7
2	1 – 2 years	29	24.3
3	2 – 3 years	22	18.3
4	More than three years	14	11.7
	Total	120	100.0%

Figure 4.1 shows that distribution of the study sample according to duration of project (less than one year) in percentage (45.7%) which is the highest percentage of the total projects, the reason is lack of funding in Gaza strip, and lack of the materials needed, (1-2 years) yields percentage (24.3%), (1-3 years) yields percentage (18.3%), and (3 years and over) yields percentage (11.7%).

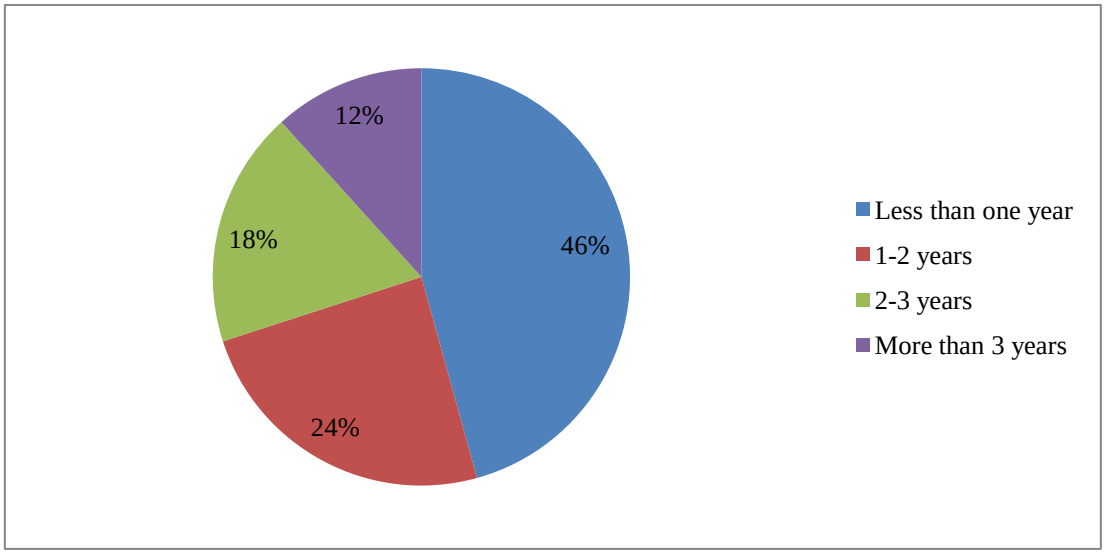

Figure 4.1: Distribution of the study sample according to duration of projects

4.6.2. Distribution of the Study Sample According to Type of Projects

As seen from Table 4.8 the distribution of study depending on the type of the project: (industrial) percentage is (10%), from the field of their project (commercial) percentage (36.7%), from the field of their project (services program) percentage is (40%) which is the highest percentage of the total projects, and from the field of their project (agricultural) percentage is (13.3%).

Table 4.8: Distribution of the study sample according to type of projects

No.	The type of construction project	The number	Ratio
1	Industrial projects programs	12	10
2	Projects of commercial programs	44	36.7
3	Project of service programs	48	40
4	Projects for agricultural programs	16	13.3
	Total	120	100

Figure 4.2 shows that distribution of study depending on the type of the project: (industrial) percentage is (10%), from the field of their project (commercial) percentage (36.7%), from the field of their project (services program) percentage is (40%) which is the highest percentage of the total projects, and from the field of their project (agricultural) percentage is (13.3%).

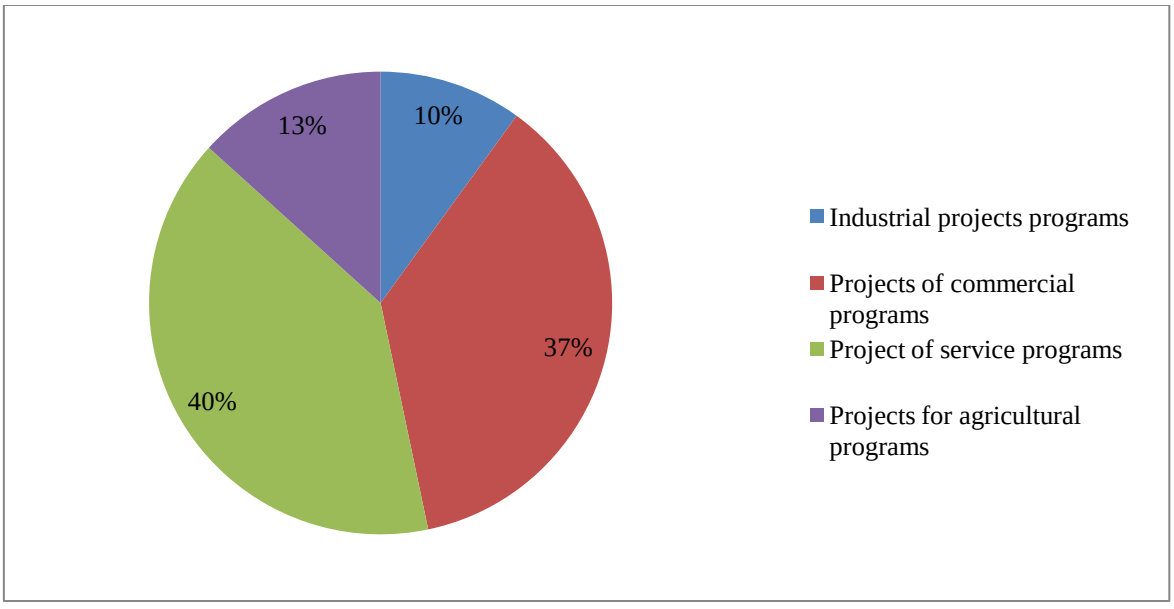

Figure 4.2: Distribution of the study sample according to type of projects

4.6.3. The Study Sample Distribution According to Geographic Regions

As seen from Table 4.9 the study sample distribution by geographic region accounted for 15% of the study sample in the north province. While accounting for 31.6% of the Gaza province, 15% accounted of the study sample in the central province, 25% accounted of the study sample in Khan Younis, and 13.4% accounted of the study sample in Rafah. The researcher attributes this to the high-density of construction projects in Gaza city area.

Table 4.9: Distribution of the study sample according to Geographical regions

The Province	No. of Questionnaire	Percentage (%)
North Governorate Region	18	15
Gaza City Region	38	31.6
Central Province Region	18	15
Khan Younis Region	30	25
Rafah City Region	16	13.4
Total	120	100

Figure 4.3 shows that study sample distribution by geographic region accounted for 15% of the study sample in the north province. While accounting for 31.6% of the Gaza province, 15% accounted of the study sample in the central province, 25% accounted of the study sample in Khan Younis, and 13.4% accounted of the study sample in Rafah. The researcher attributes this to the high-density of construction projects in Gaza city area.

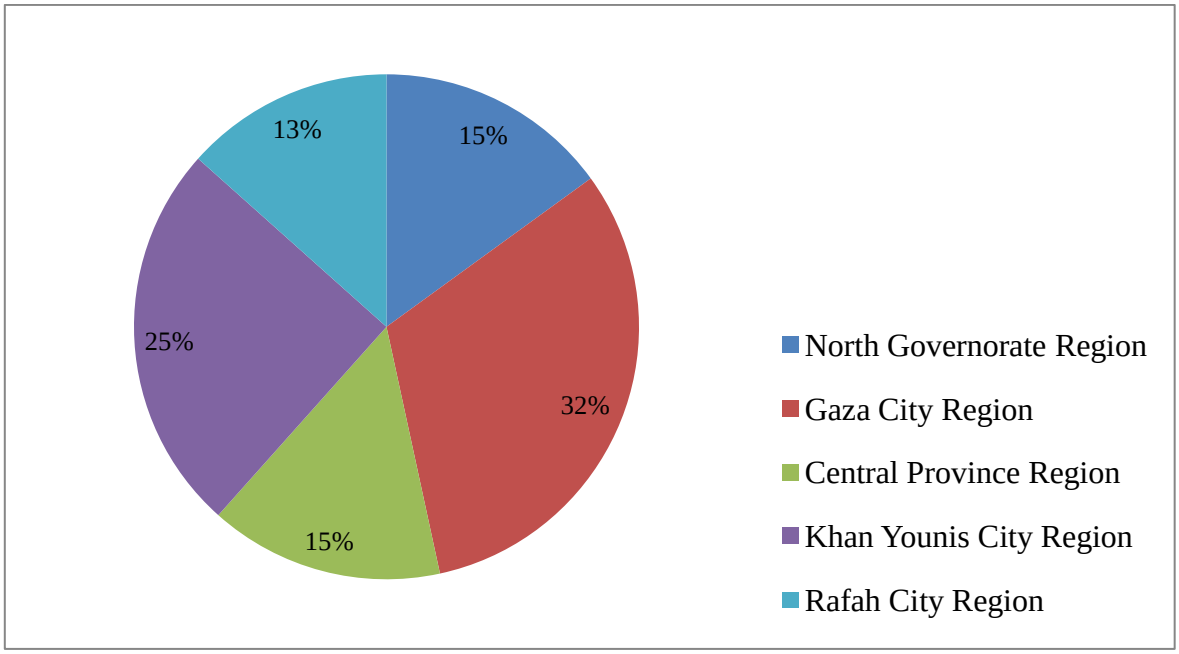

Figure 4.3: Distribution of the study sample according to Geographical region.

Evident from Table 4.10 that accounted for 9.2% of the study sample from and independent licensed while accounting for 23.3% for limited contribution. The public store holding accounted for 41.7% of the study sample and the contribution privacy had accounted for 13.3% of the study sample, Whereas the cooperative company had accounted for 12.5% of the study sample of for a total of 100%.

Table 4.10: The study sample distribution according to the quality of the project

The quality of the project contribution	**The number**	**Percentage**
Independently licensed	11	9.2%
Limited contribution	28	23.3%
Public store holding	50	41.7%
Contribution privacy	16	13.3%
Co-op/Cooperative	15	12.5%
Total	120	100

Figure 4.4 shows that accounted for 9.2% of the study sample from and independent licensed while accounting for 23.3% for limited contribution. The public store holding accounted for 41.7% of the study sample and the contribution privacy had accounted for 13.3% of the study sample, Whereas the cooperative company had accounted for 12.5% of the study sample of for a total of 100%.

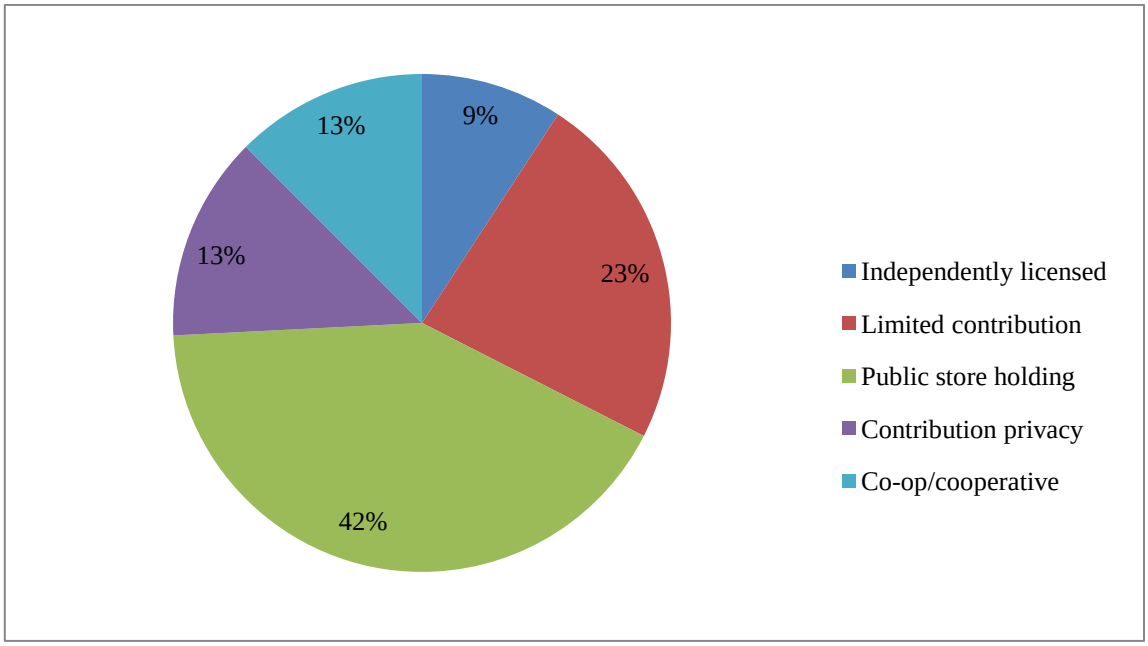

Figure 4.4: The study sample distribution according to quality of project

4.7. Results of the Study Analysis

4.7.1. Results of Question Number (1):

What risk management in construction projects in Gaza strip, a case study of the construction projects during the period 2006 – 2015?

The results from Table (4.11), Risks relating to the general budget, mistakes in the design, with the proportion of (92%), While according to project scheduling, finance interruption unexpectedly, received the highest percentage (96%), While according to quality of the project, Mismatches between structural and architectural design, with the proportion of (91%),

While according to occupational safety, Legal disputes between the parties during the construction phase, with the proportion of (93%).

Table 4.11: The values of budget, quality and occupational safety in construction projects

The Risks	Budget%	Scheduling	The quality	Occupational safety
Inflation and price volatility.	75	70	82	88
The difference between actual and contractual quantities.	88	62	90	81
Reducing the quality of work in front of time commitment.	95	91	86	83
Mismatches between structural and architectural design.	91	85	92	80
The fluctuations of the mechanisms and labor productivity rates	85	83	89	89
Mistakes in the design.	92	85	88	90
Legal disputes between the parties during the construction phase.	90	91	85	93
Non –cash-flow control.	85	81	82	90
Workers ineligible technically.	85	80	83	91
High competition during the bidding and tenders.	92	95	85	89
Changes in design.	82	96	84	88
Incompatibility between quantities drawings and specifications.	90	92	85	91
Accident due to lack of safety measures.	91	95	88	87
Delays in the payment statements according to the contract.	82	92	89	89

Non-Availability of labor, materials, and enough equipments.	90	90	90	92
Delays and technical problems with subcontractors.	92	95	91	88
Finance interruption unexpectedly.	96	96	89	87
Scheduling inaccurate for projects.	91	92	90	90
Changes in the methods of administration.	90	90	89	92
Bribing and corruption.	91	92	91	89

Inflation and price volatility, the difference between actual and contractual quantities, reducing the quality of work in exchange for the commitment duration, mismatches between the structural and architect designs, structural architectural fluctuation of the mechanisms, labor productivity rates, the mistakes in design and legal disputes during the construction phase between the parties. In addition, there is a lack of cash flow control, technically qualified labor, presentations changes in design due to the lack of compatibility between the quantities of drawings as well as specification accidents due to lack of safety measures. All the aforementioned is further reinforced by the delayed reimbursement statements in accordance with the contract due to the non-availability of labor, and materials and equipment sufficiently.

4.7.2. Results of Question Number (2) Related to Sub Hypothesis (1) which is:

What are the methods, mechanisms, policies and procedures followed by the construction projects in Gaza strip?

The analysis of the paragraphs of the study was done by using repetition, an arithmetic mean, standard deviation and relative weight, as shown in the following tables:

- It is seen from Table 4.12 that the highest paragraph in this axis is: paragraph 3 which states that" Are there in construction projects clear policies to the Contractors Union to encourage the financing of projects financing projects", ranked first. To which they

have an arithmetic mean of (3.12), relative weight of (62.40%) and is higher than the average approval is 3 out of 5.

- In addition, it shows that the lowest paragraph in this axis, paragraph (4), which reads "Is there a legal protection from the government for legal projects", came in seventh place with an arithmetic mean of (2.83) and relative weight (56.60%). The lowest degree of the average approved less than 3 out of 5.
- Total of arithmetic mean is (2.93) "Not agree, Neutral" which is less than 3 out of 5, therefore there's a statically significant in the results of the first axis that related to sub-hypothesis (1) that got not approved from the respondents
- Average account statistically significant 0.05 level.

Table 4.12: Results of the first axis according to repetition and arithmetic mean standard deviation and relative weight

No.	Paragraphs of the first axis	Arithmetic mean	Relative weight	Ranking
1	Are there clear and fair criteria in construction projects govern the size of the funding?	2.91	58.20	4
2	Is there in construction projects any concern among investors because of the complications of the Procedures?	2.86	57.20	6
3	Are there in construction projects clear policies to the Contractors Union to encourage the financing of projects financing projects?	3.12	62.40	1
4	Is there a legal protection from the government for legal projects?	2.83	56.60	7
5	Does Construction projects encouraged to provide long-term obligations with significant limitations?	2.89	57.80	5

6	Are construction projects providing the means of transport for workers with into consideration the security standards international safety during the performance of their functions?	2.97	59.40	2
7	Are construction projects following clear policies to encourage investors and meet the needs of the various sectors?	2.95	59.00	3
	Total	2.93	58.65	

Figure 4.5 shows that the highest paragraph in this axis is: paragraph 3 which states that" Are there in construction projects clear policies to the Contractors Union to encourage the financing of projects financing projects", ranked first with an arithmetic mean of (3.12), and the lowest paragraph in this axis, paragraph (4), which reads "Is there a legal protection from the government for legal projects", came in seventh place with an arithmetic mean of (2.83).

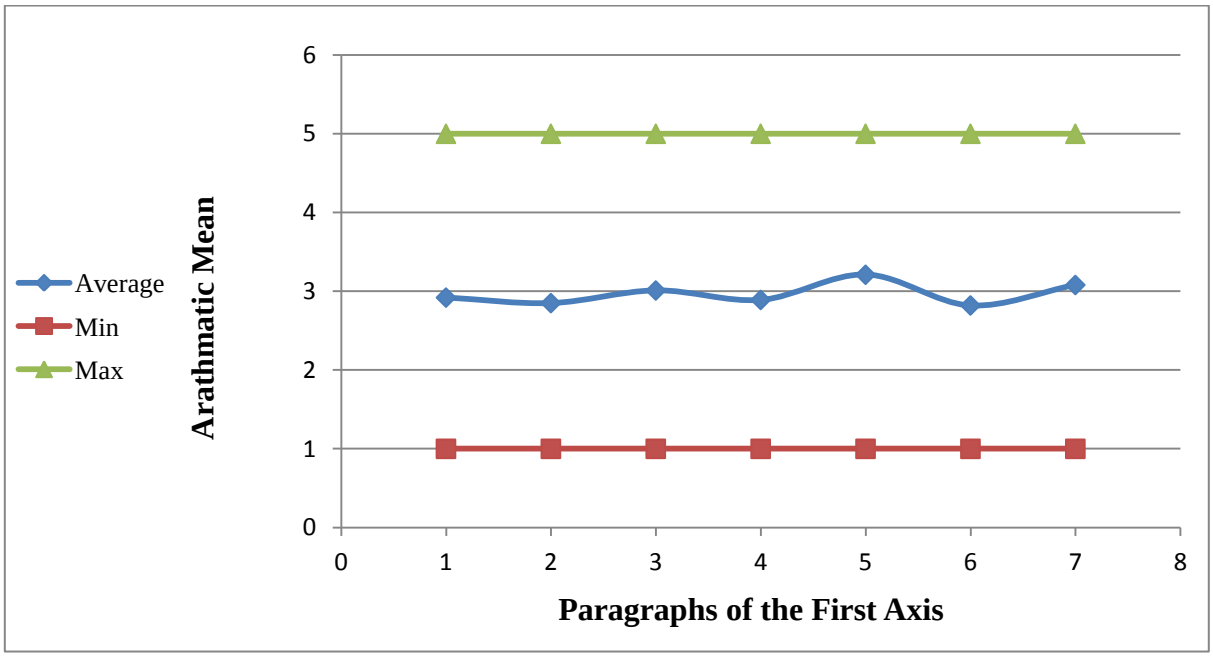

Figure 4.5: Arithmetic mean of paragraphs of first axis related to sub hypothesis (1)

4.7.3. Results of Question Number (3) Related to Sub Hypothesis (2) which is:

What are the safeguards and standards that are followed for the selection of risk management in construction projects in Gaza strip?

- It is seen from Table 4.13 that the highest paragraph in this axis are: Paragraph (2), which states "Does a construction projects identify objectives and priorities of the primary and secondary processes in construction projects", comes first ranked with an arithmetic mean of (3.05) and relative weight (61.00%). The highest degree of average approval is also 3 out of 5.
- The lowest paragraph in this axis is paragraph (4), which states "Are construction projects as being given all the power and delegation of authority", with financial budget projects coming in seventh place with an arithmetic mean of (2.83) and relative weight (56.60%). The lowest degree of average approval is less than 3 out of 5.
- Total of arithmetic mean is (2.92) "Not agree, Neutral" which is less than 3 out of 5, therefore there's a statically significant in the results of the first axis that related to sub-hypothesis (2) that got not approved from the respondents.
- Average account statistically significant at the 0.05 level.

Table 4.13: Results of the second axis according to repetition and arithmetic mean standard deviation and relative weight

No.	Paragraphs of the second axis	Arithmetic mean	Relative weight	Ranking
1	Does construction projects taking into consideration the availability of the necessary safeguards and bails for construction projects?	2.86	57.20	6
2	Does a construction projects identify objectives and priorities of the primary and secondary processes in construction projects?	3.05	61.00	1
3	Does a construction projects provide the financial budgets necessary to cover the cost of the required response?	2.89	57.80	4

4	Are construction projects as being given all the power and delegation of authority?	2.83	56.60	7
5	Does construction projects have the capacity and speed suitable to move the financial and human resources?	3.01	60.20	2
6	Does construction projects making plans and alternative scenarios to cope the developments?	2.88	57.60	5
7	Does Construction projects preparing an extensive operations room that equipped with modern techniques?	2.95	59.00	3
	Total	2.92	58.40	

Figure 4.6 shows that the highest paragraph in this axis are: Paragraph (2), which states "Does a construction projects identify objectives and priorities of the primary and secondary processes in construction projects", comes first ranked with an arithmetic mean of (3.05), and the lowest paragraph in this axis is paragraph (4), which states "Are construction projects as being given all the power and delegation of authority", with financial budget projects coming in seventh place with an arithmetic mean of (2.83).

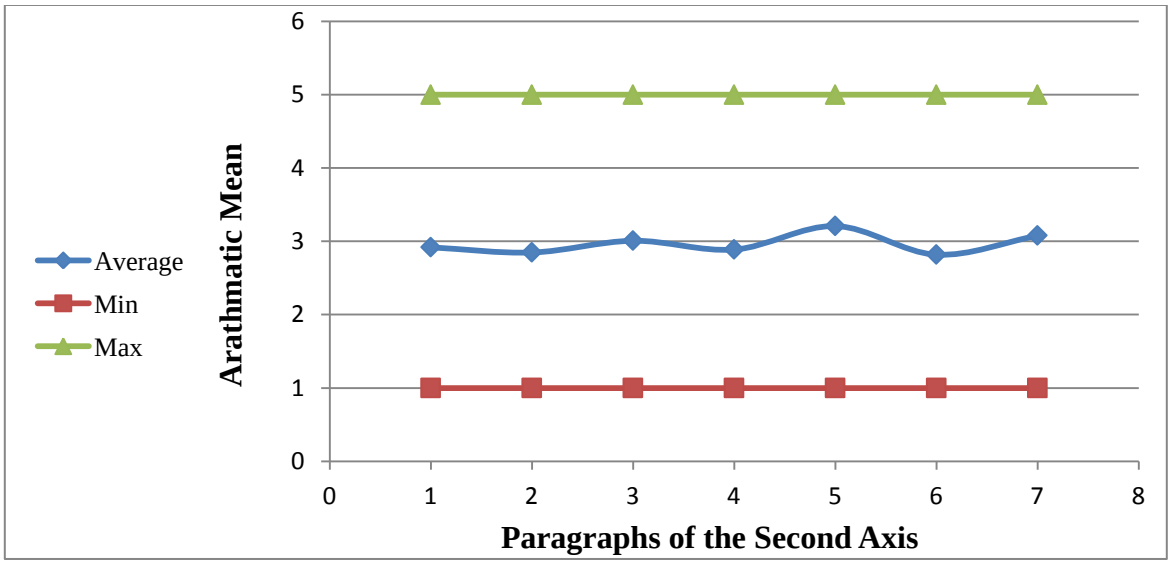

Figure 4.6: Arithmetic mean of paragraphs of second axis related to sub hypothesis (2)

4.7.4. Results of Question Number (4) Related to Sub Hypothesis (3) which is:

What the most important strategies proposed to decision makers in the management of risks in construction projects in Gaza strip?

- As seen from Table 4.14 that the highest paragraph in this axis is: Paragraph (2) which states "Does a construction projects face obstacles in finding the necessary budgets to cover the costs of emergency response supplies", came in the first place with an arithmetic mean of (3.1) and relative weight (62.00%). This is higher than average, with a degree of 3 out of 5.
- The lowest paragraph in this axis is: paragraph (5), which states "Are there in construction projects economic controls that governing the process of selecting the type or nature of the project", which came in seventh place with an arithmetic mean of (2.80) and relative weight of (56.00%). The lowest degree of average approval is less than 3 out of 5.
- Total of arithmetic mean is (2.91) "Not agree, Neutral" which is less than 3 out of 5, therefore there's a statically significant in the results of the first axis that related to sub-hypothesis (3) that got not approved from the respondents.
- Average account statistically significant at the 0.05 level.

Table 4.14: Results of the third axis according to repetition and arithmetic mean standard deviation and relative weight

No.	Paragraphs of the third axis	Arithmetic mean	Relative weight	Ranking
1	Is there in the construction projects clear plan that can be referenced in case of failure or closure of the project?	2.81	56.20	6
2	Does a construction projects face obstacles in finding the necessary budgets to cover the costs of emergency response supplies?	3.1	62.00	1
3	Does construction project provide a unified system to regulate the mechanisms of the structural sector and the policy of lending and tax incentive policies?	2.86	57.20	4
4	Are there in construction projects policies and objectives are clear about the construction projects?	3.02	60.40	2
5	Are there in construction projects economic controls that governing the process of selecting the type or nature of the project?	2.80	56.00	7
6	Does construction project pay attention by taking into consideration the time factor accurately and appropriately?	2.83	56.60	5
7	Does construction project keep taking the necessary procedures to continue the practice of normal activity without delay?	2.97	59.40	3
	Total	2.91	58.20	

Figure 4.7 shows that the highest paragraph in this axis is: Paragraph (2) which states "Does a construction projects face obstacles in finding the necessary budgets to cover the costs of emergency response supplies", came in the first ranked with an arithmetic mean of (3.1), and The lowest paragraph in this axis is: paragraph (5), which states "Are there in construction projects economic controls that governing the process of selecting the type or nature of the project", which came in seventh place with an arithmetic mean of (2.80).

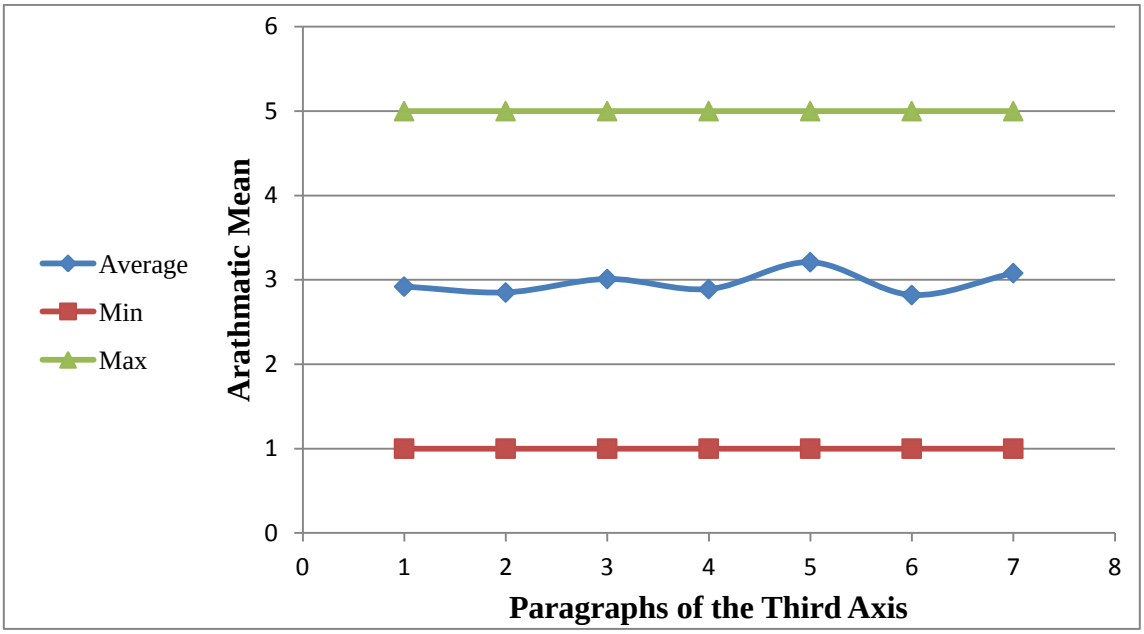

Figure 4.7: Arithmetic mean of paragraphs of third axis related to sub hypothesis (3)

4.7.5. Results of Question Number (5) Related to Sub Hypothesis (4) which is:

What the required facilities used for the risk management in construction projects in Gaza strip?

- Average account statistically significant at 0.05 level
- Evident from Table 4.15 the highest paragraph in this axis is: paragraph (3) which states "Are siege and closure imposed by Israel on the Palestinian territories significantly affected", coming in the first place with an arithmetic mean of (3.21) and relative weight (64.20%). The highest degree of average approval is 3 out of 5.

- The lowest paragraph in this axis is: paragraph (6), which states "Is there a clear tax defined from investment environment components", coming in seventh place with an average expense of (2.82) and relative weight (56.40%). The lowest degree of the average approval is less than of 3 out of 5.
- Total of arithmetic mean is (2.96) "Not agree, Neutral" which is less than 3 out of 5, therefore there's a statically significant in the results of the first axis that related to sub-hypothesis (4) that got not approved from the respondents.

Table 4.15: Results of the fourth axis according to repetition and arithmetic mean standard deviation and relative weight

No.	Paragraphs of the fourth axis	Arithmetic mean	Relative weight	Ranking
1	Is there economic stability encourages monetary and fiscal policies?	2.92	58.40	4
2	Does construction project work to provide enough information Which obliges for appropriate planning?	2.85	57.00	6
3	Does construction project have a suitable legal environment that adjusts the construction projects?	3.01	60.20	3
4	Does construction project constantly improve procedures to reduce the mistakes of work?	2.89	57.80	5
5	Are siege and closure imposed by Israel on the Palestinian territories significantly affected?	3.21	64.20	1
6	Is there a clear tax defined from investment environment components?	2.82	56.40	7
7	Does construction project have a suitable legislative environment regulate construction projects?	3.08	61.60	2
	Total	2.96	59.20	

Figure 4.8 shows that highest paragraph in this axis is: paragraph (3) which states "Are siege and closure imposed by Israel on the Palestinian territories significantly affected", coming in the first place with an arithmetic mean of (3.21), and the lowest paragraph in this axis is: paragraph (6), which states "Is there a clear tax defined from investment environment components", coming in seventh place with an average expense of (2.82).

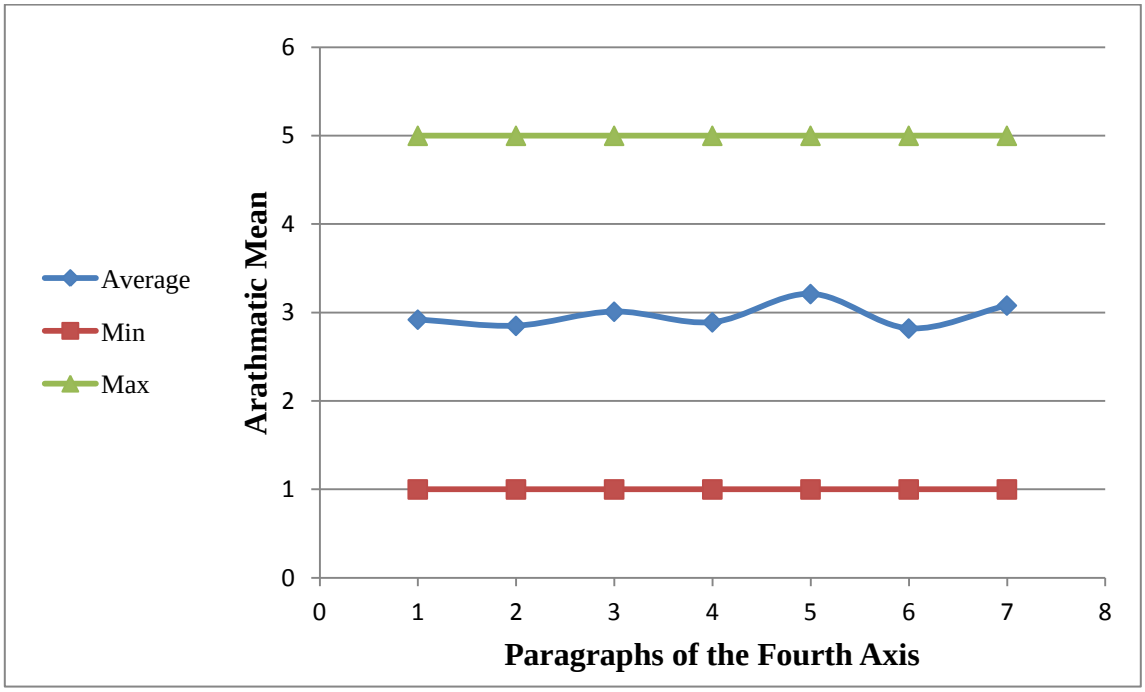

Figure 4.8: Arithmetic mean of paragraphs of fourth axis related to sub hypothesis (4)

4.7.6. Results of Question Number (6) Related to Sub Hypothesis (5) which is:

What are the actual and expected obstacles and challenges of conducting risk management in construction projects in Gaza strip?

Figure 4.16 shows that the values of types of risk according to classification of risks and the degrees Celsius and percentage between the risks

Table 4.16: Actual and expected obstacles and challenges as a result of risk management in construction projects

Types of risks	Classification of risks	Degrees Celsius	Percentage
Physical or humanity	Workers ineligible technically.	100	33.1%
	Accident due to lack of safety precautions.	120	39.7%
	Supplying invalid materials or nonconformity with the specifications.	82	27.2%
	Total	302	100%
Environmental or Natural	Work may lead to contamination of the ground.	31	22.7%
	Difficulty of abiding with the law and environmental legislation and their cost.	105	77.3%
	Total	136	100%
Design	Mistake in design.	93	41.3%
	Incompatibility between quantities drawings and specifications.	41	18.2%
	Imprecision in calculating the	91	40.5%

	quantities of business.		
	Total	225	100%
Logistics	Non-Availability of labor, materials, and enough equipments.	105	22.8%
	Poor communication between the site and the headquarters of the contractor.	82	17.9%
	High competition during the bidding and tenders.	117	25.5%
	Scheduling inaccurate for projects.	41	8.9%
	Unknown to work accurately.	84	18.2%
	The use of modern equipment the first time without training.	31	6.7%
	Total	460	100%
Financial	Price fluctuations.	118	16.1%
	Monopoly of materials required for the implementation of the result of the closure of border crossings.	120	16.3%
	Monopoly of materials required for the implementation of the result of the closure of factories or unexpected political conditions.	105	14.4%
	Finance interruption unexpectedly.	101	13.8%
	Delays in the payment statements according to the contract.	98	13.4%
	Changes in rate of currency exchange	75	10.3%

	High prices of materials used in the implementation of the project.	115	15.7%
	Total	732	100%
Legality	Legal disputes between the parties during the construction phase.	62	17.8%
	The difference between actual and contractual quantities.	52	14.9%
	Legislation related to the environment and urban planning.	48	13.7%
	Lack of clarity in the labor legislation.	92	26.4%
	The difficulty of obtaining licenses and work permits.	95	27.2%
	Total	349	100%
Political	Siege.	120	26.3%
	Closing the crossings.	120	26.3%
	Bribing and corruption	110	24%
	Political and social pressure from the authorities that do not have a major interest.	107	23.4%
	Total	457	100%
Administrative	The lack of the necessary information.	94	24%
	Problems in resource management.	101	25.7%
	Changes in prevailing laws.	8	2.1%
	Lack of internal coordination between the sub-projects.	28	7.2%

	Poor communication between the parties.	82	20.9%
	Non-understandable planning because of the complexity of the project.	79	20.1%
	Total	392	100%
Directly related to implementation	Reducing the quality of work in front of time commitment.	99	32.8%
	Delays and technical problems with subcontractors.	111	36.7%
	Lack of documentation on change orders for work.	92	30.5%
	Total	302	100%

- There are obstacles to physical or humanity. Which is, accidents due to lack of safety precautions with a proportion of (39.7%), and risk (environmental or natural) including the difficulty of abiding with the law, environmental legislation and their cost as a proportion of (77.3%).
- Risks resulting from the design, which is the result of mistakes in design, received a percentage of (41.3%).
- Risks resulting from the logistics which is the high competition during the bidding tenders with a proportion of (25.5%), and non-availability of labor materials and equipment to adequately perform with a proportion of (22.8%)
- Risks related to the financial, which is the monopoly of materials required for the implementation of the result of the closure of border crossings, received a percentage of (16.3%), and price fluctuations with a proportion of (16.1%)
- Legal risks got the difficulty of obtaining licenses and work permits by (27.2%),

- Risks resulting from the policy of siege and closure of crossing which received (26.3%)
- Risks resulting from administrative, which are the problems in the management of the resources which obtained (25.7%), and the lack of the necessary information with a proportion of (24%).
- Risks resulting from the implementation of a direct relationship got paragraph delays and technical problems with the contractors, with the proportion of (36.7%), and reducing the quality of work in front of time commitment, with the proportion of (32.8%).

4.7.8. Results of Question Number (7) Related to Sub Hypothesis (6) which is:

What are the differences in the sample estimates of risks in construction projects in Gaza strip according to the variables (Duration, Project type, Geographical area)?

4.7.8.1. The Duration of Project

The sample estimates of the risk are different in construction projects in Gaza strip according to variable duration.

The testing of this hypothesis through the use of the test "One Way ANOVA" as shown in the following table

- As can be seen from Table 4.17 the value of "F" is less than the calculated value "F" driven in the resolution as a whole and in all axes. This shows that there is no statistically significant differences at the level of significance ($\alpha \leq 0.05$) during this case study of risk management in construction project in Gaza strip with the variable of duration.
- The value of "F" driven at a degree of freedom (118.3), when the level of the significant is (0.05) = 2.28.
- The value of "F" driven at a degree of freedom (118.3), when the level of the significant is (0.01) = 2.57

Table 4.17: The values of source of variation, sum of squares, degree of freedom, F and p-value (Sig), according to duration variable of projects

No.	Axes of study	Source of variation	Sum of squares	Degrees of freedom	Average square	F- value	p- value (Sig)
1	The first axis: Mechanisms, policies and procedures for risk management	Between groups	1.255	3	1.325	2.257	0.032
		Inside group	35.001	116	0.332		
		Total	36.256	119			
2	The second axis: The guarantees and standards necessary for risk management	Between group	0.527	3	1.587	1.637	0.124
		Inside group	28.325	116	0.637		
		Total	28.852	119			
3	The third axis: Strategies proposed to decision makers in the management of risks in construction projects	Between group	0.257	3	1.247	1.694	0.073
		Within group	20.320	116	0.639		
		Total	20.577	119			
	The fourth axis: the required	Between group	1.365	3	1.555		

4	facilities used for risk management	Within group	49.282	116	0.3392	1.237	0.147
		Total	50.647	119			
	Resolution as a whole	Between group	0.363	3	1.254	2.257	1.022
		Within group	30.254	116	0.325		
		Total	30.617	119			

4.7.8.2. Type of Project

Is the sample estimate of risk different in construction project in Gaza strip, according to the variable of project type?

This hypothesis has been tested using the test "One-Way ANOVA" as shown in the following table

- As can be seen from Table 4.18 the value of "F" is less than the calculated value "F" driven in the resolution as a whole and in all axes. This shows that there is no statistically significant difference at the level of significance ($\alpha \leq 0.05$) for risk management in the case study of construction project in Gaza strip with regards to the variable of duration.
- The value of "F" driven at a degree of freedom (116.3), when the level of significance is (0.05) = 2.76
- The value of "F" driven at a degree of freedom (116.3), when the level of significance is (0.01) = 4.13

Table 4.18: The values of source of variation, sum of squares, degree of freedom, F and p-value (Sig), according to the variable of project type

No.	Axes of study	Source of variation	Sum of squares	Degrees of freedom	Average square	F- value	p- value (Sig)
1	The first axis: Mechanisms, policies and procedures for risk management	Between group	1.365	3	0.424	0.921	0.428
		Within group	30.33	116	0.527		
		Total	31.693	119			
2	The second axis: The guarantees and standards necessary for risk management	Between group	0.257	3	0.665	0.827	0.327
		Within group	20.369	116	0.527		
		Total	20.626	119			
3	The third axis: Strategies proposed to decision makers in the management of risks in construction projects	Between group	1.322	3	0.203	0.638	0.852
		Within group	20.527	116	0.672		
		Total	21.849	119			
4	The fourth axis: the required facilities used	Between group	0.324	3	0.632	0.494	0.532
		Inside	28.019	116	0.883		

	for risk management	group					
		Total	28.019	119			
	Resolution as a whole	Between group	0.527	3	1.025	0.547	0.627
		Inside group	31.251	116	0.935		
		Total	31.778	119			

4.7.8.3. Geographical Area of Projects

- It can be seen from Table 4.19 the value of "f" is less than the calculated value "F" driven in the resolution as a whole and in all axes. This show that there is no statistically significant difference at the level of significance ($\alpha \leq 0.05$) for the case study of risk management in construction project in Gaza strip with the variable of geographical area.
- The value of "F" driven at a degree of freedom (115.4), when the level of significance is (0.05) = 2.76
- The value of "F" driven at a degree of freedom (115.4), when the level of significance is (0.01) = 4.13

Table 4.19: The values of source of variation, sum of squares, degree of freedom, F and p-value (Sig), according to geographical area of projects

No.	Axes of study	Source of variation	Sum of squares	Degrees of freedom	Average square	F- value	p- value (Sig)
1	The first axis: Mechanisms, policies and procedures for risk management	Between groups	0.257	4	1.114	0.635	0.124
		Within group	22.357	115	0.524		
		Total	22.614	119			
2	The second axis: The guarantees and standards necessary for risk management	Between group	1.257	4	1.627	0.527	0.427
		Within group	20.355	115	0.417		
		Total	21.612	119			
3	The third axis: Strategies proposed to decision makers in the management of risks in construction projects	Between group	0.636	4	1.301	0.247	0.327
		Within group	21.214	115	0.107		
		Total	21.850	119			
	The fourth axis: the required	Between group	0.332	4	1.002		

4	facilities used for risk management	Inside group	20.250	115	0.291	0.324	0.639
		Total	20.582	119			
	Resolution as a whole	Between group	1.009	4	2.358	0.632	0.427
		Inside group	32.325	115	0.125		
		Total	33.334	119			

CHAPTER 5
CONCLUSION and RECOMMENDATIONS

5.1. Conclusion

The researcher presented the theoretical framework through the following:

5.1.1. Legal mistakes in the specifications include:

- Wrong characterization of materials and methods of implementation of any non-conformity of specifications for practical reality.
- The ambiguity and opacity in the specifications, for example; having a vague and unclear terms or phrases, which gives a general concept of unknown and unspecific of the best species, top-quality or first class.
- Lack of characterization information, not to mention all the properties of a particular substance that is necessary to install the required quality of the material.
- Not possible to practically apply specification in the project conditions for various reasons.
- Not clarifying the measurement methods used as well as the incompatibility with what is stated in the rest of the documents of other competitions parts of the plans and tables and quantities.
- Lack of description ways to test construction materials to get the resistors or the necessary specifications

5.1.2. Legal mistakes in measurement units approved in the specification include:

- The statement does not include the implementation of the unit of measurement of business. For example, the unit of measurement or lump must clearly show why this unit is included in the implementation of various works and the estimation of the price in proportion to components of this unit.
- Not choosing the appropriate unit of measurement, despite the fact that the engineer can initially choose any unit of measurement for the implementation of the project, but the custom ruled that the modules are used commonly for certain works.

- Typos: produced by the lack of a review of the technical condition and checking after the recent printing, especially with regard to ways and units of measurement and punctuation etc.

5.1.3. Risks Related To the Claims of the Owner From the Supervising Engineer (Consultative):

- Lack of commitment to the implementation of the contract specifications.
- Give orders for change or modification without going back to the administration.
- Not study and audit the time schedule that submitted by the contractor and follow it very well.
- Mistakes in the counting and calculation of quantities. In some of the projects were occurred in the final value of the demodulator was negative, which means that there are mistakes in the calculation and counting of quantities in the previous extracts or temporary.
- Lack of safety checks procedures and technology followed by the contractor.

5.1.4. Obstacles Caused By the Israeli Authorities Policy

- The political, economic and security unsuitable climate does not encourage to the developments of economic and investment.
- There are no difficulties in front of the industrial sector in the import of raw materials needed.
- Israel prevents the establishing and building of necessary infrastructure for the construction of roads and electricity networks and the creation of industrials zones.
- Israeli authorities did not put a lot of restrictions, legal and administrative obstacles to set up construction projects
- There are obstacles imposed by the Israeli authorities during the process of marketing of construction materials abroad.
- There's restriction of freedom of movement that is necessary for the materials required for construction projects.
- Lack of purchasing power of entrepreneurs which is reflected negatively in the economy.

- Foreign trade stopped because of the siege imposed on the import and export outlets.

5.1.5. Legal Obstacles Resulting From the Financing of Construction Projects

- Difficulty in funding to start the project such as access to funds in small quantities and similar benefits.
- Difficulty in building adequate financial reserves and maintaining them through the harsh tax systems as well as the low liquidity in the project.
- Difficulty in obtaining shares of the capital or long-term regular investment which does not serve the interests of project.
- The business cycle of the tax system places extra burdens on construction projects, making it difficult for them to build adequate financial reserves, which is maintained for a long time.
- The hindering of entrepreneurs construction efforts in obtaining capital or increasing it, especially if the income tax is high on people and the system in the collection of direct taxes from companies.

5.1.6. The Legal Obstacles Related to Marketing

- The negligence of the company's to marketing problems may exacerbate other problems in the company.
- Absence of laws limits unfair competition.
- High transport and communication costs for products.
- Lack of banking facilities granted to the owners of construction projects.
- The absence of appropriate government pricing products.
- Lack of plans and budgets for promotional products.
- Absence of government support for such projects, not to mention the deteriorating economic situation due to political events taking place in the Palestinian territories.
- The negligence of the company's marketing problems may worsen other problems at the company which is considered the biggest marketing problems faced by small businesses.

- Not preparing plans and budgets for the promotion of marketing increases in construction projects in Gaza province.

5.2. Recommendations

The study found a set of recommendations including:

- One of the major sources of claims in conclusion of projects which is engineering design of the project or design mistakes.
- The need to develop a methodology for the selection of design consultant or supervisor for the project. So that we move away from the policy of the offer with the lowest price. Here we can use the proposed manner by "FIDIC", which take into consideration the quality factor, in addition to the importance of the project and its impact.
- Considered the design contract as a project that needs a project manager. This is to apply the principles of project management, following it up financially, temporally and for technical quality control in the project.
- Composition of an expert team for the project owner to follow the design stages and the extent of its conformity with the requirements of the administration, and also to achieve the requirements of the standards and design codes used.
- Check and document the basic contract before its adoption and work to achieve harmony between the various documents of competition for the project. This is to minimize the issuance of change orders by the supervising engineer/consultant, especially those undocumented entrepreneurs from the management or project owner, it leads to financial and time demands of the contractor.
- Confirmation of the existence of a paragraph or provision in the contract regarding the solution of disputes and claims between the parties to the contract amicably or through arbitration to prevent a waste of time and effort without recourse to the courts.
- The need to develop a system for the management of claims in each project through the administrative structure authorized to examine the claims. This is to avoid gaining, example council to resolve disagreements in the project.

- The necessity to make specialized courses for the owners of construction projects to clarify the concept of risk management for them.
- Benefit from the experiences of neighboring countries in construction projects in how to deal with risks.
- Hold annual scientific conferences in risk management to discuss the obstacles concerning to the risk management that faced, the evaluation methods and tools that followed to address them.
- Take into consideration the quality factor in addition to the importance of the project and its impact, and apply the system of engineering design to achieve the quality in the consulting offices. In addition, the emphasis on the need to have regular audits by another team other than designs makers.
- The need to form a team for risks has all the capabilities (physical and human) and giving them all the appropriate powers that enable them to deal with the risks while ensuring that they are trained and qualified scientifically and technically to carry out the functions effectively.
- Work on the continuous and periodic review of the risk management plans, to choose the efficient and effectiveness the construction projects and plans.
- The need to deal construction projects with construction consulting companies, to provide them information about the latest developments foreign by centers or companies specialized in risk management.
- The need for coordination and integration in the structure of construction projects through the participation of all the different departments and sections related to the topic of risk management.
- The need for the project to prepare spacious operations rooms equipped with modern techniques to contain the reasons and damage of risks.
- The need to give powers and delegation of authority for a team to deal with future risks by setting up a special section for this team to ensure that the important decisions to deal with emergency situations with what is appropriate.
- Provide manpower and expertise in preparation to deal with future risks as well as the confrontation of certain unplanned scenarios.

- Managers need to exchange visits with other companies for learning about the various risks, without involvement as well as routine daily tasks, and administrative powers.

5.3. Future Studies

- Study the reality of the performance of risk management in construction projects in Gaza.
- Conduct similar studies on construction projects in locations other than the areas surveyed to identify all places that can serve for risk management.
- The study between the reality of risk management in Palestine and the reality of management in other Arab countries.
- Study methods used by Japan and western countries in managing construction risk.

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APPENDIX

QUESTIONNAIRE SURVEY

Mr. /Mrs. …….

I am pleased to providing this questionnaire, which is designed in order to get some data that directly serve the objectives of scientific research, that I am preparing about the topic of risk management in construction projects in Gaza strip, an empirical study in construction projects between the period 2006 – 2015

I have great hope that you will spare no effort in providing the necessary information, knowing that your answers will be the subject of interest and confidentiality care and will only be used for the purposes of scientific research.

Thank you for your cooperation and your positive response.

Researcher

Nader Al Agha

Firstly: Demographic Data

Please kindly put signal (x) in the right place:

1- **The Duration Of The Project :**

Less than one year	☐	From 1-2 years	☐
From 2-3 years	☐	From 3 years or more	☐

2- Type of the Project:

Projects for industrial programs	☐	Projects for business programs	☐
Projects for service-programs	☐	Projects for agricultural programs	☐

3- The Geographical Region:

North Governorate region	☐	Gaza governorate region	☐
Middle governorate region	☐	Khan Yunis governorate region	☐
Rafah governorate region	☐		

4- The Quality of the Project's Contribution:

Licensed Independently	☐	Limited contribution	☐
Public contribution	☐	Privacy contribution	☐

Secondly: Axes of the Questionnaire:

Axes related to risk management in construction projects

Please mark (X) in front of the appropriate phrase for your choice

The First Axis: Methods, Mechanisms, policies, and procedures followed by the construction projects in risk management

No.	Questions	Degree of approval				
		Agree	Strongly agree	Neutral	Disagree	Strongly disagree
1	Are there clear and fair criteria in construction projects govern the size of the funding?					
2	Is there in construction projects any concern among investors because of the complications of the Procedures?					
3	Are there in construction projects clear policies to the Contractors Union to encourage the financing of projects financing projects?					
4	Is there a legal protection from the government for legal projects?					
5	Does Construction projects encouraged to provide long-term obligations with significant limitations?					
6	Are construction projects providing the means of transport for workers with into consideration the security standards international safety during the performance of their functions?					

7	Are construction projects following clear policies to encourage investors and meet the needs of the various sectors?					

The Second Axis: The safeguards and standards necessary for risk management in construction projects

No.	Questions	Degree of approval				
		Agree	Strongly agree	Neutral	Disagree	Strongly disagree
1	Does construction projects taking into consideration the availability of the necessary safeguards and bails for construction projects?					
2	Does a construction projects identify objectives and priorities of the primary and secondary processes in construction projects?					
3	Does a construction projects provide the financial budgets necessary to cover the cost of the required response?					
4	Are construction projects as being given all the power and delegation of authority?					
5	Does construction projects have the capacity and speed suitable to move the financial and human resources?					
6	Does construction projects making plans and alternative scenarios to cope the developments?					
7	Does Construction projects preparing an					

	extensive operations room that equipped with modern techniques?					

The Third Axis: Strategies proposed to decision makers in the management of risks in construction projects

No.	Questions	Degree of approval				
		Agree	Strongly agree	Neutral	Disagree	Strongly disagree
1	Is there in the construction projects clear plan that can be referenced in case of failure or closure of the project?					
2	Does a construction projects face obstacles in finding the necessary budgets to cover the costs of emergency response supplies?					
3	Does construction project provide a unified system to regulate the mechanisms of the structural sector and the policy of lending and tax incentive policies?					
4	Are there in construction projects policies and objectives are clear about the construction projects?					
5	Are there in construction projects economic controls that governing the process of selecting the type or nature of the project?					

6	Does construction project pay attention by taking into consideration the time factor accurately and appropriately?					
7	Does construction project keep taking the necessary procedures to continue the practice of normal activity without delay?					

The Fourth Axis: The required facilities used in risk management in construction projects in Gaza strip

No.	Questions	Degree of approval				
		Agree	Strongly agree	Neutral	Disagree	Strongly disagree
1	Is there economic stability encourages monetary and fiscal policies?					
2	Does construction project work to provide enough information Which obliges for appropriate planning?					
3	Does construction project have a suitable legal environment that adjusts the construction projects?					
4	Does construction project constantly improve procedures to reduce the mistakes of work?					
5	Are siege and closure imposed by Israel on the Palestinian territories significantly affected?					
6	Is there a clear tax defined from investment environment components?					

7	Does construction project have a suitable legislative environment regulate construction projects?					

1. What risk management in construction projects in Gaza strip: a case study of the construction projects during the period 2006 – 2015?

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2. What are the actual obstacles and challenges of conducting risk management in construction projects in Gaza strip?

