

The Islamic University of Gaza  
Deanship of Research and Graduate studies  
Faculty of Engineering  
Civil Engineering department  
Infar Structure



الجامعة الإسلامية بغزة  
عمادة البحث العلمي والدراسات العليا  
كلية الهندسة  
قسم الهندسة المدنية  
البنية التحتية

## A framework of Disaster Management in Gaza Strip Infrastructure Projects

إطار عمل لإدارة الكوارث في مشاريع البنية التحتية في قطاع غزة

By

**Omar Y. Sarsour**

Supervised by

*Prof. Shafik Jendia*

Professor of Infra Structure Engineering

*Dr. Khalid Al Hallaq*

Assistant Professor of Construction Engineering  
and Management

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## نتيجة الحكم على أطروحة ماجستير

- بناءً على موافقة عمادة البحث العلمي والدراسات العليا بالجامعة الإسلامية بغزة على تشكيل لجنة الحكم على أطروحة الباحث/ عمر يوسف محمد صرصور لنيل درجة الماجستير في كلية الهندسة / قسم الهندسة المدنية - البنى التحتية وموضوعها:

### إطار عمل لإدارة الكوارث في مشاريع البنية التحتية في قطاع غزة

#### A framework of Disaster Management in Gaza Strip Infrastructure Projects

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أ.د. شفيق مسعود جندية	مشرفاً ورئيساً
د. خالد عبد الرؤوف الحلاق	مشرفاً
د. يونس خليل المغير	مناقشاً داخلياً
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د. هكازن اسماعيل هنية



رَبِّ إِنِّي لَمَّا أَنْزَلْتَ إِلَيَّ مِنْ خَيْرٍ فَقِيرٌ

القصص (24)

## Abstract

The bad conditions and the unstable circumstances in which the Gaza Strip experiences as a result of the Israeli ongoing aggressive actions against human and trees and the results from the successive crises that damaged all the sectors, including the infrastructure, all of that increase the agony of the Palestinians living in the Gaza Strip. The suffering has increased as the reconstruction of the Gaza Strip delays. That led to the great importance of the disaster management in all of its area.

This study aims at identifying the current state of the disaster management in the Gaza Strip organizations, in addition to knowing the challenges facing the infrastructure and the factors that affecting the infrastructure in the case of occurrence. The factors are: discovering the crises, the extent of the knowledge existed, planning before the disaster, planning after the disaster, the role of the media and its uses, the evaluation in use and the availability of the support.

To achieve the purpose of the study, the qualitative approach was used by using a questionnaire on from the Engineers in disaster management institutions (municipalities, Ministry of Works, international institutions, construction companies). The researcher collected 105 answered questionnaires out of 136. They achieved a percentage of 76.64% which is an accepted percentage of analysis. The responses to the questionnaire were analysed using the SPSS. The statistical methods used in the analysis were (percentages, tables, average, the standard deviation, half split method, alpha cronback, Pearson, the factors analysis and the importance indicators. After that, the data was presented and discussed reaching the conclusion and recommendations of the study.

The study showed that the Gaza Strip has no system of crises management and lacks the active preparation before the disaster. The study showed the importance of the provision of the sufficient information of the disaster. The study showed that there is human staff but they have obstacles and lacking of facilities and appropriate financial support. The lack of the early warning before the occurrence of the crises, and the lack of cooperation among the NGOs and Governmental organizations were the most factors for the disaster poor mar agent.

The study showed that the siege on the Gaza Strip prevents the reconstruction and prevents the movements of the construction materials. The donor countries also do not fulfill their pledges regarding the reconstruction of the Gaza strip.

## المخلص

إن الأوضاع السيئة والظروف غير مستقرة في قطاع غزة تأتي نتيجة الغطسة الإسرائيلية المستمرة ضد الإنسان والشجر والحجر والحروب المتتالية، وما ينتج من أزمات متلاحقة تطل كافة القطاعات بما فيها البنية التحتية للقطاع، كل ذلك يعمل يزيد من المعاناة التي يعيشها أهالي القطاع، وما يضاعف ذلك أكثر هو تأخر عمليات إعادة الاعمار بالشكل الذي يجعل تطوير إدارة الكارثة في كافة مراحلها والدفع بعجلة إعادة الاعمار بالأسس الصحيحة على درجة عالية من الأهمية.

يهدف هذا البحث إلى التعرف على واقع إدارة الكوارث في منظمات قطاع غزة، بالإضافة إلى معرفة التحديات التي تواجه البنية التحتية، أيضا التعرف على العوامل التي تؤثر على إدارة البنية التحتية في حال وقوع الكارثة، وتضمنت هذه العوامل: اكتشاف الأزمة، مدى المعرفة الموجودة، التخطيط قبل الكارثة، التخطيط بعد الكارثة، دور الإعلام واستخدامه، التقييم المستخدم، مدى الدعم المتوفر..

ولتحقيق الاهداف الخاصة بالأطروحة، تم اختيار طريقة البحث الكمي وذلك باستخدام الاستبانة، حيث تم استخدام استراتيجية العينة المستهدفة من المهندسين في المؤسسات التي تعمل على إدارة الكوارث مثل (البلديات - وزارة الأشغال - مؤسسات دولية - شركات المقاولات) من أجل تحقيق أهداف الأطروحة من الفئة المستهدفة وتحليل النتائج الخاصة بها. حيث تم جمع 105 استبانة صحيحة من أصل 136 تم ارسالها بما يحقق نسبة % 76.64 وهي نسبة مقبولة من أجل إجراء التحليل. الردود الناتجة من الاستبانة تم ترميزها وادخالها الى برنامج التحليل الاحصائي (SPSS) ومن ثم تحليلها بواسطة الأساليب الإحصائية المناسبة. حيث كانت الأدوات الوصفية المستخدمة في التحليل هي (النسب والجداول، المتوسط، الانحراف المعياري، وطريقة نصف الانقسام، معامل ألفا كرونباخ، معامل الارتباط بيرسون، وتحليل العوامل ومؤشر الأهمية). بعد ذلك تم عرض النتائج ومناقشتها واستنتاج المخلص من هذه الأطروحة بالإضافة الى تقديم التوصيات.

وبينت الدراسة أنّ مؤسسات قطاع غزة ذات العلاقة لا يتوفر لديها أنظمة إدارة كوارث وتفقر الى التأهب والتحضير الفعال قبل حدوث الكارثة، وبينت أنه لا بد من توفير معلومات كافية ومختلفة فيما يتعلق بإدارة الكوارث، وأيضا يجب العمل على إعداد الخطط المسبقة. وقد بينت أنه يوجد كادر بشري قادر على إدارة الكارثة لكن يوجد معوقات أمامه، وهو عدم توفر الإمكانيات والدعم المالي المناسب، وكذلك عدم توفر نظام انذار مبكر قبل وقوع الكارثة، وعدم وجود تعاون بين المنظمات الحكومية والغير حكومية والمجتمعات المحلية. كما بينت الدراسة أن هناك مجموعة من الاشكاليات التي تعيق عملية الاعمار من أهمها الحصار الإسرائيلي المفروض على القطاع منذ سنوات والذي يمنع حركة مواد البناء والتشييد، بالإضافة إلى عدم التزام كافة الجهات المانحة بتعهداتها الخاصة بخصوص الاعمار وغيرها من العقبات.

# Dedication

*I dedicate this research to...*

*.. **Palestine**, the homeland and the identity ...*

*Martyrs, Life and Freedom*

*.. My **Father**, the candle, gives me the light to continue ...*

*.. My **Mother**, the words are not enough to express my  
gratitudes ...*

*.. My wife **Raghda** the continuous support ...*

*.. My **Brothers** and My **sister** ...*

*.. Who encourages me to accomplish my study*

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## **List of Abbreviations**

RII: Relative Importance Index  
SPSS: Statistical Package for the Social Sciences  
FMEA: Failure Mode and Effect Analysis

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# Chapter I

## Introduction

## Chapter 1: Introduction

This chapter introduces the research by providing background of the issues involved in the research, research aim and objectives, research scope and limitations, and brief research methodology.

### 1.1 Background

Disasters have been accompanying humans since ever. People suffered from disasters in every time and era. These disasters are such as; earthquakes floods, storms, epidemics and starvations and other natural and disasters. People dealt with the disasters from the beginning and within their available capabilities and knowledge in order to limit the disaster's impact. If the disasters exceeded the people's abilities, they will be like the watchers (Shauf, 2008)

Disasters increased as a result of the developments of life and the complexity of its fields. The disasters became in many types and shapes. There are many risks occurred as a result of the disasters. As a result, there are many voices call for procedures taken to prevent the sudden events and their destructive effects, (Carreno et al., 2014)

Disaster science is required to investigate the elements of many ambiguous phenomena and face the challenges that encounter this science. The disaster science is based on discovering the potentials and the indicators of the events that may happen in the future relating to the defining of the expected disasters and working on stopping these disasters and eliminating their impacts, (Curnin et al., 2015)

Disaster management is an administrative method for facing the disasters and its impact. There are some activities, functions and procedures executed before, during and after the disaster took place in order to reduce its effect or prevent them (Sahli, 2011)

Human Development Report (2009) revealed that the Gaza Strip has a poor experience in managing disaster in particular; disaster management system was accused of being incapable to cope with disasters.

Aldbeek (2010) found that there is an urgent need to plan for disaster risk reduction at Palestine and linkage to the international system.

This plan should define the roles and responsibilities of national organizations, management plans should be proactive, giving emphasis to preparedness and mitigation.



Disaster management in Palestine requires efforts from many disciplines from all levels of the national authorities and the civil society organizations, each according to its scope and competence, and requires all to work together in an integrated approach.

## **1.2 Statement of the problem**

The Gaza Strip has witnessed many disasters that affect the infrastructure since many years resulted from the policy of the occupation.

The last recent wars (2008, 2012, 2014) left huge destructions in all sectors. This has led to the need of accurate strategies and choices to work on how to administrate the disasters that affect the infrastructure.

The bad conditions in Palestine makes the development of these strategies very important. The Palestinian territories face big and continued destruction from the Israeli militarism against mankind, stones and trees. The Strip also witnessed many disasters resulted from the three wars and some troughs. Some of these troughs held air masses originally came from the Arctic and lasted for many days. The ongoing rainfall on Gaza led to raise the level of the water in the low areas, sometimes exceeding three meters and this led to big human crisis forming in closing the roads, flooding of hundreds of homes along the Gaza Strip, injuring tens of citizens and closing the major and minor roads because of high levels of water.

The number of natural disasters has drastically increased in the last decades, leaving a considerable impact on the urbanized zones. Most of the buildings suffer extensive damage and many of them collapsed entirely. The destruction of houses is one of the most visible effects of a disaster, resulting in high numbers of homeless people (UNDAC, 2014).

This study tries to administrate the infrastructure through the catastrophes in a suggested way appropriates to the Palestinian circumstances and to benefit from the previous experiences that directs the mechanism of infrastructure administration to get the best results in the future and amalgamating in the process of planning.

## **1.3 Research aim and objectives**

### **1.3.1. Research Aim**

The research aims to identify factors affecting the management of infrastructure in case of disasters in the Gaza Strip and to identify and examine challenges that infrastructure faces in disaster management phases.

### 1.3.2. Research Objectives

This research was conducted to accomplish the following objectives:

1. To identify the factors affecting the discover age, knowledge, planning before the occurrence, planning after the occurrence, media rule, evaluation of disaster management.
2. To explore the severity of each factor comprising the crisis management.
3. To test the relationship between management of infrastructure system and the discovering, knowledge, planning before the occurrence, planning after the occurrence, media rule, evaluation of disaster management.

### 1.4 Research hypothesis and/or questions

In this research, there are seven hypotheses:

1. The first hypothesis: there is a significance relationship at level of significance  $\alpha = 0.05$ , between the management of the infrastructure system and discovering the crisis.
2. The second hypothesis: there is significance relationship at level of a significance  $\alpha = 0.05$ , between the management of the infrastructure system and knowledge about managing the disasters.
3. The third hypothesis: there is significance relationship at level of significance  $\alpha = 0.05$ , between management of the infrastructure system and planning of disaster management before its occurrence.
4. The fourth hypothesis: there is a significance relationship at level of significance  $\alpha = 0.05$ , between the management of the infrastructure system and planning about how to manage the disaster after the occurrence.
5. The fifth hypothesis: there is a significance relationship at level of significance  $\alpha = 0.05$ , between the management of the infrastructure system and press Rule in disaster management.
6. The sixth hypothesis: there is a significance relationship at level of significance  $\alpha = 0.05$ , between the management of the infrastructure system and evaluation of disaster management.

7. The seventh hypothesis: there is a significance relationship at level of significance  $\alpha = 0.05$ , between the management of the infrastructure system and supporting in disaster management.

### 1.5 Research scope and limitations

This research is restricted by the following limitations

- This research only for Gaza Strip region.
- This research cover samples out of all Engineers.

### 1.6 Thesis structure

The thesis consists of five chapters as follows:

**Chapter 1: Introduction:** This chapter has a general introduction to the subject of the thesis. It clarifies the problem statement of this research. In addition, it describes the research objectives, research scope and limitations, research questions, research importance.

**Chapter 2: Literature review:** presents the literature review on infrastructure management in disaster case. It highlights the strategies, factors and challenges of disaster management process.

**Chapter 3: Methodology:** Identifies the methodology of the research that will be applied through the study.

**Chapter 4: Results and Discussion:** This chapter presents the results of the research and discusses it in detail.

**Chapter 5: Conclusion and Recommendations:** The chapter states how the research has contributed to knowledge, and makes recommendations and suggestions for future research.

References.

Appendices.

## Chapter II

# Literature Review

## Chapter 2: Literature Review

In this chapter, a review of literature related to the topic of study is prepared. The literature study used different scientific sources such as related studies, relevant scientific journals, books and other publications.

### 2.1 Introduction

The first section of the chapter highlighted the literature review relating to disaster's definition, management and types. Then the researcher gave a brief review about Gaza and its location and the types of disasters there. After that the chapter mentions the disaster assessment and management steps and tools. Finally, it includes the factors that prevent progress and how to establish the management framework for reconstruction. The second section of the chapter contains the related previous studies about disasters, disasters and their management.

### 2.2 Overview: Disaster

The growing occurrence of disasters, associated with a number of developing intimidations and trends, are leaving more people vulnerable to the impact of disasters and imposing bigger damage, harm, and dislodgment on vulnerable people worldwide. According to the Centre for Research on the Epidemiology of Disasters (CRED,2008), more than (235,000) people were victimised yearly by disasters, (2.14) million extravagant, while the price of tragedies was over (190) billion US\$.

The overall of disasters was less in 2008 than 2007. Since many years ago, there has been a rise in the number of minor and average scale calamities, especially storms, floods and epidemics, which National Red Cross and Red Crescent Societies replied to under their mandate as auxiliaries to the public authorities. The first part of 2009 witnessed a continuation of this tendency, with the Red Cross Red Crescent replying to a high amount of smaller-scale, local level tragedies.

According to OCHA 2017 that the total number of people affected by disasters in 2016 (569.4 million) was the highest since 2006, far above its 2006-2015 annual average (224.1 million). This increase is mainly explained by the human impact of drought in India, which affected 330 million people in both 2015 and 2016, the highest number affected by a natural disaster ever reported.

The condition of marginalized people is now serious by developing, compound threats such as weather change, new designs of downgrading, demographic growing and an

increasing amount of older people, accidental development, high levels of violence, reflex immigration, emerging communicable disease and the growing load of non-communicable disease, environmental poverty, and diffidence of access to food, water, and natural incomes. (International Federation of Red Cross and Red Crescent Societies, Plan 2010\_2011)

### **2.3 Definitions of Disaster**

The researcher has collected many definitions of disaster according to many scholars and researchers. He firstly began with his definition of the disaster as follows:

CRED defined disaster as “a situation or event [which] overwhelms local capacity, necessitating a request to a national or international level for external assistance; an unforeseen and often sudden event that causes great damage, destruction and human suffering.”

The Centre for Research on the Epidemiology of Disasters, (2006), defined disaster as “an unforeseen event that causes great damage, destruction and human suffering, which overwhelms local capacity, necessitating a request to national or international level for external assistance”.

Dilley et al., (2005) defined the disaster as “the main source of disaster for the poor and development gains obstacles and accumulated wealth in developing countries”.

(Faulkner,2001) also argued that “the disaster happens when an enterprise is confronted with sudden, unpredictable a catastrophic change over which it has little control”.

(Hopkins and IFRC,2008) considered the disaster is unexpected event when they define the disaster as “a sudden overwhelming and unforeseen event”.

(Karunasena, et al ,2008) defined the disaster as “a rare or extreme event in the natural or human-made environment that adversely affects human life, property or activity to the extent of causing a disaster.”

The researcher can define the disaster as “an event disrupting the normal conditions of life and causing a level of suffering that exceeds the capacity of adjustment of the affected community. It is a natural or human-made event that threatens to adversely affect human life, property or activity.”

#### **Disaster subcategory definitions according to the World Bank:**

**Geophysical:** Events creating from hard soil.

**Meteorological:** Events caused by short-lived/small to meso-scale atmospheric processes in the spectrum from minutes to days).

**Hydrological:** Events caused by nonconformities in the standard water cycle and/or extra of Bodies.

**Climatological:** Actions caused by long-lived/meso- to macro-scale procedures (in the spectrum from intrapersonal to multi-decadal weather variability)

**Biological:** Disaster produced by the contact of living creatures to microbes and poisonous Substances. (World Bank, 2010).

## 2.4 Infrastructure Management

The process of infrastructure management is one of the processes that face the developing countries. Gaza is one of the areas that have witnessed a very difficult problem in developing structure. It is because of the siege imposed on Gaza (Abu Ras, 2016; Migdad, 2012).

Infrastructure is a very wide world. It is basic bodily and organizational structures wanted for the process of a society, or the services and facilities necessary for an economy to function; in civil construction. It can be infrastructures and transport (roads, railways, harbours, airports, and phones), accommodation, sewerage, power systems etc. These facilities are usually provided by public authorities and may be regarded as a prerequisite for economic growth in an economy (Lawther, 2009; Singh, 2007) Around the world, infrastructure sector is one of development keys that support any nation, predictions emphasis on two key issues: the building cost and time; and how the facility will serve the whole society, these keys have great influences on the ecological, common and economic aids of the project (Siemiatycki, 2010; Nissanka et al., 2008)

The capacity of infrastructure asset has accelerated powerfully in developing and evolution economies, for example, transportation sector in The Organisation for Economic Co-operation and Development OECD Countries, these republics devote 1% of GDP on Road and Rail Substructure on Average (International transport forum, 2012). From 1992 to 1998, Australian government has invested (\$30) billion on capitals work state-wide and of that approximately (\$21) billion was for infrastructure projects (Al-Agha, 2005). Inaccurate forecasts of facility cost make very hard problems for budgeting. It is caused by a diversity of factors, some of which are frank errors, others

which result from the planned actions. Predicting an uncertain future is integrally difficult, and there are serious practical challenges related to poor data quality, incomplete methods and models, limited time billed to analysis, and changes in the provisions and space of the project below assessment. A study by Bent Flyvbjerg and his fellows in 2003 of more than (200) carriage extra-large projects in 20 states on five continents initiate that development prices were on regular 28% higher than predicted (Siemiatycki, 2010; Subekti, 2008).

The final goal of infrastructure construction cost control is reducing cost as much as possible based on quality guarantee in order to achieve maximum benefits. Therefore, it is very significant to control the project price during the project implement. The project construction cost control mainly includes scientific plan, control and verification to labour, materials, and cost consumed during the project implement. It needs active involvement and close cooperation of everyone involved in the project. (Yang, 2012; Alokshiya, 2013).

Urban physical infrastructure can be classified into main categories:

- Transport systems: railways, motorways, parking areas, bridges, tunnels.
- Water supply: supply pipes, reservoirs, pump stations, storing tanks, firefighting hydrants.
- Sewerage drainage: collection pipes, pump stations, treatment plants.
- Storm water drainage: collection pipes, pump stations, infiltration basins.
- Power supply: supply lines, generating stations, transformers.
- Communication network: service providers, transmission lines.

## **2.5 Disaster management**

The disaster management form cycle can be separated into four phases: alleviation, readiness, answer and retrieval (Hidayat and Egbu, 2010).

Amarasinghe, et al., (2006) defined disaster management as “an applied science, which seeks, by the systematic observation and analysis of disasters to improve measures to prevent, respond and recover from the effects and consequences of a disaster”.

As disaster management is focussed at doubt related to future events and outcomes, it is unintended that all preparation movements include some form of tragedy management. There is also a strong inference that disaster management is everyone's



commercial, since persons at all levels can provide some vision into the nature, probability and impacts of disaster. (Rio Tinto, 2007; cited in Rajab, E. ,2015).

## **2.6 Types of Disasters:**

There are two types of disaster; natural ones and human made ones.

### **2.6.1 Natural Disaster**

Disasters are the union of hazards with susceptibilities. As such, an increase in bodily, social, economic, or ecological vulnerability can mean an increase in the occurrence of disasters. The whole International Disasters Database EM-DAT divisions disasters into 2 groups (natural and technological), and further gaps the natural disaster category into 5 subcategories, which in go cover 12 disaster types and more than (30) subtypes. The main groups and subgroups are exposed under.

### **2.6.2 Violence as Man-Made Disaster:**

The researcher focused on the violence since it is the main disaster here in the Gaza Strip. With regards to violence related man-made disasters such as terrorisms, riots, civil conflicts, and wars, it should be noted that the number of conflicts is not necessarily declining over time according to information from the Uppsala Conflict Data Program.

Blomberg et al. (2004) use a rich panel data set of (177) countries from (1968 to 2000) to achieve an experiential investigation of the macroeconomic penalties of global violence and relations with other formulas of joint ferocity. The daily bargains that, on regular; the incidence of ferocity may have prudently important bad effect on growing, although one that is significantly lesser and less tenacious than that related with either outside wars or internal conflict. They also find that there are heterogeneities in the occurrence and the economic consequences of terrorism. Hess, (2003) combines the framework of Lucas' 1987 welfare cost estimates with cross-country data sets for 1960 and 1992 to attain the economic welfare costs of conflict. He finds that the welfare cost of conflicts and wars amounts to approximately 8 percent of people's current level of ingesting.

## **2.7 Geographic location of Gaza Strip (Palestinian National Authority, 2009)**

It is about 41 kilometres (25 mi) long, and between 6 and 12 kilometres (4–7.5 mi) extensive, with a total area of 360 square kilometres (140 sq. mi). It has a 40-km shoreline onto the Mediterranean Sea, but has no nautical claims due to Israeli Policies (Qahman, 2004). The land takes its name from Gaza-city, its main city and administrative centre. The population of Gaza Strip is about 1.7 million capita, most of them progeny of migrants. (Palestinian Centre for Human Rights, 2011).

## **2.8 Gaza Strip and disasters:**

The Gaza Strip learned its present limits at the termination of aggressive in the 1948 Arab–Israeli War, which was recognized in the Israel-Egypt Armistice Agreement on 24 February 1949. The Gaza Strip is constant to be administrated by Egypt. At first Gaza Strip was formally achieved by the All-Palestine Government, recognized by the Arab League in September 1948. Since the end of the All-Palestine Government in 1959 and until 1967, the Gaza Strip was right run by Egyptian armed director (Roy, 1995).

In 1967, Israel seized the strip after the Six-Day War. Pursuant to the Oslo Accords excited between Israel and the Palestinian Liberation Organization in 1993, the Palestinian Authority was set up as provisional decision-making body to govern Palestinian public occupants, with Israel maintaining control of Gaza Strip's airspace, all but one of its land borders and local waters, until a last contract could be reached. As a contract continued elusive (Roy, 1995). Israel distinctly detached from Gaza in 2005.

Gaza strip is one of the areas disposed to disasters either natural or manmade. Since the beginning of the second intifada in the year 2000, thousands of houses have been damaged or demolished by Israeli military. More than 4,500 houses had been destroyed and also, more than 15,000 houses have been damaged partially before 2008-2009 the war on Gaza. As a result of the 2008-2009 war, more than 50,000 houses had been damaged partially and about 3,500 houses were demolished totally. About 1,500 people were killed while extra than 5,000 were injured (UNRWA, 2011).

At the time of the war, more than 51,000 persons had expatriated but after the war ended, about 13,000 remained displaced. In addition, Gaza had been flooded by several natural disasters before. For instance, in 2006, Um Al Nasser village was flooded by

collapse of the nearby sewage pool, where more than 90 houses sustained damages and about 1,500 people were displaced (UNOCHA, 2009).

In 2010, Gaza valley was flooded affecting more than 25 families, 25 houses had been damaged and more than 420 people were displaced. Increasing the number of natural disaster in the world, the continuous of the Israeli occupation, the ongoing conflict between the Israelis and the Palestinians and the absence of resolving this conflict are factors to increase the probability to have any natural or manmade disaster in any time in Gaza strip. As a result of November 2012 Israeli military attack on Gaza strip, more than 10,000 houses had been damaged, most of them are minor damages but about 400 houses had been classified to be unsuitable for living as they sustained major damages or totally demolished. (UNRWA and MOPWH Database, 2012).

In 2014, Gaza witnessed a very destructive war imposed on it by the Israeli Army. To assess damage in the Gaza Strip UNOSAT reviewed commercial high-resolution satellite imagery and used specialized remote sensing techniques, resulting in in-depth analysis of destruction and damage to residential and industrial buildings, health and educational facilities, roads, and agricultural areas. These analyses, part of UNOSAT Rapid Mapping activities, commenced on 24 July 2014, as combat was ongoing, and concluded on 24 September 2014, resulting in damage assessments at multiple time intervals focusing on various infrastructure types (UNITAR, 2014).

## **2.9 Disaster Assessment**

The objective of performing disaster management is to enable the organization to accomplish its mission(s) (Sadiqi, 2014; Rajab, 2015).

- Well locking the information technology systems that store, process, or transmit organizational information.
- Enabling management to make well-informed tragedy management decisions to justify the expenses that are part of an information technology budget.
- Supplementary management in approving (or accrediting) the info technology systems on the basis of the secondary documentation resulting from the performance of disaster management.

## 2.10 Disaster management phases

Disaster management is secret into pre-disaster, during tragedy and post-disaster phases. Disaster management is a collective term surrounding all aspects of preparation for and responding to disasters, counting both pre-disaster and post-disaster activities. Disaster management sequence is an open-ended procedure. The four phases counting the cycle begin and end with mitigation. The stages are not equally select – there is an overlap. The stages of disaster management can be functioning alongside, because those stages are interrelated; they are not self-governing entities with one stopping and the next following (Shaluf, 2008).

Ranjan and Abenayake,2014; Ye and Okada, 2002, divided the disaster management into four phases and defined them as the following:

### A. Emergency Phase

This phase is immediately following disaster influence. The phase period is reaching from numerous days to (2-3) weeks after influence. The end of the phase is characterized by conclusion of the following doings:

- investigate and rescue;
- Offering of emergency food, shelter and medical assistance etc.
- Permission of ruins on the main roads.

### B. Recovery Phase

It is the process by which the impacted areas are assisted in returning to their normal level of functioning following a disaster, taking several months or even more than one year.

### C. Reconstruction Phase I

- Lasting measures of rebuilding;
- Extra of structures and infrastructures which have been destroyed.

### D. Development Reconstruction Phase (Reconstruction Phase II)

In this phase it must be taken into account the followings:

- Utilizing international assistance to optimum effect.
- Presenting improved and advanced building systems and programs;
- Application of experiences learned from the disaster in future study and growth programs.

## 2.11 Disaster Management Steps & Tools

The disaster management steps are:

### 2.11.1 Setting up goals and context

The drive of this stage of planning allows understanding the environment in which the respective organization operates, that means to thoroughly comprehend the outdoor setting and the interior culture of the group. The analysis is undertaken through:

- Founding the strategic, structural and disaster management context of the group, and
- Classifying the restraints and opportunities of the operating situation.

The founding of the setting and culture is undertaken through a number of environmental analyses that include, e.g., a review of the regulatory supplies, codes and values, industry rules as well as the relevant corporate leaflets and the previous year's tragedy organization and business plans.

Part of this step is also to develop tragedy criteria. The standards should reflect the context clear, often depending on an internal rules, goals and objectives of the organization and the interests of stakeholders. Criteria may be affected by the insights of investors and by legal or governing requirements. It is important that appropriate criteria be unwavering at the onset.

Though the broad standards for making decisions are originally developed as part of establishing the disaster management setting, they may be further developed and refined subsequently as particular disasters are identified and disaster analysis practises are chosen. The tragedy criteria must link to the type of disasters and the way in which ruin levels are uttered (Alokshiya, 2013).

Methods to assess the ecological analysis are SWOT (Strength, Weaknesses, Opportunities and Threats) and PEST (Political, Economic, Societal and Technological) frameworks, characteristically exposed as tables. (Oehmen, 2005; Quero, 2012).

### 2.11.2 Identify the disasters

Using the data increased from the context, chiefly as categorized by the Strength, Weaknesses, Opportunities, and Threats SWOT and Political, Economics, Societal, and Technological PEST frameworks, the next step is to

classify the disasters that are likely to affect the attainment of the areas of the organization, activity or initiative. It should be underscored that a disaster can be an chance or asset that has not been realized.

Key questions that may assist your identification of disasters include:

- To us to attain our goals, when, where, why, and how are disasters likely to occur?
- What are the tragedies associated with achieving each of our priorities?
- What are the tragedies of not achieving these priorities?
- Who might be got engaged (for example, suppliers, contractors, stakeholders)?

The suitable disaster identification method will depend on the application area (i.e. countryside of doings and the hazard collections), the nature of the project, the project phase, resources available, regulatory supplies and client supplies as to objects, required consequence and the obligatory level of detail. (Bolvin et al., 2007; Carreño et al. 2014). The use of the following tools and methods may further assist the identification of disasters:

- Instances of possible tragedy bases,
- List of possible commercial disasters and fraud disasters,
- Distinctive disasters in stages of the procurement procedure,
- Scenario planning as a disaster taxation tool,
- Process mapping, and
- Certification, relevant review reports, program evaluations and / or research reports.

Specific lists, e.g. from standards, and organizational experience support the identification of internal disasters. To collect knowledge available in the organization regarding interior disasters, people with appropriate knowledge from the different parts of the group should be involved in identifying disasters. Creativity tools support this group process.

The identification of the bases of the disaster is the most critical stage in the disaster assessment course. The sources are desired to be managed for practical disaster management. The restored the understanding of the sources, the better the outcomes of

the adversity charge process and the more eloquent and effective will be the management of disasters.

Key questions to ask at this stage of the disaster assessment method to identify the impact of the disaster are:

1. Say how is this event a disaster?
2. What occurs if the disaster eventuates?
3. How can it influence on achieving the objectives/outcomes?

Disaster identification of a particular system, facility or activity may yield a very large number of potential unintentional events and it may not continuously be feasible to subject each one to full quantitative analysis. In practice, disaster identification is a screening process where events with low or trivial tragedy are dropped from further consideration.

However, the aim for the events not deliberate in detail should be given. Quantification is then concentrated on the proceedings which will give rise to higher levels of disaster. Important methods such as Hazard and Operability (HAZOP) educations, fault trees, occasion tree logic drawings and Failure Mode and Effect Analysis (FMEA) are gears which can be used to classify the disasters and assess the criticality of possible outcomes.

An example of a methodical technique for classifying technical disasters of a shrub is the amplification of a disaster register where different types of tragedies and injury classes are connected to local areas of a plant. (DIC of Ontario, 2011)

### **2.11.3 Analyze the Disaster**

Disaster analysis includes the deliberation of the source of disaster, the consequence and likelihood to approximation the inherent or defenseless disaster without controls in place. It also comprises identification of the controls, an estimation of their use and the subsequent level of disaster with panels in place (the protected, residual or controlled disaster). Qualitative, semi-quantitative and quantitative techniques are all acceptable analysis techniques depending on the disaster, the purpose of the analysis and the information and data available.

Often qualitative or semi-quantitative techniques can be used for screening disasters while higher disasters are being exposed to more expensive quantitative techniques as compulsory. Disasters can be projected qualitatively and semi-quantitatively using gears such as hazard matrices, disaster graphs,

disaster matrices or monographs but noting that the disaster matrix is the most common.

Smearing the disaster medium, it is required to define for each tragedy its outline using probability and consequences criteria. Typical definitions of the probability and consequence are skillful in the disaster matrix.

Using the consequence criteria provided in the disaster matrix, one has to determine the penalties of the event occurring (with current controls in place).

To control the likelihood of the disaster up, one can apply the likelihood criteria (again contained in the disaster matrix). As before, the assessment is undertaken with reference to the efficacy of the current control doings.

To determine the level of each disaster, one can again refer to the disaster matrix. The disaster level is identified by crossing the likelihood and consequence levels on the disaster matrix.

#### **2.11.4 Evaluate the disaster**

Once the disaster has been analyzed they can be compared against the previously documented and approved tolerable disaster criteria. When using disaster matrices this tolerable disaster is generally documented with the disaster matrix. Should the protected disaster be greater than the tolerable disaster then the specific disaster needs additional control measures or improvements in the effectiveness of the existing controls.

The decision of whether a disaster is acceptable or not acceptable is taken by the relevant manager. A disaster may be considered acceptable if for example:

- The disaster is sufficiently low that treatment is not considered cost effective, or
- A treatment is not available, e.g. a project terminated by a change of government, or
- A sufficient opportunity exists that outweighs the perceived level of threat.

If the manager determines the level of disaster to be acceptable, the disaster may be accepted with no further treatment beyond the current controls. Acceptable disasters should be monitored and periodically reviewed to ensure they remain acceptable. The level of acceptability can be organizational criteria or safety goals set by the authorities.

(Wheeler, 2011)



### 2.11.5 Treat the disaster

An unacceptable disaster requires treatment. The objective of this stage of the disaster assessment process is to develop cost effective options for treating the disasters. Treatment options, which are not necessarily mutually exclusive or appropriate in all circumstances, are driven by outcomes that include:

- Evading the disaster,
- Dipping (mitigating) the disaster,
- Moving (sharing) the disaster, and
- Retentive (accepting) the disaster.
- Evading the disaster – not undertaking the activity that is likely to trigger the disaster. Reducing the disaster, controlling the likelihood of the disaster occurring, or controlling the impact of the consequences if the disaster occurs.

### 2.12 Factors to be considered for this disaster treatment strategy:

- A. Does it have the ability likelihood of the disaster occurring be reduced? (through preventative maintenance, or quality assurance and management, change in business systems and processes), or
- B. Can the penalties of the event be reduced? (Through eventuality preparation, reducing exposure to sources of tragedy or separation/relocation of an activity and resources).

Moving the disaster totally or in part – This plan may be achievable through touching the responsibility to another party or sharing the tragedy through a contract, insurance, or company/joint venture. Though, one should be aware that a new disaster arises in that the meeting to whom the disaster is moved may not sufficiently manage the disaster Retaining the tragedy and managing it – Resource requirements feature deeply in this strategy.

The next period is to govern the target level of disaster resultant from the successful application of the preferred actions and current control doings.

The meaning of a disaster action is to reduce the expected level of an intolerable disaster. Using the tragedy medium, one can control the consequence and likelihood of the disaster and identify the predictable target disaster level. (IEC, 2008; Jafar, 2017).

### **2.13 Disaster preparedness and response phases**

The readiness for disaster is considered one of the major factors that prevent the great bad impact of the disaster. This should be done through long serious steps taken and adopted from the concerned departments and authorities.

Vicente, et al., (2014) discussed the general principles of disaster preparedness planning:

1. Assembling meetings for the purpose of sharing information;
2. Land disaster drills, rehearsals and reproductions;
3. Emerging techniques for exercise, knowledge relocation and assessments;
4. Expressing memos of understanding and mutual aid agreements;
5. Educating the community and others involved in the planning process;
6. Procurement, positioning and maintaining relevant material incomes;
7. Undertaking public educational doings;
8. Founding informal connections between involved groups;
9. Rational and communicating information about future dangers and hazards;
10. Picture up organizational disaster plans and integrating them with overall public- mass-emergency plans; and frequently updating obsolete ingredients/strategies.

Planning and Preparedness Phase is designed to structure the disaster response prior to the occurrence of a disaster. It is a state of readiness to respond to a disaster or other emergency situation and involves evaluating the community's potential disaster risks, vulnerabilities, and the likelihood for a disaster to occur. This risk assessment process is sometimes referred to as an All-Hazards Analysis 2. An All-Hazards Analysis can be completed at multiple levels, counting:

- Central, state, and county levels
- Business, hospital and agency levels
- Individual and family levels. (Herrmann, 2007; Oehmen, J. ,2005)

### **2.14 Disaster assessment types and methodologies**

Al-Sahli (2011) stated that for the retrieval and reconstruction phase of a disaster, two types of full disaster assessment are most relevant:

**2.14.1 Damage Assessment collects the following types of information which are most valuable for the persistence of reconstruction planning.**

- Damage to housing and buildings;
- Damage to living (e.g., shops of small traders, salt pans, industrial units);
- Damage to agriculture and animal husbandry (crops, fruit trees, livestock);
- Damage to facilities (educational, health, recreational facilities) and government buildings;
- Damage to infrastructure and utilities (water supply, sewerage, roads, bridges, electricity, telecommunications, etc.).

**2.14.2** Assessment needs determine the level and types of help required by the pretentious population, their priorities, and their preferred strategies to encounter these urgencies. Common wants contain: housing requirements, livelihood needs, and individual needs (of the injured, handicapped, orphaned, those suffering from disaster instigated trauma), and needs for facilities (water supply and hygiene, electricity, schools, health and centers)

**2.15 Reconstruction process**

Hidayat and Egbu, (2010) divided the reconstruction process into two main programs, first is structure housing units and the another is restoring or structure organization like roads, ports, electricity, lifelines, railways, water supply and sanitation. Housing projects seem to be the first important in most post tragedy reconstructions in many countries, needed by disasters object and become the first urgency for the government. In developing countries where disaster fatalities have no home insurance or financial admission for rebuilding their home-based government must provide enduring houses to homeless tragedy victim countries.

The renovation process entails of four different stages: pre-disaster phase, instant relief phase, rehabilitation phase and reconstruction phase, the pre-disaster phase is the phase when major policies are decided and database is formed. The prompt relief phase is significant for the damage and needs assessments which should be realized straight after the disaster. The refurbishment phase is where all the critical choices about the detailed

implementation plan are made. The construction, implementation and evaluation phase of the eternal post-disaster houses is named the reconstruction phase (Baradan, 2006).

### **2.15.1 Pre- disaster phase**

The fixing and the responsibility assessments well are in loan of the disaster, both the data required and the process most appropriate for its accurate and speedy collection can be identified and sophisticated prior to the disaster. Proper enterprise of sampling and survey methods can increase substantially the accuracy and usefulness of assessment data. Standard survey practises, questionnaires, lists and procedures should be prepared to ensure that all areas are examined and that the material is reported by standard terminology and classifications (Naumann and Raschid, 2006; cited on Hristidis, et al., 2010].

Two types of detailed disaster assessment are most germane the damage assessment pulls together the following types of information which are most valuable for the purpose of renovation planning, damage to houses and structures. The second type is the needs assessment control the level and sorts of help vital by the affected population, their urgencies, and their preferred strategies to meet these urgencies. Common needs comprise: housing wants, living needs, individual needs, and needs for services (water source and hygiene, electricity, schools, health centres, etc.) (EPC and TCG, 2004; Ophiyandri, et al., 2010).

Subekti, A., 2008; Harvie and Saleh, 2008) decided that destruction can best be described in terms of usability; while damage estimate is usually the work of sector experts, it is essential that the disaster-affected relationships partake in damage assessment studies concerning their case and determines the level and sorts of assistance required by the affected populace, their priorities, and their preferred strategies to meet these priorities.

### **2.15.2 Immediate relief phase**

The instant relief phase is the delivery of emergency housings, assessment the needs of the vagrant, and the damage, and the reinstatement of damaged substructure, if essential. Field work is mostly used for the assessment of damage and needs. It is still the most shared data-collection method; and field labours are more fruitful in gaining admission to persons, doings, and info sources than the use of high-technology

communication devices, especially in the emerging countries (Barakat, 2003; Moe and Pathranarakul, 2006).

Many of the activities and measures taken in the instant relief period are intended to curtail the physical and community destruction, and survivor's mental disturbance. Furthermore, actions and decisions to be realized in this period can greatly influence employments in the future stage. As for post-disaster reconstruction, the past tasks of assessment of damage, existing resources and needs should be precise because case reconstruction decisions are grounded on these early figures (Shakale, 2016; cited on Baradan, 2006].

A typical procedure after disasters adopted by administrations and humanitarian aid agencies is to provide provisional or transitional shelter at the emergency response and relief stages followed by building permanent housing in following stages of reintegration and rebuilding. In some bags, disaster victims are moved through resettlement programmes with a view near reducing future decay, as done in several countries (Iftekhar, 2011).

### **2.15.3 Rehabilitation phase**

Rehabilitation is the time retro where all the vital decisions about the full implementation plan are made. In this stage, the data gotten afterward damage and needs valuations are examined and evaluated, and then the types, structure and quantities of the dwellings, and regions to be implemented are decided (Baradan, 2006; Kapucu, 2015), In the rehabilitation phase, events are usually designed at cultivating living conditions in the short-term. The project should conduct a rapid assessment of the requirements of mortalities in the area. All pretentious persons should be provided with care and medicine for flood-related illnesses, temporary shelter, and basic nourishments and goods (Bayleyegn, et al., 2006; Renkli and Duran, 2015).

The examination and assessment of data got from damage and needs valuations is the only act related to organizations in the reintegration retro. On the other hand, this action is very significant because the level of damage and desires are translated into appropriate action. During the recuperation period, the types, arrangements and numbers of the permanent post-disaster houses and regions to be implemented are decided at the national level. Preparation of a comprehensive plan about the production of housing, emerging and keeping a list of builders and suppliers, exercise and communication with the actors involved in the production and organization of

dwellings are appreciated at this old-fashioned (UN/ISDR 2009; Barakat 2003; Baradan 2006).

#### **2.15.4 Reconstruction phase**

The construction and application phase of the permanent post-disaster houses is called the reconstruction period. In conflicting to popular belief, this stage does not end with the delivery of the houses to the stayers of the disaster. The activities for the evaluation of the households fall into this period, as well as the first period of the post-disaster reconstruction cycle, namely preparing for the next pre-disaster period, as mentioned before. The reconstruction period can last between two and four years depending on the capitals of the affected public (UN/ISDR 2009; Barakat 2003; Baradan 2006; Chang, et al., 2010).

Iftekhhar (2011), in his study stated that during post-disaster rebuilding a compound range of tasks arise, among them, intensely, the heaviness to build communities within the constrictions of a interrupted context as swiftly as possible so that displaced disaster fatalities have homes again. Large-scale enduring housing reconstruction is usually a prolonged process and in developing countries, due to existing institutes and economic losses, attempting rapid reconstruction in a whole set of problems connected to institutional arrangements, house materials procured, builder and labour accessibility, as well as unscrupulously intensified levels of endemic bounds such as fraud and favouritism. In such a setting, notwithstanding goodhearted meanings of performing agencies, transformation schemes often run up in contrast to hurdles.

#### **2.16 Capacity of the construction industry**

The volume of the construction industry in the aftermath of the disaster in terms of professionals, physical, work etc., was insufficient to carry construction smoothly due to high request. Prices increased and high inflation rates due to lack of physical, labour etc., where house owners were powerless to complete the reconstruction of houses within limited grants in the first phase of the housing reconstruction program (Nissanka, et al., 2008).

Karunasena, et al., (2008) in his study revealed that the construction industry did not possess the adequate number of contractors, equipment, skilled workforce, this is a critical issue that needs to be addressed for the purposes of effective post disaster reconstruction and there are no readymade solutions; every programme must be

appropriately designed for a given post disaster scenario. The developing countries suffer from the lack and the inefficient use of available resources.

Damage following a disaster or conflict (with the exception of major power plants, dams and in some cases bridges) can be repaired by the local construction industry. It is, however, true that the construction industry, particularly in the wake of conflict, can emerge divided and weakened, especially in situations where there has been a political split in the country and where the industry is expected to go through a transition from public to private ownership as in the former Yugoslavia and Iraq (Aldabeek, 2010).

Sathyendrakajan, et al., (2007) indicates that the major factors which causes delays in successful housing reconstruction is capacity of the construction industry that it is necessary to provide the construction industry with the requisite capacity and capability, the construction industries need to be equipped for these purposes by given the apparent differential frequency and severity of various types of disasters.

Auffret, et al., (2009) clarified that, before war and due to the continuous blockade on the Gaza Strip, most of the private sector activities were paralyzed, and partially functioning; the constraints on the amount and type of material allowed through the borders, has resulted in the closure of most of the businesses. Since 2007, around (90%) of industrial businesses have been closed and (94%) of workers have lost their jobs (33,000 workers).

## **2.17 Factors preventing the progress of reconstruction**

Reconstruction includes different tasks and a set of large scale complex tests. Donor-driven and owner ambitious are the main cover rebuilding programs that are observed in the tragedy reconstruction progress. Whether the reconstruction of cover on-going at the proper time, executed correctly to achieve appropriate recovery of livelihoods as the planned output are some of the major factors affecting the success of the rebuilding procedure (Nissanka et al., 2008; Kapucu, 2015)

Iftekhar,(2011) decided that five keys delaying the obtainability of resources for renovation plans with, ranking of works, ability to pool resources, principal time of finding, prevailing votive associations and transportation bent on and around the disaster zone, other resourcing-related problems such as vain resourcing approaches, poor supply management, and speculative behaviours of material procurement, along with ecological concerns.

Chang, et al., (2010) made his effort to address resourcing problems after a disaster, many traditional methods have been employed such as regulating the market to stem post-disaster inflation, importing resources from overseas. The key aspects of a successful resourcing approach including input requirements, market linkage, infrastructure settings, and key stakeholder interactions are not yet being addressed; as mentioned in the research thesis of (Singh, 2007)

It was also observed that the prices of construction materials, labour and plant have raised suddenly in affected region's efforts making the reconstruction costlier (Karunasena and Rameezdeen, 2010).

### **2.18 Human resources in reconstruction**

Sathyendrakajan et al, (2008); and Curnin et al., (2015) found that, contractors give importance to the human resource, finance and management capacities in the elements of the capacity building; after the disaster occurred the construction industry does not have the necessary contractors, equipment, skilled workforce, modern management practices or access to finance required speeding reconstruction work. It is very important to make sure of the capacity of the contracting organizations to face any kind of challenges in relation to capacity for natural or man-made disasters. The need for understanding of the construction industry's capacity to carry out the reconstruction and to predict the performance on future disaster is becoming inevitable.

Overseas experience in large-scale disaster recovery demonstrates how delays and additional costs may arise if the availability of resources is not aligned with the reconstruction needs; in the case of reconstruction following disaster, the impacts of skills shortages, such as overtime and increasing costs, will affect pricing, quality and Reconstruction of housing started at the proper time, executed properly to achieve appropriate recovery of livelihoods as the planned output are some of the major factors affecting the success of the reconstruction process (Nissanka et al., 2008).

### **2.19 Establishing the management framework for reconstruction**

Disaster management requires an institutional framework that identifies the specific agency with overall responsibility for managing this task, and other supporting agencies responsible for the range of specific services to be provided. This framework also specifies mechanisms for multi-agency coordination, allowing for the management of



reconstruction to be undertaken and resourced at the most appropriate level, and providing for support from the next higher level to be properly coordinated. Such institutional arrangements should be clearly understood and accepted by the disaster-affected population and all those providing them with assistance for reconstruction (Subekti, 2008; Chang et al., 2010; Meding et al., 2009).

Subekti, (2008) mentioned that the master plan provided with priorities in the reconstruction program where the effective aid relationship requires donor and partner governments to build working consensus on objectives and strategy. This is more feasible when the partner government has a definite strategy.

Chang et al., (2010) concludes that in transformation planning and ordering, appropriate decisions about reconstruction activities are needed. Streamlined decision-making procedures for reserve obtaining should be put in place early, planned planning is not just about assessment and preparation of the necessities for disaster recovery, but also requires pre-determined ways of occupied together with a range of stakeholders in the construction industry, construction market, governmental agencies to activate desirable resourcing strategies and procedures. In the critical stage of disaster management, evaluation and monitoring are significant supplies in management disasters (Kusumasari et al., 2010; Al Radee,2011)

Labadi, (2008) in his study shows that monitoring and evaluation of the disaster recovery and rebuilding process can be significantly enhanced by applying the principles and practices of auditing and calculation to provide detached assurance that system of governance, including disaster management, operational performance, and financial control, are truly working. The inspecting and assessment can help to fix whether: financial and operational information, for both internal and external use, is reliable and credible; operations are performed efficiently and efficiently; assets are protected; and actions and decisions obey with laws, rules, and agreements.

## Important factor influencing the disaster management

N.	Factor	Name of the Researcher											
		Alokshiy a, (2013)	Haywa rd (2011)	Vagha ni, (2005)	Cha tat, (201 2	Ziy ada, 201 2	Al- Jazza r, 2012	Miqd ad, 2012	Shaqal ih 2016	El Ne mes (201 6)	El Jabri 2015	Musa 2005	El Maqoo si 2007
1.	The bus system in Gaza Strip does not follow a definite system of routing and scheduling	/					/						
2.	Many of the nations in this study performed poorly in the areas that face disasters		/		/				/			/	
3.	There is an inverse correlation between mitigation and preparation efforts and the loss of life as a result of an earthquake.		/										
4.	Land and soil around lack are affected by floods.			/									
5.	Funds are insufficient in the case of disasters				/								
6.	Insufficiency of the international organization to address the crisis					/				/			
7.	Transportation planning studies, lack or absence of transportation data, unavailability of extensive amount of land use, socioeconomic, and demographic data and the lack of resources.	/			/		/		/				
8.	No significant difference in the actual performance between the governmental organizations and international agencies in disaster mitigation phase.							/	/			/	
9.	Identify and evaluate strategies that the communities practice in disaster management process		/						/				
10.	Identify and examine types and roles of disaster knowledge management in the disaster management life cycle.				/				/				
11.	Universities and departments of education should endorse curriculum reviews and adjustments of disaster management in Gaza governorates.								/				
12.	Disaster management content can fittingly be infused into all the natural science courses, geography, social studies, literature and language arts, and even mathematics.								/	/			

13.	NGOs should facilitate the participation of learners, educators, parents as well as the community members in undertaking the vulnerability/capacity and multi-hazard evaluations, and classifying gaps in disaster management.							/	/				
14.	Academic institutions should ensure that learners acquire a basic appreciation of scientific concepts with a deeper level of systems thinking, such as knowledge of history and causes of disasters;							/	/				
15.	NGOs should also give more attention to knowledge transfer about seismic-safe building design and house construction methods to the community							/	/		/		/
16.	Government, NGOs and local communities need to collaborate, conduct research to harness and document the existing community based knowledge and local structures for disaster management							/	/			/	
17.	Prices increased due to lack of material after disaster				/						/		
18.	Multilateral donors with different budget mechanisms to channel their funds and contribute to the reconstruction program				/						/		/
19.	Weak government institutions during the immediate post-disaster period				/							/	
20.	Exaggerate the magnitude of the disaster by the media and initial reports issued				/								
21.	Identifying vulnerable people and areas within the disaster zone		/		/								
22.	Corruption which common in developing countries				/								
23.	Historically and aesthetic of the buildings				/								
24.	Speed of delivery for reconstruction				/								/
25.	Competencies of managers and team members, administrators, conceptual and technical skills				/								
26.	developed relationships between the agencies (including trust and respect)				/	/		/	/				
27.	Exiting of specified governmental department for disaster management				/							/	

28.	Using new technology such as GIS and remote sensing to enhance capacity for coordination				/								
29.	Appropriate knowledge and adequate institutional structures for risk reduction				/			/					
30.	The fast response from donors				/								
31.	The risk management techniques had an important role on the likelihood of small business success in the Gaza Strip.							/	/				
32.	The organizational structure related to project and grants management should be developed in order to be able to respond to projects risks.				/					/			
33.	Instructions and manuals related to project risk management are somewhat inactive							/		/			

## Chapter III

# Methodology

## Chapter 3: Methodology

This chapter discusses the methodology that is used in this research. The adopted methodology to accomplish this study uses the following techniques: the information about the research strategy and design, research population and sample, questionnaire design, the process of data collection, statistical data analysis, content validity and pilot study are also summarized.

### 3.1 Framework of the research methodology:

This study employed a quantitative data. The researcher designed the research by seven main steps as described below and shown in Figure 3.1.

#### **First step: Theme identification (Problem definition)**

The first one is to define the problems in order to establish objectives.

#### **Second step: Literature review**

The second phase of the research includes a literature review of the factors affecting the disaster management with their different phases.

#### **Third step: The main survey**

The third phase of the research included a field survey.

#### **Fourth step: Questionnaire development**

The fourth stage of the research was to modify the questionnaire by distributing it to the pilot study. The purpose was to prove that the questions were clear to answer in order to help achieve the objectives of the study. The questionnaire was modified according to the results of the pilot study.

#### **Fifth step: questionnaire distribution**

While the fifth step was the distribution of the questionnaire, and was used to obtain the data required to achieve the goal of the research.

#### **Sixth step: Results and discussion**

The sixth phase was a data analysis and discussion, and has been conducted the Social Sciences (SPSS 22) to obtain the required analysis.

#### **Seventh step: Conclusion and recommendations**

The final phase of the research included the conclusions and recommendations.

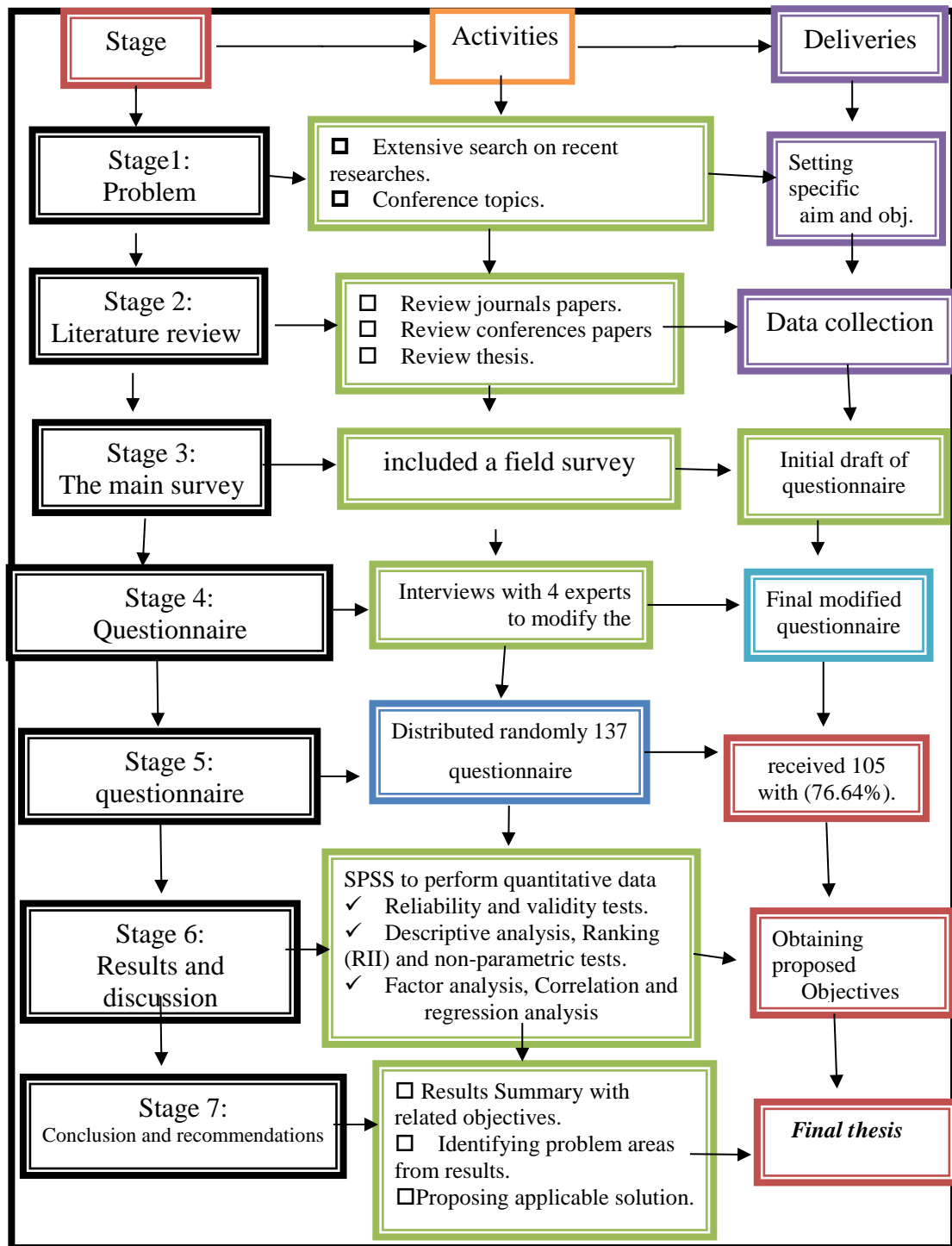


Figure (3.1) shows the methodology flowchart, which leads to achieve the research objective.

### **3.2 Research period**

The beginning of the study in February 2016 after the approval of the proposal, and then was completed literature review by the end of May 2017. The validity testing, piloting and questionnaire distribution and collection took two months and completed on the beginning of Oct.2017. The discussion, analysis, conclusions and recommendations were completed by the end of October 2017.

### **3.3 Research location**

The research was carried out in the five governorates of the Gaza Strip: the north, Gaza, central, Khan Younis and finally Rafah.

### **3.4 Data Collection**

In this research, the questionnaire tool was used, so that the questionnaire most frequently used in data collection for conducting surveys. The method of questionnaires is widely used in descriptive and analytical surveys to understand opinions and facts (Naoum, 2007). The method of questionnaires enhances confidentiality, facilitates analysis and supports authority at all levels, and provides resources. Data are collected uniformly from samples of the population. The standard model allows the researcher to make statistical inferences on the data, often with the help of computers. The questionnaire used contains some limitations such as: contain simple questions, no control over respondents, and respondents may respond with inaccurate feedback (Naoum, 2007).

### **3.5 Research Population and sample size**

The population for this study is the engineers who work in the field of disaster management, and after the research and study shows that the number 136. The method was used select sample.

Based on the equation shows that the required sample size equal 136. The researcher distributed randomly 136 questionnaires, and received 105 with (77.84%).

### **3.6 Questionnaire Design**

The questionnaire was distributed with an explanation explaining the purpose of the study, the method of response, the aim of the research, and the confidentiality of the information in order to encourage the high response. The questionnaire included a



multiple-choice question that is widely used, and the diversity of questions aims at achieving the research objectives, gathering the required data that support the analysis, discussion and recommendations. The research departments will develop a clear understanding of about proposal for the management of disaster infrastructure in Gaza Strip as the following:

**Section one:** General Information consist from 14 items.

**Section two:** Factors affecting on the management of disaster infrastructure in Gaza Strip, and sub divided into fields as follows:

1. Discovering the crisis contains six items.
2. Knowledge about managing the disasters contains nine items.
3. Planning of disaster management before its occurrence contains fourteen items.
4. Planning about how to manage disaster after the occurrence contains five items.
5. Press Rule in disaster management contains eight items.
6. Evaluation of disaster management contains fifteen items.
7. Supporting in disaster management contains fourteen items.

### **3.7 Data analysis method**

To maximize external validity, perceived reliability, and to achieve optimal balance between the depth and breadth of the research, the quantitative method was adopted (Muskat et al., 2012; Fellows & Liu, 2008). In fact, quantitative research is the main type of data collection and analysis methods adopted in behavioral and management research studies. Quantitative methods also seek to accurately measure variables, which is appropriate for analysis of questionnaire data.

### **3.8 Quantitative data analysis using SPSS**

SPSS 22 (Statistical Package for the Social Sciences) for Windows contains a set of capabilities for the whole analytical process, can produce information that will work on decision-making, work to deliver results with output tables and graphs, and share results using a variety of reporting methods. By using this software, seven kinds of data analysis techniques were adopted in this study:

1. The relative importance index (RII).
2. One sample t test.
3. Independent sample t test.
4. One-way ANOVA test.

5. Frequency and descriptive analysis.
6. Cronbach's alpha for reliability statistics.
7. Spearman correlation coefficient.

### 3.9 Data measurement

In order to be able to choose the appropriate method of analysis, the level of measurement must be understood. For each type of measurement, there was/were an appropriate method/s that can be applied and not others. In this research, ordinal scales were used. Ordinal scale is a ranking or a rating data that normally uses integers in ascending or descending order. The numbers assigned to the important (1, 2, 3, 4, 5) do not indicate that the interval between scales are equal, nor do they indicate absolute quantities. They are merely numerical labels (Naoum, 2007). Likert scales (originally devised by R. Likert in 1932) which were used in this questionnaire, are devices to discover strength of feeling or attitude towards a given statement or series of statements and the implication here is that the higher the category chosen, the greater the strength of agreement, but care has to be taken not to read too much in these ranked scales. They are usually a three, five or seven-point range and ask respondents to indicate rank order of agreement or disagreement by circling the appropriate number (Bell, 2005). For this study, the five-point scale was chosen as the following:

<b>Item</b>	Very low	Low	Middle	High	Very high
<b>Scale</b>	(1)	(2)	(3)	(4)	(5)

#### Relative importance Index (RII).

Descriptive statistics namely relative importance index method (RII) was used to determine the ranks of all performance factors and to highlight the relative importance of attributes as perceived by the respondents (Assaf et al., 1995; Faridi & El-Sayegh, 2006). The relative importance index was computed as (Sambasivan & Soon, 2007):

$$RII = \frac{\sum W}{A \times N} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{5N} \dots\dots\dots \text{equ. (3.3)}$$

Where:

W: the weighting given to each factor by the respondents (ranging from 1 to 5).

A: the highest weight (i.e. 5 in this case).

N: the total number of respondents.

RII: value had a range from 0 to 1 (0 not inclusive), the higher the value of RII, the more impact of the attribute

However, RII does not reflect the relationship between the various attributes.

### **3.10 One sample t test**

Test is used to determine if the mean of a paragraph was significantly different from a hypothesized value 3 (Middle value of Likert scale). If the P-value (Sig.) is smaller than or equal to the level of significance,  $\alpha = 0.05$  then the mean of a paragraph was significantly different from a hypothesized value 3. The sign of the Test value indicates whether the mean is significantly greater or smaller than hypothesized value 3. On the other hand, if the P-value (Sig.) is greater than the level of significance,  $\alpha=0.05$ , then the mean a paragraph is insignificantly different from a hypothesized value 3.

### **3.11 Independent sample t test**

Test is used to examine if there was a statistical significant difference between two means among the respondents toward proposal for the management of disaster infrastructure in the Gaza Strip due to general information.

### **3.12 One-way ANOVA test**

Test was used to examine if there was a statistical significant difference between several means among the respondents toward proposal for the management of disaster infrastructure in Gaza Strip due to general information.

### **3.13 Validity of the Questionnaire**

The is statistical validity of the questionnaire shall be determined to the extent to which the instrument measures what is to be measured (Poilt and Hungler,1985). Validity has a number of different aspects and evaluation approach. To ensure the validity of the questionnaire, two statistical tests should be applied. The first test is the validity test for the standard (Spearman test) which measures the correlation coefficient between each element in the field and the entire field. The second test is the (Spearmen test), which is used to test the validity of the questionnaire structure by testing the validity of each field and the validity of the entire questionnaire. It measures the correlation coefficient between one filed and all areas of the questionnaire that have the same level of the comparable scale.

### **3.14 Criterion Related Validity**

#### **3.14.1 Internal consistency**

The internal consistency of the questionnaire is measured by a scout sample consisting of thirty questionnaires by measuring Pearson correlation coefficients between each paragraph in one field and the whole field. Tables No.'s from (A-1) to (A-7) clarify the correlation coefficient and p-value for each field item. As shown in the table the p-values are less than 0.05, so the correlation coefficients of this field are significant at  $\alpha = 0.05$ , so it can be said that the paragraphs of this field are consistent and valid to be measured what it was set for.

#### **3.14.2 Structure Validity of the Questionnaire**

Structure validity is the second statistical test that is used to validate the questionnaire structure by testing the validity of each field and the validity of the entire questionnaire.

It measures the correlation coefficient between one field and all the fields of the questionnaire that have the same level of liker scale. Table (A-8) in Appendix clarifies the correlation coefficient for each field and the whole questionnaire. The p-values (Sig.) were less than 0.05, so the correlation coefficients of all the fields were significant at  $\alpha = 0.05$ , so it can be said that the fields were valid to measure what it was set for to achieve the main aim of the study.

#### **3.14.3 Reliability of the Research**

Reliability of an instrument is the degree of consistency that measures the attribute that is supposed to be measured and repeat the test to the same sample of people in two occasions then compare the results obtained by calculating the reliability factor. For the most purposes reliability coefficient above 0.6 are considered satisfactory. The statistician's explained that, overcoming the distribution of the questionnaire twice to measure the reliability can be achieved by using Cronbach's Alpha coefficient through the SPSS software.

#### **3.15.4 Cronbach's Coefficient Alpha**

This method is used to measure the reliability of the questionnaire between each field and the average of the entire questionnaire domains. The normal range of Cronbach's coefficient alpha value between 0.0 and + 1.0, and the higher values reflect a higher degree of internal consistency. Table A-9 in the Annex shows the Cronbach's coefficient alpha value for each area of the questionnaire and the questionnaire in full.

The results were from 0.795 and 0.921, and the general reliability of all items was 0.967. Thereby, it can be said that the researcher proved that the questionnaire was correct and reliable and ready for distribution.

## Chapter IV

# Results and discussion

## Chapter 4: Results and discussion

This chapter introduces the survey results and the discussion of the questionnaire's sections. First section presents the profile and all necessary information about the respondents. Other sections in the questionnaire were designed to attain the objectives of this research. The first objective was to Identifying Factors affecting the management of infrastructure in case of disasters in the Gaza Strip. The second objective to Identify the differences among respondents toward the management of infrastructure in the case of disaster in Gaza Strip.

### A. Descriptive Results

#### 4.1 Socio-demographic information

Table (4.1) summarizes the distribution of respondents based on socio demographic factors.

**Table No. (4.1):** Socio-demographic information

Item		Frequency (F)	Percentages (%)
<b>Gender</b>	Male	89	84.8
	Female	16	15.2
<b>Age</b>	Less than 25	15	14.3
	25 - Less than 35	62	59
	35- Less than 50	21	20
	More than 50	7	6.7
<b>Education level</b>	Bachelors	82	78.1
	Master	23	21.9
	PHD	-	-
<b>The Specialization</b>	Civil Eng.	54	51.4
	Arch. Eng.	26	24.8
	Electricity / Mechanical	15	14.3
	Other	10	9.5

Item		Frequency (F)	Percentages (%)
<b>Governorate</b>	The northern	6	5.7
	Gaza	27	25.7
	The middle	8	7.6
	Khanyounus	59	56.2
	Rafah	5	4.8
<b>Respondent's years' experience</b>	Less than 5	28	26.7
	5 - Less than 10	44	41.9
	More than 10	33	31.4
<b>Type of institution</b>	Governmental institution	36	34.3
	International institution	4	3.8
	Consultant office	19	18.1
	contracting company	31	29.5
	Other	15	14.3
<b>Fields of work of the institution</b>	Building	66	62.9
	Roads	32	30.5
	Water and sewer	35	33.3
	Other	21	20
<b>Job title for respondent</b>	Supervising engineer	25	23.8
	Designer Engineer	19	18.1
	Project Manager	17	16.2
	Other	44	41.9

As shown that 84.8% (89) of respondents were male, and 15.2% (16) were female. The previous result indicates the diversity of the gender of the respondents with administrative and supervisory positions in their institutions which reflect the availability of the gender factor. It serves the objectives of the study.

Also, 14.3% (15) of respondents age less than 25 years, and 59.0% (62) their age from 25 to less than 35 years, 20.0% (21) their age from 35 to less than 50 years, finally 6.7% (7) their age more than 50 years.



The previous result reflects the diversity of the average age of the study population, with relatively moderate age, reflecting the availability of experience factor and serves the objectives of the study. It ensures that the views of various age levels are understood and accumulated experience about the readiness of official institutions to manage crises and disasters. Identifying age-level views involves the accumulated experience of the readiness of formal institutions to manage crises and disasters.

In the Table 4.1 about 78.1% (82) of the respondents have bachelor degree, and 21.9% (23) have master degree.

The result indicates the diversity of the educational level of the vocabulary of the, which means that their knowledge of the disaster management, and the extent to which their institution is ready to manage crises and disasters will be affected (to a certain extent) by their scientific background, that is, it will not be a random assessment.

In term of specialization, 51.4% (54) from the respondents are Civil Eng., and 24.8% (26) are Arc. Eng., and 14.3% (15) are Electricity / Mechanical, while 9.5% (10) have other specialization.

This finding indicates that there is a diversity in the nature of specialization, which means that determining their knowledge of the methodology of disaster management, and the extent of readiness will be affected by the nature of the work of the respondent. And this serves the objectives of the study.

Regarding residential area, 5.7% (6) of the respondents from the northern governorate, 25.7% (27) of the respondents from Gaza governorate, 7.6% (8) from the middle governorate, and 56.2% (59) from Khanyounus governorate, and 4.8% (5) from Rafah governorate.

This different distribution of engineers at the level of the governorates as evidence of natural distribution in the various governorates of the Gaza Strip.

In the same table it is illustrated that 26.7% (28) respondents from the total sample have years of experience Less than 5 years, and 41.9% (44) respondents from the total sample have years of experience between 5- less than 10 years, and 31.4% (33) respondents from the total sample have years of experience more than 5 years.

The previous result indicates the availability of the experience factor in their institutions resulting from the years of routine and long work in the population items which make

them able to form accurate insights into their knowledge of the methodology for preparing emergency plans and their readiness to manage disasters in their institutions

As shown that 23.8% (25) were supervising engineer, 18.1% (19) were Designer Engineer, 16.2% (17) were Project Manager, and 41.9% (44) were other job title.

#### 4.2 Institutional Information

Table No. (4.2): information about institution

General information		Frequency (F)	Percentages (%)
Classification of institution	First class	69	65.7
	Second class	21	20
	Third class	15	14.3
Years of institution experience	Less than 5	8	7.6
	5 – Less than 10	29	27.6
	More than 10	68	64.8
Company headquarters	The northern governorate	5	4.8
	Gaza governorate	41	39
	The middle governorate	7	6.7
	Khanyounus governorate	50	47.6
	Rafah governorate	2	1.9
Number of project last 5 years	One project	4	3.8
	Two projects	12	11.4
	Three projects	12	11.4
	Four projects and more	77	73.3
Project size last 5 years in dollars	1 million	7	6.7
	2 million	10	9.5
	3 million	21	20
	4 million	15	14.3
	5 million and more	52	49.5

In the same table it is (65.7%) respondents from the Companies have Classification of institution first class, (20%) second class, and (14.3%) third class.

Also In the same table it is (7.6%) respondents from the Companies have Years of institution experience less than 5 years, (27.6%) between 5- less than 10 years, and (64.8%) more than 10 years.

Also In the same table it is (6.7%) respondents from the Companies have Years of Project size last 5 years in dollars is 1 million, (9.5%) 2million, (20%) 3 million, (14.3 %) 4 million, and (49.5 %) 5 million and more.

### 4.3 Factors affecting the management of infrastructure in case of disasters in the Gaza Strip

This part consists of results and discussion of factors that influence the management of infrastructure in case of disasters, these factors were grouped into seven groups, the first group is related to factors affect discovering the crisis; the second group is related to factors influencing knowledge about managing the disasters; the third group is related to factors influence planning of disaster management before its occurrence; the fourth group is related to factors affect planning about how to manage the disaster after the occurrence; the fifth group is related to the rule of Press in disaster management; the sixth group is related to evaluation of disaster management; the last group is related to Supporting in disaster management. Table 4.3 shows the relative index and the ranks of each group affecting the disaster management process.

Table (4.3) RII's and test values for groups affecting the infrastructure management process in the case of disasters

No.	Item	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
1	Discovering the crisis	2.66	0.82	53.17	-4.29	0.000*	4
2	Knowledge about managing the disasters	2.72	0.69	54.33	-4.21	0.000*	3
3	Planning of disaster management before its occurrence	2.58	0.63	51.56	-6.84	0.000*	5
4	Planning about how to manage the disaster after the occurrence	2.58	0.70	51.67	-6.10	0.000*	6
5	Media Rule in disaster management	2.87	0.76	57.36	-1.79	0.076	2

No.	Item	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
6	Evaluation of disaster management	2.94	0.58	58.77	-1.09	0.277	1
7	Supporting of disaster management	2.49	0.62	49.78	-8.39	0.000*	7
	<b>All fields</b>	2.70	0.52	53.91	-6.03	0.000*	

\*The mean is significantly different from 3 SD: Std. Deviation RII: Relative importance Index

#### 4.3.1 Factors affect discovering the crisis in infrastructure management process in case of disasters (field one)

##### Test of hypothesis

**The null hypothesis (H0):** there is no significant positive effect at 0.05 level of the discovering the crisis in infrastructure management process in the case of disasters.

**The alternative hypothesis (H1):** there is significant positive effect at 0.05 level of the discovering the crisis in infrastructure management process in the case of disasters.

From Table 4.3, it is shown that:

Table (4.4) RII's and test values for factors affecting discovering the crisis in infrastructure management process in case of disasters

No.	Statement	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
1	Is your institution has a special part, to monitor the indicants of crisis occurrence	2.36	1.05	47.24	6.24-	0.000*	6
2	The high administration cares about monitoring the crisis indicants	2.90	0.96	57.90	1.12-	0.266	1
3	Scanning the institution environment in a general way to know the indicants of crisis occurrence	2.72	0.91	54.48	3.09-	0.003*	3
4	The institution cares about classification of the indicants of crisis occurrence	2.73	0.94	54.67	-2.90	0.005*	2
5	The institution cares about the training for the staff of collecting and analyzing of the indicants of crisis occurrence	2.63	1.04	52.57	3.66-	0.000*	4

No.	Statement	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
6	A very well-trained team analyses the indicants of the crisis occurrence	2.61	1.07	52.19	3.74-	0.000*	5
	<b>All items</b>	2.66	0.82	53.17	4.29-	0.000*	

\*The mean is significantly different from 3 SD: Std. Deviation RII: Relative importance Index

**Hypothesis test:** From table 4.4, it is shown that there is a significant effect at 0.05 level of the discovering the crisis in infrastructure management process in the case of disasters.

“The high administration cares about monitoring the crisis indicants” was ranked in the first position by the respondents under this field as a critical factor influencing the factors affecting discovering the crisis in infrastructure management process in case of disasters with relative important index equals (57.90%), Test-value = -1.12, and P-value = 0.266 which is greater than the level of significance  $\alpha = 0.05$ , that means this statement not differ significantly from the degree of neutrality (mediation).

“The institution cares about classification of the indicants of crisis occurrence” was ranked in the second position by the respondents under this field as a critical factor influencing the factors affecting discovering the crisis in infrastructure management process in case of disasters with relative important index equals (54.67%), Test-value = -2.90, and P-value = 0.005 which is smaller than the level of significance.  $\alpha = 0.05$ , The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This result reflects the dissatisfaction of respondents regarding the importance of the institution cares about classification of the indicants of crisis occurrence.

“Is your institution having a special part, to monitor the indicants of crisis occurrence” was ranked in the last position by the respondents under this field with relative important index equals (47.24%), Test-value = -6.24, and P-value = 0.000 which is smaller than the level of significance  $\alpha = 0.05$ , The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This result reflects the dissatisfaction of respondents regarding having the institution a special part, to monitor the indicants of crisis occurrence.

**Regarding the whole field of “factors affecting discovering the crisis in infrastructure management process in case of disasters”** it was ranked in the fourth position with relative important index equals (53.17%), Test-value = -4.29, and P-value = 0.000 which is smaller than the level of significance  $\alpha= 0.05$ . The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value (Table 4.3).

It is clear that the opinions of the sample members in all the paragraphs are negative as the relative weight is less than 60% for each of the paragraphs of the first axis, that is, the individuals of the sample agree that their institution does not have a special section. Some of its functions are to monitor crisis indicators. The senior management of the institution attention and support to monitor the indicators of the occurrence of crises to a medium degree. The work environment of the institution is not surveyed comprehensively to identify indicators of the probability of the crisis. The management of the institution is not concerned with the classification and disaggregation of crisis indicators. Also, the management of the institution is not concerned with the continuous training of the team to collect and analyse crisis indicators, and it does not analyse the indicators of the crises of the staff trained and qualified to do its duty.

In general, the average of the paragraphs is 2.66, which is less than the neutral average 3, and the relative weight of all the paragraphs of this axis is 53.17%, which is less than 60%. The moral level is 0.000, which is less than 0.05.

This indicates that there is no effective crisis management system at the stage of detecting warning signals in construction companies in the Gaza Strip.

We can conclude from this that companies are very weak in discovering the indicators of the crisis then preventing and preparing for them. The researcher attributes very little approval from respondents to the area of discovering the crisis in general to:

1. Lack of plans
2. Lack of competencies capable of planning and predicting.
3. Nature beyond the will of engineers, represented by the general situation in the Gaza Strip which is characterized by In the blurred future vision of Strip which makes it difficult to predict the coming future.

The results of this study in this field, together with a local study (Jadidi, 2006) agree that there is no effective crisis management system at the stage of detecting warning signals in the hospitals of the Palestinian Ministry of Health in the Gaza Strip

There is a severe weakness in the hospitals of the Palestinian Ministry of Health in the Gaza Strip in the detection of signs of crisis.

The results were agreed with (Carreño et al., 2014). The results showed that there was no predictability and advance planning. This could be improved by adopting a risk management indicator in Colombia - Latin America.

It differed with a local study (al-Minawi and al-Zinati, 2016), where he showed that the working environment of the Shifa hospital is regularly surveyed to identify indicators of the probability of a crisis. And that the work environment of the hospital is thoroughly surveyed to identify the indicators of the probability of a crisis. On the other hand, it has been agreed that the hospital administration does not care about the continuous training for collecting the crew and analyzing the indicators of the crisis.

The results of the study also differed with the results of the (Hijazi, 2001) study which conducted on Saudi commercial banks. The study showed that there is a relatively moderate crisis management system in these banks in terms of the availability of the essential elements of effective crisis management at each stage of this system and in the combined stages.

The study proved that these banks are fairly prepared, and banks are paying more attention to remedial efforts than preventive and planning efforts.

The study of (Al-Sahli, 2011) revealed the existence of flexible scenarios for confronting disasters, the identification of their prerequisites, the use of an effective system for collecting information and relying on forecasting and the adoption of clear disaster response strategies at the Civil Defence Directorate in Saudi Arabia.

#### **4.3.2 Factors affecting Knowledge about managing the disasters in infrastructure management process in case of disasters (field two)**

##### **Test of hypothesis**

Table (4.5) RII's and test values for factors affecting the knowledge about managing the disasters in infrastructure management process in case of disasters

No.	Statement	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
1	The extent of previous, various, educational knowledge about managing the disasters	2.46	1.00	49.14	-5.56	0.000*	9
2	The extent of Special knowledge about managing the disasters and practicing it at Gaza strip	2.52	0.89	50.48	-5.49	0.000*	7
3	Co-operation between the members of the community during the disaster	3.06	1.01	61.14	0.58	0.563	1
4	The ability of employing the human and materialistic potentials and using them well	2.90	0.96	58.10	-1.02	0.310	2
5	The possibility of arriving to some stricken areas	2.84	0.98	56.76	-1.69	0.094	3
6	Knowledge of systems and formal instructions	2.80	0.99	56.00	-2.06	0.042*	5
7	The existence of researches and studies in the subject of disaster managing	2.52	0.95	50.48	-5.13	0.000*	8
8	Entrenching the knowledge of the causes and history of disasters in the educational institutions	2.53	0.92	50.67	-5.20	0.000*	6
9	System of documenting, archiving, lands ownership and historical landmarks	2.81	1.03	56.19	-1.90	0.061	4
	<b>All items</b>	2.72	0.69	54.33	-4.21	0.000*	

\*The mean is significantly different from 3 SD: Std. Deviation RII: Relative importance Index

**Hypothesis test:** From table 4.5, it is shown that there is a significant effect at 0.05 level of the knowledge about managing the disasters in infrastructure management process in the case of disasters.

**The null hypothesis (H0):** there is no significant positive effect at 0.05 level of the knowledge about managing the disasters in infrastructure management process in the case of disasters.

**The alternative hypothesis (H1):** there is significant positive effect at 0.05 level of the knowledge about managing the disasters in infrastructure management process in the case of disasters.



From Table 4.5, it is shown that “Co-operation between the members of the community during the disaster” was ranked in the first position by the respondents under this field as a critical factor influencing the factors affecting the knowledge about managing the disasters in infrastructure management process in case of disasters with relative important index equals (61.14%), Test-value =0.58, and P-value = 0.563 which is greater than the level of significance  $\alpha = 0.05$ , that means this statement not differ significantly from the degree of neutrality (mediation).

“The ability of employing the human and materialistic potentials and using them well” was ranked in the second position by the respondents under this field as a critical factor influencing the factors affecting the knowledge about managing the disasters in infrastructure management process in case of disasters with relative important index equals (58.10%), Test-value = -1.02, and P-value = 0.310 which is greater than the level of significance  $\alpha = 0.05$ , that means this statement not differ significantly from the degree of neutrality (mediation).

“The extent of previous, various, educational knowledge about managing the disasters” was ranked in the last position by the respondents under this field with relative important index equals (49.14%), Test-value = -5.56, and P-value = 0.000 which is smaller than the level of significance.  $\alpha = 0.05$ , the sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This result reflects the dissatisfaction of respondents regarding this paragraph.

**Regarding the whole field of “factors affecting the knowledge about managing the disasters in infrastructure management process in case of disasters”** it was ranked in the third position with relative important index equals (54.33%), Test-value = -4.21, and P-value = 0.000 which is smaller than the level of significance  $\alpha = 0.05$ . The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value (Table 4.5).

The results showed that the relative weight of all the paragraphs was less than 60%. Except for the third paragraph, the relative weight was 61.14%, which is "cooperation between the members of society during the disaster". The researcher attributed that the reason for this is a proof of the authenticity of the Palestinian people and that it is side by side in all circumstances and conditions, and that the cooperation force and prevent it and the ability to get rid of the damage that

surrounds members of society. Cooperation is also of psychological and economic importance.

Ranjan and Abenayake study (2014) shows that education and knowledge of disaster management enhance personal preparedness, which is critical to disaster risk mitigation. It also explained that living in a highly educated society is useful in improving preparedness levels.

The results agreed with (Kangabam, 2012) that disaster-related information in the community varies according to the educational background, which can be enhanced by combining appropriate disaster preparedness, knowledge management and how to educate and train the community.

The Davidson et al., (2007) concluded that the awareness of the affected communities in post-disaster reconstruction helps to increase cultural awareness and allows a sustained flow of information throughout the lifecycle of reconstruction projects. In addition, lack of effective communication and awareness of local culture can lead to poor results in post-disaster reconstruction.

The study of (Quero, 2012) concluded that in the absence of programs or projects at the community level for awareness and disaster risk reduction measures, the response process would be weak and this would increase the negative impact of disasters on society.

The results of this research differed with the results of (Al-Otaibi, 2007) in Saudi Arabia, where the results showed that the employment of human and material potentials and their optimum use by the security commander in the Directorate of Civil defence in Madinah existed in a high percentage of 82.5%. While in the researcher's results, the paragraph appeared to be existed at a low rate of 58.10%. The importance of this paragraph lies in the fact that, in the face of the disaster, the working group needs to use all its capabilities and capacities to cope with the disaster, thereby making it possible to invest the human and material resources and employ them to the best of their potential to face the disaster.

During the disaster, the working group works to take advantage of all the realities of the disaster to effectively control and manage the disaster. Therefore, in confronting the disaster, the team works to choose the best ways and means to cope with the disaster as it has facts about the reality of the disaster.

The results also differed with (al-Otaibi 2007) that the security commander in his administration has a familiarity with the regulations and rules. This is why he needs to act more, take many decisions and issue many directives that must be consistent with the regulations, rules and official regulations. Therefore, it must identify the powers and flexibility provided by the laws, regulations and official instructions. Then, it becomes necessary for the security commander to be fully aware of that.

#### 4.3.3 Factors affecting planning of disaster management before its occurrence in infrastructure management process in case of disasters (field three)

##### Test of hypothesis

Table (4.6) RII's and test values for factors affecting planning of disaster management before its occurrence in infrastructure management process in case of disasters

No.	Statement	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
1	The extended of preparedness plan for disaster suitable for Gaza Strip	2.51	0.93	50.29	-5.34	0.000*	13
2	Suggesting programmers of awareness, and knowledge for people about disaster management	2.61	0.93	52.19	-4.33	0.000*	6
3	Determining the kinds and rules of knowledge in the circle life of disaster management	2.55	0.94	51.05	-4.88	0.000*	10
4	The existence of early ultimatum and depopulation plans	2.41	0.87	48.19	6.93-	0.000*	14
5	Coordinating in preparation phase	2.66	0.86	53.14	-4.07	0.000*	1
6	The existence of authority able to manage the disasters locally	2.65	1.00	52.95	-3.61	0.000*	2
7	The existence of structural framework for the institutions to prepare and plan well for the disasters	2.52	0.87	50.48	-5.63	0.000*	11
8	Rehabilitation of human cadres to face disaster	2.63	0.86	52.57	-4.44	0.000*	3
9	The existence of a clear system for disaster management	2.52	0.96	50.48	-5.07	0.000*	12

No.	Statement	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
10	The existence of enough plans for disaster management and training how to implement them	2.59	0.93	51.81	-4.53	0.000*	8
11	Good aptness to deal well with the disasters	2.62	0.90	52.38	-4.32	0.000*	5
12	Contracting of courses, symposia and conferences about how to manage the disaster	2.63	0.91	52.57	-4.17	0.000*	4
13	Warnings arrives for the target category in a suitable time	2.60	0.91	52.00	-4.53	0.000*	7
14	Enough information about disasters and how to face them	2.59	0.95	51.81	-4.43	0.000*	9
	<b>All items</b>	2.58	0.63	51.56	-6.84	0.000*	

\*The mean is significantly different from 3 SD: Std. Deviation RII: Relative importance Index

**Hypothesis test:** From table 4.6, it is shown that there is a significant effect at 0.05 level of planning of disaster management before its occurrence in infrastructure management process in case of disasters.

**The null hypothesis (H0):** there is no significant positive effect at 0.05 level of Planning of disaster management before its occurrence in infrastructure management process in the case of disasters.

**The alternative hypothesis (H1):** there is significant positive effect at 0.05 level of Planning of disaster management before its occurrence in infrastructure management process in the case of disasters.

From Table (4.6), it is shown that “Coordinating in preparation phase” was ranked in the first position by the respondents under this field as a critical factor influencing of the factors affecting planning of disaster management before its occurrence in infrastructure management process in case of disasters with relative important index equals (53.14%), Test-value = -4.07, and P-value = 0.000 which is smaller than the level of significance.  $\alpha = 0.05$ , The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This result reflects the dissatisfaction of respondents regarding coordinating in preparation phase.

“The existence of authority able to manage the disasters locally” was ranked in the second position by the respondents under this field as a critical factor influencing the factors affecting planning of disaster management before its occurrence in infrastructure management process in case of disasters with relative important index equals (52.95%), Test-value = -3.61, and P-value = 0.000 which is smaller than the level of significance.  $\alpha = 0.05$ , The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This result reflects the dissatisfaction of respondents regarding the importance of existence of preparedness plan for disaster suitable for Gaza Strip.

“Coordinating in preparation phase” was ranked in the last position by the respondents under this field with relative important index equals (66.86%), Test-value = 4.07, and P-value = 0.000 which is smaller than the level of significance.  $\alpha = 0.05$ , the sign of the test is positive, so the mean of this factor is significantly greater than the hypothesized value. This result reflects the satisfaction of respondents regarding the existence of authority able to manage the disasters locally.

**Regarding the whole field of** “Factors affect planning of disaster management before its occurrence in infrastructure management process in case of disasters” it was ranked in the fifth position with relative important index equals (51.56%), Test-value = -6.84, and P-value = 0.000 which is smaller than the level of significance  $\alpha = 0.05$ . The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value (Table 4.6).

As indicated that the opinions of the sample members in all the paragraphs are negative as the relative weight is less than 60% for each of the paragraphs of the fifth axis, i.e., the individuals of the sample do not see any of the paragraphs achieved, existed and applied. Where there are a number of reasons that lead to the lack of advance planning, and can be referred to the most important in the following points:

1. Absence of large goals and aspirations
2. Lack of responsibility.
3. Lack of awareness of variables.
4. inward looking and inertia.
5. Misconceptions.
6. not to establish a budget to comply with them.

The study of (okuma, 2003) in the city of Kampala - Uganda showed the importance of planning for institutions in improving results, focus, guidance, problem solving, learning opportunity, road building, communication, marketing, avoidance and even overcoming current and future crises.

The researcher considers that one of the basic steps that all institutions must implement to be ready to face crises is to prepare a plan for emergency preparedness. The analysis showed that this paragraph is in the thirteenth order, meaning that there is no plan of preparedness. So that any institution in the event of a pre-disaster planning should take this paragraph into consideration.

Studies have shown that there are a number of constraints that prevent the use of early warning signals.

1. Denial of danger and denial of its existence.
2. the weakness of the attention of senior management to activate the role of the early warning system.
3. The high material costs of applying early warning system and lack of funding.
4. Weak attention to early warning and readiness for it as it relates to a default event in the future. In contrast, we tend to risk the optimistic assumption that the crisis and disaster will not happen in the foreseeable future
5. Misreading of early warning signals.
6. Early warning signals are delayed to the relevant agencies.
7. Use wrong indicators.
8. Using indicators give a superficial reading.

The findings agreed with (Mathpour's, 2007) that active participation in disaster management and preparation of preparedness and coordination plans between interested parties make bridge for the vulnerable populations to obtain the resources required at the time of the disaster.

Disaster preparedness can be defined as the process of empowering the population through the exchange of knowledge and information on the various types of disasters and their potential dangers as widely as possible in order to allow people to act appropriately when a disaster occurs. It can also be defined as the ability to anticipate and respond to disasters quickly and effectively in a good and coordinated manner.

Lack of disaster preparedness also increases the level of vulnerability to disasters and their adverse impact on local communities.

Some findings also agreed with (Metri, 2006) that providing an early warning system requires long-term plans and the early warning should be seen as a strategy to reduce effectively the growing vulnerability of infrastructure.

Kangabam (2012), said that preparedness plans are important for local communities to face the impact of the disaster from the initial stages.

According to (Mathbor, 2007) many victims could have been rescued recently if there were any kind of the preparedness plans in the affected areas.

Vicente, et al. (2014), noted that knowledge management has a role to prevent and reduce risks and to make local communities aware of the risks in order to develop their capacities.

The researcher also indicates to what (Newport and Jawahar, 2003) pointed out that the best way to warn the public about impending disasters is through the early warning protocols that use the media. They added that there are many communication tools available for warning such as SMS, email, television and the web service. Information and communication technology (ICT) is a key element in early warning. It plays an important role in communication in the occurrence of a disaster and the dissemination of information to competent authorities in response to disasters.

The findings of the researcher agreed with a local study (Jafar, 2017) that coordination between the crisis management team and other leaders related to the crisis is a necessary and important requirement to implement decisions as well as to prevent conflict of procedures and to ensure that work is carried out smoothly and easily as well as the possibility of exchanging resources.

Al Ghaliby (2007), in Amman-Jordan showed that the greater the managers' awareness and understanding of the planning process, the more positive their response will be to participate in the planning process and successful implementation of the required plan when it is implemented.

In contrast of the findings of the researcher, the results showed that there is no qualification for the necessary staffs to cope with the disaster.

A local study (Jafar, 2017) confirmed that the ability to predict of the future conditions surrounding of the target position is one of the challenges facing the planning process.

This is illustrated by the researcher's findings that there is no early warning system and evacuation plans.

Some studies have shown that delegating for a structural framework is extremely important in dealing with the crisis. Events may have to make decisive, appropriate and speedy decisions without waiting for the responsible person whose decisions fall under his responsibility. This prevents the interruption of work, wasting time and creating confusion.

The researcher felt through the results that there is no structural framework for the institutions in order to prepare and plan for disaster preparedness despite its importance and necessity.

It agreed with the results of the local study (Alan and Sadaka, 2011), where their results indicated that there is a significant effect of the practice of planning in reducing the risks which are associated with the investment decisions taken by companies in the industrial sector listed on Palestine Exchange.

The researcher compared his results with the findings of (Al-Sahli, 2011) in Riyadh in Saudi Arabia. His results showed the following:

1. The behaviours that reflect the high level of knowledge of civil defines officers of the dimensions of the strategic planning to reduce disaster damage in the Eastern Province is to rely on security forecasting when developing disaster management scenarios, making strategic disaster decisions in the view of the internal and external environment, and using an effective system for gathering information on potential future disasters.
2. Requirements that reflect the availability of strategic planning requirements necessary to reduce damage disasters from the point of view of civil defines officers in the Eastern Province are: creating a working group that specializes in disaster management, providing an operations room for disaster management and giving all authorities and powers to the disaster management team.
3. Significant constraints that limit the role of strategic planning in the face of disaster damage from the view of civil defines officers in the Eastern Province are very strong. They are: Lack of the financial resources to implement disaster response strategies and the absence of the necessary techniques to implement prevention containment and confrontation strategies, and restore control of the disaster, and the scarcity of qualified human resources to prepare strategies for prevention, containmet and confrontation.



His results matched with most of the researcher's findings.

This result agreed with the study of (Al-Hathali, 2007) which showed that the poor qualifying of heads and subordinates in Riyadh to face the emergency problem is one of the constraints of decision-making in emergency situations.

Al-Hathali (2007) agrees that disaster management knowledge and practice must be provided because some characteristics of the disaster are sudden occurrence, speed and sequence of events, lack of data and information and its conflict. Therefore, during disaster management the administrator needs to make his decisions sound and based on accurate information about the disaster. Then, one of the biggest obstacles faced by the administrator during the management of the disaster is the lack of accuracy and clarity of information related to the disaster. All this depends on the extent of knowledge and its application.

#### 4.3.4 Factors affect planning of disaster management after its occurrence in infrastructure management process in case of disasters (field four)

##### Test of hypothesis

Table (4.7) RII's and test values for factors affecting planning of disaster management after its occurrence in infrastructure management process in case of disasters

No.	Statement	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
1	The existence of programs about easing the dangers of the disasters	2.50	0.91	50.10	5.57-	0.000*	4
2	The existence of effective system between them to interfere during disasters at any time	2.59	0.83	51.81	5.07-	0.000*	3
3	The existence of a clear emergencical plan to answer during the disasters	2.64	0.86	52.76	4.33-	0.000*	1
4	Spreading of an accurate warning in a suitable time after the disaster occurrence	2.60	0.96	52.00	4.28-	0.000*	2
	<b>All items</b>	2.58	0.70	51.67	6.10-	0.000*	

\*The mean is significantly different from 3 SD: Std. Deviation RII: Relative importance Index

**Hypothesis test:** From table 4.7, it is shown that there is a significant effect at 0.05 level of planning of disaster management after its occurrence in infrastructure management process in case of disasters.

**The null hypothesis (H0):** there is no significant positive effect at 0.05 level of Planning of disaster management after its occurrence in infrastructure management process in the case of disasters.

**The alternative hypothesis (H1):** there is significant positive effect at 0.05 level of Planning of disaster management after its occurrence in infrastructure management process in the case of disasters.

From Table 4.7, it is shown that “The existence of a clear emergencical plan to answer during the disasters” was ranked in the first position by the respondents under this field as a critical factor influencing of the factors affecting planning of disaster management after its occurrence in infrastructure management process in case of disasters with relative important index equals (52.76%), Test-value = -4.33, and P-value = 0.000 which is smaller than the level of significance.  $\alpha = 0.05$ , The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This result reflects the dissatisfaction of respondents regarding the existence of a clear emergencies plan to answer during the disasters.

“Spreading of an accurate warning in a suitable time after the disaster occurrence” was ranked in the second position by the respondents under this field as a critical factor influencing the factors affecting planning of disaster management after its occurrence in infrastructure management process in case of disasters with relative important index equals (52.00%), Test-value = -4.28, and P-value = 0.000 which is smaller than the level of significance.  $\alpha = 0.05$ , The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This result reflects the dissatisfaction of respondents regarding spreading of an accurate warning in a suitable time after the disaster occurrence.

“The existence of programs about easing the dangers of the disasters” was ranked in the last position by the respondents under this field with relative important index equals (50.10%), Test-value = -5.57, and P-value = 0.000 which is smaller than the level of significance.  $\alpha = 0.05$ , the sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This result reflects the dissatisfaction

of respondents regarding the existence of programs about easing the dangers of the disasters.

**Regarding the whole field of** “Factors affect planning of disaster management after its occurrence in infrastructure management process in case of disasters” it was ranked in the sixth position with relative important index equals (51.67%), Test-value = -6.10, and P-value = 0.000 which is smaller than the level of significance  $\alpha= 0.05$ . The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value (Table 4.7).

The results show that the opinions of the sample members in all the paragraphs are negative as the relative weight is less than 60% for each paragraph of the sixth axis, i.e. there is little approval by the sample members.

Through studies and despite the different forms of crisis, there are some basic steps Assessment of the situation.

**A-** The first phase: Assessing the situation

- Verifying the magnitude of the crisis.
- Ensuring staff safety and meeting their needs.
- Conducting an inventory of the basic assets (data, physical facilities and operations).
- Forming a crisis management team.
- Reviewing the crisis response plan and reviewing and adjusting crisis response policies.
- Informing the staff of policies and procedures.
- Assessing the impact\_ regular examination of clients, micro-finance institutions and the environment.
- 8. Assessing the immediate cash flow situation and ensure adequate supply of financial liquidity to meet the needs of customers and institutions in the near future.
- Managing the financial liquidity in the organization and obtaining liquidity support when it is needed.
- Consider how micro-finance institutions can support relief efforts.

**B-** The second phase: Monitoring and Analysis:

- Monitoring and following up with customers.

- Designing product adjustments (such as rescheduling and refinancing and changing group-based lending methodology to individual-based lending)
- Introducing new products (such as emergency loans, leasing and grants).

#### C- The Third Phase: Focus on the medium term

- Examining the offers of crisis recovery products \_developing new products and markets as a part of comprehensive reconstruction efforts.
- Assessing the new market /Work environment and re-establish the strategic operational plan taking into account the new environment.
- Assessing the needs of the institution and identifying the necessary funding sources.

The findings agreed with an article on the European Commission website that Disaster Risk Reduction (DRR) programs are cost-effective and save aid funds. On average, every euro spent on risk reduction and preparedness activities provides four to seven euros to be spent on the response that is provided in the aftermath of the disasters.

Echo allocated about 16% of the humanitarian budget for disaster risk reduction activities and guidelines for disaster risk reduction policies have been developed. The plan of action of Hyogo agreement said that timely deployment of warnings and preparations would reduce the severity of the disaster.

Some findings have agreed (Shakale, 2016) to the lack of disaster risk reduction programs including structural activities that may require more time and pre-disaster preparation.

Aldabeek (2010) concluded that mitigation is the preparedness activities associated with sustainable development plans.

#### **4.3.5 The effect of Media in infrastructure management process in case of disasters (field five)**

Table (4.8) RII's and test values for the effect of Media in infrastructure management process in case of disasters

No.	Statement	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
1	Using the social communication for spreading early warning	2.61	1.09	52.19	-3.68	0.000*	8
2	Providing people with enough information that reducing false news	2.88	0.88	57.52	1.43-	0.155	5
3	Spreading of instructions for people to deal with the disaster results	2.90	0.92	57.90	1.17-	0.245	3
4	Preparing a high medial speech about disasters	2.90	0.95	57.90	1.13-	0.261	4
5	Showing the rules accurately and clearly without hiding any information	2.82	0.97	56.38	1.91-	0.058	7
6	The workers in the local press have enough experience about dealing with disasters	2.86	0.96	57.14	1.53-	0.128	6
7	The media press helps the relief organization to show the important needs	2.96	1.06	59.24	0.37-	0.715	2
8	Exaggeration of the disasters form the media press	3.03	0.99	60.57	0.30	0.767	1
	<b>All items</b>	2.87	0.76	57.36	1.79-	0.076	

\*The mean is significantly different from 3 SD: Std. Deviation RII: Relative importance Index

**Hypothesis test:** From table 4.8, it is shown that there is insignificant effect at 0.05 level of press in infrastructure management process in case of disasters.

### Test of hypothesis

**The null hypothesis (H0):** there is no significant positive effect at 0.05 level of press in infrastructure management process in the case of disasters.

**The alternative hypothesis (H1):** there is significant positive effect at 0.05 level of press in infrastructure management process in the case of disasters.

From Table (4.8), it is shown that “Exaggeration of the disasters form the media press” was ranked in the first position by the respondents under this field as a critical factor influencing of press in infrastructure management process in case of disasters with relative important index equals (60.57%), Test-value =0.30, and P-value = 0.767 which

is greater than the level of significance  $\alpha = 0.05$ , that means this statement not differ significantly from the degree of neutrality (mediation).

“The media press helps the relief organization to show the important needs” was ranked in the second position by the respondents under this field as a critical factor influencing of press in infrastructure management process in case of disasters with relative important index equals (59.24%), Test-value = -0.37, and P-value = 0.715 which is greater than the level of significance  $\alpha = 0.05$ , that means this statement not differ significantly from the degree of neutrality (mediation).

“Using the social communication for spreading early warning” was ranked in the last position by the respondents under this field with relative important index equals (52.19%), Test-value = -3.68, and P-value = 0.000 which is smaller than the level of significance.  $\alpha = 0.05$ , the sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This result reflects the dissatisfaction of respondents regarding using the social communication for spreading early warning.

**Regarding the whole field of** “The effect of press in infrastructure management process in case of disasters” it was ranked in the second position with relative important index equals (57.36%), Test-value = -1.79, and P-value = 0.076 which is greater than the level of significance  $\alpha = 0.05$ . that means this field not differ significantly from the degree of neutrality (mediation).

The researcher attributed the approval to the field of media by the respondents that the Palestinian society in general and the Gaza Strip in particular is the focus of the attention of the international community. Therefore, the spotlight on any change in all sectors, whether in its beginning or worsening may occur in the Gaza strip is the concern of all international and regional bodies through the media and its various agencies. The fact that these international communities especially regional and local in general is of great importance to the Palestinian government and to push the international community to see the Palestinian reality from the real and realistic lens of what is happening in the Gaza Strip. It is interested in putting all these bodies through their relief and supporting institutions in all possible ways and means, including the media. The role of the media reflects the tragic picture of the Palestinian society as the victim of the practices of the occupation and the siege, and thus to highlight the most important necessary needs to withstand against this dilemma and put the international community in front of its obligations towards the Palestinian nation. It is an essential means to

convey information and guidance to the Palestinian society which is subjected to repeated executions by the occupation.

Jason (2011), found that social media without purpose and content would do little to enable people to prepare, respond and recover from disasters. It showed that by harnessing the characteristics of social media tools, the ability to withstand the disaster can be greatly enhanced by creating new avenues of cooperation to help in building more resilient societies over time. For example, at the start of a crisis, crisis managers and respondents can access information from social networks and blogs to help identify the source and intensity of the crisis and distribute a coherent message to affected communities. Search links and other relevant resources are also marked and evaluated based on recommendations from people on bookmark sites, and crisis managers are more able to search and gather information and respond to ongoing developments in their direction.

Chan (2011), study also showed that social media tools can be used to enhance the ability of the community to predict and prepare for crises. For example, collaborative projects can be initiated on social networking platforms to enable communities which are interested in a rich database of content to analyze and validate information that can support opportunities for intervention during a crisis.

The results agreed with (Al-Dowaihi, 2004) study in Saudi Arabia, where it showed that the media has a very important role in mitigating crises and disasters with the importance of appointing an official spokesperson, maintaining confidentiality of information and raising morale, as well as the significant of planning in the media work and setting up media plans in the Ministry of Information and Civil Defense In Riyadh. The results of this study were agreed with a local study (Salama, 2013), where the results showed the importance of identifying an information management team and issuing it to the public and providing the necessary from it for all groups of society in government institutions in the West Bank – Palestine.

Al-Saud (2007), showed that the media outlets has a role in dealing with security crises and disseminating instructions to the public in order to deal with crises and prevent spreading rumours and lies. Also, it is keen to address and provide information carefully and in details. It also focused on the importance of coordination among the media outlets in Saudi Arabia.

He also agreed with (Abdelkader, 2014) in Egypt, where his study showed a widespread spread of rumours when dealing with crises. There is ambiguity in the roles of those involved in crisis management, with a centralized approach in issuing decisions to deal with them, and that the administration conceals the facts related to crises.

#### 4.3.6 The effect of evaluation of disaster management in infrastructure management process (field six)

Table (4.9) RII's and test values for the effect of evaluation of disaster management in infrastructure management process

No.	Statement	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
1	Evaluate the previous disaster affects and beneficial ness of it.	2.74	0.87	54.86	-3.04	0.003*	13
2	The ability to evaluate the disaster and expect what will be possible	2.82	0.91	56.38	-2.04	0.043*	12
3	Using the infrastructure in Gaza strip has a definite system of instructions	2.83	0.89	56.57	-1.97	0.052	11
4	International defaulting in treating the crisis	2.92	0.98	58.48	-0.80	0.426	6
5	Evaluating the strategies that local communities practice in managing the disasters	2.86	0.93	57.14	-1.57	0.120	10
6	Lack in the curriculums of teaching disaster management	3.15	1.06	63.05	1.47	0.145	3
7	Sharing of the guardians and community members in the evaluating process of weakness and dangers	2.63	0.95	52.57	-3.99	0.000*	15
8	Co-operation between governmental organizations, non-governmental organizations and local communities	2.74	0.98	54.86	-2.69	0.008*	14
9	Increasing of prices because of decreasing of materials and disaster occurrence	3.23	1.09	64.57	2.14	0.035*	2
10	Environmental effect affects the reconstructing	3.12	1.03	62.48	1.24	0.219	5
11	Many donors and many members in reconstructing	3.24	0.98	64.76	2.50	0.014*	1
12	Weakness of governmental organizations during the disasters	3.13	0.91	62.67	1.50	0.136	4
13	Instructions about dealing with the disaster	2.87	0.81	57.33	-1.69	0.094	9
14	The ability of contractors to deal with reconstructing	2.90	0.91	58.10	-1.07	0.289	7
15	Efficiency of the team's members in reconstruction	2.89	0.93	57.71	-1.26	0.212	8



No.	Statement	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
	All items	2.94	0.58	58.77	-1.09	0.277	

\*The mean is significantly different from 3 SD: Std. Deviation RII: Relative importance Index

**Hypothesis test:** From table 4.9, it is shown that there is insignificant positive effect at 0.05 level of evaluation of disaster management in infrastructure management process.

### Test of hypothesis

**The null hypothesis (H0):** there is no significant positive effect at 0.05 level of evaluation of disaster management in infrastructure management process.

**The alternative hypothesis (H1):** there is significant positive effect at 0.05 level of evaluation of disaster management in infrastructure management process.

From Table 4.9, it is shown that “Many donors and many members in reconstructing” was ranked in the first position by the respondents under this field as a critical factor influencing of evaluation of disaster management in infrastructure management process with relative important index equals (64.76%), Test-value =2.50, and P-value = 0.014 which is smaller than the level of significance.  $\alpha = 0.05$ , The sign of the test is positive, so the mean of this factor is significantly greater than the hypothesized value. This result reflects the satisfaction of respondents regarding that paragraph.

“Increasing of prices because of decreasing of materials and disaster occurrence” was ranked in the second position by the respondents under this field as a critical factor influencing of evaluation of disaster management in infrastructure management process with relative important index equals (64.57%), Test-value = 2.14, and P-value = 0.035, which is smaller than the level of significance.  $\alpha = 0.05$ , The sign of the test is positive, so the mean of this factor is significantly greater than the hypothesized value. This result reflects the satisfaction of respondents regarding increasing of prices because of decreasing of materials and disaster occurrence.

“Sharing of the guardians and community members in the evaluating process of weakness and dangers” was ranked in the last position by the respondents under this field with relative important index equals (52.57%), Test-value = -3.99, and P-value =

0.000 which is smaller than the level of significance.  $\alpha = 0.05$ , the sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This result reflects the dissatisfaction of respondents regarding Sharing of the guardians and community members in the evaluating process of weakness and dangers.

**Regarding the whole field of** “The effect of evaluation of disaster management in infrastructure management process” it was ranked in the first position with relative important index equals (58.77%), Test-value = -1.09, and P-value = 0.277 which is greater than the level of significance  $\alpha = 0.05$ . that means this field not differ significantly from the degree of neutrality (mediation).

The assessment factor obtained the highest relative weight among other factors and this shows the significance of this factor. The researcher believes that the reason for this is that the evaluation is formal and official status that reflects the strengths and weaknesses of the disaster management process, and is one of the most important management operations of all kinds.

#### **4.3.6.1 The Importance of the assessment:**

1. In raising the efficiency of the working group during the disaster.
2. The level of performance by raising the efficiency of the team and thus get better results in the management process.
3. Know the obstacles to work and what to avoid during the disaster.
4. Identify shortcoming in team performance and identify weaknesses in available possibilities.
5. Detect resources and potential that can assist the team in dealing with the disaster.

Assessment is considered the basis for making many decisions related to the life cycle of the disaster and identify the training needs that the team requires. The evaluation process can serve as a tool to provide the management with information on ways to reduce the occurrence of disasters.

A study conducted by the United Nations Center against Corruption (2014) in the Gaza Strip and the West Bank recommended that the professional competence of the Non-Governmental Organizations (NGOs) and the local level be strengthened to provide a better understanding of cooperation and coordination of emergency response. This strategy was adopted by (Ganor and Lavy, 2003) and recommended that local levels of

responsibility be strengthened and self-reliant, rather than waiting for outside assistance. Moreover, instead of the competition between the different organizations in a single society, those who provide better service or bring more assistance must be set aside and replaced by a spirit of cooperation and interdisciplinary work.

Lawther (2009), study has shown that the most important steps of the disaster management are the public participation. This participation forms the fundamental aspects of sustainability that includes the involvement of everyone in the management process, as well as creating a vision of what the society should be after reconstruction.

The community must adhere to this engagement and begin to design public participation in all phases of its reconstruction.

The study (Shakli, 2016) has shown that enabling communities to participate in reconstruction can provide an opportunity for community members to contribute their knowledge and skills to the process, which in turn will have a profound impact on their future lives. Community empowerment will become possible when affected communities participate actively in all phases of post-disaster reconstruction.

Sadiqi (2014), and (Ophiyandri, 2013) concluded that community empowerment and participation are critical to ensuring successful results, and effective consultation between communities and actors in the reconstruction process will lead to the formulation of an acceptable reconstruction process.

The results agreed with the study of (Lawther, 2009) that the unstable political conditions in the Palestinian territories represented by the siege and the closure policies of the crossing points on the economic conditions. They have overshadowed the inflation, high prices and the economic and social effects on the Palestinian citizen. And the imposition of the Israeli occupation siege on the Gaza Strip is a policy of continuous closures of the border crossings.

And the prevention of the entry of many consumer goods, building materials and construction and export prevention all contributed to the exacerbation of crises and led to high prices.

It agrees with the study of (Davidson, 2007) that the relationship between governmental and non-governmental entities in Syria is not good at all and varies from region to region and that the satisfaction rate is very low. About 67% of the organizations in the opposition areas consider that their relationship is bad or very bad with the controlling

parties, whether fighting factions or local councils, compared to 60% in the areas of self-government, 46% in government control areas and 51% outside Syria. With government agencies in Turkey, Iraq and Lebanon.

The results were approved by a local study (Jafar, 2017) "Applied Study:

"The lack of involvement of employees and members of society in the assessment is an obstacle to solving problems, and it reveals the strengths and weaknesses of the institution." He recommended that they should be involved and take their views because it contributes to alleviating the crisis

#### 4.3.7 The effect of supporting of disaster management in infrastructure management process (field seven)

Table (4.10) RII's and test values for the effect supporting of disaster management in infrastructure management process

No	Statement	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
1	The existence of a supporting fund for the activities of the disasters	2.55	0.99	51.05	-4.63	0.000*	5
2	The degree of the governmental services for people in managing the disaster	2.70	0.89	54.10	-3.41	0.001*	2
3	The community has resources for disasters	2.49	0.95	49.71	-5.54	0.000*	7
4	The ability to reach for the resources during the disaster	2.46	0.91	49.14	-6.12	0.000*	8
5	The existence of enough facilities for disaster management	2.36	0.88	47.24	-7.44	0.000*	13
6	The existence of equipment's and mechanisms to face the disaster	2.36	0.86	47.24	-7.64	0.000*	12
7	The degree of the arrival of the necessary support of resources	2.49	0.84	49.71	-6.24	0.000*	6
8	The extent of communication	2.60	0.87	52.00	-4.70	0.000*	4
9	The existence of enough money to securing the needed supplies in facing disasters	2.40	0.85	48.00	-7.23	0.000*	11
10	The existence of trained staff to face the disasters	2.42	0.81	48.38	-7.39	0.000*	9
11	Money is enough in the case of disasters	2.14	0.90	42.86	-9.72	0.000*	14
12	The attribution of data before, after and during the disaster	2.42	0.93	48.38	-6.42	0.000*	10

No .	Statement	Mean	SD	RII (%)	Test Value	P-value (Sig.)	Rank
13	The attribution of grants in the first phases of reconstruction programme	2.64	0.83	52.76	-4.45	0.000*	3
14	The ability of the donor to financing reconstruction projects	2.82	0.91	56.38	-2.04	0.043*	1
	<b>All items</b>	2.49	0.62	49.78	-8.39	0.000*	

\*The mean is significantly different from 3 SD: Std. Deviation RII: Relative importance Index

**Hypothesis test:** From table 4.10, it is shown that there is a significant effect at 0.05 level of supporting of disaster management in infrastructure management process.

### Test of hypothesis

**The null hypothesis (H0):** there is no significant positive effect at 0.05 level of Supporting of disaster management in infrastructure management process.

**The alternative hypothesis (H1):** there is significant positive effect at 0.05 level of supporting of disaster management in infrastructure management process.

From Table (4.10), it is shown that “The ability of the donor to financing reconstruction projects” was ranked in the first position by the respondents under this field as a critical factor influencing supporting of disaster management in infrastructure management process with relative important index equals (56.38%), Test-value = -2.04, and P-value = 0.043 which is smaller than the level of significance.  $\alpha = 0.05$ , The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This result reflects the dissatisfaction of respondents regarding the ability of the donor to financing reconstruction projects.

“The degree of the governmental services for people in managing the disaster” was ranked in the second position by the respondents under this field as a critical factor influencing supporting of disaster management in infrastructure management process with relative important index equals (54.10%), Test-value = -3.41, and P-value = 0.001, which is smaller than the level of significance.  $\alpha = 0.05$ , The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This

result reflects the dissatisfaction of respondents regarding the degree of the governmental services for people in managing the disaster.

“Money is enough in the case of disasters” was ranked in the last position by the respondents under this field with relative important index equals (42.86%), Test-value = -9.72, and P-value = 0.000 which is smaller than the level of significance.  $\alpha = 0.05$ , the sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value. This result reflects the dissatisfaction of respondents regarding the quantity of money in the case of disasters.

**Regarding the whole field of “The effect supporting of disaster management in infrastructure management process”** it was ranked in the seventh position with relative important index equals (49.78%), Test-value = -8.39, and P-value = 0.000 which is smaller than the level of significance  $\alpha = 0.05$ , which is smaller than the level of significance  $\alpha = 0.05$ . The sign of the test is negative, so the mean of this factor is significantly smaller than the hypothesized value (Table 4.10).

The results show that the seventh paragraph in table (4.3) obtained a relative average of 49.78%, p-value equals 0.000 and T-value = 8.39. This means that there is very little approval from the individuals of the sample.

The researcher thinks that the very few consents that the respondents showed to the seventh paragraph about the available support is due to the lack of financial resources that enable the concerned parties to carry out their duties perfectly. The current siege from the occupation, the Arabs and the foreign countries has contributed to the weakness of the financial resources which led to the inability to allocate funds and the modern equipment necessary for disaster management.

The researcher attributed the approval of the few respondents on the support axis to:

- a. The severe siege imposed on the Gaza Strip from several entities.
- b. The internal Palestinian division that harms the interests of the people in general and the Gaza Strip in particular.
- c. 3.The sensitivity of this aspect, especially the physical aspect of it, as it relates to money and material in kind that it creates a kind of concern among the workers in this area while preventing them from dealing flexibly with this file and it force them to increase administrative procedures for work.

Therefore, the researcher recommends the need to pay attention to this aspect as much as possible, especially that there are some things that can create alternatives of them even if there are no financial resources such as the development of plans ready for that. The results were agreed with (Barakat et al. 2009), showing that the extent of reconstruction depends on the availability of the local materials and funding, which is considered the success factor for post-disaster activities.

It also agreed with (Guo and Kapucu,2015) where they emphasized problems in China's current emergency management system, such as poor access to resources related to disaster response, such as shelters, etc.

The results of this study were agreed in this regard. The local study (Salama, 2013) showed the weak availability of equipment, tools and assistance in the face of disasters and adequate budgets for Palestinian government institutions in the West Bank.

It agreed to some extent with another local study (Lawther, 2009) on the partial-updating r equipment and supplies for disaster management as respondents disagreed about that. With the study of (Al-Ammar, 2003) on the availability of management information System and its importance in saving time, and that their proper use leads to timely and appropriate decisions by the directorate of Civil defence in Riyadh-Saudi Arabia.

The results of this study were not consistent with the study of (Renkli and Duran ,2015) which showed the availability of logistics planning and explained its importance in the disaster response process in Istanbul, Turkey.

(Curnin et al., 2015) showed an effective availability of communication in logistics support operations. The study emphasized the importance of this aspect in the Emergency Operations Center in Australia.

In the study of the Al Radee (2011), respondents showed an approval to a budget for dealing with crises and disasters, availability of operation rooms and the easy access to the required material and human resources. While their views were neutral about the availability of equipment and the necessary appointments and access to equipment in the civil defines in Gaza.

In the study of (Al Salem, 2008), it showed an important role for the availability of equipment and supplies to deal with disasters in the security services in Saudi Arabia.

The study of Al-Sheikh (2008) shows the provision of modern equipment and appliances to the departments. They are supported by professional staffs with an increase in the financial allocations for disaster management in the Royal Commission in Saudi Arabia.

### **B. Inferential Statistics:**

#### **Differences among respondents toward the management of infrastructure in the case of disaster in Gaza Strip**

This part was to analyse the differences among respondents toward the management of infrastructure in the case of disaster in Gaza Strip due to general information.

#### **4.4 There is a statistically significant difference at the level of $\alpha \leq 0.05$ about management of infrastructure in the case of disaster in Gaza Strip due to gender.**

To test the hypothesis, we use the Independent Samples Test and the result illustrated in table no. (4.11).

Table No. (4.11) Independent Samples Test for differences about management of infrastructure in the case of disaster in Gaza Strip due to gender.

Field	Test value	P-value (Sig.)	Means	
			Male	female
Discovering the crisis	0.263	0.793	2.65	2.71
Knowledge about managing the disasters	0.385	0.701	2.70	2.78
Planning of disaster management before its occurrence	0.996	0.322	2.55	2.72
Planning about how to manage the disaster after the occurrence	0.257	0.797	2.58	2.63
Press Rule in disaster management	1.719	0.089	2.81	3.16
Evaluation of disaster management	2.298	0.024*	2.88	3.24
Supporting of disaster management	0.075	0.940	2.49	2.50
All fields	1.209	0.229	2.67	2.84

Table (4.11) shows that the p-value (Sig.) is greater than 0.05 for each field and all the fields that means there is no significant difference among the respondents toward these fields due to gender. The result as shown in table (4.11) indicate that there are one group which have significant difference among the respondents, which the P-value (Sig.) is smaller than the level of significance  $\alpha = 0.05$  for field "Evaluation of disaster management"



The results indicate that the percentage of males constitutes 84.8% of the total study population and the proportion of females is 15.2%. The previous result indicates the diversity of the gender of the respondents with administrative and supervisory positions in their institutions which reflect the availability of the gender factor. It serves the objectives of the study.

#### 4.4.1 There is a statistically significant difference at the level of $\alpha \leq 0.05$ about management of infrastructure in the case of disaster in Gaza Strip due to age.

To test the hypothesis one-way ANOVA was used and the result illustrated in Table no. (4.12) which show that the p-value is greater than 0.05, that's means there is no significant difference at level of  $\alpha = 0.05$  among the respondents toward management of infrastructure in the case of disaster in Gaza Strip due to Age.

Table No. (4.12) One-way ANOVA test for differences toward management of infrastructure in the case of disaster in Gaza Strip due to age.

Field	Test value	P-value (Sig.)	Means			
			Less than 25	25 - Less than 35	35- Less than 50	More than 50
Discovering the crisis	0.034	0.992	2.60	2.67	2.65	2.67
Knowledge about managing the disasters	0.108	0.955	2.64	2.74	2.73	2.65
Planning of disaster management before its occurrence	0.584	0.627	2.73	2.54	2.64	2.41
Planning about how to manage the disaster after the occurrence	0.360	0.782	2.57	2.63	2.54	2.36
Press Rule in disaster management	2.122	0.102	2.85	2.99	2.71	2.32
Evaluation of disaster management	2.201	0.093	3.25	2.93	2.77	2.86
Supporting of disaster management	2.069	0.109	2.59	2.53	2.49	1.94
All fields	0.745	0.527	2.79	2.71	2.65	2.46

**4.4.2 There is a statistically significant difference at the level of  $\alpha \leq 0.05$  about management of infrastructure in the case of disaster in Gaza Strip due to educational level.**

To test the hypothesis, we use the Independent Samples Test and the result illustrated in table no. (4.13) shows that there is no significant difference among the respondents toward management of infrastructure in the case of disaster in Gaza Strip due to educational level.

Table No. (4.13) Independent Samples Test for differences about management of infrastructure in the case of disaster in Gaza Strip due to educational level.

Field	Test value	P-value (Sig.)	Mean	
			Bachelor's	Master's
Discovering the crisis	-1.203	0.232	2.71	2.48
Knowledge about managing the disasters	0.140	0.889	2.71	2.73
Planning of disaster management before its occurrence	-1.425	0.157	2.62	2.41
Planning about how to manage the disaster after the occurrence	-0.392	0.696	2.60	2.53
Press Rule in disaster management	-1.200	0.233	2.91	2.70
Evaluation of disaster management	-0.646	0.520	2.96	2.87
Supporting of disaster management	-0.148	0.883	2.49	2.47
All fields	-0.905	0.368	2.72	2.61

**4.4.3 There is a statistically significant difference at the level of  $\alpha \leq 0.05$  about management of infrastructure in the case of disaster in Gaza Strip due to specialization.**

To test the hypothesis, we use the one-way ANOVA and the result illustrated in Table no. (4.14) which show that the p-value is greater than 0.05, that's means there is no significant difference at level of  $\alpha = 0.05$  among the respondents toward management of infrastructure in the case of disaster in Gaza Strip due to specialization.

Table No. (4.14) One-way ANOVA test for differences toward management of infrastructure in the case of disaster in Gaza Strip due to specialization.

Field	Test value	P-value (Sig.)	Means			
			Civilian	Architectural	Electricity / Mechanical	Others
Discovering the crisis	1.220	0.306	2.56	2.62	2.92	2.93

Field	Test value	P-value (Sig.)	Means			
			Civilian	Architectural	Electricity / Mechanical	Others
Knowledge about managing the disasters	2.011	0.117	2.76	2.50	2.68	3.08
Planning of disaster management before its occurrence	1.316	0.273	2.57	2.41	2.71	2.82
Planning about how to manage the disaster after the occurrence	1.347	0.264	2.53	2.46	2.85	2.77
Press Rule in disaster management	0.383	0.766	2.92	2.73	2.90	2.87
Evaluation of disaster management	1.038	0.379	3.02	2.79	2.87	2.92
Supporting of disaster management	1.139	0.337	2.52	2.37	2.39	2.76
All fields	1.135	0.339	2.72	2.55	2.72	2.88

**4.4.4 There is a statistically significant difference at the level of  $\alpha \leq 0.05$  about management of infrastructure in the case of disaster in Gaza Strip due to governorate.**

To test the hypothesis, we use the one-way ANOVA and the result illustrated in Table no. (4.15) which show that the p-value is greater than 0.05, that's means there is no significant difference at level of  $\alpha = 0.05$  among the respondents toward management of infrastructure in the case of disaster in Gaza Strip due to governorate.

Table No. (4.15) One-way ANOVA test for differences toward management of infrastructure in the case of disaster in Gaza Strip due to governorate

Field	Test value	P-value (Sig.)	Means				
			The northern governorate	Gaza governorate	The middle governorate	Khanyounus governorate	Rafah governorate
Discovering the crisis	0.779	0.542	2.3	2.67	2.58	2.65	3.16
Knowledge about managing the disasters	0.848	0.498	2.85	2.62	2.69	2.7	3.22
Planning of disaster management before its occurrence	0.619	0.650	2.36	2.61	2.42	2.57	2.9

Field	Test value	P-value (Sig.)	Means				
			The northern governorate	Gaza governorate	The middle governorate	Khanyounus governorate	Rafah governorate
Planning about how to manage the disaster after the occurrence	1.418	0.233	2.5	2.74	2.19	2.54	2.95
Press Rule in disaster management	1.542	0.196	2.45	3.03	3.17	2.76	3.15
Evaluation of disaster management	0.895	0.470	3.10	2.93	3.15	2.87	3.21
Supporting of disaster management	1.911	0.114	2.47	2.55	2.87	2.37	2.88
All fields	0.916	0.458	2.62	2.73	2.79	2.64	3.06

**4.4.5 There is a statistically significant difference at the level of  $\alpha \leq 0.05$  about management of infrastructure in the case of disaster in Gaza Strip due to experience.**

To test the hypothesis, we use the one-way ANOVA and the result illustrated in Table no. (4.16) which show that the p-value is greater than 0.05, that's means there is no significant difference at level of  $\alpha = 0.05$  among the respondents toward management of infrastructure in the case of disaster in Gaza Strip due to experience.

Table No. (4.16) One-way ANOVA test for differences toward management of infrastructure in the case of disaster in Gaza Strip due to experience.

Field	Test value	P-value (Sig.)	Means		
			Less than 5	5 - Less than 10	More than 10
Discovering the crisis	0.636	0.531	2.77	2.56	2.70
Knowledge about managing the disasters	0.704	0.497	2.76	2.62	2.80
Planning of disaster management before its occurrence	0.291	0.748	2.59	2.52	2.63
Planning about how to manage the disaster after the occurrence	0.594	0.554	2.53	2.67	2.50
Press Rule in disaster management	1.601	0.207	2.84	3.00	2.70
Evaluation of disaster management	0.731	0.484	3.01	2.95	2.84
Supporting of disaster management	0.599	0.551	2.59	2.44	2.45

<b>All fields</b>	0.202	0.817	2.74	2.67	2.67
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**4.4.6 There is a statistically significant difference at the level of  $\alpha \leq 0.05$  about management of infrastructure in the case of disaster in Gaza Strip due to job title.**

To test the hypothesis, we use the one-way ANOVA and the result illustrated in Table no. (4.17) which show that the p-value is greater than 0.05, that's means there is no significant difference at level of  $\alpha = 0.05$  among the respondents toward management of infrastructure in the case of disaster in Gaza Strip due to job title.

Table No. (4.17) One-way ANOVA test for differences toward management of infrastructure in the case of disaster in Gaza Strip due to job title.

Field	Test value	P-value (Sig.)	Means			
			Supervising engineer	Designer Engineer	Project Manager	Other
Discovering the crisis	0.131	0.941	2.61	2.61	2.75	2.67
Knowledge about managing the disasters	0.521	0.669	2.61	2.86	2.76	2.69
Planning of disaster management before its occurrence	0.203	0.894	2.51	2.62	2.65	2.56
Planning about how to manage the disaster after the occurrence	0.338	0.798	2.47	2.61	2.55	2.64
Press Rule in disaster management	0.137	0.938	2.79	2.90	2.92	2.87
Evaluation of disaster management	1.082	0.360	2.87	3.07	2.76	2.98
Supporting of disaster management	0.804	0.495	2.32	2.53	2.52	2.55
<b>All fields</b>	<b>0.388</b>	<b>0.762</b>	<b>2.60</b>	<b>2.76</b>	<b>2.70</b>	<b>2.71</b>

**Chapter V**  
**Conclusions and Recommendations**

## Chapter 5: Conclusions and Recommendations

This chapter presents the overall conclusion and reflections towards the whole process of this research. It summarizes the key findings and main conclusions of the study. The study contribution in conducting the research are highlighted and it offers recommendations for future research.

### 5.1 Key findings related to the research objectives

In achieving the aim of the research, the first objective has been outlined and achieved through Literature review methods. The first objective of the research is to identify the factors affecting the management of infrastructure in case of disasters, Where the previous studies have shown seven factors that affect the management of infrastructure: discovering the disaster and prediction before they occur, knowledge about managing the disasters, planning of disaster management before its occurrence, planning about how to manage the disaster after the occurrence, media in disaster management, evaluation of disaster management , supporting in disaster management. The second research objective was related to the severity of each factor comprising the disaster management and its impact. The third objective of the research was to test the relationship between management of infrastructure system and the factors affecting the management of infrastructure in case of disasters

#### 5.1.1 Key findings related to objective one:

The researcher in this field through previous studies reached seven factors affecting the infrastructure:

Discovering the disaster, Knowledge about managing the disasters, Planning of disaster management before its occurrence, Planning about how to manage the disaster after the occurrence, Evaluation of disaster management, supporting in disaster management.

Early detection before a disaster, prearrangement and disaster preparedness reduce losses and help manage disaster better. While having knowledge about disaster management helps to reduce their risk by knowing each person what their role is and what they should do. Advance planning is so important that if it exists, it facilitates disaster management procedures to get the least losses. The media is of critical importance because it makes the public aware and direct them in the right direction and what steps should be taken. In terms of evaluation, through which the degree of

readiness and preparedness to cope with the disaster and gives a preview of the possibilities available and how to exploit them optimally. and the degree of support provided in the event of a disaster affects significantly, if the support is to buy the necessary equipment and mechanisms, as well as start the reconstruction process once the disaster.

### **5.1.2 Key findings related to objective two:**

The second objective of the research shows to explore the severity of each factor comprising the disaster management. Table 4.3 shows that the evaluation factor has the highest impact on infrastructure. This indicates the importance of evaluation, and it is necessary to evaluate the existing situation and know the existing possibilities in order to draw the plan as it exists. The media factor ranked second in terms of impact, which indicates its importance and role in the disaster management process in terms of awareness and advice. While the knowledge factor was in the third place, this indicates the need for prior knowledge in order to avoid the greatest possible losses from the disaster. The table showed that the factor of early detection of the disaster ranked fourth in terms of impact, this factor plays an important role and helps to prepare disaster to reduce the risk. The pre-disaster planning factor ranked fifth, and this does not affect the importance of planning as an important and necessary element in the life cycle of the disaster. For the planning factor after the disaster was ranked sixth, because it is based on solving the effects of the disaster and not to face them. As for the support factor, it was ranked seventh in terms of impact. Respondents were of the view that most of the support available was after the disaster as a result of the appeals from the authorities, and not before the disaster.

### **5.1.3 Key findings related to objective three:**

The objective was: To identify the reality of management of the infrastructure in case of disaster in the Gaza Strip. This research objective is related to the following hypotheses:

- ✓ H1: management of the infrastructure system is available in the first stage “Discovering the disaster”.
- ✓ H2: management of the infrastructure system is available in the second stage “Knowledge about managing the disasters”.



- ✓ H3: management of the infrastructure system is available in the third stage “Planning of disaster management before its occurrence”.
- ✓ H4: management of the infrastructure system is available in the fourth stage “Planning about how to manage the disaster after the occurrence”.
- ✓ H5: management of the infrastructure system is available in the fifth stage “Press Rule in disaster management”.
- ✓ H6: management of the infrastructure system is available in the sixth stage “Evaluation of disaster management”.
- ✓ H7: management of the infrastructure system is available in the seventh stage “supporting in disaster management”.
- ✓ H8: There is relationship, statistically significant at  $\alpha \leq 0.05$ , between the seven stages of management of the infrastructure system to each other.

The six main hypotheses tested through applying one sample t test, that was used to determine if the mean of the paragraph was significantly different from a hypothesized value 3 (Middle value of Likert scale). The findings of hypotheses are as follows:

At first (for H1), the results for all items of the availability of management of the infrastructure system in detecting Discovering the crisis phase shows that management of the infrastructure system is available in weak degree.

This stage is clear through actions being taken to reduce the causes of the crisis and minimize the risks, and it includes early warning sensor which foretells of impending crisis. Detecting early warning signs considers a problem, where managers receives many types of signals at the same time, and it is difficult for them to capture real and important signals. Also, it may be difficult to differentiate between signals to each crisis separately. Accordingly, this stage is one of the most difficult stages in management. Gaza Strip organizations have been exposed to several crises which repeated frequently, this helps managers to capture the most proper and important signals quickly in somewhat moderate level at this stage of management.

Also (for H2, H3, H4, H5, H7), the results for all statements of the availability of management of the infrastructure system in Knowledge about managing the disasters,

Planning of disaster management before its occurrence, Planning about how to manage the disaster after the occurrence, Media Rule in disaster management, supporting of disaster management shows that management of the infrastructure system is available in relatively weak degree.

Knowledge about managing the disasters stage includes the researcher concluded that there is no provision of various educational knowledge about crisis management. The cooperation among the members of the community was average. Also, there is no research and studies for disaster management. It has been shown that human resources were not used optimally in a mediocrelly way.

Planning of disaster management before its occurrence stage It showed that there was a lack of a disaster preparedness plan, as well as an early warning system and evacuation plans. There is also a shortage of courses and symposiums on the management of the disaster and there was a severe weakness in terms of pre-planning of the disaster.

Planning about how to manage the disaster after the occurrence stage, there was no warnings are issued at the right time, and disaster risk mitigation programs are not available.

Media Rule in disaster management stage Social media are misused to warn about disaster and that the magnitude of the disaster is exaggerated.

The results showed that the media helps relief organizations to highlight the needs, and it has been shown that the public is provided with the necessary information to reduce the spread of rumours, and that media professionals are experienced in the occurrence of a disaster.

Supporting of disaster management stage, it turned out that there is insufficient funding and Inadequate facilities in the occurrence of a disaster. Also, it has been shown that there is difficulty in reaching the resources during the disaster in addition to a particular vulnerability in machinery and equipment to face the disaster.

analysis results showed that Gaza Strip Companies include management of the infrastructure system in the six stages mentioned earlier, in relatively weak degree.

For H6 the results of the availability of evaluation disaster management shows that management of the infrastructure system is available in relatively middle degree.

It has been shown that there is multiple donors and multilateral parties in the reconstruction phase. Also, there is weakness in government institutions during the period of the disaster. The analyses showed that prices rise due to the shortage of materials and disaster occurrence. There is also a shortage of international bodies in dealing with the disaster when it occurs. Also, there is lack of participation of students, parents and members of society in the process of assessing the weakness of capacities. It also found that cooperation between governmental and non-governmental organizations is weak and needs to strengthen links and more communication.

On the other hand, H8 was about relationship between stages of management of the infrastructure system to each other. findings are as follows:

The researcher considers the personal variables such as (gender, age, specialization, the place of the residence, and the job title) had not effect on the effects to the responses of the respondents. The engineers who have the same age responded live in the same conditions. The geographical area where the respondents live is considered very small and there is an exchange of opinions.

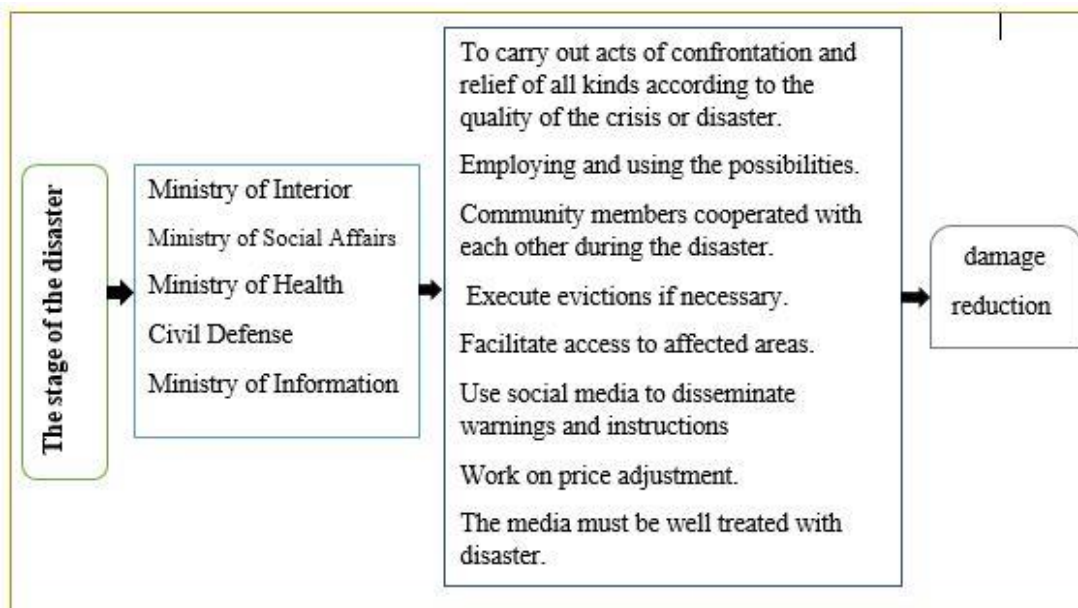
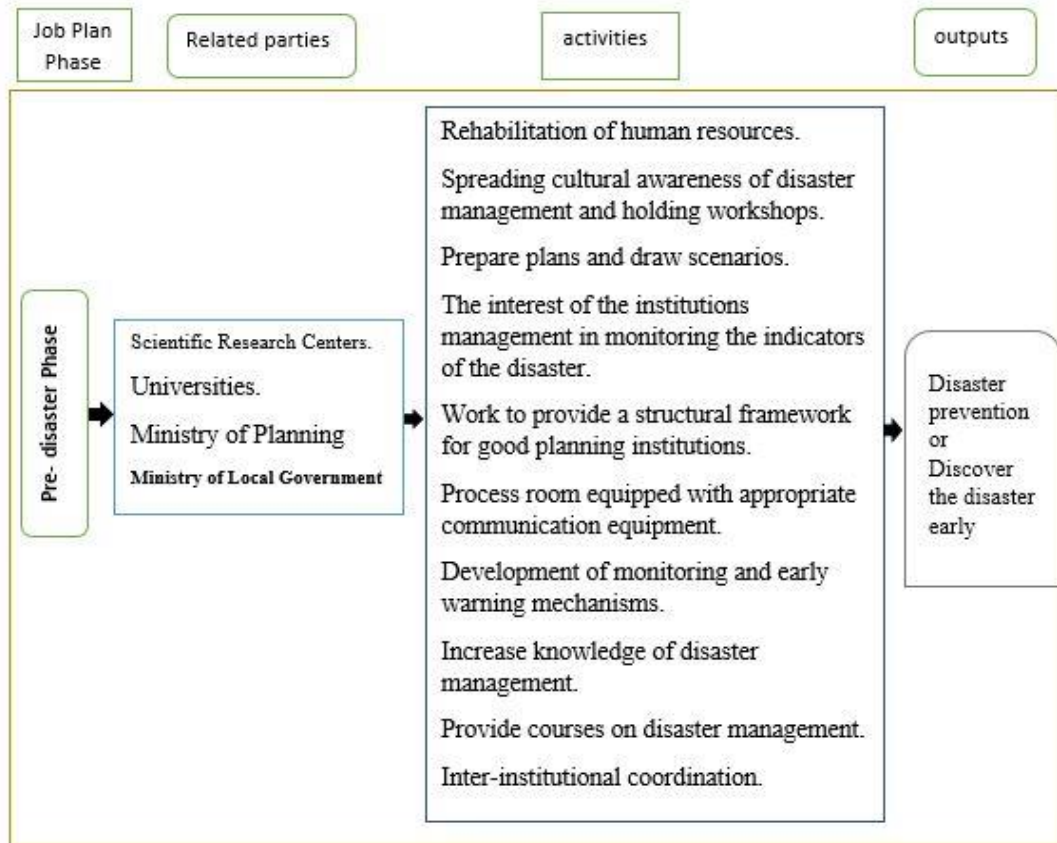
The researcher attributes that there are differences in the study level to the increase of the study level of the person that makes him more able to overcome difficulties. That means if the engineer joins training courses in the scope of his specialization.

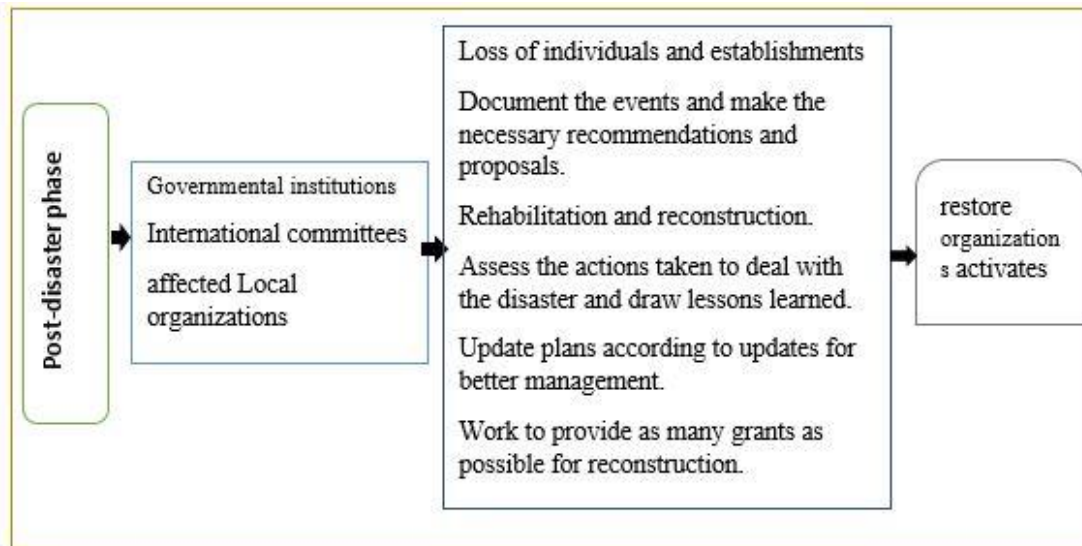
The researcher explains that the years of experience affects the methodology, the knowledge extent, the thinking method and the ability of planning.

## **5.2 Research Contributions**

Infrastructure management require commitments of considerable large resources and the application of models such as that developed in this research can be of help to for those working in disaster management in developing better understanding and appreciation of disaster.

A prototype decision support model has been developed. The presented framework contributes to Contribute to reducing and reducing the impact of the disaster.





### 5.3 Recommendations:

Based on the findings of this research that stated above and the information in the previous chapters of this study, a set of recommendations were drowning below as follows:

#### A. Recommendations at the state level

- Establishing a central unit for information and accurate data.
- The international community has to force Israel to fully end the siege and allow the full movement o of the persons and goods.
- Reinforcing the role of the NGOs.
- The necessity of compensation for the persons whose homes were damaged in the war.
- The government has to fully support the group of disasters to enable it to presume his roles.
- Increasing the level of community awareness among the people.
- The general institutions have to make strategic plans to the experienced and qualified employees.
- Opening new supportive channels.
- Supporting the role of media in the process of facing disasters.

#### B. Recommendations for the municipalities

- Qualifying the staff to work in the case of disasters.

- Contracting with special management of disasters to make the plans.

#### C. Recommendations for the planners

- The recovery plan should focus on the urgent needs and the long term developmental project.
- Listing the requirements of sustainability, whether before or after the crises or planning before the war or in the process of the reconstruction.
- The strategic plans have to include programs, political policies to manage the crises. The plan ought to be before the crisis not during it.

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appendix 1  
English Version of Questionnaire

The Islamic University Gaza  
Higher Education Deanship  
Faculty of Engineering  
Civil Engineering Dept.  
Infrastructure Engineering



Topic / fill in a questionnaire for the Master

The researcher studied about " **A framework of Disaster Management in Gaza Strip Infrastructure Projects**", to complement the requirements for obtaining a master's degree in infrastructure in the Islamic University of Gaza.

The researcher wishes that you help him by filling this questionnaire as accurately as possible.

Researcher:  
Omar Y. Sarsour

Section 1: Questions related to personal information.

1. Please indicate your gender

Male  Female

2. Indicate your age in years

Less than 25  25 - Less than 35  35- Less than 50  More than 50

3. Indicate your education level

Bachelors  Master  Upper

4. The Specialization

Civilian  architectural  Electricity / Mechanical  Others

5. In which governorate is your area located

Northern Governorate  Governorate of Gaza  Central Governorate  Governorate of Khan Younis  Governorate of Rafah

6. Indicate your level of experience (in years)

Less than 5  5 - Less than 10  More than 10

7. Type of organization you are currently working on

Governmental institution  International institution (non-governmental)  Consultant office  contracting company  Other

8. Fields of work of the institution you are currently working in (more than one option can be chosen)

Building  Methods  Water and sewer  Other

9. Current job title

Supervising engineer  Designer Engineer  Project Manager / Projects  Other

10. Resigning the company you are currently working on

first  seconds  third

11. Company experience

Less than 5  5 - Less than 10  More than 10

12. Company headquarters

Northern Governorate  Governorate of Gaza  Central Governorate  Governorate of Khan Younis  Governorate of Rafah

13. Number of projects last 5 years

One project  Two projects  Three projects  Four projects and more

14. Project size last 5 years in dollars  
 1 million     2 million     3 million     4 million     5 million and more

Item no.	Strategies	1	2	3	4	5
<b>Firstly: Discovering the crisis</b>						
1.	Is your institution has a special part, to monitor the indicants of crisis occurrence					
2.	The high administration cares about monitoring the crisis indicants					
3.	Scanning the institution environment in a general way to know the indicants of crisis occurrence					
4.	The institution cares about classification of the indicants of crisis occurrence					
5.	The institution cares about the training for the staff of collecting and analyzing of the indicants of crisis occurrence					
6.	A very well trained team analyses the indicants of the crisis occurrence					
<b>Secondly: Knowledge about managing the disasters</b>						
1.	The extent of previous, various, educational knowledge about managing the disasters					
2.	The extent of Special knowledge about managing the disasters and practicing it at Gaza strip					
3.	Co-operation between the members of the community during the disaster					
4.	The ability of employing the human and materialistic potentials and using them well					
5.	The possibility of arriving to some stricken areas					
6.	Knowledge of systems and formal instructions					
7.	The existence of researches and studies in the subject of disaster managing					
8.	Entrenching the knowledge of the causes and history of disasters in the educational institutions					
9.	System of documenting , archiving , lands ownership and historical landmarks					

Third: Planning of disaster management before its occurrence					
1.	The extnce of preparedness plan for disaster suitable for Gaza Strip				
2.	Suggesting programmers of awareness, and knowledge for people about disaster management				
3.	Determining the kinds and rules of knowledge in the circle life of disaster management				
4.	The existence of early ultimatum and depopulation plans				
5.	Coordinating in preparation phase				
6.	The existence of authority able to manage the disasters locally				
7.	The existence of structural framework for the institutions to prepare and plan well for the disasters				
8.	Rehabilitation of human cadres to face disaster				
9.	The existence of a clear system for disaster management				
10.	The existence of enough plans for disaster management and training how to implement them				
11.	Good aptness to deal well with the disasters				
12.	Contracting of courses, symposia and conferences about how to manage the disaster				
13.	Warnings arrives for the target category in a suitable time				
14.	Enough information about disasters and how to face them				
Fourth: Planning about how to manage the disaster after the occurrence					
1.	The existence of programmes about easing the dangers of the disasters				
2.	The existence of effective system between them to interfere during disasters at any time				
3.	The existence of a clear emergencical plan to answer during the disasters				

4.	Spreading of an accurate warning in asuitable time after the disaster occurrence					
5.	The existence of alternative plans to face the developments of the disaster and deal with the variables					
<b>Fifth: Press Rule in disaster management</b>						
1.	Using the social communication for spreading early warning					
2.	Providing people with enough information that reducing false news					
3.	Spreading of instructions for people to deal with the disaster results					
4.	Preparing a high medial speech about disasters					
5.	Showing the rules accurately and clearly without hiding any information					
6.	The workers in the local press have enough experience about dealing with disasters					
7.	The media press helps the relief organization to show the important needs					
8.	Exaggeration of the disasters form the media press					
<b>Sixth: Evaluation of disaster management</b>						
1.	Evaluate the previous disaster affects and beneficial ness of it.					
2.	The ability to evaluate the disaster and expect what will be possible					
3.	Using the understructure in Gaza strip has a definite system of instructions					
4.	International defaulting in treating the crisis					
5.	Evaluating the strategies that local communities practice in managing the disasters					
6.	Lack in the curriculums of teaching disaster management					

7.	Sharing of the guardians and community members in the evaluating process of weakness and dangers					
8.	Co-operation between governmental organizations, non-governmental organizations and local communities					
9.	Increasing of prices because of decreasing of materials and disaster occurrence					
10.	Environmental effect affects the reconstructing					
11.	Many donors and many members in reconstructing					
12.	Weakness of governmental organizations during the disasters					
13.	Instructions about dealing with the disaster					
14.	The ability of contractors to deal with reconstructing					
15.	Efficiency of the teams members in reconstruction					
Seventh: supporting in disaster management						
1.	The existence of a supporting fund for the activities of the disasters					
2.	The degree of the governmental services for people in managing the disaster					
3.	The community has resources for disasters					
4.	The ability to reach for the resources during the disaster					
5.	The existence of enough facilities for disaster management					
6.	The existence of equipment's and mechanisms to face the disaster					
7.	The degree of the arrival of the necessary support of resources					
8.	The extent of communication					
9.	The existence of enough money to securing the needed supplies in facing disasters					
10.	The existence of trained staff to face the disasters					

11.	Money is enough in the case of disasters					
12.	The attribution of data before, after and during the disaster					
13.	The attribution of grants in the first phases of reconstruction programme					
14.	The ability of the donor to financing reconstruction projects					



appendix 2  
Arabic Version of Questionnaire



الجامعة الإسلامية - غزة  
عمادة الدراسات العليا  
كلية الهندسة - إدارة البنية التحتية

الأخوات الكريمات / : \_\_\_\_\_ المحترمة

السلام عليكم ورحمة الله وبركاته

الموضوع / تعبئة استبيانته لرسالة ماجستير

يقوم الباحث بدراسة حول " إطار عمل لإدارة الكوارث في مشاريع البنية التحتية في قطاع غزة "، وذلك استكمالاً لمتطلبات الحصول على درجة الماجستير في البنية التحتية في الجامعة الإسلامية بغزة. أهداف الدراسة /

1. تحديد ودراسة التحديات التي تواجه البنية التحتية في مراحل إدارة الكوارث.
2. تحديد دور كل من الجهات ذات العلاقة لتنظيم وإدارة الكارثة.
3. تصميم نمط تنظيمي فعال للكارثة التي تؤثر على البنية التحتية عند حدوثها.

ولإيماننا العميق بأنكم الأكثر معرفة بالوضع القائم في المدينة ، وأنكم خير مصدر للوصول الى المعلومات المطلوبة ، يسر الباحث ان يضع بين ايديكم هذه الاستبانة لتعبئتها وكله أمل ان يجد التعاون المطلق من قبلكم .

يرجى قراءة فقرات الاستبانة المرفقة واختيار الاجابة التي تعكس الواقع الفعلي ، علما ان المعلومات التي ستعبأ من قبلكم ستعامل بسرية تامة ، ولن تستخدم إلا لأغراض البحث العلمي.

وتقبلوا فائق الاحترام والتقدير

إشراف/

أ.د. شفيق جندي

د. خالد الحلاق

الباحث/

عمر صرصور

الجزء الأول: الأسئلة المتعلقة بمعلومات عن يقوم بتعبئة الاستبيان  
1. نرجو تحديد الجنس

- ذكر  أنثى
2. تحديد العمر بالسنوات  أقل من 25  25- أقل 35  35- أقل من 50  50 فأكثر
3. تحديد المستوى التعليمي  بكالوريوس  ماجستير  دكتوراه
4. التخصص  مدني  معماري  كهرباء / ميكانيك  أخرى
5. المحافظة التي تتبع لها مدينتك؟  محافظة الشمال  محافظة غزة  محافظة الوسطى  محافظة خان يونس  محافظة رفح
6. الخبرة  أقل من 5 سنوات  من 5 إلى أقل من 10 سنوات  10 سنوات فأكثر
7. نوع المؤسسة التي تعملون بها حالياً  مؤسسة حكومية  مؤسسة دولية (غير حكومية)  مكتب استشاري  شركة مقاولات  أخرى
8. مجالات عمل المؤسسة التي تعملون بها حالياً (يمكن اختيار أكثر من خيار)  مباني  طرق  مياه ومجاري  أخرى
9. المسمى الوظيفي الحالي  مهندس إشراف  مهندس مصمم  مدير مشروع / مشاريع  أخرى
10. تصنيف الشركة التي تعملون بها حالياً  أولى  ثانية  ثالثة
11. خبرة الشركة  أقل من 5 سنوات  من 5 سنوات إلى أقل من 10 سنوات  10 سنوات فأكثر
12. مقر الشركة  محافظة الشمال  محافظة غزة  محافظة الوسطى  محافظة خان يونس  محافظة رفح
13. عدد المشاريع آخر 5 سنوات  مشروع واحد  مشروعين  ثلاثة مشاريع  أربعة مشاريع فأكثر
14. حجم المشاريع آخر 5 سنوات بالدولار  1 مليون  2 مليون  3 مليون  4 مليون  5 مليون فأكثر

الجزء الثاني: الأسئلة المتعلقة بموضوع الاستبيان وهي من 5 فقرات

كبيراً جداً	كبيراً	متوسطة	قليلة	قليلة جداً	الفقرة
5	4	3	2	1	
					<b>اكتشاف الأزمة</b>
					يتوفر لدى مؤسستكم قسم خاص، من مهامه رصد مؤشرات وقوع الأزمات
					تولي الإدارة العليا في المؤسسة اهتماماً ودعماً لرصد مؤشرات حدوث الأزمات
					يتم مسح بيئة عمل المؤسسة بصورة شاملة للتعرف على مؤشرات احتمال حدوث الأزمة
					تهتم إدارة المؤسسة بعمليات تصنيف وتبويب مؤشرات حدوث الأزمات.
					تهتم إدارة المؤسسة بالتدريب المستمر لطواقم جمع وتحليل مؤشرات حدوث الأزمات
					يتم تحليل مؤشرات حدوث الأزمة فريق مدرب ومؤهل للقيام بواجبه.
					<b>مدي المعرفة الموجودة عن إدارة الكوارث</b>
					مدي توفير معرفة تعليمية متنوعة مسبقة عن إدارة الكوارث
					مدي المعرفة الخاصة بإدارة الكوارث وممارستها علي مستوي قطاع غزة
					التعاون بين أفراد المجتمع أثناء حدوث الكارثة
					القدرة علي توظيف الإمكانيات البشرية والمادية واستخدامها الاستخدام الأمثل
					امكانية الوصول إلي بعض المناطق المنكوبة
					إمام الجهات المعنية بالأنظمة واللوائح والتعليمات الرسمية
					توفير البحوث والدراسات في موضوع إدارة الكوارث
					ترسيخ معرفة تاريخ وأسباب الكوارث في مؤسستكم
					نظام التوثيق والأرشفة وملكية الأراضي والمعالم التاريخية
					<b>: التخطيط المتعلق بإدارة الكوارث قبل وقوعها</b>
					توفير خطة تاهب للكوارث مناسبة لقطاع غزة
					اقتراح برامج التوعية والمعرفة والاعداد للجمهور بخصوص ادارة الكوارث
					تحديد ومعرفة أنواع وأدوار إدارة المعرفة في دورة حياة إدارة الكوارث
					توفير نظام إنذار مبكر و خطط اخلاء
					التنسيق بين الجهات المعنية في مرحلة الإعداد
					وجود سلطة لها علاقة في إدارة الكوارث علي مستوي المجتمع المحلي
					وجود الإطار الهيكلي للمؤسسات من أجل الإعداد والتخطيط للتأهب للكوارث المحتملة
					تأهيل الكوادر البشرية اللازمة لمواجهة وإدارة الكارثة
					إيجاد نظام أو تعليمات واضحة لإدارة الكوارث
					إيجاد الخطط الكافية والملائمة لإدارة الكوارث والتدريب علي تنفيذها
					الاستعداد الجيد للجهات المختصة المختلفة للتعامل مع الكوارث فور حدوثها
					عقد دورات وندوات ومؤتمرات متخصصة في مجال القيادة وإدارة الكوارث
					تصل التحذيرات للفئة المستهدفة في الوقت المناسب
					تأسيس قاعدة معلومات كافية عن الكوارث وأساليب مواجهتها
					<b>: التخطيط المتعلق بإدارة الكوارث بعد وقوعها</b>
					توفير برامج التخفيف من مخاطر الكوارث

					وجود تنظيم فعال بين الجهات ذات العلاقة للتدخل أثناء حدوث الكوارث في أي لحظة
					وجود خطة طوارئ واضحة للاستجابة أثناء الكوارث
					يتم نشر تحذيرات دقيقة وفي الوقت المناسب بعد وقوع الكارثة
					وجود خطط بديلة لمواجهة تطورات الكارثة والتعامل مع المتغيرات
سأ: دور الإعلام واستخدامه في إدارة الكوارث					
					استخدام التواصل الاجتماعي لنشر إشارات الإنذار المبكر
					تزويد الجماهير بالمعلومات الكاملة التي تحد من انتشار الشائعات والأخبار الكاذبة
					بث توجيهات ونشر تعليمات للجماهير بهدف التعامل مع نتائج الكوارث
					إعداد خطاب اعلامي علي مستوي عال أمنياً وإعلامياً حول الكوارث
					يتم الالتزام بعرض الحقائق بدقة ورفض مبدأ حجب المعلومات أو إخفائها
					يتسم العاملون بأجهزة الإعلام المحلية بالخبرة في التعامل مع الكوارث
					تساعد وسائل الإعلام منظمات الإغاثة والجمهور علي تسليط الضوء علي الاحتياجات اللازمة
					المبالغة في حجم الكارثة من قبل وسائل الإعلام
سأ: التقييم المستخدم في إدارة الكوارث					
					يتم تقييم آثار الكوارث السابقة والاستفادة منها
					القدرة علي تقييم الكارثة وتوقع الاحتمالات
					استخدام البنية التحتية في القطاع يتبع نظام محدد من التوجيه والتعليمات
					قصور من الجهات الدولية في معالجة الأزمة
					تقييم الاستراتيجيات التي تمارسها المجتمعات المحلية في إدارة الكوارث
					نقص بمناهج التعليم لتدريب علم إدارة الكارثة
					تسهيل مشاركة المتعلمين وأولياء الأمور وأفراد المجتمع في عملية تقييم ضعف القدرات والمخاطر المتعددة
					التعاون بين المنظمات الحكومية والغير حكومية والمجتمعات المحلية
					الأسعار ترتفع بسبب نقص المواد ووقوع الكارثة
					الأثر البيئي يأتري في إعادة الإعمار
					تعدد الجهات المانحة وتعدد الأطراف في برنامج إعادة الإعمار
					ضعف المؤسسات الحكومية خلال فترة الكارثة
					الإرشادات الموجهة للتعامل مع الكارثة
					قدرة المقاولين علي التعامل مع إعادة الإعمار
					كفاءة أعضاء الفرق والهيئات المشاركة بإعادة الإعمار
سأ: مدى الدعم المتوفر في إدارة الكوارث					
					توفير صندوق دعم سريع للاستجابة لأنشطة الكوارث
					درجة الخدمات الحكومية المقدمة للناس فيما يخص ادارة الكارثة
					المجتمع يوجد لديه موارد من أجل التحضير والتأهب للكوارث المحتملة
					مدى القدرة للوصول للموارد أثناء حدوث الكارثة
					يوجد مرافق خدمتية كافية لإدارة الكوارث أثناء حدوثها
					وجود الآليات والمعدات والأجهزة المخصصة لمواجهة الكارثة

					درجة وصول الدعم اللازم من الموارد المادية والبشرية
					مدي الاتصال وإيصال المعلومات إلي الأطراف المعنية
					وجود مخصصات مالية لتأمين المستلزمات المطلوبة من مواجهة الكارثة
					وجود طاقم بشري مدرب وخبير وكافي لمواجهة الكوارث
					التمويل كافي في حالة الكارثة
					نسبة وجود البيانات قبل وبعد وأثناء الكارثة
					نسبة المنح في المراحل الأولى من برنامج الإعمار
					قدرة الجهات المانحة لتمويل مشاريع إعادة الإعمار

appendix 3

Tables about Spearman correlation coefficient of factors influencing

Table No. (A-1)  
Spearman correlation coefficient of factors influencing discovering the crisis

No.	Statements	Spearman Correlation Coefficient	p-value (Sig.)
1.	Is your institution has a special part, to monitor the indicants of crisis occurrence	0.839	0.000*
2.	The high administration cares about monitoring the crisis indicants	0.824	0.000*
3.	Scanning the institution environment in a general way to know the indicants of crisis occurrence	0.816	0.000*
4.	The institution cares about classification of the indicants of crisis occurrence	0.814	0.000*
5.	The institution cares about the training for the staff of collecting and analyzing of the indicants of crisis occurrence	0.814	0.000*
6.	A very well trained team analyses the indicants of the crisis occurrence	0.806	0.000*

\*Correlation is significant at the 0.05 level

Table No. (A-2)

Spearman correlation coefficient of factors influencing Knowledge about managing the disasters

No.	Statements	Spearman Correlation Coefficient	p-value (Sig.)
1.	The extent of previous, various, educational knowledge about managing the disasters	0.705	0.000*
2.	The extent of Special knowledge about managing the disasters and practicing it at Gaza strip	0.769	0.000*
3.	Co-operation between the members of the community during the disaster	0.746	0.000*
4.	The ability of employing the human and materialistic potentials and using them well	0.694	0.000*
5.	The possibility of arriving to some stricken areas	0.706	0.000*
6.	Knowledge of systems and formal instructions	0.686	0.000*
7.	The existence of researches and studies in the subject of disaster managing	0.663	0.000*
8.	Entrenching the knowledge of the causes and history of disasters in the educational institutions	0.755	0.000*
9.	System of documenting , archiving , lands ownership and historical landmarks	0.684	0.000*

\*Correlation is significant at the 0.05 level

Table No. (A-3)

Spearman correlation coefficient of factors influencing Planning of disaster management before its occurrence



No.	Statements	Spearman Correlation Coefficient	p-value (Sig.)
1.	The extended of preparedness plan for disaster suitable for Gaza Strip	0.629	0.000*
2.	Suggesting programmers of awareness, and knowledge for people about disaster management	0.677	0.000*
3.	Determining the kinds and rules of knowledge in the circle life of disaster management	0.709	0.000*
4.	The existence of early ultimatum and depopulation plans	0.666	0.000*
5.	Coordinating in preparation phase	0.687	0.000*
6.	The existence of authority able to manage the disasters locally	0.560	0.000*
7.	The existence of structural framework for the institutions to prepare and plan well for the disasters	0.626	0.000*
8.	Rehabilitation of human cadres to face disaster	0.677	0.000*
9.	The existence of a clear system for disaster management	0.674	0.000*
10.	The existence of enough plans for disaster management and training how to implement them	0.761	0.000*
11.	Good aptness to deal well with the disasters	0.723	0.000*
12.	Contracting of courses, symposia and conferences about how to manage the disaster	0.629	0.000*
13.	Warnings arrives for the target category in a suitable time	0.685	0.000*
14.	Enough information about disasters and how to face them	0.689	0.000*

\*Correlation is significant at the 0.05 level

Table No. (A-4)  
Spearman correlation coefficient of factors influencing planning about how to manage the disaster after the occurrence

No.	Statements	Spearman Correlation Coefficient	p-value (Sig.)
1.	The existence of programs about easing the dangers of the disasters	0.712	0.000*
2.	The existence of effective system between them to interfere during disasters at any time	0.797	0.000*
3.	The existence of a clear emergencical plan to answer during the disasters	0.812	0.000*
4.	Spreading of an accurate warning in a suitable time after the disaster occurrence	0.763	0.000*

\*Correlation is significant at the 0.05 level

Table No. (A-5)  
Spearman correlation coefficient of factors influencing Media Rule in disaster management

No.	Statements	Spearman Correlation Coefficient	p-value (Sig.)
1.	Using the social communication for spreading early warning	0.751	0.000*
2.	Providing people with enough information that reducing false news	0.817	0.000*
3.	Spreading of instructions for people to deal with the disaster results	0.827	0.000*
4.	Preparing a high medial speech about disasters	0.776	0.000*
5.	Showing the rules accurately and clearly without hiding any information	0.764	0.000*
6.	The workers in the local press have enough experience about dealing with disasters	0.744	0.000*
7.	The media press helps the relief organization to show the important needs	0.756	0.000*
8.	Exaggeration of the disasters form the media press	0.582	0.000*

\*Correlation is significant at the 0.05 level

Table No. (A-6)  
Spearman correlation coefficient of factors influencing evaluation of disaster management

No.	Statements	Spearman Correlation Coefficient	p-value (Sig.)
1.	Evaluate the previous disaster affects and beneficial ness of it.	0.588	0.000*
2.	The ability to evaluate the disaster and expect what will be possible	0.628	0.000*
3.	Using the infrastructure in Gaza strip has a definite system of instructions	0.533	0.000*
4.	International defaulting in treating the crisis	0.494	0.000*
5.	Evaluating the strategies that local communities practice in managing the disasters	0.676	0.000*
6.	Lack in the curriculums of teaching disaster management	0.587	0.000*
7.	Sharing of the guardians and community members in the evaluating process of weakness and dangers	0.535	0.000*
8.	Co-operation between governmental organizations, non-governmental organizations and local communities	0.631	0.000*
9.	Increasing of prices because of decreasing of materials and disaster occurrence	0.614	0.000*
10.	Environmental effect affects the reconstructing	0.697	0.000*
11.	Many donors and many members in reconstructing	0.618	0.000*
12.	Weakness of governmental organizations during the disasters	0.432	0.000*
13.	Instructions about dealing with the disaster	0.537	0.000*
14.	The ability of contractors to deal with reconstructing	0.537	0.000*
15.	Efficiency of the teams members in reconstruction	0.519	0.000*

\*Correlation is significant at the 0.05 level

Table No. (A-7)  
Spearman correlation coefficient of factors influencing supporting of disaster management

No.	Statements	Spearman Correlation Coefficient	p-value (Sig.)
1.	The existence of a supporting fund for the activities of the disasters	0.688	0.000*
2.	The degree of the governmental services for people in managing the disaster	0.699	0.000*
3.	The community has resources for disasters	0.758	0.000*
4.	The ability to reach for the resources during the disaster	0.741	0.000*
5.	The existence of enough facilities for disaster management	0.661	0.000*
6.	The existence of equipment's and mechanisms to face the disaster	0.642	0.000*
7.	The degree of the arrival of the necessary support of resources	0.720	0.000*
8.	The extent of communication	0.686	0.000*
9.	The existence of enough money to securing the needed supplies in facing disasters	0.775	0.000*
10.	The existence of trained staff to face the disasters	0.654	0.000*
11.	Money is enough in the case of disasters	0.728	0.000*
12.	The attribution of data before, after and during the disaster	0.748	0.000*
13.	The attribution of grants in the first phases of reconstruction programme	0.607	0.000*
14.	The ability of the donor to financing reconstruction projects	0.482	0.000*

\*Correlation is significant at the 0.05 level

Table No. (A-8)  
Spearman correlation coefficient of each field and the whole of questionnaire

No.	Field	Spearman Correlation Coefficient	p-value (Sig.)
.1	Discovering the crisis	0.760	0.000*
.2	Knowledge about managing the disasters	0.780	0.000*
.3	Planning of disaster management before its occurrence	0.861	0.000*
.4	Planning about how to manage the disaster after the occurrence	0.709	0.000*
.5	Press Rule in disaster management	0.677	0.000*
.6	Evaluation of disaster management	0.602	0.000*
.7	Supporting of disaster management	0.802	0.000*

\*Correlation is significant at the 0.05 level

Table (A-9)  
Cronbach's Alpha for each field of the questionnaire

No.	Field	Cronbach's Alpha
.1	Discovering the crisis	0.901
.2	Knowledge about managing the disasters	0.877
.3	Planning of disaster management before its occurrence	0.915
.4	Planning about how to manage the disaster after the occurrence	0.795
.5	Press Rule in disaster management	0.903
.6	Evaluation of disaster management	0.877
.7	Supporting of disaster management	0.921
	All paragraphs of the questionnaire	0.967

Thereby, it can be said that the researcher proved that the questionnaire was valid, reliable, and ready for distribution for the population sample.