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Assessment of the Palestinian Stone & Marble Industry in Terms of Quality Management & Safety Management Systems

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DEDICATION

To my Mother

ACKNOWLEDGEMENT

First of all, I have readily acknowledged and give thanks to Al Mighty God, the Omnipotent and Omniscient who created everything and in giving me the ability to begin and complete this project.

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God bless you all.

إقرار

أنا الموقع أدناه، مقدم الرسالة التي تحمل عنوان:

تحسين صناعة الرخام والحجر في فلسطين باستخدام نظم الجودة والسلامة

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أقر بأن ما اشتملت عليه هذه الرسالة هي نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيثما ورد، وإن هذه الرسالة ككل، أو أي جزء منها لم يقدم من قبل لنيل أية درجة أو لقب علمي أو بحثي لدى أية مؤسسة تعليمية أو بحثية أخرى.

Declaration

The work provided in this thesis, unless otherwise referenced, is the research's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's Name:	**Nour Ahmad Hussain**	اسم الطالب:
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Abstract

There has been a belief among economists and others that natural resources are a blessing which means that countries richly endowed with natural resources have an advantage over countries that are not. Palestine is rich with natural stone, but the stone industry in Palestine declined in recent years.

This research aims at studying the requirement for improving the Palestinian stone and marble industry by employing quality assurance and safety management systems, then introducing necessary recommendations to improve such reality. Accordingly, improving workers' performance.

To carry out the research, the researcher adopted the analytical descriptive method depending on the questionnaire as a main instrument to collect data related to research. In addition, interviews were made for managers and workers. The population of the research consisted of all workers in cutting stone facilities in the West Bank. To carry out the research, a randomly chosen sample of 365 workers and 242 manager were selected.

Results of the research showed that the majority of marble and stone facilities face common problems that affect the efficiency of their work, there is ignorance among workers and managers to the concept of TQM and SMS, there is weakness in the application of occupational health and safety standards, there are some internal and external constrain which prevent the application of TQM and SMS within the cutting stone facilities. The study also showed that marble and stone facilities in Hebron and Bethlehem are more numerous and larger in size, they are even more advanced technology with a large production capacity and labor force.

Among the most important recommendations reached by a researcher are: the need to educate employees and managers about the importance of application and activation of TQM and SMS in cutting stone facilities, preparation and implementation of education programs and intensive training about SMS and TQM to all levels in cutting stone facilities. In addition to the points with application of rules and laws related to SMS and TQM in cutting stone facilities in Palestine.

Chapter One

Introduction

1.1. The nature of cutting stone industry:

Mosques, cathedrals, churches and monuments have stood for centuries in Palestine as evidence of the strength, durability and timelessness of Holy Land marble and stone. The Palestinian marble and stone industry helped to protect and to reserve the country's history. Historically, the stone and marble industry has tended to consist of family run enterprises, the ownership of which was passed down through hereditary lines. Recently, this sector still comprised mainly of family owned businesses with minimal direct foreign investment (USM studies, 2005).

Stone and Marble industry in Palestine is considered one of the conventional and historic industries. Researches were in agreement with the fact that Palestine is one of those countries in which raw material for construction stone is available at quantities, and distinguished for its type, quality and multicolor. Nationally, it contributes approximately 25% to Palestine’s overall industrial revenue, 4.5% to the Gross National Product (GNP) and 5.5% to the Gross Domestic Product (GDP).

The Palestinian marble and stone derive its unique commercial value from four key characteristics:

1. Holy land origin that creates spiritual and symbolic imagery.

2. The variety of colors and textures of the products.

3. Exceptional quality.

4. Availability of raw stone as the main raw material for the manufacture of stone in Palestine, in commercial quantities and sizes allow for the stone and marble factories for producing various types.

Stones and marble enterprises in the Palestinian territories could be classified into three categories:

1. Stone and marble facilities:

According to new data from the PFI, there are about 652 stone facilities scattered in the West Bank and distributed according to the following areas:

Table (1): Distribution of cutting stone facilities in Palestine

Hebron	Bethlehem	Ramallah	Nablus	Jenin	Tulkarm	Qalqilya	Salfit
200	210	55	86	78	8	8	7

These factories are shaping and processing raw materials and turn them into products ready or half-ready, using the latest machinery and technology, which varies in size and productivity according to different geographical areas. Machines of large size are available in Bethlehem and Hebron while the smaller size in the northern West Bank. The most important machines used are (Alqatr, sickle, Filaqh, Alfrish, lines clear...).

The most important products is (panels, tiles, stone masonry, trims) (Wisam, 2012). Factories need relatively high capital to set up in some areas the factories comes on clusters forms, sparse, random and individually in other places (PFI studies, 2006).

2. Quarries:

Quarry is anywhere work takes place in order to extract stones (PLC, 1999), which sources provide raw materials stones classified by quality and color, are in the hills mountains, and where taking off and cut rough stones that are manufactured and refined in stone factories that are often near (USM studies, 2005). The estimated number of quarries in West Bank is about 300 quarries, spread from the north to the south of the West Bank, and heavily concentrated in Hebron, which is of strategic reserves of crude stone, especially in the mountains) Seir, Senate, Bani Na'im, Yatta, smelt.

3. Workshops:

Workshops are small facilities of stone and marble industry that contain simple machines (Wisam, 2012).

The annual growth rate of the stone and marble industry worldwide is currently estimated at 9% per year. The total monetary value of the annual Palestinian stone sales is estimated to $440 million, where 71% of the annual revenue comes from exporting to Israel, approximately 4% comes from exporting to international markets and the rest comes from

domestic markets (namely, East Jerusalem, the West Bank and Gaza Strip). It is worth mentioning that a high percentage of the exported goods to Israel are re-exported by Israelis to the International market (USM studies, 2009).

1.2. Problem Statement:

The stone industry represented by quarries and cutting is considered one of the main industrial sectors in Palestine. Unfortunately, the majority of owners and managers of such stone cutting plants do not use modern managerial practices in their production activities. The sector is characterized of its family business nature and heritage, so more emphasis on educating and training of both administrative staff and management is needed. Management information systems and computer applications are also needed (USMs studies, 2009). Estimated number of workers in the industry of stone and marble is about 20,000 workers, working at various levels, administrative, technical and unskilled workers, in addition to a few thousand working indirectly in transportation, maintenance, and other activities (PCBS Data, 2009).This sector suffers from lack of strategic planners, marketing experts, safety managers in addition to the low capacity of workers in this sector, lack of necessary personal protective equipments for workers, poor internal organizational systems and the lack of skilled labor, which reflects negatively on the performance of the sector as a whole (PCBS Data – 2009). Two of the most important aspects that are missing in such industry are quality assurance and safety management

systems. Safety and quality performance are interlinked as they are indirect measures of the attention to detail. A business with a high rate of safety incidents is unlikely to be consistently producing high quality goods or services. Quality basically is to ensure we can meet the specification within tolerable limit. Safety is quite the same. They share the same approach in analysis and "fault" finding as well as improvement. Both safety and quality indicator basically shows your management capability and commitment into meeting specs and manages risks. Quality systems that guarantee the consistency of process and the continuous development to productivity and quality levels are what the companies need to introduce, such systems include international certification such as ISO 9000:2000. Currently, the total number of certified companies is 9 companies, a number that represent a low percentage of the total production facilities (USM studies, 2005).

PMSI made a SWOT analysis for stone and marble industry according to survey results illustrated hereinafter is suffering from weaknesses that needs to be tackled. Some of the weaknesses are at the management level (lack of strategic planning expertise on firm level, lack of middle management expertise, use of Information technology is limited…) and technical level (lack of proper maintenance systems, lack of production management capacity …). According to the threats: lack of proper infrastructure to support the industry, lack of regulation and policy frame work to support the industry. In the results of the survey they found

that 24.9% of facilities have bought new and modern machinery depending on previous knowledge and use of these machinery, while 11.6% relied of advice from colleagues in the same business or similar facilities, 14.5% of them made their decisions upon a visit they made to international exhibitions. On other hand, 61.8% of the facilities prefer to employee administrators in their work places. Consequently, upon inquiring about the quality control system inn facility, results have indicated that 49.7% have such a system in the facility (PFI studies, 2009). According to the strengths: Palestine is very rich in stone and marble deposits in; there are 400 quarries, 652 cutting stone facilities and 1500 workshops which shows the existence of a well operating industry, this is very important for the sustainability of the industry, a variety of Textures and Color of the Palestinian stone, ranging from golden yellow to pastels such as cream and beige are in high demand across the world. The suitability of Holy Land stone for various architectural uses and applications is determined by the product's physical properties and chemical composition which has been tested in well known laboratories. According to the Opportunities: The Palestinian marble brands have good reputation internationally, in terms of land, it is “guess-estimated” that there are approximately 20,000 donums of quarrying area of which more than half is believed to be in Area C.

1.3. Research Questions:

1. Do the top management in stone cutting facilities understand the concept of Safety Management?

2. What are the views of workers about the reality of industrial safety within stone cutting facilities?

3. What are the views of workers about the working conditions that affect both positively and negatively on the performance of stone cutting facilities?

4. What are the views of workers about the industrial safety factors that affect their performance in stone cutting facilities?

5. What are the obstacles in the application of safety systems in stone cutting facilities?

6. Do the top management in stone cutting facilities understand the concept of Total Quality Management?

7. What are the challenges and obstacles facing TQM application in stone cutting facilities?

1.4. Research Objectives:

The main objective of this research is to inspect and analyze the use of quality assurance and safety systems in stone cutting industry in Palestine through:

1) Performing a deep analysis of the stone cutting industrial sector to assess the sectors' current situation, legislations, competitors,

contribution to the Palestinian economy and their difficulties and problems.

2) Studying and assessing the level of implementation for quality control/ quality management systems and international standards such as ISO9001, inside cutting stone plants.

3) Evaluating the current practices in stone cutting sector: the use of the safety management, accident rates, legislation and insurance requirements.

4) Making comprehensive recommendations and suggestions that will improve the stone cutting facilities to in the area of quality and safety.

1.5. Research hypotheses:

In view of the abovementioned questions, the research examines the following hypothesis:

The first hypothesis testify the availability of safety and health factors in the cutting stone facilities according to the district. Safety and health factors (location of facilities and internal style, availability of safety factors in the machinery and equipment used in the work, the role of the administration in the promotion and application of the concept of security and public safety). The one way analysis of variance was used to testify this hypothesis

The null hypothesis:

" There are no statistical significant differences at $\alpha \leq 0.05$ in the availability of safety and health factors in the facility according to the district."

The second hypothesis testifies whether there is significant differences in the application of TQM in cutting stone facilities according to the district**,** TQM factors taken are (senior management commitment to quality, customer satisfaction, continuous improvement, operational procedures, marketing, promotion, competition, using examinations and tests and obstacles facing application of quality). The one-way analysis of variance was used to testify this hypothesis.

The null hypothesis:

"There are no statistical significant differences at $\alpha \leq 0.05$ in the application of TQM in cutting stone facilities according to the district**.**"

The third hypothesis testifies whether there is significant differences in the application of TQM in cutting stone facilities according to the year of facility establishment. The one-way analysis of variance was used to testify this hypothesis.

The null hypothesis:

"There are no statistical significant differences at $\alpha \leq 0.05$ in the application of TQM in cutting stone facilities according to the year of establishment."

The fourth hypothesis testifies whether there is significant differences in the application of TQM in cutting stone facilities according to the number of employees. The one way analysis of variance was used to testify this hypothesis.

The null hypothesis:

There are no statistical significant differences $\alpha \leq 0.05$ in the application of TQM in cutting stone facilities according to the number of employees.

The fifth hypothesis testifies whether there is significant differences in the application of TQM in cutting stone facilities according to quality certificates. The one way analysis of variance was used to testify this hypothesis.

The null hypothesis:

There are no statistical significant differences $\alpha \leq 0.05$ in the application of TQM in cutting stone facilities according to quality certificates.

1.6. Research Limitations:

This thesis is restricted by the following items:

1. The lack of research and previous studies concerned with safety systems and stone cutting industry especially on the local level.
2. The inability of the researcher to obtain previous studies, searching on TQM and SMS in cutting stone sector.

3. Researcher didn't study the economic and legal dimensions.

4. Spread of the sample in distant geographical issues.

1.7 Thesis Outline:

The thesis is formed of five chapters. The introductory chapter, which outlines the nature of the study, and presents an overview about the situation of stone cutting industry in Palestine. Chapter two reviews the related literature of TQM and safety management systems in stone cutting industry. Chapter three outlines the methodology followed in the study. Chapter four discusses data gathering and analysis issues. Finally, Chapter five presents the study conclusions and recommendations.

Chapter Two

Literature Review

2.1. Introduction:

This chapter provides an overview of the Palestinian stone and marble industry in general, followed by the general overview of concepts of safety system and occupational health, their objectives and importance, workplace accidents, injuries and occupational diseases, and health conditions in workplace, followed by the general overview of concepts of quality and total quality management, their importance, principles and dimensions, and ISO 9000.

2.2. The Palestinian Stone and Marble Industry:

The stone and marble industry is a highly competitive industry in the global market. The world stone industry has expanded since the early 1990s with production growing by over 7% per year, such a long lasting tendency is linked to the natural global development of the building industry parallel to the increase of the world population, however, it is currently still in a cyclical downturn(PMS studies, 2011). The sector has the capacity to manufacture up to 35 million square meters annually; actually it operates only at a capacity of about 30% of its total capacity, i.e. 12 million square meters annually. The sector needs to be better informed about the advancements in tools and other needed accessories for

production. Maintenance is another problem affecting the continuity of operations (PFI studies, 2009).

It is essential that Palestinian companies should invest in improving their stone and marble industries in order to produce high quality products to compete in the global markets. More specifically, producers have no alternative, but to improve their productivity, efficiency, and quality in order to penetrate more global markets and gain international excellence and reputation. However, the capability of Palestinian heavy industries to manufacture and install high-end cutting equipments or processing lines of stone and marble is currently very limited.

Product quality requires significant investment in equipment, efficient management systems, and serious interests in investing in those technologies in order to achieve more returns. High precision cutting equipment, for example, is needed for the cut to size, thin tiles, slabs and customized products that are sold in the global market higher standards than are required for the Israeli market for which the invested capital in local factories has been principally designed to serve(PMS studies, 2005).

Despite the importance of the stone industry in Palestine, we do not have clear standards and specifications' systems to control and assess quality of its diverse products in the stone industry sector. Nevertheless, there are many local institutes which try to address and regulate the main issues of quality assurance, safety and health in stone industry. Specifically,

Palestine Standards Institution (PSI), Union of Stone and Marble in Palestine (USM), Palestinian Federation of Industries (PFI) and Palestinian Civil Defense (PCD) are among many of those institutes. However, these institutes lack the systematic methodology of developing and improving the quality assurance, safety and health management in the local stone industry. (USM studies, 2000).

2.2.1. Productivity:

Annual productivity of the worker in the industrial sector in the Palestinian Territory (excluding East Jerusalem) was $11,064.9, while annual compensation per worker (wages and salaries) in this sector was $2,732.9 during 2005. Within the industrial sector, annual productivity in non-metallic products was $11,834 compared to $10,540.2 in food and beverages and $17,169.6 in mining and quarrying. At the same time, construction had $15,076 annual productivity per worker compared to $5920.3 in internal trade.

2.2.2. Local Market:

According to USM, statistics indicates that around 25% of the Palestinian stones and marble production is consumed in the local market (23% in the West Bank and 2% in Gaza Strip), while the Palestinian National Economy Ministry indicates that 50% of the production is consumed locally (48% in the West Bank and 2% in the Gaza Strip). Those ratios are quit significant due to two reasons:

1. The use of local stones is compulsory by law.

2. The prices of some kinds of stones are relatively economical.

2.2.3. Export Market Destination:

Historians are in agreement that the commercial mining of stone for export has taken place in Palestine for centuries, serving the construction needs of neighboring nations. Nowadays, the Palestinian Marble and stones export markets can be classified as follows:

2.2.3.1. Israeli Market:

Israeli market is considered as the most significant market for the Palestinian marble and stones. 71% of the Palestinian marble and stone production is exported to Israel where a significant portion of this percentage is re-exported by Israelis to the international markets. Before the eruption of the Intifada in the year 2000, the Palestinian marble and stones cutting factories used to sell their products directly to the Israeli companies and contractors. Now, however, the Israelis buy the Palestinian marble and stones product through middle distributors.

2.2.3.2. The Middle East Market:

The Middle East region as a whole is a strong growing market. This market is geographically close to Palestine and is supported by business and personal relationships, as distribution systems are already developed through Middle-Eastern countries. Until recently, Jordan and the Arab

countries' markets were major importers of the West Bank limestone. However, this share has declined due to the difficulties on export and the high cost of transportation across borders, which is conducted via old and limited number of trucks.

2.2.3.3. International market:

The United States is a large, highly competitive market, with marble produced domestically as well as being imported from the entire world, including nearby Mexico. Europe is another good market. However, Palestinian marble exported to this market competes with similar materials from Italy, Portugal, France and Spain. Nevertheless, there is still potential for the export of rough blocks such as golden and gold-beige marble, which are not otherwise available in Europe. Other areas are Asia and the Pacific Rim.

2.2.4. Industry problems and needs:

Although this sector is the biggest in the whole industry, it faces many complex problems. The sector is characterized by its family business nature and heritage, so more emphasis on educating and training of both workers and top management is needed. Management information systems and computer applications are also needed.

Transportation problems are encountered especially with those products sold in the Israeli market. Redesigning and restructuring work inside the firms will enhance their productivity and reduce operation costs.

Linking the industry to relevant stakeholders; academic institutions, professional associations and the like will enhance its strength.

This industry is represented by a well-organized federation that still needs further capacity building to serve better its membership (USM studies, 2009).

2.2.5. Competitive advantage:

The competitive capacity of Palestine's stone and marble varies based on the market to which it supplies its products. For example, competitive capacity in the local market is different from that in the other primary markets including Israel, Jordan, and some other international markets and also from the secondary markets including Europe and China (Trade Corridors' Facilitation Project, 2009). Due to the uniqueness of the product and labor intensity, it is very competitive in the local market when it comes to the building stone. However, in other uses of stone, such as decorative uses, the Italian suppliers pose a competitive threat to the Palestinian firms. In the Israeli market, pricing is often determined by the buyer because of the large volumes of product sourcing. However there is increasing competition from Turkey in this market. Jordan not only provides a strong market for Palestinian stones, it also can be a strategic partner as a location for storage and as a gateway to the international market. Other international markets, both primary and secondary, are

offering export opportunities to the Palestinian cluster, but not without stiff competition from suppliers from other parts of the world.

Palestine's most prominent competitors are developing countries with vast reserves of raw materials, access to advanced technology, and large skilled and low paid workforce resulting in aggressively low pricing. The principal competitive threats come from China, Turkey, India, Egypt, Brazil and Iran. Other significant competitive pressures come from countries whose product is internationally recognized as being of high quality because of their industries' sophistication in terms of technology, work force experience and tradition and well established infrastructure. These countries include Italy, Spain, Portugal, and Greece (USM studies, 2009).

China:

China has turned into a natural stone giant with rapid development, particularly in the last five years. Chinese contribution to the development of stone sector in the world continues to get bigger. During the last years, the most important market parameters highlighted rises extremely higher than average, with special reference to the export of raw and processed materials as well as for technologies. China is playing a more and more leading role on the international stone scene, and its expansion, first of all toward the nearby and receptive markets of Japan and South Korea, is backed by two thousand exporting companies.

Italy:

In 2012 Italy exported stone for a value of 1,810,421,274 Euros for a total of 4,178,259 tons, recording an increase of +9,8% in value and +4,17% in quantity compared to 2011.

Industry performance shows the distinctive features of a long established mature business with high efficiency, superior products quality and state-of-the-art technology solutions, which are associated with high operating costs, decreasing investments and elevated selling prices.

The industrial texture of the Italian stone sector is characterized by a large number of small to medium enterprises with a very articulated presence on the entire territory. Due to the long tradition and excellence of professionalism, this industry express a remarkable socio-economical incidence in the country, employing about one per cent of the total national industrial workforce, a figure much higher than in anywhere else in Europe.

In all the Italian stone business is a consolidated sector composed of a solid industrial infrastructure reinforced by a number of market advantages:

- Existence of rich and commercially renown stone deposits
- Long industrial experience and know-how
- Leadership in R&D and innovation
- Product quality and service reliability (Raimondo Ciccu, 2005)

Turkey:

Trade statistics of Turkey´s natural stone industry, being highly exported, help to understand the dynamism of the markets for stone all over the world.

In the last decade, Turkey, with its vast resources of natural stone geographically spread all over the country, and the rapid development of its industry both in quarrying and in processing, has become a reliable "thermometer" of the state of the industry. Its trade statistics not only serve to measure the development of its industry, being a highly exported oriented industry with diversified markets, they also help to improve understanding of the dynamism of different markets for stone all over the world. (Caglayan, 2012)

2.3. Safety systems:

2.3.1. Definition of Safety systems:

Safety is defined as freedom from those conditions that can cause death, injury, occupational illness, damage or loss of equipment or property, or damage to the environment. safety system are defined as application of engineering and management principles, criteria and techniques to achieve acceptable mishap risk, within the constraints of operational effectiveness and suitability, time and cost, throughout all phases of the system life cycle. (MIL-STD-882C, 1993).

Safety management system (SMS) is an integrated system used to manage all aspects of safety throughout an organization. It provides a systematic way to identify hazards and control risks while maintaining assurance that these risk controls are effective. SMS has been defined as:

*"*A businesslike approach to safety. It is a systematic, explicit and comprehensive process for managing safety risks. As with all management systems, a safety management system provides for goal setting, planning, and measuring performance. A safety management system is woven into the fabric of an organization. It becomes part of the culture, the way people do their jobs."(Ibrahim, 2012)

A safe system of work is derived from a risk assessment being carried out to determine the hazards and the risks arising from them. All reasonably practicable steps must be taken to eliminate risks. The next step is to control the remaining risks by substitution with safer alternatives, reducing the quantities involved and by implementing control measure. Checking the effectiveness of control measures by regular audit and inspection, and providing adequate supervision, instruction and training would also be essential.

2.3.2. Definition of Occupational Health:

Occupational health should aim at: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from

health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize, the adaptation of work to man and of each man to his job.

Occupational Safety aims to get into production without accidents and injuries through:

Protection of individuals:

Protection from the risks:

1. Remove the danger of the work area.

2- Minimize the risk if it is not removed.

3- Provide personal protective equipment.

Provide vocational proper atmosphere:

Terms of lighting, humidity and temperature comfortable to work, even if these things are not exceeding the limit which can be considered a risk to the worker and facility.

Protection of Establishment:

Including machinery and material risks can occur through:

1. The proper technical planning for prevention bases in facilities.

2. Legislation stemming from the need to implement the planned technical.

3. Implementation based on proper scientific foundations at construction operations. (Campbell, 2008)

2.3.3. Objectives of Occupational Safety and Health:

Occupational safety and health focus on reducing work-related assaults, by applying a set of procedures and precautions:

1. Maintaining the safety and health of the workforce and visitors to the institutions, facilities and neighboring.

2. Conservation of raw materials and manufactured products.

3. Maintaining the machinery, equipment and buildings.

4. Improving the working environment and provide a safe working environment free from risk.

5. Increasing production and reducing costs and expenses caused by work injuries, accidents and occupational diseases.

6. Increasing preventive awareness among the workforce and society in general. (Tadesse, 2006)

To achieve the objectives of industrial security at the facility the following must be achieved:

1. Study the best way of performance of each of the acts, to put each worker in the appropriate place.

2. Study the machines risks and prepare suitable means of prevention.

3. Design of the facility and organize it in a way that helps to achieve the objectives of occupational safety and health.

4. Organize of statistical studies to determine the causes of accidents, whether being reported or recorded. (Falih, 1977)

2.3.4. The importance of occupational safety and health:

Work plays a central role in people's lives, since most workers spend at least eight hours a day in the workplace, work environments should be safe and healthy. Yet this is not the case for many workers. Every day workers are faced with a multitude of health hazards, such as: dusts, gases, noise, vibration and extreme temperatures. Diseases and other health concerns affect on workers ability to effectively perform the job duties, so it is important for employers to take the necessary steps to protect employees from the health and safety concerns.

The importance of occupational safety and health can be summarized in the following:

1. Reduce work costs: the proper management of the work environment voids the organization a lot of the problems of occupational accidents and diseases, such incidents which cost the organization a

lot of material and moral costs included compensation paid to employees or their families after them, as well as downtime.

2. Provide a healthy work environment and low risk, management is responsible for providing the right place and the risk-free which is leading to danger of the employees during their work, his responsibility has become increasingly in light of technological development particularly in industrial organizations, so administrations is working to minimize the psychological effects of industrial accidents and diseases.

3. Provide appropriate work system, through the provision of protective equipment and using of statutory records about any injury or accidents and diseases.

4. Strengthen the humanitarian relationship between management and workers: good management of occupational safety and health create good reputation of the organization. (Abbas, 2003)

2.3.5. Training in industrial safety:

Training in industrial security is one of the most important topics that need further attention and study, where the industrialized world is suffering at present from a lack of quantitative and qualitative cadre specialized in occupational health and safety, to have an effective training the must determine its objectives, principles and its components.

2.3.6. Responsibility for Occupational Health and Safety;

The responsibility for achieving the occupational Health and Safety upon parties within the facility and outside the facility are as follows:

1. Responsibility within the facility:

The responsibility for safety within the facility is on several parties, mainly top management, workers, industrial security committees and officials of the maintenance department.

1.1 Responsibility of top management

The response of top management to implement the requirements of the security depend on their understanding for the dimensions of the problem in the facility, and how much the security and safety provide an increase in production or reduce losses. Responsibility of top management can be summarized in:

- Full ensure to free workplace from obvious risks that may cause injury or death of the worker.
- Worker training on machines and how to improve their performance, and avoid getting in accidents.
- Provide workers by personal protective equipments, and emphasize on thier use.

- Ensure the application of the laws of Occupational Health and Safety.
- Keep records of workplace injuries and work-related accidents.
- Commitment to medical examination of the employees.

1.2 Responsibility of workers:

Includes the following:

- Attention and focus during the performance of work.
- Don't take decisions according to work without knowing the consequences.
- Abide by the rules and instructions for occupational health and safety.
- Inform the officials or supervisors for hazardous working conditions.
- Inform supervisors about the injuries and illnesses that occur relating to work.

1.3 Responsibility of industrial security committees:

Responsibility of industrial security committees is summarized in:

- Analysis of all operations carried out by the organization, put the instructions and guidance on the best ways of working, and how to use machines and equipments.

- Train workers on the proper working modes, and the supervision and control of the implementation of methods.
- Discuss workplace injuries and put precautions to prevent their occurrence.
- Discuss serious accidents and put precautions to prevent their occurrence.
- Discuss the emergence of occupational diseases and to develop precautions to prevent their occurrence.
- Cooperation in the implementation of laws and legislations related to Occupational Safety and Health.

1.4 Responsibility of Maintenance Department

The responsibility of the maintenance department are as follows:

- Participate in the committees of occupational safety of the facility.
- Prepare maintenance plans for equipment, machinery and implementation.
- Make inspection programs according to the Occupational Safety periodically.

2. Responsibility outside the facility:

The government is considered the most important external party holding responsibility towards Occupational Safety and Health in industries, Its responsibility can be summarized in the following:

- Legislation: the enactment of laws and regulations related to occupational safety.
- Inspection: processing control teams to implement and enforce legislation.
- Training: Provide technical staff is able to work efficiently in occupational safety in various facilities.
- Insurance: Insurance, medical care and rehabilitation for the injured, and to ensure their income and the income of their families. (Sonia, 2013)

2.3.7. Risks:

Risk defined as "Uncertainty concerning the occurrence of a loss", Workplace risk is "Conditions that may lead to accidents including injuries, or malfunction in the machinery, and equipment in construction or destruction or loss of material, in every workplace there are always risks, safety cannot be achieved, but knowing these dangers and take the necessary preventive measures to remove them". (Rejda, 2002)

2.3.7.1 Types of occupational risks:

Physical risks: the natural factors that infect employees of certain diseases, including:

2.3.7.1.1. Noise: Noise is a health hazard in many industries. The effects of noise are of two types:

(i) Auditory effects - which consist of temporary or permanent hearing loss

(ii) Non-auditory effects – which consist of nervousness, fatigue, interference with communication by speech, decreased efficiency and annoyance.

The degree of injury from exposure to noise depends upon a number of factors such as intensity and frequency range, duration of exposure and individual susceptibility.

Where the allowable limit for noise is 85 dB, but if the sound level reached 90 dB this lead to occupational deafness. (Ridley, 2003)

2.3.7.1.2. Light: The workers may be exposed to the risk of poor illumination or excessive brightness. The acute effects of poor illumination are eye strain, headache, eye pain, lachrymator, congestion around the cornea and eye fatigue. The chronic effects on health include “miners' nystagmus”. Exposure to excessive brightness or “glare” is associated with discomfort, annoyance and visual fatigue. Intense direct glare may also result in blurring of vision and lead to accidents. There should be sufficient and suitable lighting, natural or artificial, wherever persons are working.

The improvement in lighting one of the factors leading to increased production and reduce errors and accidents, and good lighting enables the group to see all workplace tools of machinery and raw materials and this helps to reduce the rate of injuries.

2.3.7.1.3. Dust: Air contains impurities and materials stuck from the original is its components, or that the original components are highly concentrated, which makes them harmful to human beings, and the surrounding environment.

2.3.7.1.4. Electricity: Caused by the passage of electric current in the human body in bringing about the effects of gravity depends on the current path, intensity and duration during which remains the injured under the influence of the current, and the resulting minor burns were caused by the passage of the current in the topical cause paralysis or death.

2.3.7.1.5. Humidity: It is known that the best relative humidity suitable for the human body is located between (40%-50%), humidity less than 30% doesn't fit the human body and hampered his performance. High humidity in the work environment lead to feeling tired, fatigue and the inability to do the job properly.

2.3.7.1.6. Manual and automatic transportation: Represents the material handling activity in any production process and includes the transfer of material handling operations to and from the production departments, operation and services in the industrial facility, the process of

transportation, either manually or automatically and is the correct rules for manual handling, including the following: Knowing the weight of things and its nature, Take the standby mode for the body and then constipation loads in balance, maintain the back straight and bend the knee when lifting and Use personal protective equipment such as safety shoes and paws.

2.3.8. Workplace accidents:

The industrial world today is suffering from high rate of accidents and human and material losses associated with it. According to the International Labor Organization (ILO), more than 337 million accidents happen on the job each year, resulting, together with occupational diseases, in more than 2.3 million deaths annually, Where reports of the social security corporation of employment injury in 2012 shows that there is workplace accident every 32 minutes, with rate of occurrence of work injuries (14.5) injury per thousand insured, death resulting from a work accident all (4) days, (15.4%) of the injuries that led to the death or disability.

Accident is defined as "an unexpected event, unpredictably and unintentional", others defined it as:

- Discrete occurrence in the course of work which leads to physical or mental harm**.**
- An injury or illness that occurs in relation to an employee’s job.

The incidents have multiple definitions, but most of them involved in the two main points: the sudden fall and the occurrence of involuntary bodily injury. So the facilities must take into consideration the following during their study of accidents:

- The nature of the damage or loss.
- The source of harm or loss: materials, movements.
- Type of the incident: an event that directly led to the loss.
- Personal data: name, date of employment, sex, occupation or work.
- Site loss: section, circle, area, building.
- Cause of the accident**.**
- Type of injury: the implications of the injury**.** (Ridley, 2003)

2.3.9. Work injuries and occupational diseases:

Workers are exposed to many risks in cutting stone factories, that can lead to several accidents, injuries and occupational diseases, where it is difficult to determine the period of time for the emergence of these diseases, Since they undoubtedly began with the beginning of worker action. Some of occupational diseases takes chronically character where spend long time before discovered, and this increases the risk of the diseases.

Occupational disease (OD) is defined as any disease contracted as a result of an exposure to risk factors arising from work activity. Risk factors include exposure to physical, chemical, biological or psychosocial hazards at the workplace. (Workplace Safety and Health Guidelines, 2011)

This means that the disease must have been developed due to exposures in the workplace and that the correlation between the exposures and the disease is well known in medical research, or put in another way, it must not be likely, beyond reasonable doubt, that the disease was caused by factors other than work. (Takele and Admassu, 2006)

2.3.10 Occupational disease caused by stone cutting industry:

An occupational disease is a health problem caused by exposure to a workplace health hazard. In relation to occupational diseases that the workers may be exposed to in cutting stone industries are:

- Occupational Lung Diseases (Silicosis, grinder's asthma, potter's rot and other occupation-related names)" is a form of occupational lung disease caused by inhalation of crystalline silica dust, and is marked by inflammation and scarring in the form of nodular lesions in the upper lobes of the lungs" (Choy, 2012). Silicosis is the most common occupational lung disease worldwide; it occurs everywhere, but is especially common in developing countries. (Bert, 1991)

Because of work-exposure to silica dust, silicosis is an occupational hazard to mining, sandblasting, quarry, ceramics and foundry workers, as well as grinders, stone cutters, refractory brick workers, tombstone workers, pottery workers and others. (Ridley, 2003)

- Occupational Hearing Loss (Noise-induced Hearing Loss and Acoustic Trauma), it has become common practice to define noise, as unwanted sound and it has been known for many years as a cause of hearing loss in industry. (Bailey, 2010)

  Workers are exposed in the stone cutting factories for different levels of noise that increase in the level of intensity (85) dB for intermittent periods during the daily work. Hearing loss may be chronic and occur gradually over a period of time as a result of prolonged exposure to excessive noise at work, resulting in noise-induced deafness. (Ridley, 2003)

  Causing temporary or permanent hearing loss, noise can also be a safety hazard. Most obviously, noise interferes with verbal communication, leading to errors and failures to respond to warning sounds and shouts. (Bailey, 2010)

- Occupational Rheumatism disease: Arthritis literally means joint inflammation. Although joint inflammation describes a symptom or sign rather than a specific diagnosis, the term “arthritis” is often used

to refer to any disorder that affects the joints. These disorders fall within the broader category of rheumatic diseases.

2.3.11 Personal protective equipments:

Regarding to personal protective equipments, which protect phenomenon body parts from exposure to work-related injuries for workers in the stone cutting industry, each employee must have the following:

- Protective Clothing: Be in the form of long-proof vest to the chest and abdomen and extends up to the feet, made of leather.
- Safety Glasses: To protect the eyes from stone fragments.
- Air-purifying Respirators (Disposable Respirator): These gags are either made of a single piece of sponge or padded plastic cover from the inside with a piece of sponge or wool so that the pieces can be washed internally or replaced after each use.
- Plastic gloves: made from PVC material to protect the hands against scratches.
- Over-the-head Earmuffs: Reduce loud factory noise to the level of a normal conversation. These ear protectors fit completely over the ear with large, comfortable ear cups. They are easily worn or taken off and generally give better acoustic seal than earplugs thus providing better hearing protection, its available in different sizes.

- Footwear: To prevent it from slipping and used when driving on wet ground, and the surface of the sole of the shoe with a rough protrusions raise the friction surface of the ground.

2.3.12 History of occupational safety and health in Palestine:

The first legislation passed in Palestine for occupational safety during the British Mandate labs Law No.11 in 1946, included safety of the physical and mechanical hazards and risks of machinery and cranes. (First National Congress of the Occupational Safety and Health in Palestine, 2008)

1985 prevention and safety unit was set up managed by operation and usage in Gaza, the task was to spread preventive awareness of workers through several newsletters and courses in various fields in both the West Bank and Gaza Strip.

1987 association for the prevention and safety was established in Gaza Strip, in order to spread preventive awareness and extend its branches to the governorates of North and South in Palestine, and is still licensed by the Palestinian National Authority. (First National Congress of the Occupational Safety and Health in Palestine, 2008)

Since the establishment of the Palestinian authority, general administration was created for the safety and public health professional in ministry of labor, where legislations for occupational safety, and health

were released, represented by a set of regulations and decisions emanating from the Labor Law No. 7 of 2000. (Palestinian Ministry of Labour, 2004)

2.4. Quality Management Systems:

2.4.1. Definition of quality:

In technical usage, quality can have the following meanings: (1) the characteristic of a product or service that bear on its ability to satisfy stated or implied needs and (2) a product or service free of deficiencies (Summers, 2006). As a result of the importance of this concept and the spread of its application in the world, the attention of researchers and scholars have increased, resulting in many contributions that have helped in adopting and applying it. The search for a universal definition of quality has yielded inconsistent results.

According to Dr. Joseph Juran, in his book Juran's Quality Control Handbook, quality is described through two definitions of quality:

"Quality" means those features of products which meet customer needs and thereby provide customer satisfaction. In this sense, the meaning of quality is oriented to income.

"Quality" means freedom from deficiencies-freedom from errors that require doing work over again (rework) or that results in field failures, customer dissatisfaction, customer claims and so on. In this sense, the

meaning of quality is oriented to costs, and higher quality usually "costs less". (Juran, 1998).

Mr. Crosby defined quality as a conformity to certain specifications set forth by management and not some vague concept of "goodness." These specifications are not arbitrary either; they must be set according to customer needs and wants. Four Absolutes of Quality Management:

- Quality is defined as conformance to requirements, not as 'goodness' or 'elegance'.
- The system for causing quality is prevention, not appraisal.
- The performance standard must be Zero Defects, not "that's close enough".
- The measurement of quality is the Price of Nonconformance, not indices.

International Organization for Standardization; ISO definitions: The quality of something can be determined by comparing a set of inherent characteristics with a set of requirements. If those inherent characteristics meet all requirements, high or excellent quality is achieved. If those characteristics do not meet all requirements, a low or poor level of quality is achieved. (ISO 9000, 9001, and 9004 Quality management definitions. Praxiom Research Group Limited (2001-2010)

2.4.2. Definition of TQM:

There are many definitions of the concept of Total Quality Management, we can say that TQM is a most prominent modern management concepts that work to bring radical changes in the organization's approach, in order to make comprehensive improvements in all stages of work in the way that matches the specifications to get customers satisfaction.

TQM is a management philosophy which puts systems and processes in place to meet and exceed the expectations of customers. It is a relentless quest for continuous improvement through documentation and the use of tools in a problem solving atmosphere that features team actions and good leadership practices" (Hudaib, 2009)

Tobin defined TQM as "the totally integrated effort for gaining competitive advantage by continuously improving every facet of organizational culture". Feigenbaum defined TQM as the "total quality control's organization-wide impact". Wilkinson and Witcher provided a comprehensive definition for TQM:

- Total: every person in the firm is involved (including customers and suppliers).
- Quality: customer requirements are met exactly.
- Management: senior executives are fully committed. (Hudaib, 2009)

According to Philip Crosby TQM is "methodology organization to ensure that the activities planned in advance, it is also the best method which helps to prevent and avoid the problems and that by encouraging the behaviors of good as well as the optimal use of the methods of control that prevent the occurrence of these problems and make prevention possible".

Josef Jablonski, defined TQM as "cooperative form of doing business that relies on the talents and capabilities of both labor and management to continually improve quality and productivity using teams".

Michael J. Stahl defined TQM as" A systems approach to management the aims to continuously increase value to customers by the user, focuses on process quality, continuous improvement as strategy and extension of the approach to every corporate sector, level and process.

Deming's philosophy of quality management emphasized that top management must orient themselves to innovate and commit resources constantly to support innovation and continuous improvement (Deming, 1986).

2.4.3. The evolution of TQM:

The concept of quality has existed for many years, but the evolution of the concept of quality management did not come all at once.

The first stage was in the early twentieth century where quality management meant inspecting products to ensure that they met

specifications. During World War II, quality became more statistical in nature. Statistical sampling techniques were used to evaluate quality, and quality control charts were used to monitor the production process.

The second stage is that of quality control which involved operational techniques and activities aimed both at monitoring a process and eliminating causes of unsatisfactory performance or relevant stages of the quality loop (quality spiral) in order to result in economic effectiveness

The third stage of this development, quality assurance contained all the previous stages in order to provide sufficient confidence that a product or service will satisfy customers' needs. Other activities such as comprehensive quality manuals, use of cost of quality, development of process control and auditing of quality systems are also developed in order to progress from quality control to the quality assurance era of Total Quality Management. At this stage there was also an emphasis of change from detection activities towards prevention of bad quality.

The fourth stage of Total quality management involved the understanding and implementation of quality management principles and concepts in every aspect of business activities. Total Quality Management demands that the principles of quality management must be applied at every level, every stage and in every department of the organization. The idea of Total Quality Management philosophy must also be enriched by the application of sophisticated quality management techniques. The process of

quality management would also be beyond the inner organization in order to develop close collaboration with suppliers. (Casas, 2011)

2.4.4. The importance of quality:

Quality of great importance, both at the level of the beneficiary or the level of organization of different activities or at the national level for the country and the limited importance of quality as follows:

1. Reputation of the organization.

2- Legal responsibility for the quality.

3- Global competition.

4- Protect the beneficiary.

5- Costs and market share.

2.4.5. Dimensions of the Quality:

David Garvin, a specialist in the area of quality control, argues that quality can be used in a strategic way to compete effectively and an appropriate quality strategy would take into consideration various important dimensions of quality.

1. Performance: refers to a product's primary operating characteristics. This dimension of quality involves measurable attributes, so brands can usually be ranked objectively on individual aspects of

performance. Overall performance rankings, however, are more difficult to develop, especially when they involve benefits that not every consumer needs. Performance is often a source of contention between customers and suppliers, particularly when deliverables are not adequately defined within specifications.

2. Features: are additional characteristics that enhance the appeal of the product or service to the user. Similar thinking can be applied to features, a second dimensions of quality that is often a secondary aspects of performance. Features are the "bells and whistles" of products and services, those characteristics that supplement their basic functioning. The line separating primary performance characteristics from secondary features is often difficult to draw.

3. Reliability: is the likelihood that a product will not fail within a specific time period. This is a key element for users who need the product to work without fail. This dimension reflects the probability of a product malfunctioning or failing within a specified time period. Among the most common measures of reliability are the mean time to first failure, the mean time between failures, and the failure rate per unit time. Because these measures require a product to be in use for a specified period, they are more relevant to durable goods than to products and services that are consumed instantly.

4. Conformance: he dimension of conformance depicts to what extent a product's design and operating characteristics meet established standards. All products and services involve specifications of some sort. When products are developed, these specifications are set and a target is set, for instance the materials used or the dimension of the product.

5. Durability: measures the length of a product's life. When the product can be repaired, estimating durability is more complicated. The item will be used until it is no longer economical to operate it. This happens when the repair rate and the associated costs increase significantly. Technically, durability can be defined as the amount of use one gets from a product before it deteriorates. After so many hours of use, the filament of a light bulb burns up and the bulb must be replaced.

6. Serviceability: involves the consumer's ease of obtaining repair service, the responsiveness of service personnel and the reliability of service. Competence and ease of repair is the speed with which the product can be put into service when it breaks down, as well as the competence and the behavior of the service personnel. (Evans, 1999)

7. Aesthetics: The aesthetic properties of a product contribute to a company's or brand's identity. Faults or defects in a product that diminish its aesthetic properties, even those that do not reduce or

alter other dimensions of quality, are often cause for rejection. It's refers to how the product looks, feels, sounds, tastes or smells. It is clearly a matter of personal judgment and a reflection of individual preference.

8. Perceived Quality: The product or service may possess adequate or even superior dimensions of quality, but still fall victim to negative customer or public perceptions. Consumers do not always have complete information about a product's or service's attributes; indirect measures may be their only basis for comparing brands. A product's durability for example, can seldom be observed directly; it usually must be inferred from various tangible and intangible aspects of the product.

Although there are different dimensions of quality, they cannot be separated from each other completely. Rather, each dimension is translation of several other dimensions. For example, to determine performance, it is based on reliability, compliance, characteristics, and this indicates that the product has a lot of these dimensions at the same time.

Depending on the multiplicity of dimensions, companies rely on one or more quality dimensions due to the difficulty of taking all dimensions due to high cost, and this makes the organization able to outperform its competitors through showing one or more dimensions of quality, without neglecting the other dimensions (Danna C.D.S., 2006).

2.4.6. Total quality management principles:

The application of total quality management and commitment to implement elements requires a comprehensive change in management methods, in terms of encouraging the participation of employees, training and upgrading their performance, total quality management approach based on a set of heterogeneous principles

1. Customer Focus:

Customers are the most important elements that underpin the Total quality management, customers are the ones who judge the quality through the value offered by the properties of the product or service, so the top management must focus on customers. (Omachonu, 2004)

In order to produce and deliver quality, employees need to know what both internal and external customers want/expect of them. Only when employees have this information with they be able to start improving the processes. (Casas, 2011)

2. Leadership:

Leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives.

3. Continuous Improvement:

Continuous improvement must deal not only with improving results, but more importantly with improving capabilities to produce better results in the future.

Higher quality both should and can be achieved through:

1. Internal quality improvements

2. External quality improvements

The main aim of internal quality improvements is to make the internal processes to prevent defects and problems in the internal processes which will lead to lower costs.

External quality improvements are aimed at the external customer, the aim being to increase customer satisfaction and thereby achieve a bigger market share and with it, higher earnings. (Pekar, 1995)

4. Communications.

During times of organizational change, as well as part of day-to-day operation, effective communications plays a large part in maintaining morale and in motivating employees at all levels. Communications involve strategies, method, and timeliness.

5. Employee Empowerment:

A significant part of the TQM principles is to empower all employees to recognize quality problems and correct them. TQM offers incentives for employees to identify quality problems. Employees are then rewarded for uncovering quality problems.

To further emphasize the role of employees in quality, TQM differentiates between external and internal customers. External customers are those that purchase the company's goods and/or services. Internal customers are employees of the organization who receive goods or services from others in the company. (GOH, 2000)

6. Process-centered:

A fundamental part of TQM is a focus on process thinking. A process is a series of steps that take inputs from suppliers (internal or external) and transforms them into outputs that are delivered to customers (again, either internal or external). The steps required to carry out the process are defined, and performance measures are continuously monitored in order to detect unexpected variation. (Pekar, 1995)

2.4.7. Requirements of the application of Total Quality Management:

The application of the concept of total quality management in organizations requires some requirements that precede start applying this system in the organizations so they can prepare employees to accept the

idea and then seek to be effectively achieved the desired results and inventory. Behold, here the main requirements needed for the application.

2.4.7.1. Reshape the culture of the organization:

The introduction of any new principle in the organization requires a reconfiguration of culture of the organization as the acceptance or rejection of any principle depends on the culture and beliefs of employees in the organization. The quality culture radically different from the traditional management culture and hence the need to create this culture appropriate for the application of the concept of Total Quality Management, it must create an appropriate environment for the application of this new concept with its new cultures.

2.4.7.2. Promotion and marketing of the program:

The publication of the concepts and principles of total quality management to all employees in the organization is essential before deciding the application. Marketing of the program helps a lot in reducing the opposition to change and to identify potential risks due to the application so that it can be reviewed. The program is promoted by organizing lectures, conferences or training courses for the definition of the concept of quality and its benefits to the organization.

2.4.7.3. Education and training:

Until the application of the concept of total quality management properly, it must train and teach participant's methods and tools of this new

concept can even be based on a sound and solid and thus lead to the desired results of its application. Since the implementation of this program without awareness or understanding of the principles and requirements may lead to a fiasco. Full consciousness can be achieved through effective training programs.

The objective of the training is to raise awareness and enable participants to identify methods of development. The training must be directed to all categories and levels of management (executive board, managers, supervisors, employees) must meet the requirements of each category by the challenges they face. Special training is of the Executive Authority must include the application strategy while training for the work teams should include methods and techniques for the development of technical operations.

The training should address the importance of quality tools and methods, the necessary skills and methods of problem solving, decision making, the principles of effective leadership, statistical tools and methods for measuring performance.

2.4.7.4. Forming work teams:

Forming work team including between five to eight members from involved departments or those who actually perform the developed work and which will be affected by the results of the program. where the teams members must be trusted people, willingness to work and development,

and they should given the authority to review and evaluate the tasks included in the process and make suggestions for improvement.

2.4.7.5. Encouragement and motivation:

Motivating employees for doing a great job will inevitably lead to encourage them, instill confidence, and strengthen the desired performance. This encouragement and motivation has a significant role in the development of a TQM program in organization and continuity, since the continuity of the program in the organization is entirely dependent on the willingness of the participants in the optimization, so this enthusiasm should be strengthened through appropriate incentives and this varies from financial reward to encourage moral.

2.4.7.6. Supervision and monitoring:

Necessities of the application of the quality program is to supervise the work teams to modify any wrong path and follow-up evaluation of their achievements and if necessary. One of the quality requirements is supervision, monitoring and coordination between the various departments and employees in the organization and to overcome the difficulties of working groups, taking into account the public interest.

2.4.7.7. Application strategy:

The strategy of development and introduction of a TQM program into the application goes several steps or stages, starting from the preparation of this program until the achievement of results and evaluation.

1. Preparation: Is the stage of the exchange and dissemination of knowledge and expertise to determine the need for improved conduct a comprehensive review of the results of the application of this concept in other organizations. And is at this stage put the desired objectives.

2. Planning: plan is developed and the method of application and identify the resources needed to plan the application.

3. Evaluation: Using statistical methods for continuous development and performance measurement and improvement.(Joss, 1998)

2.4.8. ISO 9000: Quality Management System:

The ISO 9000 standards have had great impact on quality systems implementation by organizations worldwide. These international standards have been adopted as national standards by over 100 countries and regional groups of countries. The ISO 9000 standards deal with the management systems used by organizations to design, produce, deliver, and support their products. The standards apply to all generic product categories: hardware, software, processed materials, and services. Specific ISO 9000 family standards provide quality management guidance, or quality assurance requirements, or supporting technology for an organization's management system. (Juran, Sec.11, P315, 1998)

The ISO 9000 family addresses various aspects of quality management and contains some of ISO's best known standards. The standards provide guidance and tools for companies and organizations who want to ensure that their products and services consistently meet customer's requirements, and that quality is consistently improved. (Brown, 1996)

There are many standards in the ISO 9000 family, including:

- ISO 9001:2008 - sets out the requirements of a quality management system.
- ISO 9000:2005 - covers the basic concepts and language.
- ISO 9004:2009 - focuses on how to make a quality management system more efficient and effective.
- ISO 19011:2011 - sets out guidance on internal and external audits of quality management systems.

2.4.9. The relationship between the total quality management system and ISO 9000:

Although Total Quality Management (TQM) came on the scene first as a method for companies to improve profits and repeat business, complying to the ISO 9000 standards is the first thing a company should consider to improve the way it does business. ISO contributes to improve the management levels in organizations in all aspects relating to production, or provide the service either in the planning or production,

marketing or quality control, thus give confidence to the beneficiary organizations and management alike. (Juran, 1998)

Since organizations applying the ISO 9000 standard can claim that their management system meets an international quality management standard, it is not surprising that quality management, now referred to most often as total quality management (TQM), is confused with the quality management system of ISO 9000.

ISO describes the functions and the actions that you need to be able to have the minimum standard of quality systems in place. ISO can be considered as a tool to implement TQM, and also has some basic requirements like strict documentation for audit purposes. You can easily monitor your records with this kind of management program. TQM focuses on finding the best and maximum results, and how to get to them. It can be considered to be a management program based on quality. TQM does not require any kind of documentation. (Juran, 2002)

Table (2): The difference between TQM and ISO9000

TQM	ISO9000
Quality management from a holistic perspective.	Quality System is based on the certified specifications
The management of quality from the perspective of the supplier	The management of quality from the perspective of the customer
Interested in continuous improvement	Periodic Review interested continuous updating according to the improvements brought about by the TQM program, if any
interested the social human dimension and compose between it and the technical system (the philosophy and concepts of the most comprehensive)	Focus on the methods and operating procedures (dimension technical)
Include all sectors, departments, sections and work teams	Can be applied to certain sectors or departments or sections, not necessarily for the whole organization
Responsibility of all sectors and departments, sections and teams	Responsibility of quality control department
Self-evaluation process to look for potential opportunities for improvement	External auditing process to match the specification

Brown, A. & Wiele, 1996.

Quality Management and ISO are complementary, ISO can be obtained without TQM, and TQM can adopt without obtaining the ISO, or an adopt TQM as an entry point for getting the ISO, and this is the best. (Sun, H.,2000)

2.4.10. Integrate safety and quality management:

There is a strict relationship between OHS and TQM activities within an organization. They affect the success of each other. Having successfully implementing TQM may result successful occupational health and safety (OHS) vice versa.

Occupational health and safety provides several means to ensure the safety of employees within an organizations. Basic characteristics of a successful safety program include: management commitment, employee involvement, hazard identification and control, training and education, and some form of program of evaluation. as well as risk management and continuous improvements in these areas. In addition to those there are several other characteristics which would be required for an efficient and effective OHS management. They should include; worksite cleanliness, emergency preparedness, and improved employee selection procedures etc.

Similar to safety management, a successful total quality management requires management commitment, employee involvement, data collection/analysis and change implementation, training and education.

TQM and OHS should not be considered as two different management systems. They should be considered perhaps under the umbrella of TQM as it could be considered as an overall management systems including every activity to secure over all business performance. In other words, the TQM's operational sphere integrates aspects of workplace

and occupational safety. That means successful safety and health management supports successful implementation of TQM. That is why big industrial organizations consider occupational safety and health as an integral part of their commercial success and prerequisite the highest possible standards of maintenance of environment, health, safety. Below some very important aspects of OHS which in turn increase the success of TQM are explained. (Keleş, 2005)

There are some other factors supporting the successful implementation of OHS and TQM. They may include ethics, integrity (honesty, values, sincerity, moral fairness etc.), trust, training, recognition, communication as well as leadership. These are required characteristics of the people involved in the organizational activities in both managerial and operational levels.

OHS management could not be successful without a firm believes, trust, ethical approach and could not be spread within the organization without communication and recognition. These should obviously be supported by the leadership. The same applies to TQM. Creating success in these factors may definitely create success in both OHS and TQM. (Herreroa, 2001)

2.5. Relative Studies:

2.5.1. Safety Climate In Construction Industry The Case Of Gaza Strip

The objective of this paper is to investigate the perceptions of construction workers regarding safety climate and safety behavior work in Gaza Strip construction sites. Its explore the relationship between personal characteristics of construction workers and safety climate/safe work behavior. Furthermore, the relationship between safety climate and safe work behavior will be explored.

It was found that construction workers have positive attitude and perception towards safety climate and safe work behavior. There exist a positive relationship between safety climate and safe work behavior. There is an impact of experience, field of work, smoking habit, and job on safety climate. In contrast, the personal characteristics; marital status, direct employer, educational level, family members to support, skill levels have no influence on safety climate. There exist a relationship between personal characteristics age, experience, field of work, smoking habit, educational level, and job on the field safe work behavior.

2.5.2. The Reality of Industrial Safety and Range of its Effect on Workers' Performance at Private Industrial Sector Plants in South West Bank. (Ewaiwi, 2008):

The research aims at studying the reality of industrial safety and range of its effect on workers performance at private industrial sector plants

in South West Bank. Results of the research showed that public safety instruments that most available there were extinguishments, then the first aid, next cutter off electricity. Besides, the safety instruments that workers closely use were the gloves, then the safety shoes. Moreover, the utilities that most available were the toilettes where sanitary conditions were available, following this came places of wearing clothes. At the same time, good drinking water is largely available. The results, also showed that the private industrial plants are committed to making available safety conditions related to machines, equipments and other tools used in work, particularly in connection to operation of machines and maintenance. It had been recommended that both workers and employers shall commit to conditions of safety at work at plants of private industrial sectors. In addition, awareness and training interests shall be paid in field of industrial safety by all concerned sides in order to achieve a better performance.

2.5.3. Status and Challenges of Total Quality Management Application in Selected Palestinian Chemical Industries (Rabaya, 2013):

This study aims at assessing the status of Palestinian chemical industries, and at measuring the level of the application of total quality management philosophy in Palestinian chemical sectors, especially in the pharmaceuticals, food and detergents sectors from the perspective of top managements. The study seeks also to identify the obstacles and challenges facing the application of total quality management philosophy in the PCS.

The researcher found that there was a great interest by industrial plants in applying the variables of TQM philosophy of different degrees and at different levels. The highest application level was the continuous improvement.

The study findings, several recommendations were suggested. One recommendation is the importance of applying the philosophy of total quality management by companies that did not adopt this philosophy previously. Another recommendation is the need for continuous work to achieve suppliers' participation in order to reach a comprehensive application of combined TQM dimensions. A third suggestion is giving more attention and interest to the use of statistical techniques and quality control tools because they help in identifying and analyzing quality problems.

2.5.4. Modeling The Factors Affecting Quality Of Building Construction Projects During The Construction Phase In Gaza Strip (Issam, 2002):

This research is intended to provide clients, project managers, designers, and contractors with necessary information needed to better manage the quality of a construction building project in Gaza Strip. Factors that affect the quality of a construction building project during construction phase are identified. Nominal Group Technique was used at the preliminary stage to identify these factors and the associated sub-factors.

It is concluded that the most important factors affecting quality of a building construction project are: characteristics of site layout, skill and experience of site staff, characteristics of design documents, and using equipment, materials, quality and labor management systems and the owner quick response in taking decisions. Type of awarding system and the political environment also among the factors effecting quality.

It is recommended that contracting and consulting firms to develop a quality system before starting the construction of a project to meet the requirements of international quality standards, and to develop comprehensive management systems for equipment, materials, and labors. Also, using the developed model as a tool to measure quality of the construction project and identify the weakness points that lowers the degree of quality and improve it.

2.5.5. The Reality of Industrial Safety and Range of its Effect on Workers' Performance at Private Industrial Sector Plants in South West Bank:

This study investigates the presence, implementation of safety and occupational health rules and regulations in manufacturing industrial establishment. It also assesses the External (governmental) supervisory role on industrial installations in Gaza strip.

The results of this study revealed a strong positive correlation between the effectiveness of safety and occupational health measures

industrial establishment and the degree of provision, implementation of safety and occupational health rules and regulations in these establishments. It also revealed positive correlation between the effectiveness of safety and occupational health measures in industrial installations and educational level in both industrial installations and supervisory bodies. The results also showed that industrial installations do not regularly report work incidents and injuries.

The study recommended that the supervisory bodies regularly supervise industrial establishment, that local studies should be used to develop safety and occupational health rules, regulations and procedures. Owners of industrial institutions should be educated about the importance of reporting work incidents and injuries, the importance of providing a safe working environment for their employees and the importance of appointing safety and occupational health officers in their institutions.

Chapter Three

Methodology

This chapter presents the methodology of the study, its population, the tools of data collection and the methods of verifying its validity and reliability, the procedures of the study and statistical analysis.

3.1 Study Approach:

The present study used the descriptive quantitative and qualitative approaches since both of them are considered to be the most suitable research approaches to study the improving of the Palestinian stone and marble industry by employing quality assurance and safety management systems; both approaches are the most convenient to fulfill the study objectives since both work on describing facts regarding positions as they stand or describing what is already existent and collection of data and information which would be later classified, organized and expressed quantitatively; they would also be interpreted accordingly in order to reach an understanding of the relationship between the phenomenon and its different factors using convenient research tools.

3.2. Safety Management

3.2.1. Study Population

The study population for "quality assurance questionnaire" consists of all the Senior management people for cutting stone factories in West

Bank in the years 2013/2014, which includes (652) factories, as shown in Table 3.

Table (3): Distribution of study population (for Safety questionnaire) in West Bank by district

No.	District	Number of employees	Sample
1.	Hebron	2520	113
2.	Bethlehem	2740	118
3.	Ramallah	450	31
4.	Nablus	700	48
5.	Tulkarm	50	4
6.	Salfit	50	4
7.	Qalqilya	50	4
8.	Jenin	600	43
Total		**7160**	**365**

3.2.2 Study Sample:

The study sample consists of (365) employees, selected by random stratified method as it is clear in Table 4. The sample size was calculated using the web. http://www.surveysystem.com/sscalc.htm, sample size calculator, with an error 0.05 (Appendix C). The sample constituted (0.02%) of the study population. Tables 4-9 present the main characteristics of the sample.

Table (4): Sample distribution (for Safety questionnaire) by district

District	Number	Percent %
Hebron	113	31
Bethlehem	118	32.3
Ramallah	31	8.5
Nablus	48	13
Jenin	43	11.7
Tulkarm	4	1
Salfit	4	1
Qalqilya	4	1
Total	**365**	**100**

Table 4 clarifies the distribution of the sample participants by district in the West Bank as follows: 31% from the city of Hebron, 32.3% from Bethlehem, 8.5% from Ramallah, 15.3 from Nablus. Besides, 12.9% from Jenin.

Table (5): Sample distribution by Post Title

Post title	Number	Percent %
Officer	23	6.3
Worker	342	93.7
Total	**365**	**100**

Table 5 shows the sample distribution of the participants according to post title, as 6.3% officers compared to 93.7% workers.

Table (6): Sample distribution by years of experience

Years of experience	Number	Percent %
Less than 5 years	47	12.9
5-10	62	17
11-15	147	40.3
15+	109	29.9
Total	**365**	**100**

Table 6 clarifies the distribution of participants according to their years of experience, as 12.9% their experience below 5 years, 17% have experience between 5-10 years, the majority (40.3%) of them have experience between 11-15 years, while 29.9% have experience 15 years and above.

Table (7): Sample distribution by educational level

Educational level	Number	Percent %
Basic	87	23.8
Secondary	247	67.7
Tertiary	31	8.5
Total	**365**	**100**

Table 7 clarifies the distribution of respondents by educational level, 23.8% of them have received basic education, the majority (67.7%) have received secondary education, while 8.5% have received tertiary education.

Table (8): Sample distribution by insurance

Insurance	Number	Percent %
Insurance covers work injuries	361	98.9
Insurance doesn't cover work injuries	4	1.1
Total	**365**	**100**

Table 8 shows the distribution of participants according to insurance, 98.9% has insurance that covers work injuries, 1.1% don't have insurance against work injuries.

Table (9): Sample distribution by daily working hours

Daily working hours	Number	Percent %
7 hours	50	13.7
8 hours	315	86.3
Total	**365**	**100**

Table 9 clarifies the distribution of the participants according to daily working hours as follows: 13.7% of the employees work 7 hours daily, 86.3% of them work 8 hours daily.

3.2.3 Method and Tools of Data Collection:

The present study used the approach of sampling survey, and the questionnaire (Appendix A; B), as tools for data collection. Based on literature review in order to examine improving the Palestinian stone and marble industry by employing safety management systems, the researcher develops a questionnaire which consists of five sections. The first has the demographic characteristics of the employees like such as: post title, years of experience, educational level, insurance, daily working hours. The second includes workers opinions in matters related to the factory and the application of the concept of public safety, which consists of (27 items). The third includes the reality of occupational health and safety at the facility, which consists of (43 items). The fourth includes work injuries and occupational diseases, which consists of (10 items). The fifth aimed to know the effect of working conditions on the performance of employees, which consists of (15 items).

3.3. Quality Assurance:

3.3.1 Study Population:

The study population for "quality assurance questionnaire" consists of all the Senior management in the cutting stone facilities in West Bank in the year 2013/2014, which includes (652) factories, as it is clear in Table 10.

Table (10): Distribution of study population (for quality assurance questionnaire) in West Bank by district

No.	District	Number of factories	Sample
1.	Hebron	200	75
2.	Bethlehem	210	78
3.	Ramallah	55	20
4.	Nablus	86	32
5.	Tulkarm	8	3
6.	Salfit	8	3
7.	Qalqilya	7	3
8.	Jenin	78	28
Total		**652**	**242**

3.3.2 Study Sample:

The study sample consists of (242) managers in cutting stone facilities, selected by random stratified method as it is clear in Table 11. The sample size was calculated using the web. http://www.surveysystem.com/sscalc.htm, sample size calculador, with an error 0.05 (Appendix C). The sample constituted (0.02%) of the study population. Tables 11-19 shown below present the main characteristics of the participants.

Table (11): Sample distribution (for quality assurance questionnaire) by district

District	Number	Percent %
Hebron	75	31
Bethlehem	78	32.2
Ramallah	20	8.3
Nablus	38	15.7
Jenin	31	12.8
Total	**242**	**100**

Table 11 clarifies the distribution of the sample participants by district in the West Bank as follows: 31% from the city of Hebron, 32.2% from Bethlehem, 8.3% from Ramallah, 15.7 from Nablus. Besides, 12.8% from Jenin.

Table (12): Sample distribution by year of establishment of the facility

Year of establishment	Number	Percent %
-1992	94	38.8
1993+	76	31.4
Missing	72	29.8
Total	**242**	**100**

Table 12 shows the sample distribution of the participants according to year of establishment of the facility, as 38.8% of facilities established before 1992, 31.4% of them established after, 29.8% didn't answer.

Table (13): Sample distribution by company type

Company type	Number	Percent %
Family company	210	86.8
Non family company	32	13.2
Total	**242**	**100**

Table 13 clarifies the distribution of respondents by company type, the majority (86.8%) of facilities are family companies, while 13.2% them are non family companies.

Table (14): Sample distribution by number of employees

Number of employees	Number	Percent %
-10	86	35.5
11-20	101	41.7
20+	55	22.7
Total	**242**	**100**

Table 14 clarifies the distribution of respondents by number of employees, 35.5% of facilities have less than 10 employees, the majority (41.7%) of the facilities have employees between 11-20, while 22.7% of facilities have more than 20 employee.

Table (15): Sample distribution by employee's years of work in the company to the worker

Employee's years of work in the company to the worker	Number	Percent %
-5	18	7.4
5-10	37	15.3
10-15	77	31.8
15+	110	45.5
Total	**242**	**100**

Table 15 shows the distribution of participants according to employee's years of work in the company to the worker, 7.4% of them work with the company less than 5 years, 15.3% of them work with the company between 5-10 years, 31.8% of them work with the company

between 10-15 years, the majority (45.5%) of them work with the company more than 15 years.

Table (16): Sample distribution by educational level

Educational level	Number	Percent %
Basic	25	10.3
Secondary	138	57
Tertiary	79	32.6
Total	**242**	**100**

Table 16 clarifies the distribution of respondents by educational level, 10.3% of managers have received basic education, the majority (57%) have received secondary education, while 32.6% have received tertiary education.

Table (17): Sample distribution by certificates obtained by the company

Certificates	Number	Percent %
ISO9000	6	2.5
Palestinian Quality mark	79	32.6
Supervision Certification	10	4.1
All above	3	1.2
Others	144	59.5
Total	**242**	**100**

Table 17 clarifies the distribution of respondents by certificates obtained by the company, 2.5% of companies obtained ISO9000, 32.6% of companies obtained Palestinian Quality mark, 4.1% of companies obtained supervision Certification, 1.2% of companies obtained (ISO9000, Palestinian Quality mark and supervision Certification), the majority (59.5%) haven't.

Table (18): Sample distribution by source of machines

Source of machines	Number	Percent %
Italy	123	50.8
Turkey	4	1.7
Germany	9	3.7
All above	36	14.9
Other	70	28.9
Total	**242**	**100**

Table 18 clarifies the distribution of respondents by source of machines, the majority (50.8%) of facilities their machines from Italy, 1.7% of them their machines from Turkey, 4.1% of them their machines from Turkey, 3.7% of them their machines from Germany, 14.9% of machines from (Italy, Turkey and Germany), 28.9% of them their machines from locally made.

Table (19): Sample distribution by if the company aims to reach a comprehensive quality

If the company aims to reach a comprehensive quality	Number	Percent %
Yes	241	99.6
No	1	.4
Total	**242**	**100**

Table 19 clarifies the distribution of respondents by if the company aims to reach a comprehensive quality, the majority (99.6%) of facilities aims to reach a comprehensive quality, while.4% of them aren't.

3.3.3 Method and Tools of Data Collection

The present study used the approach of sampling survey, and the questionnaire (Appendix A; B), as tools for data collection. Based on

literature review in order to examine the improving the Palestinian stone and marble industry by employing quality management systems, the researcher develops a questionnaire which consists of three sections. The first has the demographic characteristics of the employees like: year of establishment of the facility, company type, number of employees, employee's years of work in the company to the worker, certificates obtained by the Company, educational level, source of machines. The second includes the application of company to the concepts of quality management, which consists of (36 items). The third includes the competition policies of facilities, which consists of (35 items).

Table (20): Factor Analysis for Senior Management Commitment of Quality

No.	Scale items	Alpha
1.	Senior management adopts a clear strategic policy and specific objectives in the application of quality.	.830
2.	Senior management is working continuously to fulfill their obligations towards customers.	.825
3.	The company considered quality a motto for itself.	.847
4.	Senior management supports the principle of devolution of powers and facilitate the auditing of information between the different sections.	.749
5.	Senior management developed a knowledge of the various administrative levels of the company to strengthen its commitment to quality.	.811
6.	Management works to clarify the objectives to the workers especially the goals related to quality.	.867
7.	Senior management is working to promote a culture of quality in all departments and levels of management.	.810
8.	Senior management confirms that the customer is the most important element in their objectives and this can change the culture of the organization to achieve this.	.682

9.	Senior management is working hard in order to distinct company services.	.857
10.	Senior management seeks to build a good reputation among the customers of high-quality and perfection.	.842
11.	Senior management believes that quality is the way and philosophy in conducting its business.	.839
12.	Workers involved in the preparation of plans to improve quality.	.752
13.	Company trains workers on modern techniques and skills that will help to develop their performance and quality improvement.	.822
14.	Implementation of training programs based on clear principles.	.852

Table (21): Factor Analysis for Customer Satisfaction

15.	Company always studies the needs and desires of customers and their satisfaction with the products.	.703
16.	The company is characterized by rapidly satisfy the needs of the customers.	.798
17.	The company focuses on achieving customer satisfaction by studying their requirements.	.745
18.	Company studies customer complaints constantly and provides appropriate solutions.	.814
19.	The company believes that quality determines by satisfying customers' needs.	.747

Table (22): Factor Analysis for Continuous Improvement

20.	The company is keen on the continuous improvement of the system of production and service in order to improve quality.	.775
21.	The Company seeks to improve the products and services continuously.	.853
22.	The company is keen continuously to reduce the gap between the expectations of consumers about the quality and the actual quality provided to them.	.823
23.	The company relies on scientific methods and tools for improving quality.	.781
24.	The company seeks to take responsibility towards society through continuous improvement of products.	.828

25.	Senior management consider continuous improvement in work as part of the quality requirements.	.753
26.	Continuous improvement of goods and services earns the company a competitive advantage compared to companies.	.716

Table (23): Factor Analysis for Operational procedures

27.	The verification of products quality is by following the methods of inspection from time to time.	.815
28.	Company deals with a specific set of suppliers.	.680
29.	Company uses specific criteria in the selection of suppliers and these criteria are based on quality.	.786
30.	Company is interested in the regulations of purchases with lower price suppliers regardless of quality.	.660
31.	Company maintains an integrated database for suppliers and the quality of their products.	.776
32.	The company relies on a third party in the scrutiny and examination of raw materials that they purchase.	.800
33.	Raw material bought according to specifically tailored.	.771
34.	The company is keen to deal with suppliers who possess international standards certificate.	.795
35.	Senior management are working to determine the nature and causes of the lack of conformity within the company, and take corrective action.	.803
36.	The company operates on analysis and customer complaints for the purpose of reducing the cases of non-conformity.	.750

Table (24): Factor Analysis for Marketing

No.	Scale items	Alpha
37.	Company is interested to export products to other countries.	.850
38.	The company is committed to standard specifications on the goods.	.739
39.	The company respond to customers attributes according to goods.	.744
40.	The company has Internet or / & Email service.	.788
41.	The company is keen on providing its products different shapes and sizes based on the study of the desires of customers.	.644

42.	The company takes into consideration its responsibility towards society and the environment during production processes.	.771
43.	In case of any defective in service are taken corrective action to ensure customer satisfaction.	.738

Table (25): Factor Analysis for Promotion

44.	The company distributes promotional materials for definition and promotion of products.	.808
45.	The company uses local media to reach customers.	.778
46.	The company uses external media to reach customers.	.749
47.	The company is involved in local economic activities (seminars / exhibitions).	.818
48.	The company is involved in the global economic events (seminars / exhibitions).	.783
49.	The company gives great attention to the promotion and advertising in order to build a reputation for the products and the company.	.811

Table (26): Factor Analysis for Competition

50.	The Company believes that its products are able to compete with other products in terms of price in the local market.	.727
51.	The Company believes that its products are able to compete with other products in terms of quality in the local market.	.705
52.	The Company compares its global products with competitors in terms of price.	.658
53.	The Company compares its global products with competitors in terms of quality.	.783
54.	The company is pricing the goods based on the toddler price.	.711
55.	The company is pricing the goods based on the quality of products.	.817
56.	The company is pricing the goods based on cost.	.807

Table (27): Factor Analysis for Examinations and tests

57.	Samples are taken from the final product to make sure they conform to the required specifications.	.842
58.	Company uses the records to record the results of the examination and testing in order to benefit from them in the future.	.799
59.	The company uses statistical techniques widely to reduce the variation and deviation in the production process.	.805

Table (28): Factor Analysis for Obstacles facing application of quality

60.	Senior management commitment to the concepts of traditional management.	.735
61.	Lack of top-management commitment to and understanding the quality programs.	.738
62.	Low level of knowledge for staff to the philosophy of Total Quality Management.	.755
63.	Implementation of quality program is an unnecessary cost.	.742
64.	Actual results of implementation of quality program does not encourage continuity.	.790
65.	Quality program implementation does not solve the problems of the company.	.828
66.	Lack of quality education and training programs for workers to drive the improvement process in the company.	.746
67.	Low efficiency of the hardware and manufacturing.	.746

3.4. Reliability of the Study Tool:

In regards to the questionnaire reliability, it was tested by calculating the internal consistency of the questionnaire sub-scales using the Cronbach Alpha Formula, as it is clear in Table 29.

Table (29): Cronbach Alpha reliability analysis for the questionnaire sub-scales

No.	Sub-scale	No. Of items	Alpha
1.	Senior Management Commitment of Quality	14	.914
2.	Customer Satisfaction	5	.708
3.	Continuous Improvement	7	.86
4.	Operational procedures	10	.724
5.	Marketing	7	.849
6.	Promotion	6	.86
7.	Competition	7	.735
8.	Examinations and tests	3	.865
9.	Obstacles facing application of quality	8	.837
10.	Total degree	67	.938

Findings in Table 29 indicate that the questionnaire with its different dimensions is highly reliable. The results were as follows: Senior Management Commitment of Quality is (0.914), forms of Customer Satisfaction (.708), Continuous Improvement (0.86), Operational procedures (.724), Marketing (.849), Promotion (.86), Competition (.735), Examinations and tests (.865), Obstacles facing application of quality (.837), while the reliability of the total degree was (.938).

3.5. Study Procedures:

The statistics of the study population in the West Bank were obtained from the Central Union of Stone and Marble and the Palestinian Ministry of Labor. The researcher distributed 607questionnaire (365 for workers, 242 for owners) to all members of the study sample.

The process of data collection was carried out in the period from 1 June to 30 October, 2013. The participants were very cooperative.

3.6. Statistical Analysis:

Following data collection, it was reviewed in preparation for processing into the computer; they were allocated certain numbers to i.e. transformed verbal answers into numbers (strongly agree 5, agree 4, neutral 3, disagree 2, strongly disagree 1) in order to carry out the required statistical procedures for the data which took place through obtaining: numbers, percentages, means, standard deviations and graphics. In addition, the following statistical tests were used: Pearson Correlation, T. test, one way analysis of variance, Cronbach Alpha, Factor Analysis, and figures, using statistical package for social sciences (SPSS). In order to understand the findings of the study, the mean key in table No.30 shown below will be useful.

Table (30): Mean key for the findings of the study

No.	Mean	Key	Standard
1.	1 – 2.33	Low	One Standard Deviation below
2.	2.34 – 3.67	Moderate	Mean
3.	3.68 - 5	High	One Standard Deviation above

Chapter Four

Analysis of the Study Data

The current study aimed at analyzing and evaluating the safety systems and quality assurance in cutting stone facilities in Palestine. The output are as follows:

4.1 Safety Management:

4.1.2 Availability of safety tools within the facility:

What are the availability of safety tools within the facility?

The degree of availability of some important safety tools in the facilities covered by the study is shown in Table 31.

Table (31): Sample distribution by availability of safety tools within the facility

Tools	Yes		No	
	Number	Percent%	Number	Percent%
First aid box	365	100	0	0
Alarms	127	34.8	238	65.2
Emergency exit	121	33.2	244	66.8
Pamphlets or brochures about occupational safety	46	12.6	319	87.4
Outlet	347	95.1	18	4.9
Extinguishers	320	87.7	45	12.3
Shields and barriers around pools of water (asthma)	294	80.2	71	19.5

Table 31 shows the distribution of participants according to existence of first aid box in the facility, 100% of participants pointed out that there is a first aid box in the facility.

The distribution of participants according to existence of alarms in the facility, 34.8% of employees pointed to existence of alarms in the facility, while the majority (65.2%) were disagreed.

The distribution of participants according to existence of emergency exit in the facility, 33.2% of employees pointed to existence of emergency exit in the facility, while the majority (66.8%) were disagreed.

The majority of participants (80.2%) pointed to existence of shields and barriers around pools of water (asthma) in the facility, while 19.5% were disagreed.

4.1.2 Workers need for personal protective equipment:

The degree of workers need for personal protective equipments is shown in Table 32.

Table (32): Sample distribution by workers need for personal protective equipment

Personal protective equipment	Never		Sometimes		Always	
	Number	Percent %	Number	Percent %	Number	Percent %
Safety Helmet	263	72.1	76	20.8	26	7.1
Safety Glasses	46	12.6	172	47.1	147	40.3
Over the head Earmuffs	9	2.5	105	28.8	251	68.8
Safety Belt	230	63	59	16.2	76	20.8
Plastic Gloves	11	3	143	39.2	211	57.8
Footwear	8	2.2	133	36.4	224	61.4
Air-purifying Respirators	14	3.8	199	54.5	152	41.6
Protective Clothing	6	1.6	72	19.7	287	78.6

From Table 32 it can be seen that majority of participants workers (72.1%) in the study thought they don't need safety helmet during their work, 20.8% of them thought that they need safety helmet from time to time, 7.1% of them thought that they need safety helmet always.

The distribution of participants according to workers need to safety glasses, 12.6% of workers thought that they don't need safety glasses in their work, the majority (47.1%) of them thought that they need safety glasses from time to time, 40.3% of them thought that they need safety glasses always.

According to participants need for over the head earmuffs, 2.5% of workers thought that they don't need over the head earmuffs in their work, 28.8% of them thought that they need over the head earmuffs from time to time, the majority (68.8%) of them thought that they need over the head earmuffs always.

The majority of workers (78.6%) thought that they need protective clothing during the work, 1.6% of workers thought that they don't need protective clothing in their work, 19.7% of them thought that they need protective clothing from time to time.

4.1.3 workers use of personal protective equipments:

The degree of workers use of personal protective equipments is shown in Table 33.

Table (33): Sample distribution by workers use of personal protective equipments

Personal protective equipment	Never		Sometimes		Always	
	Number	Percent %	Number	Percent %	Number	Percent %
Safety Helmet	101	27.7	236	64.7	28	7.7
Safety Glasses	137	37.5	202	55.3	26	7.1
Over the head Earmuffs	54	14.8	291	79.7	20	5.5
Safety Belt	309	84.7	32	8.8	24	6.6
Plastic Gloves	8	2.2	255	69.9	102	27.9
Footwear	30	8.2	197	54.0	138	37.8
Air-purifying Respirators	100	27.4	217	59.5	48	13.2
Protective Clothing	11	3	149	40.8	205	56.2

Table 33 shows the distribution of participants according to workers used to safety helmet, 27.7% of workers thought that they don't need safety helmet in their work, the majority (64.7%) of them thought that they need safety helmet from time to time, 7.7% of them thought that they need safety helmet always.

The distribution of participants according to workers need to safety glasses, 37.5% of workers thought that they don't need safety glasses in their work, the majority (55.3%) of them thought that they need safety

glasses from time to time, 7.1% of them thought that they need safety glasses always.

The majority of participants (56.2%) thought that they need protective clothing work always, 40.8% of them thought that they need protective clothing from time to time, while3% of workers thought that they don't need protective clothing in their work.

4.1.4 Availability of Public units within the facility:

Table 34 shows the degree of availability of public units within the facility.

Table (34): Sample distribution by availability of public units within the facility

Public units	Yes		No	
	Number	Percent %	Number	Percent %
Dining hall	208	57	157	43
Place for clothes exchange	356	97.5	9	2.5
Sanitary baths	262	71.8	103	28.2
Medical Clinic	16	4.4	349	95.6

Table 34 shows the distribution of participants according to existence of dining hall in the facility, the majority (57%) of employees pointed to existence of dining hall in the facility, while 43% were disagreed.

The majority of participants pointed to lack of medical clinic in the facility, while 4.4% of them pointed to existence of medical clinic in the facility.

4.1.5 Availability of health conditions in the facility:

Table 35 shows the degree of health conditions in the facility from the workers point of view.

Table (35): Sample distribution by availability of health conditions in the facility

Personal protective equipment	Never		Sometimes		Always	
	Number	Percent %	Number	Percent %	Number	Percent %
Potable water	0	0	7	1.9	358	98.1
Meal	152	41.6	175	47.9	38	10.4
Heating system in the winter	266	72.9	74	20.3	25	6.8
Cooling system in summer	305	83.6	51	14	9	2.5
Rubbish bins for solid waste (stone)	45	12.3	6	1.6	314	86
Rubbish bins for cardboard and metal waste	118	32.3	50	13.7	197	54.0

Table 35 shows that the distribution of participants according to availability of potable water in the facility is as follows: 1.9% of participants mentioned that there is potable water from time to time, the majority (98.1%) of them mentioned that there is always potable water.

The majority (47.9%) of participants mentioned that there is a meal from time to time, 10.4% of them mentioned that there is a meal always, while 41.6% of workers mentioned that there isn't a meal in the facility.

32.3% of participants mentioned that there isn't rubbish bins for cardboard and metal waste in the facility, 13.7% of participants mentioned that there is rubbish bins for cardboard and metal waste from time to time, the majority (54%) of them mentioned that there is rubbish bins for cardboard and metal waste always.

4.1.6 Exposure to Work injuries and occupational diseases:

Table 36 shows the degree of exposure to work injuries and occupational diseases according to the workers covered by the study.

Table (36): Sample distribution by exposure to Work injuries and occupational diseases

Work injuries and occupational diseases	Yes		No	
	Number	Percent %	Number	Percent %
Exposure to the work injury as a result of working inside the facility	338	92.6	27	7.4
The injury caused by work injury is large Missing 27 7.4%	39	10.7	299	81.9
The employer paid treatment costs Missing 27 7.4%	298	81.6	40	11
Employees have received compensation for the injury Missing 27 7.4%	100	27.4	238	65.2
Employees have an occupational disease Missing 27 7.4%	17	4.7	321	87.9
The occupational disease effected on employee performance Missing 348 95.3%	1	0.3	16	4.4
Employment Type has been changed as a result of occupational disease Missing 348 95.3%	0	0	17	4.7

Table 36 shows that the distribution of participants according to work injury as a result of the work inside the facility is as follows: the majority (92.6%) of employees were injured during their work in the facility, while 7.4% weren't injured.

According to the degree of injury if it is large, 10.7% of participants their injury degree were large, while the majority (81.9%) their injury degree weren't large. 7.4% didn't answer.

The distribution of participants according to if employers paid treatment costs, the majority (81.6%) of employees pointed that employer paid treatment costs, while 11 were disagreed. 7.4% didn't answer.

The distribution of participants according to if employees have received compensation for their injury, 27.4% of employees have received compensation for their injury, while the majority (65.2%) haven't. 7.4% didn't answer.

According to if employees have an occupational disease, 4.7% of employees have an occupational disease, while the majority (87.9%) haven't. 7.4% didn't answer.

The distribution of participants according to if the occupational disease effected on employees performance,.3% of participants have affected, while 4.4% haven't. 95.3% didn't answer.

Percentage of participants whom their job type has been changed as a result of occupational disease, 4.7% their employment type hasn't changed. 95.3% didn't answer.

4.1.7 Classification of incidents within the facility

Table 37 shows the degree of classification of incidents within the facility.

Table (37): Sample distribution by classification of incidents within the facility

Incidents	Yes		No	
	Number	Percent %	Number	Percent %
Incidents related to infrastructure in the facility	146	40	219	60
Incidents related machine, bad transportation and storage	271	74.2	94	25.8
Accidents caused by fire or chemicals	12	3.3	353	96.7
Incidents related to asthma pools and solid and liquid wastes	132	36.2	233	63.8

From Table 37, it can be noted that 40% of participants thought incidents caused by bad infrastructure, while the majority (60%) didn't. The majority (74.2%) of participants thought incidents caused by machine, bad transportation and storage, while the majority (25.8%) didn't. 3.3% of participants thought incidents caused by fire or chemicals, while the majority (96.7%) didn't. 36.2% of participants thought incidents caused by asthma pools and solid and liquid wastes, while the majority (63.8%) didn't.

4.1.8 Location of the facility and internal organizational system

Table No.38 shows the appropriate degree of the location of the facility and the internal organizational system.

Table (38): Mean scores and standard deviation for the views of workers about the location of the facility and internal organizational system

Location Of The Facility And Internal organizational system	Mean	Standard deviation
Doors in the facility are wide	4.22	0.46
Windows inside the facility provide adequate lighting for work	4.18	1.02
Ceilings designed to provide comfort for workers	4.1	0.51
Corridors area between workplaces suitable for the movement and transport of materials and machines	4.05	0.45
Space inside the factory allows the free movement for workers without crowding	3.94	0.62
Floors inside the facility are easy to clean and free from obstructions	3.93	0.71
Walls color inside the facility reflect light	3.92	0.57
Truck routes and vehicles inside the factory wide and safe	3.91	0.56
Location of the factory is suitable for the type of industry	3.76	0.91
The distance between the facility and other facilities suitable	3.71	0.872
Total	**3.97**	**0.668**

Table 38 clarifies the views of participants about the location of the facility and internal organizational systems ranked in a descending order as follows: doors in the facility are wide, windows inside the facility provide adequate lighting for work, ceilings designed to provide comfort for

workers, corridors area between workplaces suitable for the movement and transport of materials and machines, space inside the factory allows the free movement for workers without crowding. The lowest, distance between the facility and other facilities suitable.

4.1.9 Availability of safety factors in the machinery and tools used in the work within the facility

Table 39 shows the degree of availability of safety factors in using machinery and tools in the work within the facility.

Table (39): Mean scores and standard deviation for the views of workers about the availability of safety factors in the machinery and tools used in the work within the facility

Provide Safety Factors In The Machinery And Tools Used In The Work	Mean	Standard deviation
Machines are suspended & power supply separated during maintenance	4.02	0.66
Facility's ground is solid and steady	3.69	1.03
The available machines in the work are safe	3.68	0.68
Workers have directed and trained to use and maintain machines	3.61	0.77
Machines are run in the facility under specialists knowledge and supervision	3.55	0.82
Goods are stored safely, whether (raw stones, plates, boxes)	3.47	1.06
There is a regular maintenance for machines and equipments	3.4	0.96
Stores far from cutting machines	3.06	1.07
The workers have the knowledge of the maximum weights which they raise and committed to	2.41	1.09
There are guiding plates near machines in the workplace to instruct workers to work in the right way	2.33	1.03
Total	**3.32**	**0.917**

Table 39 shows that the availability of safety factors in using machinery and tools in the work within the facility is ranked in a descending order as follows: machines are suspended and power supply separated during maintenance, facility's ground is solid and steady, the available machines in the work are safe, workers have directed and trained to use and maintain machines, machines are run in the facility under specialists knowledge and supervision. The lowest indicating factor is related to guiding signs placed near machines in the workplace to instruct workers.

4.1.10 The role of the administration in the application of security and safety

Table 40 shows the degree of commitment of the administration in the application of security and safety.

Table (40): Mean scores and standard deviation for the views of workers about the role of the administration in the application of security and safety

Provide Safety Factors In The Machinery And Tools Used In The Work	Mean	Standard deviation
The administration is making sufficient efforts to ensure the health and safety of workers.	3.56	0.76
The administration makes elementary medical tests (pre-employment) for workers.	3.31	0.92
The administration makes periodic medical tests (from time to time) for workers.	2.04	0.89
The administration provides papers and brochures related to security and general safety.	1.88	0.92
The administration always provides the necessary protective equipment for workers.	1.75	0.68
The administration holds training courses about security and general safety.	1.75	0.73
The administration holds training courses about first aid.	1.7	0.62
Total	**2.28**	**0.788**

Table 40 shows that the availability of safety factors in the machinery and tools used in the work within the facility is ranked in a descending order as follows: the administration is making sufficient efforts to ensure the health and safety of workers, the administration makes elementary medical tests (pre-employment) for workers, the administration

makes periodic medical tests (from time to time) for workers, the administration provides papers and brochures related to security and general safety, the administration always provides the necessary protective equipment for workers, the administration holds training courses about security and general safety, the administration holds training courses about first aid.

4.1.11 The natural conditions within the facility:

Table 41 shows that the suitability of the natural conditions inside the facility for work is within an average of (3.63).

Table (41): Mean scores and standard deviation for the views of workers about the natural conditions within the facility.

Natural conditions	Mean	Standard deviation
Natural lighting	4.26	0.49
Ventilation	3.81	0.71
Hygiene	3.77	0.75
Break time	3.52	0.83
Humidity	3.44	0.66
Temperature	3.32	0.73
Industrial lighting	3.3	1.16
Total	**3.63**	**0.761**

Table 41 shows that the suitability of the natural conditions inside the facility for work is ranked in a descending order as follows: Natural lighting, ventilation, hygiene, break time, humidity, temperature, industrial lighting.

4.1.12 Factors having adverse effect on workers performance

The effect of natural factors on the workers performance is shown in Table 42.

Table (42): Mean scores and standard deviation for the views of workers about the factors that having adverse effect on workers performance

Natural conditions	Mean	Standard deviation
Lighting intensity	4.13	0.57
Poor lighting	4.01	0.63
Noise	3.94	0.71
High humidity	3.92	0.78
Existence of dust in the workplace	3.79	0.66
Fatigue and tiredness caused by work pressure	3.73	0.83
Dealing with sharps tools	3.36	0.78
Doing a dangerous work	2.88	0.71
Temperature rise than normal	2.79	0.68
Temperature drop than normal	2.79	0.93
Total	**3.53**	**0.728**

Table 42 shows that the affect of natural factors on workers performance is ranked in a descending order as follows: lighting intensity, poor lighting, noise, high humidity, existence of dust in the workplace, fatigue and tiredness caused by work pressure, dealing with sharps tools**,** doing a dangerous work, temperature rise than normal**,** temperature drop than normal**.**

4.1.13 Factors having positive effect on workers performance:

The effect of natural factors on workers performance is shown in Table 43.

Table (43): Mean scores and standard deviation for the views of workers about the factors that having positive effect on workers performance

Natural conditions	Mean	Standard deviation
Cleanliness in workplace	4.54	0.54
Arrangement of tools in the workplace	4.49	0.5
Rest for a sufficient period	4.48	0.51
Eating a meal	4.41	0.55
Sufficient space to allow operate freely and movement within the facility	4.39	0.54
Using the safety equipment required to the job	3.61	1.01
Total	**4.32**	**0.608**

Table 43 shows that the affect of natural factors on workers performance is ranked in a descending order as follows: cleanliness in workplace, arrangement of tools in the workplace, rest for a sufficient period, eating a meal, sufficient space to allow operate freely and movement within the facility, using the safety equipment required to the job**.**

4.2 Quality Assurance

4.2.1 Senior management commitment to total quality

Table 44 shows the degree of commitment of the senior management to total quality.

Table (44): Mean scores and standard deviation for the views of managers about their commitment to total quality

Senior management commitment to quality	Mean	Standard deviation
Senior management confirms that the customer is the most important element in their objectives and this can change the culture of the organization to achieve this	4.49	0.55
Senior management is working continuously to fulfill their obligations towards customers	4.31	0.6
Senior management is working hard in order to distinct company services	4.12	0.73
Senior management seeks to build a good reputation among the customers of high-quality and perfection	4.07	0.79
Senior management developed a knowledge of the various administrative levels of the company to strengthen its commitment to quality	3.84	0.65
Management works to clarify the objectives to the workers especially the goals related to quality	3.8	0.67
Senior management believes that quality is the way and philosophy in conducting its business	3.79	0.84
The company considered quality a motto for itself	3.78	0.8
Senior management adopts a clear strategic policy and specific objectives in the application of quality	3.73	0.82
Senior management is working to promote a culture of quality in all departments and levels of management	3.7	0.74
Senior management supports the principle of devolution of powers and facilitate the auditing of information between the different sections	3.69	0.82

Company trains workers on modern techniques and skills that will help to develop their performance and quality improvement	3.44	0.95
Implementation of training programs based on clear principles	3.36	0.91
Workers involved in the preparation of plans to improve quality	3.21	0.91
Total	**3.80**	**0.77**

Table 44 shows that the views of managers about their commitment to total quality is ranked in a descending order as follows: senior management confirms that the customer is the most important element in their objectives and this can change the culture of the organization to achieve this, senior management is working continuously to fulfill their obligations towards customers, senior management is working hard in order to distinct company services, Senior management seeks to build a good reputation among the customers of high-quality and perfection, senior management developed a knowledge of the various administrative levels of the company to strengthen its commitment to quality. The lowest, workers involved in the preparation of plans to improve quality.

4.2.2 Customer Satisfaction

The degree of achievement of customer satisfaction from the managers views is shown in Table 45.

Table (45): Mean scores and standard deviation for the views of managers according to their achievement to customer satisfaction

Customer satisfaction.	Mean	Standard deviation
The company is characterized by rapidly satisfy of desires of the customers	4.33	0.60
The company focuses on achieving customer satisfaction by studying their requirements	4.21	0.64
Company always studies the needs and desires of customers and their satisfaction with the products	4.11	0.78
The company believes that quality determines by satisfying customers' needs	4.00	0.67
Company studies customer complaints constantly and provides appropriate solutions	3.86	0.96
Total	**4.10**	**0.73**

Table 45 shows that the achievement of customer satisfaction in the company is ranked in a descending order as follows: the company is characterized by rapidly satisfy of desires of the customers, the company focuses on achieving customer satisfaction by studying their requirements, company always studies the needs and desires of customers and their satisfaction with the products, the company believes that quality determines by satisfying customers' needs, Company studies customer complaints constantly and provides appropriate solutions.

4.2.3 Continuous Improvement

Table 46 shows that the degree of achievement of continuous improvement in the facilities covered by the study is within an average of (3.98).

Table (46): Mean scores and standard deviation for the views of managers according to their achievement to continuous improvement

Continuous improvement	Mean	Standard deviation
The Company seeks to improve the products and services continuously	4.17	0.47
The company is keen on the continuous improvement of the system of production and service in order to improve quality	4.15	0.47
The company is keen continuously to reduce the gap between the expectations of consumers about the quality and the actual quality provided to them	4.06	0.55
Continuous improvement of goods and services earns the company a competitive advantage compared to companies	3.98	0.68
The company seeks to take responsibility towards society through continuous improvement of products	3.96	0.61
Senior management consider continuous improvement in work as part of the quality requirements	3.93	0.64
The company relies on scientific methods and tools for improving quality	3.66	0.77
Total	**3.98**	**0.598**

Table 46 shows that the achievement of continuous improvement in the company is ranked in a descending order as follows: the Company seeks to improve the products and services continuously, the company is

keen on the continuous improvement of the system of production and service in order to improve quality, the company is keen continuously to reduce the gap between the expectations of consumers about the quality and the actual quality provided to them, continuous improvement of goods and services earns the company a competitive advantage compared to companies, the company seeks to take responsibility towards society through continuous improvement of products, senior management consider continuous improvement in work as part of the quality requirements, the company relies on scientific methods and tools for improving quality.

4.2.4 Operational procedures:

Table 47 shows that the degree of achievement of operational procedures is within an average of (3.28).

Table (47): Mean scores and standard deviation for the views of managers according to their achievement to Operational procedures

Operational procedures	Mean	Standard deviation
Company deals with a specific set of suppliers	3.96	0.70
Company uses specific criteria in the selection of suppliers and these criteria are based on quality	3.84	0.81
The company operates on analysis and customer complaints for the purpose of reducing the cases of non-conformity	3.81	0.77
Raw material bought according to specifically tailored	3.73	0.97
Senior management are working to determine the nature and causes of the lack of conformity within the company, and take corrective action	3.62	0.88
The verification of products quality is by following the methods of inspection from time to time	3.37	1.10

Company maintains an integrated database for suppliers and the quality of their products	3.13	1.14
Company is interested in the regulations of purchases with lower price suppliers regardless of quality	2.43	0.97
The company relies on a third party in the scrutiny and examination of raw materials that they purchase	2.57	0.90
The company is keen to deal with suppliers who possess international standards certificate	2.23	0.76
Total	**3.28**	**0.90**

Table 47 shows that the achievement of operational procedures in the company is ranked in a descending order as follows: company deals with a specific set of suppliers**,** company uses specific criteria in the selection of suppliers and these criteria are based on quality, the company operates on analysis and customer complaints for the purpose of reducing the cases of non-conformity**,** raw material bought according to specifically tailored, senior management are working to determine the nature and causes of the lack of conformity within the company, and take corrective action, the verification of products quality is by following the methods of inspection from time to time, company maintains an integrated database for suppliers and the quality of their products**,** company is interested in the regulations of purchases with lower price suppliers regardless of quality**,** the company relies on a third party in the scrutiny and examination of raw materials that they purchase, The company is keen to deal with suppliers who possess international standards certificate.

4.2.5 Marketing

Table 48 shows that the degree of achievement of marketing is within an average of (3.78).

Table (48): Mean scores and standard deviation for the views of managers according to marketing

Marketing	Mean	Standard deviation
The company is keen on providing its products different shapes and sizes based on the study of the desires of customers	4.06	0.70
In case of any defect in service corrective actions are taken to ensure customer satisfaction	4.00	0.65
The company is committed to standard specifications on the goods	3.98	0.95
The company takes into consideration its responsibility towards society and the environment during production processes	3.77	0.68
The company respond to customers attributes according to goods	3.70	1.07
The company has Internet or / & Email service	3.56	1.18
Company is interested to export products to other countries	3.40	1.22
Total	**3.78**	**0.92**

Table 48 shows that the achievement of marketing in the company is ranked in a descending order as follows: the company is keen on providing its products different shapes and sizes based on the study of the desires of customers, in case of any defective in service are taken corrective action to ensure customer satisfaction, the company is committed to standard specifications on the goods, the company takes into consideration its responsibility towards society and the environment during production

processes, the company respond to customers attributes according to goods, the company has Internet or / & Email service, company is interested to export products to other countries.

4.2.6 Promotion

The degree of achievement of promotion, shown in Table 49, is within an average of (3.2).

Table (49): Mean scores and standard deviation for the views of managers according to promotion

Promotion	Mean	Standard deviation
The company gives great attention to the promotion and advertising in order to build a reputation for the products and the company	3.60	1.06
The company is involved in local economic activities (seminars / exhibitions)	3.57	1.07
The company distributes promotional materials for definition and promotion of products	3.51	1.14
The company is involved in the global economic events (seminars / exhibitions)	3.51	1.15
The company uses external media to reach customers	2.53	1.14
The company uses local media to reach customers	2.50	1.03
Total	**3.20**	**1.098**

Table 49 shows that the achievement of promotion in the company is ranked in a descending order as follows: the company gives great attention to the promotion and advertising in order to build a reputation for the products and the company, the company is involved in local economic activities (seminars / exhibitions), the company distributes promotional

materials for definition and promotion of products, the company is involved in the global economic events (seminars / exhibitions), the company uses external media to reach customers, the company uses local media to reach customers.

4.2.7 Competition:

The degree of achievement of competition, shown in Table 50, is within an average of (3.62).

Table (50): Mean scores and standard deviation for the views of managers according to competition

Competition	Mean	Standard deviation
The Company believes that its products are able to compete with other products in terms of quality in the local market	4.10	0.66
The Company believes that its products are able to compete with other products in terms of price in the local market	3.92	0.76
The company is pricing the goods based on cost	3.88	0.85
The company is pricing the goods based on the quality of products	3.83	0.89
The Company compares its global products with competitors in terms of quality	3.33	1.22
The company is pricing the goods based on the toddler price	3.32	1.14
The Company compares its global products with competitors in terms of price	2.97	1.14
Total	**3.62**	**0.95**

Table 50 shows that the achievement of competition in the company is ranked in a descending order as follows: the company believes that its

products are able to compete with other products in terms of quality in the local market, the company believes that its products are able to compete with other products in terms of price in the local market, the company is pricing the goods based on cost, the company is pricing the goods based on the quality of products, the company compares its global products with competitors in terms of quality, the company is pricing the goods based on the toddler price, the company compares its global products with competitors in terms of price.

4.2.8 Examinations and tests:

The degree of application for examinations and tests, shown in Table 51, is within an average of (3.06).

Table (51): Mean scores and standard deviation for the views of managers according to examinations and tests

Examinations and tests	Mean	Standard deviation
Samples are taken from the final product to make sure they conform to the required specifications	3.43	1.24
Company uses the records to record the results of the examination and testing in order to benefit from them in the future	3.11	1.29
The company uses statistical techniques widely to reduce the variation and deviation in the production process	2.65	1.24
Total	**3.06**	**1.256**

Table 51 shows that the application for examinations and tests is ranked in a descending order as follows: samples are taken from the final

product to make sure they conform to the required specifications, company uses the records to record the results of the examination and testing in order to benefit from them in the future, the company uses statistical techniques widely to reduce the variation and deviation in the production process.

4.2.9 Obstacles facing application of quality:

The degree of the obstacles facing application of quality, shown in Table 52, is within an average of (2.93).

Table (52): Mean scores and standard deviation for the views of managers according to obstacles facing application of quality

Obstacles facing application of quality	Mean	Standard deviation
Lack of quality education and training programs for workers to drive the improvement process in the company	3.55	0.95
Low level of knowledge for staff to the philosophy of total quality management	3.44	0.81
Lack of top management commitment to and understanding the quality programs	2.91	1.05
Quality program implementation does not solve the problems of the company	2.87	1.08
Senior management commitment to the concepts of traditional management	2.81	0.99
Actual results of implementation of quality program does not encourage continuity	2.67	0.94
Implementation of quality program is an unnecessary cost	2.64	0.89
Low efficiency of the hardware and manufacturing	2.62	1.05
Total	**2.93**	**0.97**

Table 52 shows that obstacles facing application of quality is ranked in a descending order as follows: lack of quality education and training programs for workers to drive the improvement process in the company, low level of knowledge for staff to the philosophy of total quality management, lack of top-management commitment to and understanding the quality programs, quality program implementation does not solve the problems of the company, senior management commitment to the concepts of traditional management, actual results of implementation of quality program does not encourage continuity, implementation of quality program is an unnecessary cost, low efficiency of the hardware and manufacturing.

4.2.10 Competitive intensity in the markets:

The degree of competition in the markets, shown in Table 53, is within an average of (2.56).

Table (53): Mean scores and standard deviation for the views of managers according to competitive intensity in the markets

Competitive intensity in the markets	Mean	Standard deviation
Local market	3.42	0.908
Arab markets	2.67	1.242
Israeli market	2.24	1.164
International markets	1.93	1.194
Total	**2.56**	**1.125**

Table 53 shows that the achievement of competition in the markets is ranked in a descending order as follows: local market, Arab markets, Israeli market, International markets.

4.3 Variables analysis of improving the Palestinian Stone and Marble Industry by Employing Quality Assurance and Safety Management Systems:

4.3.1 There are no statistical significant differences at $\alpha \leq 0.05$ in the availability of safety and health factors in the facility according to the district:

One way analysis of variance was used to identify the above hypothesis. Table 54 shown below present the results.

Table (54): One way analysis of variance for the availability of safety and health factors in the facility according to the district

Sub-scale	Source	Df	Sum of squares	Mean square	F-value	Sig.
Location of the property and the style of the internal organization	Between groups	4	10.964	2.741	19.117	0.000
	Within groups	360	51.619	0.143		
	Total	364	62.584	-----		
Availability of safety factors in the machinery and equipment used in the work	Between groups	4	12.458	3.114	8.650	0.000
	Within groups	360	129.624	0.360		
	Total	364	142.081	-----		
The role of the administration in the promotion and application of the concept of security and public safety	Between groups	4	3.352	0.838	2.730	0.029
	Within groups	360	110.505	0.307		
	Total	364	113.857	-----		

Table 54 indicates that there are statistical significant differences at $\alpha \leq 0.05$ in the availability of safety and security factors in the facility according to the district. The differences were in the sub-scale of the forms of availability of safety and health factors in the facility,in favor to Hebron in the first and second dimensions, on the other hand difference in the third dimension in favor to Bethlehem, as it clears from the mean scores in the above table.

Table (55): Mean scores and standard deviation for availability of safety and health factors in the facility according to district

Sub-scale	City	N	Mean	Std. Deviation
Location of the property and the style of the internal organization	Hebron	113	4.20	0.36
	Bethlehem	118	3.92	0.36
	Ramallah	31	3.79	0.26
	Jenin	47	3.70	0.38
	Nablus	56	3.91	0.47
	Total	365	3.97	0.41
Availability of safety factors in the machinery and equipment used in the work	Hebron	113	3.51	0.58
	Bethlehem	118	3.38	0.59
	Ramallah	31	3.20	0.57
	Jenin	47	2.96	0.61
	Nablus	56	3.17	0.65
	Total	365	3.32	0.62
The role of the administration in the promotion and application of the concept of security and public safety	Hebron	113	2.28	0.61
	Bethlehem	118	2.40	0.58
	Ramallah	31	2.26	0.50
	Jenin	47	2.15	0.39
	Nablus	56	2.16	0.48
	Total	365	2.28	0.55

4.3.2 There are no statistical significant differences at $\alpha \leq 0.05$ in the availability of safety and health factors in the facility according to insurance:

T-test was used to identify the above hypothesis. Table 56 shown below present the results.

Table (56): T-test for the differences availability of safety and health factors in the facility according to insurance

Sub-scale	Insurance	N	Mean	Std. Deviation	DF	T-value	Sig.
Location of the property and the style of the internal organization	Yes	361	3.97	0.41	363	1.562	0.119
	No	4	3.65	0.30			
Availability of safety factors in the machinery and equipment used in the work.	Yes	361	3.32	0.62	363	1.362	0.174
	No	4	2.9	0.69			
The role of the administration in the promotion and application of the concept of security and public safety	Yes	361	2.29	0.55	363	1.545	0.123
	No	4	1.85	0.65			

Table 56 indicates that there are no statistical significant differences at $\alpha \leq 0.05$ in the availability of safety and health factors in the facility according to the insurance.

4.4 Quality management:

4.4.1 There are no statistical significant differences at $\alpha \leq 0.05$ in the application of TQM in cutting stone facilities according to the district:

One way analysis of variance was used to identify the above hypothesis. Table 57 shown below present the results.

Table (57): One way analysis of variance of application of TQM in cutting stone facilities according to the district

Sub-scale	Source	Df	Sum of squares	Mean square	F-value	Sig.
Senior management commitment to quality	Between groups	4	14.070	3.517	14.648	0.000
	Within groups	237	56.909	0.240		
	Total	241	70.979	-----		
Customer satisfaction	Between groups	4	4.387	1.097	4.523	0.002
	Within groups	237	57.472	0.242		
	Total	241	61.859	-----		
Continuous improvement	Between groups	4	5.725	1.431	7.834	0.000
	Within groups	237	43.302	0.183		
	Total	241	49.027	-----		
Operational procedures	Between groups	4	11.814	2.954	15.193	0.000
	Within groups	237	46.072	0.194		
	Total	241	57.886			
Marketing	Between groups	4	25.398	6.349	16.797	0.000
	Within groups	237	89.586	0.378		
	Total	241	114.984	-----		
Promotion	Between groups	4	43.620	10.905	19.944	0.000
	Within groups	237	129.585	0.547		
	Total	241	173.205	-----		
Competition	Between groups	4	8.327	2.082	6.116	0.000
	Within groups	237	80.675	0.340		
	Total	241	89.003	-----		
Examinations and tests	Between groups	4	57.526	14.382	13.896	0.000
	Within groups	237	245.280	1.035		
	Total	241	302.806	-----		

Table 57 indicates that there are statistical significant differences at $\alpha \leq 0.05$ in the application of TQM in cutting stone facilities according to the district. The differences were in the sub scale of the forms of application of TQM in cutting stone facilities,in favor to Hebron in the first, second and third dimensions, on the other hand difference in the fourth, fifth, sixth, seventh and eighth dimensions, on the other hand difference in the ninth dimension in favor to Nablus, as it clears from the mean scores in the above table.

Table (58): Mean scores and standard deviation for application of TQM in cutting stone facilities according to different Cities

Sub-scale	City	N	Mean	Std. Deviation
Senior management commitment to quality	Hebron	75	3.98	0.43
	Bethlehem	78	3.96	0.42
	Ramallah	20	3.67	0.53
	Jenin	31	3.29	0.63
	Nablus	38	3.63	0.54
	Total	242	3.80	0.54
Customer Satisfaction	Hebron	75	4.26	0.49
	Bethlehem	78	4.10	0.44
	Ramallah	20	4.06	0.45
	Jenin	31	3.92	0.57
	Nablus	38	3.91	0.53
	Total	242	4.09	0.50
Continuous Improvement	Hebron	75	4.12	0.40
	Bethlehem	78	4.05	0.36
	Ramallah	20	3.89	0.45
	Jenin	31	3.65	0.62
	Nablus	38	3.90	0.38
	Total	242	3.98	0.45
Operational procedures	Hebron	75	3.42	0.39
	Bethlehem	78	3.45	0.42

	Ramallah	20	3.25	0.54
	Jenin	31	2.90	0.39
	Nablus	38	2.97	0.53
	Total	242	3.28	0.49
Marketing	Hebron	75	3.98	0.61
	Bethlehem	78	4.04	0.62
	Ramallah	20	3.68	0.68
	Jenin	31	3.26	0.56
	Nablus	38	3.30	0.60
	Total	242	3.78	0.69
Promotion	Hebron	75	3.42	0.79
	Bethlehem	78	3.52	0.69
	Ramallah	20	3.40	0.67
	Jenin	31	2.66	0.72
	Nablus	38	2.44	0.76
	Total	242	3.20	0.84
Competition	Hebron	75	3.66	0.63
	Bethlehem	78	3.80	0.54
	Ramallah	20	3.72	0.56
	Jenin	31	3.35	0.45
	Nablus	38	3.32	0.66
	Total	242	3.62	0.60
Examinations and tests.	Hebron	75	3.26	0.98
	Bethlehem	78	3.45	0.99
	Ramallah	20	3.38	1.24
	Jenin	31	2.12	0.71
	Nablus	38	2.46	1.19
	Total	242	3.06	1.12

4.4.2 There are no statistical significant differences at $\alpha \leq 0.05$ in the application of TQM in cutting stone facilities according to year of establishment:

One way analysis of variance was used to test the above hypothesis. Table 59 shown below present the results

Table (59): T-test for the differences application of TQM in cutting stone facilities according to the year of facility's establishment

Sub-scale	Year	N	Mean	Std. Deviation	Df	T-value	Sig.
Senior management commitment to quality	1992-	94	3.82	0.44	168	-2.787	0.006
	1993+	76	4.01	0.46			
Customer Satisfaction	1992-	94	4.07	0.58	168	-0.728	0.486
	1993+	76	4.13	0.39			
Continuous Improvement	1992-	94	3.96	0.41	168	-1.884	0.059
	1993+	76	4.08	0.37			
Operational procedures	1992-	94	3.19	0.49	168	-4.388	0.000
	1993+	76	3.50	0.41			
Marketing	1992-	94	3.70	0.65	168	-3.653	0.000
	1993+	76	4.06	0.62			
Promotion	1992-	94	3.21	0.77	168	-2.756	0.006
	1993+	76	3.53	0.72			
Competition	1992-	94	3.54	0.55	168	-3.392	0.001
	1993+	76	3.85	.60			
Examinations and tests	1992-	94	2.95	1.01	168	-3.909	.0000
	1993+	76	3.57	1.04			

Table 59 indicates that there are statistical significant differences at $\alpha \leq 0.05$ in the application of TQM in cutting stone facilities according year of establishment. The differences were in the sub-scale of the forms of application of TQM in cutting stone facilities,in favor to (1992-) in the first, fourth, fifth, sixth, seventh, eighth and ninth dimensions, as it clears from the mean scores in the above table.

4.4.3 There are no statistical significant differences at $\alpha \leq 0.05$ in the application of TQM in cutting stone facilities according to number of employees:

One way analysis of variance was used to identify the above hypothesis. Table 60 shown below present the results.

Table (60): One way analysis of variance application of TQM in cutting stone facilities according to number of employees

Sub-scale	Source	Df	Sum of squares	Mean square	F-value	Sig.
Senior management commitment to quality	Between groups	2	14.893	7.447	31.733	0.000
	Within groups	239	56.086	0.235		
	Total	241	70.979	-----		
Customer Satisfaction	Between groups	2	2.484	1.242	4.999	0.007
	Within groups	239	59.375	0.248		
	Total	241	61.859	-----		
Continuous Improvement	Between groups	2	4.723	2.361	12.738	0.000
	Within groups	239	44.305	0.185		
	Total	241	49.027	-----		
Operational procedures	Between groups	2	12.333	6.166	32.352	0.000
	Within groups	239	45.554	0.191		
	Total	241	57.886	-----		
Marketing	Between groups	2	27.210	13.605	37.045	0.000

	Within groups	239	87.775	0.367		
	Total	241	114.984	-----		
Promotion	Between groups	2	43.421	21.710	39.980	0.000
	Within groups	239	129.785	0.543		
	Total	241	173.205	-----		
Competition	Between groups	2	9.227	4.614	13.822	0.000
	Within groups	239	79.776	0.334		
	Total	241	89.003	-----		
Examinations and tests	Between groups	2	63.788	31.894	31.892	0.000
	Within groups	239	239.018	1.000		
	Total	241	302.806	-----		

Table 60 indicates that there are statistical significant differences at $\alpha \leq 0.05$ in the application of TQM in cutting stone facilities according to number of employees. The differences were in the sub-scale of the forms of application of TQM in cutting stone facilities, in favor to (20+). Except the second dimension, in favor to (11-20), as it clears from the mean scores in the above table.

Table (61): Mean scores and standard deviation for the application of TQM in cutting stone facilities according to number of employees

sub-scale	number of employees	n	mean	std. deviation
Senior management commitment to quality.	10-	86	3.52	0.60
	11-20	101	3.84	0.41
	20+	55	4.18	0.39
	Total	242	3.80	0.54
Customer Satisfaction.	10-	86	3.98	0.53
	11-20	101	4.11	0.51
	20+	55	4.25	0.39
	Total	242	4.09	0.50
Continuous Improvement.	10-	86	3.81	0.48
	11-20	101	4.03	0.40
	20+	55	4.16	0.38
	Total	242	3.98	0.45
Operational procedures.	10-	86	2.98	0.46
	11-20	101	3.39	0.45
	20+	55	3.52	0.35
	Total	242	3.28	0.49
Marketing.	10-	86	3.35	0.58
	11-20	101	3.91	0.66
	20+	55	4.20	0.53
	Total	242	3.78	0.69
Promotion.	10-	86	2.66	0.78
	11-20	101	3.37	0.75
	20+	55	3.73	0.61
	Total	242	3.20	0.84
Competition.	10-	86	3.39	0.57
	11-20	101	3.65	0.59
	20+	55	3.91	0.53
	Total	242	3.62	0.60
Examinations and tests.	10-	86	2.41	1.07
	11-20	101	3.25	0.99
	20+	55	3.72	0.87
	Total	242	3.06	1.12

4.4.4 There are no statistical significant differences at $\alpha \leq 0.05$ in the application of TQM in cutting stone facilities according to quality Certificates.

One way analysis of variance was used to test the above hypothesis. Table 62 shown below present the results

Table (62): One way analysis of variance application of TQM in cutting stone facilities according to the quality Certificates

Sub-scale	Source	Df	Sum of squares	Mean square	F-value	Sig.
Senior management commitment to quality.	Between groups	4	14.338	3.585	14.999	0.000
	Within groups	237	56.641	0.239		
	Total	241	70.979	-----		
Customer Satisfaction.	Between groups	4	3.129	0.782	3.157	0.015
	Within groups	237	58.730	0.248		
	Total	241	61.859	-----		
Continuous Improvement.	Between groups	4	7.514	1.879	10.725	0.000
	Within groups	237	41.513	0.175		
	Total	241	49.027	-----		
Operational procedures.	Between groups	4	9.843	2.461	12.139	0.000
	Within groups	237	48.043	0.203		
	Total	241	57.886	-----		
Marketing.	Between groups	4	19.228	4.807	11.897	0.000
	Within groups	237	95.756	0.404		
	Total	241	114.984	-----		
Promotion.	Between groups	4	28.250	7.063	11.547	0.000
	Within groups	237	144.955	0.612		

	Total	241	173.205	-----		
Competition.	Between groups	4	16.804	4.201	13.790	0.000
	Within groups	237	72.199	0.305		
	Total	241	89.003	-----		
Examinations and tests	Between groups	4	49.364	12.341	11.540	0.000
	Within groups	237	253.442	1.069		
	Total	241	302.806	-----		
Obstacles facing application of quality.	Between groups	4	8.647	2.162	5.145	0.001
	Within groups	237	99.578	0.420		
	Total	241	108.225	-----		

Table 62 indicates that there are statistical significant differences at $\alpha \leq 0.05$ in the application of TQM in cutting stone facilities according to Quality Certificates. The differences were in the sub-scale of the forms of application of TQM in cutting stone facilities,in favor to the first till seventh dimension(ISO9000). The eighth dimension, in favor to (ISO9000, Palestinian Quality mark, Supervision Certification). The ninth dimension, in favor to (nothing), as it clears from the mean scores in the above table.

Table (63): Mean scores and standard deviation for Quality Commitment in the facility according to Quality Certificates

Sub-scale	Certificates	N	Mean	Std. Deviation
Senior management commitment to quality.	ISO9000	6	4.76	0.28
	Palestinian Quality mark	79	3.98	0.42
	Supervision Certification	10	4.00	0.39
	All above	3	4.64	0.12
	Other	144	3.64	0.53
	Total	242	3.80	0.54
Customer Satisfaction.	ISO9000	6	4.73	0.39
	Palestinian Quality mark	79	4.15	0.3845
	Supervision Certification	10	4.04	0.46
	All above	3	4.20	0.69
	Other	144	4.04	0.55
	Total	242	4.09	0.50
Continuous Improvement.	ISO9000	6	4.80	0.46
	Palestinian Quality mark	79	4.11	0.36
	Supervision Certification	10	4.05	0.25
	All above	3	4.23	0.65
	Other	144	3.87	0.44
	Total	242	3.98	0.41
Operational procedures.	ISO9000	6	3.88	0.40
	Palestinian Quality mark	79	3.48	0.44
	Supervision Certification	10	3.47	0.42
	All above	3	3.6	0.36
	Other	144	3.12	0.456
	Total	242	3.28	0.49
Marketing.	ISO9000	6	4.88	0.189
	Palestinian	79	3.96	0.60

	Quality mark			
	Supervision Certification	10	4.12	0.35
	All above	3	4.71	0.24
	Other	144	3.58	0.67
	Total	242	3.78	0.69
Promotion.	ISO9000	6	4.44	0.53
	Palestinian Quality mark	79	3.41	0.78
	Supervision Certification	10	3.61	0.65
	All above	3	4.66	0.00
	Other	144	2.97	0.79
	Total	242	3.20	0.847
Competition.	ISO9000	6	4.42	0.36
	Palestinian Quality mark	79	3.86	0.62
	Supervision Certification	10	3.85	0.47
	All above	3	4.38	0.16
	Other	144	3.42	0.52
	Total	242	3.62	0.60
Examinations and tests.	ISO9000	6	4.38	0.64
	Palestinian Quality mark	79	3.42	1.17
	Supervision Certification	10	3.53	0.98
	All above	3	5	0.00
	Other	144	2.73	0.97
	Total	242	3.06	1.12

Chapter Five

Conclusions and Recommendations

Results and recommendations

This research has provided an assessment for Palestinian cutting stone industry in terms of quality assurance and safety management systems. This chapter summarizes the study outcomes and brings together the main conclusions reached. This chapter will therefore consider the directions of future work in this area.

5.1. Results and important conclusions:

Following is a summary results of assessment for Palestinian stone cutting industry in terms of quality assurance and safety management systems.

5.1.1. Safety Systems:

5.1.1.1. Results derived from the characteristics of the study sample:

The results of the first division can be summarized as follows:

1. The percentage of workers who have experience less than five years in cutting stone industry is 12.9%, the percentage of workers who have experience between 5-10 years is 17%, the percentage of workers who have experience between 11-15 years is 40.3%, while 29.9% have experience of 15 years and more.

The researcher concludes that more than half of workers in stone cutting industry have experience more than ten years.

2. The percentage of holding tertiary education from the participants in the study is 8.5%, where the percentage of those holding a secondary school certificate is 67.7%, while 23.8% have received only basic education.

The researcher concludes that the majority of the participants were holding of a secondary school certificate or less (91.5%).

3. The percentage of facilities having health insurance for their employees is 98.9%.

4. The percentage of workers who work 7 hours or less per day is 13.7%, while the percentage of workers who work 8 hours or more per day is 86.3%.

The researcher concludes that most of the workers work 8 hours/daily or more (86.3%). According to Palestinian Labor Law the actual work hours mustn't exceed 45 per week "7.5 hours per day". Stone cutting industry is considered one of the hazardous occupations and according to Palestinian Labor Law there must be a reduction of daily working hours not less than one hour in the hazardous works or harmful to health works and night works which means that workers

in stone cutting industry must work just (6.5h per day), so most of workers may be in danger.

5.1.1.2. Classification of results according to the study dimensions:

Results from the second division of the study: The views of employees regarding the location of the facility and internal organizational system, providing safety factors in the machinery and tools used in the work, and providing safety factors in the machinery and tools used in the work.

1. The workers evaluation for the degree of satisfaction in the location of the facility and internal organizational system is high, with a mean: 3.97.

2. The workers evaluation for the degree of satisfaction in for the availability of safety factors in the machinery and tools used in the work place within the facility is moderate, with a mean: 3.32.

3. The workers evaluation for the degree of satisfaction for the commitment of the administration in the application of health and safety is low, with a mean 2.28.

The researcher found this indicates to misunderstanding, managing and negligence from the senior management of cutting stone facilities to health and safety concept.

Results from the Third division of the study: The views of employees regarding the availability of safety tools within the facility, workers need for personal protective equipment, workers used for personal protective equipment, availability of Public units within the facility and the availability of health conditions in the facility.

1. Results showed that availability of safety tools within the facility in the cutting stone facilities are in the following: first aid box 100%, alarms 34.8%, emergency exit 33.2%, pamphlets or brochures about occupational safety 12.6%, outlet 95.1%, extinguishers 87.7%, shields and barriers around pools of water (asthma) 80.2%.

2. The results of the search shows that the most personal protective equipments needed for employee in cutting stone industry are arranged according to their importance as follows: safety helmet 7.1%, safety glasses 40.3%, over the head earmuffs 68.8%, safety Belt 20.8%, plastic gloves 57.8%, Footwear 61.4%, air-purifying respirators 41.6%, and protective clothing 78.6%.

3. The results showed that the workers used for personal protective equipment in cutting stone industry are arranged according to their importance as follows: safety helmet, safety glasses, over the head earmuffs, safety belt, plastic gloves, footwear, air-purifying respirators, and protective clothing.

4. According to the necessary public units in cutting stone facilities: The percentage of facilities which have dining hall is 57%, percentage of facilities which have place for clothes exchange is 97.5%, percentage of facilities which have sanitary baths 71.8%, finally percentage of facilities which have medical Clinic 4.4%.

   The researcher concludes that just (57%) of facilities are committed to providing dining hall, according to Palestinian Labor Law there is must be allocated a place with sufficient space and away from work places for eating in each facility, to be clean, free of pollution, and comes with adequate lighting and proper ventilation (Declare No. 2/4"). medical Clinic 4.4% reflects the extent of the negligence of the employees health.

5. The research results showed that the availability of health requirements at work is in the cutting stone industry facilities is in the following: water, meal, heating system in the winter, cooling system in summer, rubbish bins for solid waste (stone), finally rubbish bins for cardboard and metal waste.

6. The workers evaluation for the degree of satisfaction in the natural conditions within the facility is high, with a mean 3.63.

Results from the fourth division of the study: The views of employees regarding the exposure to work injuries and occupational diseases, classification of incidents within the facility, location of the facility and

internal organization method, availability of safety factors in the machinery and tools used in the work within the facility, the role of the administration in the application of security and safety, factors have adversely affect on workers performance, and the factors have positively affect on workers performance.

1. The research results showed that 92.6% of workers exposure to the work injury as a result of working inside the facility, 10.7% of injuries were large, 81.6% were treated by the employer, 27.4% of workers were compensated for their injuries.

   The researcher found that the percentage of injuries very large, This indicates either lack of workers experience in the job or they haven't received the appropriate training to use machines and equipments, inadequate or lack of personal protective equipments.

   Even though most of employers were treat workers injuries, but they don't compensated for injuries, this could reflect negatively on worker's psyche and productivity.

2. The research results showed 4.7% of workers thought that they have occupational diseases. 0.3% the occupational diseases effected on employees performance. None of them their work were changed.

   Regarding to the researcher opinion the percentage of workers who have an occupational diseases is not true, because there isn't any

medical clinic in the West Bank to diagnosis occupational diseases. Through the researcher interviews for workers in the cutting stone facilities noticed that a lot of workers don't understand the concept of occupational diseases, in addition to disease markers that observed on them (eyes redness, back arched, skin ulcers, etc.).

3. The research results showed 40% of incidents happened because of bad infrastructure in the facility, 74.2% of incidents related to machines, bad transportation and storage, 3.3% of accidents caused by fire or chemicals, 36.2% incidents related to asthma pools and solid and liquid wastes.

   The researcher found that most of workers their injuries caused by machines and bad transportation, this mean there is lack in employees training and awareness.

4. The workers evaluation for the degree of the factors having adverse effect on their performance (lighting intensity, poor lighting, noise, high humidity, existence of dust in the workplace, fatigue and tiredness caused by work pressure, dealing with sharps tools, doing danger, temperature rise than normal, temperature drop than normal) is moderate, with a mean 3.53.

5. The workers evaluation for the degree of factors having positive effect on workers performance (cleanliness in workplace, arrangement of tools in the workplace, rest for a sufficient period,

eating a meal, sufficient space to allow operate freely and movement within the facility, using the safety equipment required to the job) is high, with a mean 4.32.

5.1.2 Quality management system:

5.1.2.1 Results derived from the characteristics of the study sample:

The results of the first division can be summarized as follows:

1. Most of the facilities established before 1992.

2. The percentage of family companies is 86.8%, while percentage of non family companies is 13.2%.

3. The percentage of facilities which have employees less than ten workers in cutting stone industry is 35.5%, the percentage of facilities which have employees between 11-15 workers is 41.7%, while 22.7% of facilities which have employees 15 workers and more.

   The researcher found that the number of workers in Northern of the West Bank is small compared to the number in the middle and south, and they are mainly specialized in stones building.

4. The percentage of managers who have experience less than five years in cutting stone industry is 7.4%, the percentage of managers who have experience between 5-10 years is 15.3%, the percentage of

managers who have experience between 11-15 years is 31.8%, while 45.5% have experience 15 years and more.

The researcher concludes that more than the half of managers for cutting stone facilities have experience more than 15 years this mean they may have accumulated experience in this sector.

5. The percentage of holding tertiary education from the participants in the study is 10.3%, where the percentage of those holding secondary school certificate is 57%, while 32.6% have received only basic education.

   The researcher concludes that the majority of participants were holding of secondary school certificate or less (89.6%), this indicates of lack of education for workers in cutting stone sector, which affect on the development of cutting stone industry.

6. The percentage of companies obtained certifications, 2.5% having ISO9000, 32.6% having Palestinian quality mark, 4.1% having supervision certification, 1.2% having (ISO9000, Palestinian quality mark, supervision certification), 59.5% having other certifications.

   The researcher found that most facilities haven't get any kind of quality certifications (59.5%), this indicates that the companies don't adhere to the quality standards through production process.

7. The percentage of the facilities which have Italy machines is 50.8%, 4.1% of facilities having Turkish machines, 3.7% of facilities having German machines, while 14.9% of facilities having (Italy, Turkey and Germany machines), 28.9% of facilities having locally made machines.

   The locally made machines are handy machines, lacks to safety specifications, this type of machines are frequently in the northern of the West Bank, the technology they used in cutting stone is very old; they use very simple cutting machines with one blade, these machines are not accurate and the cutting precision is not good. The marble and stone facilities in Hebron and Bethlehem more technologically advanced, in both of these areas the Italian technology is the most applied, the Turkish brands have significant presence as well, and in some cases Chinese machinery can be found

5.1.2.2 Classification of results according to the study dimensions:

Results from the second division of the study: The views of managers regarding to the senior management commitment to total quality, customer satisfaction, continuous improvement, operational procedures.

1. The managers evaluation for the degree of senior management commitment to total quality is high, with a mean 3.80.

2. The managers evaluation for the degree of customer satisfaction is high, with a mean 4.10.

3. The managers evaluation for the degree of continuous improvement is high, with a mean 3.98.

4. The managers evaluation for the degree of operational procedures is moderate, with a mean 3.28.

Results from the third division of the study: The views of managers regarding to marketing, promotion, competition, examinations and tests, obstacles facing application of quality.

1. The managers evaluation for the degree of marketing is high, with a mean 3.78.

2. The managers evaluation for the degree of promotion is moderate, with a mean 3.20.

3. The managers evaluation for the degree of competition is moderate, with a mean 3.62.

4. The managers evaluation for the degree of examinations and tests is moderate, with a mean 3.06.

Testing of the material is usually done upon request, most of the southern facilities test their materials using the facility of Palestine Polytechnic University, some other facilities, especially those who export

to foreign countries, test their materials in Israeli labs. The ASTM (American Society for Testing and Material) are the most utilized reference standards.

5.1.3. Other results:

1. According if top management in cutting stone industry understand the concepts of safety management and total quality management:

   The researcher found through interviews that most of cutting stone managers don't understand the meaning of total quality management, safety management of safety systems concepts, even some of them don't understand the meaning of security and occupational safety, especially in the northern of West Bank.

2. According to the views of workers in the reality of industrial safety within cutting stone facilities:

   According to the workers they have problem to deal with personal protective equipments, some workers complain that the use of safety helmet and footwear causing sweat and discomfort, in addition most of them don't understand the importance of safety in their work.

3. According to the challenges and obstacles facing TQM application in cutting stone facilities:

   - Lack of quality education and training programs for workers to drive the improvement process in the company, with a mean 3.55.

- Low level of knowledge for staff to the philosophy of total quality management, with a mean 3.44.
- Lack of top management commitment to and understanding the quality programs, with a mean 2.91.
- Quality program implementation does not solve the problems of the company, with a mean 2.87.
- Senior management commitment to the concepts of traditional management, with a mean 2.81.
- Actual results of implementation of quality program does not encourage continuity, with a mean 2.67.
- Implementation of quality program is an unnecessary cost, with a mean 2.64.
- Low efficiency of the hardware and manufacturing, with a mean 2.62.
- limited management and marketing expertise in cutting stone facilities.
- lack of conformity to international product standards.
- there is an high competition amongst the companies, facilities work independently. This creates many difficulties in organizing common services and in reaching a joint cooperation.

5.1.4. Results derived from the hypotheses of the study:

The following shows the results from the research hypotheses:

1. ***The analysis of data rejected the first hypothesis.*** **The analysis of data shows that there are significant differences in the availability of safety and health factors in the cutting stone facilities according to the district.**

   Hebron is the highest rank in comparison with other districts regarding to the availability of safety factors in the machinery and equipment used in the work and availability of facilities location of the property and the style of the internal organization, while Bethlehem is the highest rank in comparison with other districts regarding to application of health and public safety by top management. Jenin is the lowest in the availability of safety and health factors in the cutting stone facilities.

2. ***The analysis of data rejected the second hypothesis*****. The analysis of data shows that there are significant differences in the application of TQM in cutting stone facilities according to the district.**

One way analysis shows that Hebron is the highest rank in comparison with other districts regarding to senior management's commitment to TQM concept, customer satisfaction, and continuous improvement.

According to operational procedures, marketing, promotion, competition, and examinations and tests for the products Bethlehem have the highest mean.

3. ***The analysis of data rejected the third hypothesis*. The analysis of data shows that there are significant differences in the application of TQM in cutting stone facilities according to the year of facility's establishment.**

   It is noticed that the application of TQM in cutting stone facilities before 1992 is better than after 1992.

4. ***The analysis of data rejected the fourth hypothesis*. The analysis of data shows that there are significant differences in the application of TQM in cutting stone facilities number of employees in the facilities.** Application of TQM in cutting stone facilities in favor to number of employees is more than 20.

5. ***The analysis of data rejected the fifth hypothesis*. The analysis of data shows that there are significant differences in the application of TQM in cutting stone facilities number of quality Certificates.**

5.2. Recommendations:

Based on the results and conclusions, the following recommendations could be implemented to enhance the safety and quality in cutting stone facilities.

1. Senior management must provide the necessary personal protective equipments for workers.

2. Workers have to wear required personal protective equipments while working in cutting stone facilities.

3. Redesign personal protective equipments to become more suitable for workers.

4. Workers have to follow guiding signs and instructions during the use of machines.

5. Senior management of cutting stone facilities in collaboration with USM have to provide guiding signs on machines, making training courses about safety Systems and TQM for all departments in cutting stone facilities.

6. Senior management must provide the places for workers in cutting stone facilities, such as dining room, Sanitary baths and medical clinic.

7. Senior management must provide appropriate heating system in the winter, cooling system in summer, daily meal, rubbish bins for solid waste and rubbish bins for cardboard and metal waste.

8. Forming safety systems and quality control department within cutting stone facilities.

9. Senior management should make elementary medical tests (pre-employment) and periodic medical tests after employment, to ensure that workers don't have any occupational diseases, or take the necessary action if any worker has an occupational diseases.

10. Evaluate employees performance periodically; in order to determine the effect of working conditions on employees performance to improve these conditions thus improve employees performance.

11. Hold conferences and seminars on the subject of industrial security by universities, union of stone and marble and ministry of labor.

12. Increasing awareness of the concept of Safety systems and total quality management to make it the most important part of the prevailing organizational culture in cutting stone facilities.

13. The Ministry of Labor should intensified efforts according maintaining and controlling occupational safety and health in cutting stone facilities, and developing of occupational safety and health laws and regulations.

14. Giving enough powers to employees to change and improve their working methods after receiving the necessary training and qualification to achieve optimum utilization of the workforce through collective action and provide a suitable regulatory environment.

15. Increase publicity in local and international media for cutting stone products, and highlight Palestinian stone characteristics.

16. Hold local and international exhibitions for cutting stone products.

17. Expand and increase the work scope of union of stone and marble to covers all West Bank.

18. Make training courses for managers about TQM.

19. Reform stone cutting facilities to be more safe, by using sound-absorbing material, conditioning and cooling systems, providing adequate lighting at night, and providing water recycling systems through sedimentation ponds or filters.

5.3. Proposed future Research:

1. Making a study to determine the effect of the political environment, economic and social factors to achieve the occupational safety and health within the cutting stone facilities.

2. Making a study to compare the costs of the application of safety systems and the costs arising from accidents and work-related injuries.

3. Making a study about strategies to improve cutting stone industry in Palestine.

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Appendices

Appendix A

An-Najah National University

College of Graduate Studies and Research

Master of Engineering Management

Dear Sir.,

Please kindly answer the questionnaire prepared by the researcher in order to obtaining a master's degree in engineering management. entitled:**"Improve the sector saws and marble stone in Palestine through the employment of safety management systems and quality assurance"**

Note that all information provided will be treated confidentially, and all data will be used for research purposes only.

Thank you for your cooperation and your patience. I highly appreciate your valuable efforts in supporting this scientific research.

Researcher: Nour Hussain

Questionnaire to assess safety in cutting stone and marble facilities

The questionnaire is designed to analyze and evaluate the safety in stone and marble facilities in order to explore development opportunities.

General Data:

1. Governorate:

1. Hebron 2. Bethlehem 3. Ramallah & Jerusalem 4. Tulkarem

5. Jenin 6. Nablus 7. Salfeet 8. Qalqelia 9. Jericho

2. Job Title: …….

3. The number of years of work in the facility:

□ Less than 5 years. □ 5-10 years.

□ 10-15 years □ More than 15 years.

4. Education Level: □ primary □ secondary □ university

5. Insurance: □ Covered work injury insurance

□ Is not covered by the work injury insurance

6. The number of daily working hours…….

7. What is the concept of safety systems your opinion: ……..……..

……

8. What is the concept of occupational health and safety your opinion: ……..

……

Part II

There is in this part set of questions related to the views of workers below, please tick (X) in front of the appropriate option:

	Location of the facility and internal organizational system	**Strongly Disagree**	**Disagree**	**In between**	**Agree**	**Strongly agree**
1	Location of the facility is suitable for the type of industry					
2	The distance between the facility and other facilities suitable					
3	Space inside the facility that allows freedom of movement for each worker without congestion					
4	Truck routes and vehicles inside the factory wide and safe					
5	Corridors space between workplaces suitable for the movement and transport of materials and machines					
6	Ceilings designed to provide comfort for workers					
7	Walls color inside the facility reflects light.					
8	Floors inside the facility are easy to clean and free from obstructions					
9	Windows inside the facility provide adequate lighting for work					
10	Doors in the facility are wide					
provide safety factors in the machinery and tools used in the work						
11	The available machines in the work are safe					

12	Machines are run in the facility under specialists knowledge and supervision					
13	There is a regular maintenance for machines and equipments					
14	Machines are suspended and power supply separated during maintenance					
15	There are guiding signs near machines in the workplace to instruct workers to work in the right way					
16	Workers have directed and trained to use and maintain machines					
17	Goods are stored safely, whether (raw stones, plates, boxes)					
18	Stores far from cutting machines					
19	Facility's ground is solid and steady					
20	The workers have the knowledge of the maximum weights which they raise and committed to					
provide safety factors in the machinery and tools used in the work						
21	The administration is making sufficient efforts to ensure the health and safety of workers					
22	The administration makes elementary medical tests (pre employment) for workers					
23	The administration makes periodic medical tests (from time to time) for workers					
24	Administration provides papers and brochures related to security and general safety					
25	Administration always provides the					

	necessary safety equipment to work					
26	The administration holds training courses about security and general safety					
27	The administration holds training courses about first aid					

Part III

There is in this part set of questions related to the rate of occupational health and safety at the facility, please tick (X) in front of the appropriate option:

Available within the facility and the means and tools following safety		**Yes**	**No**
28	Fund ambulance		
29	Alarms		
30	Emergency exit		
31	Pamphlets or brochures related to occupational safety		
32	Ports of exit		
33	Extinguishers		
34	Shields and barriers around pools of water (asthma)		

Your business requires the use of safety equipment following		**Always**	**Sometimes**	**Never**
35	Safety Helmet			
36	Safety Glasses			
37	Over the head Earmuffs			
38	Safety Belt			
39	Plastic Gloves			
40	Footwear			
41	Air-purifying Respirators			
42	Protective Clothing			

Committed during the performance of safety equipment for your business by following the nature of your business		**Always**	**Sometimes**	**Never**
43	Safety Helmet			
44	Safety Glasses			
45	Over the head Earmuffs			
46	Safety Belt			
47	Plastic Gloves			
48	Footwear			
49	Air-purifying Respirators			
50	Protective Clothing			
Available within the facility the following places			**Yes**	**No**
51	Dining hall			
52	Place for clothes exchange			
53	Sanitary baths			
54	Medical Clinic			
The facility is available in the following requirements:		**Always**	**Sometimes**	**Never**
55	Potable water			
56	Meal			
57	Heating system in the winter			
58	Cooling system in summer			
59	Rubbish bins for solid waste (stone)			
60	Rubbish bins for cardboard and metal waste			

The following working conditions inside the facility suitable for work		**Very suitable**	**Occasion**	**In between**	**Inappropriate**	**Not suitable at all**
61	Natural lighting					
62	Industrial lighting					
63	Ventilation					
64	Temperature					
65	Humidity					
66	Hygiene					
67	Eating a meal					

Exposed during your performance for your business to work the following conditions		**Always**	**Sometimes**	**Never**
68	Noise			
69	Dust			
70	Chemicals			

Part IV

Here is in this part set of questions related to work injuries and occupational diseases, please tick (X) in front of the appropriate option:

Available within the facility and the means and tools following safety		**Yes**	**No**
71	Exposure to the work injury as a result of the work inside the facility		
If the answer is yes answer the following questions:			
72	The injury caused by work injury is large		
73	The employer paid treatment costs		
74	Employees have received compensation for the injury		
75	Employees have an occupational disease		
If the answer is yes answer the following questions:			
76	The occupational disease effected on employee performance		
77	Employment Type has been changed as a result of occupational disease		
Classification of incidents within the facility			
78	Incidents related to infrastructure in the facility		
79	Incidents related machine, bad transportation and storage		
80	Accidents caused by fire or chemicals		
81	Incidents related to asthma pools and solid and liquid wastes		

Part V

There is in this part set of questions designed to find out the impact of working conditions on the performance of workers in stone saws, please tick (X) in front of the appropriate option:

	The following factors negatively affect my performance for my business	**Strongly Disagree**	**Disagree**	**In between**	**Agree**	**Strongly agree**
82	Lighting intensity					
83	Poor lighting					
84	Noise					
85	High humidity					
86	Existence of dust in the workplace					
87	Fatigue and tiredness caused by work pressure					
88	Dealing with sharps tools					
89	Doing a dangerous work					
90	Temperature rise than normal					
91	Temperature drop than normal					
The following factors positively affect my performance for my business						
92	Cleaner workplace					
93	The order of the tools in the right place					
94	Break long enough					
95	Eating a meal					
96	There is enough space to allow freedom of action and movement within the facility					
97	Commitment necessary safety equipment during work					

Appendix B

An-Najah National University

College of Graduate Studies and Research

Master of Engineering Management

Dear Sir.,

Please kindly answer the questionnaire prepared by the researcher in order to obtaining a master's degree in engineering management. entitled:**"Improve the sector saws and marble stone in Palestine through the employment of safety management systems and quality assurance"**

Note that all information provided will be treated confidentially, and all data will be used for research purposes only.

Thank you for your cooperation and your patience. I highly appreciate your valuable efforts in supporting this scientific research.

Researcher: Nour Hussain

Questionnaire to assess quality in cutting stone and marble facilities

The questionnaire is designed to analyze and evaluate quality in cutting stone marble facilities in order to explore development opportunities.

General Data:

1. Governorate:

1. Hebron 2. Bethlehem 3. Ramallah & Jerusalem 4. Tulkarem

5. Jenin 6. Nablus 7. Salfeet 8. Qalqelia 9. Jericho

2. Year of establishment: …….

3. Is the institution: □ Family □ Non-family

4. The total number of employees: …….

5. The number of years of work in the organization:

□ Less than 5 years □ 5-10 years

□ 10-15 years □ More than 15 years

6. Education Level: □ primary □ secondary □ university

7. The company holds a :

□ Certification to international standards ISO9000

□ Quality mark Palestinian

□ Certificate of Supervision

□ All of the above

8. The source of your existing machines:

□Italy □Turki □Germany □Other……

9. Is your company aims to reach the overall quality:

□Yes □No

10. What is the concept of TQM your opinion: ……..

……

Part II

There is in this part set of questions related to the extent of the application of your institution for Total Quality Management, please tick (X) in front of the appropriate option:

	Senior management commitment to quality	**Strongly Disagree**	**Disagree**	**In between**	**Agree**	**Strongly agree**
1	Senior management adopts a clear strategic policy and specific objectives in the application of quality					
2	Senior management is working continuously to fulfill their obligations towards customers					
3	The company considered quality a motto for itself					
4	Senior management supports the principle of devolution of powers and facilitate the auditing of information between the different sections					
5	Senior management developed a knowledge of the various administrative levels of the company to strengthen its commitment to quality					
6	Management works to clarify the objectives to the workers especially the goals related to quality					
7	Senior management is working to promote a culture of quality in all departments and levels of management					
8	Senior management confirms that the customer is the most important element in their objectives and this can change the culture of the organization to achieve this					

9	Senior management is working hard in order to distinct company services					
10	Senior management seeks to build a good reputation among the customers of high-quality and perfection					
11	Senior management believes that quality is the way and philosophy in conducting its business					
12	Workers involved in the preparation of plans to improve quality					
13	Company trains workers on modern techniques and skills that will help to develop their performance and quality improvement					
14	Implementation of training programs based on clear principles					
Focus on customers						
15	Company always studies the needs and desires of customers and their satisfaction with the products					
16	The company is characterized by rapidly satisfy of desires of the customers					
17	The company focuses on achieving customer satisfaction by studying their requirements					
18	Company studies customer complaints constantly and provides appropriate solutions					
19	The company believes that quality determines by satisfying customers needs					
Continuous Improvement						
20	The company is keen on the continuous improvement of the system of production and service in order to improve quality					

21	The Company seeks to improve the products and services continuously					
22	The company is keen continuously to reduce the gap between the expectations of consumers about the quality and the actual quality provided to them					
23	The company relies on scientific methods and tools for improving quality					
24	The company seeks to take responsibility towards society through continuous improvement of products					
25	Senior management consider continuous improvement in work as part of the quality requirements					
26	Continuous improvement of goods and services earns the company a competitive advantage compared to companies					
Operational procedures						
27	The verification of products quality is by following the methods of inspection from time to time					
28	Company deals with a specific set of suppliers					
29	Company uses specific criteria in the selection of suppliers and these criteria are based on quality					
30	Company is interested in the regulations of purchases with lower price suppliers regardless of quality					
31	Company maintains an integrated database for suppliers and the quality of their products.					
32	The company relies on a third party in the scrutiny and examination of raw materials					

	that they purchase					
33	raw material bought according to specifically tailored					
34	The company is keen to deal with suppliers who possess international standards certificate					
35	Senior management are working to determine the nature and causes of the lack of conformity within the company, and take corrective action					
36	The company operates on analysis and customer complaints for the purpose of reducing the cases of non conformity					

Part III

There is in this part set of questions that are relevant for the competitiveness policy in your company, please tick (X) in front of the appropriate option:

	Marketing	Strongly Disagree	Disagree	In between	Agree	Strongly agree
37	Company is interested to export products to other countries					
38	The company is committed to standard specifications on the goods					
39	The company respond to customers attributes according to goods					
40	The company has Internet or / & Email service					
41	The company is keen on providing its products different shapes and sizes based on the study of the desires of customers					
42	The company takes into consideration its responsibility towards society and the environment during production processes					
43	In case of any defective in service are taken corrective action to ensure customer satisfaction					
	Promotion					
44	The company distributes promotional materials for definition and promotion of products.					
45	The company uses local media to reach customers					
46	The company uses external media to reach customers					
47	The company is involved in local economic activities (seminars / exhibitions)					
48	The company is involved in the global economic					

	events (seminars / exhibitions)					
49	The company gives great attention to the promotion and advertising in order to build a reputation for the products and the company					
Competition						
50	The Company believes that its products are able to compete with other products in terms of price in the local market					
51	The Company believes that its products are able to compete with other products in terms of quality in the local market					
52	The Company compares its global products with competitors in terms of price					
53	The Company compares its global products with competitors in terms of quality					
54	The company is pricing the goods based on the toddler price					
55	The company is pricing the goods based on the quality of products					
56	The company is pricing the goods based on cost					
Examinations and tests						
66	Samples are taken from the final product to make sure they conform to the required specifications					
67	Company uses the records to record the results of the examination and testing in order to benefit from them in the future					
68	The company uses statistical techniques widely to reduce the variation and deviation in the production process					
69	Senior management commitment to the concepts of traditional management					

Obstacles facing application of quality						
70	Lack of top-management commitment to and understanding the quality programs					
71	Low level of knowledge for staff to the philosophy of Total Quality Management					
72	Implementation of quality program is an unnecessary cost					
73	Actual results of implementation of quality program does not encourage continuity					
74	Quality program implementation does not solve the problems of the company.					
75	Lack of quality education and training programs for workers to drive the improvement process in the company					
76	Low efficiency of the hardware and manufacturing					

- Other obstacles facing the application of the principles of quality : -

_____

._____

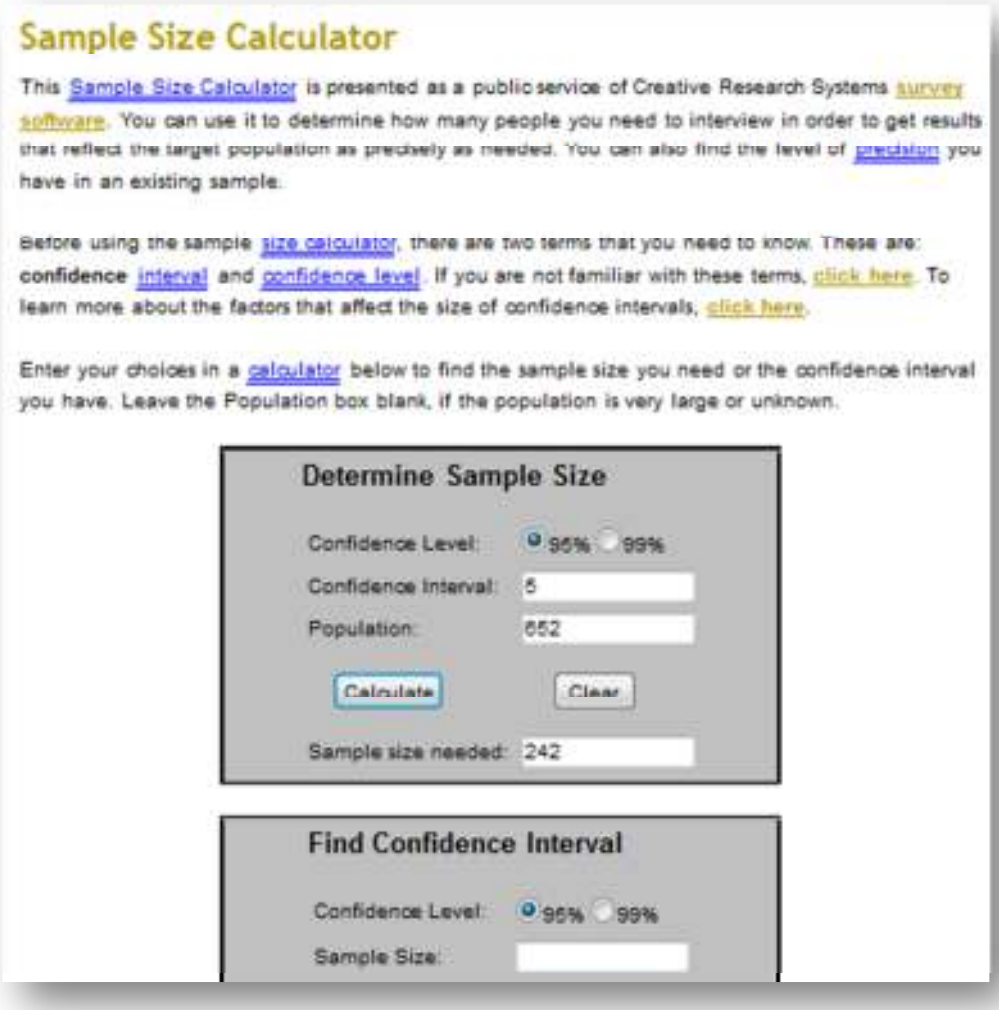
How do you see the size of the competition in the following markets :

1. Local market □ severe □ weak central □ Medium □ I do not know
2. Arab markets □ severe □ weak central □ Medium □ I do not know
3. Israeli market □ severe □ weak central □ Medium □ I do not know
4. International markets □ severe □ weak central □ Medium □ I do not know

Appendix C

Appendix C.1. The sample size for safety system questionnaire

Appendix C.2. The sample size for Quality management questionnaire



Appendix D

Names Of Arbitrators

No.	Name	University / organization
1.	Dr. Ramiz Assaf	An-Najah National University
2.	Dr. Suhail S. Sultan	Birzeit University
3.	Dr. Yahya Saleh	An-Najah National University
4.	Dr. Yousef Abu Fara	Al-Quds Open University
5.	M. Maher Hashish	Federation of stone and marble industry
6.	Eng. Nafez Sharawi	Palestine Polytechnic University
7.	Dr. Bassam Banat	Al-Quds University

Appendix E

Pictures for cutting stone facilities


مدرسة
بالقرب
من منشار

جامعة النجاح الوطنية
كلية الدراسات العليا

تحسين صناعة الرخام والحجر في فلسطين باستخدام نظم الجودة والسلامة

اعداد
نور احمد حسين

اشراف
د. رياض عبد الكريم عوض

قدمت هذه الأطروحة استكمالاً لمتطلبات درجة الماجستير في الإدارة الهندسية بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس، فلسطين.
2014

تحسين صناعة الرخام و الحجر في فلسطين باستخدام نظم الجودة و السلامة

اعداد

نور احمد حسين

اشراف

د. رياض عبد الكريم عوض

الملخص

كان هناك اعتقاد سائد بين الاقتصاديين وغيرهم بأن الموارد الطبيعية هي نعمة وهو ما يعني أن الدول الغنية بالموارد الطبيعية لديها ميزة على الدول التي ليست كذلك. فلسطين غنية بالحجر الطبيعي. لكن تراجعت صناعة الحجر في فلسطين في السنوات الاخيرة.

يهدف البحث إلى دراسة امكانية تطوير قطاع الرخام والحجر في فلسطين من خلال نظم ضمان الجودة و السلامة، ووضع التوصيات الملائمة لتحسين هذا الواقع ومن ثم تحسين أداء العاملين في هذه المنشآت، ولتنفيذ البحث تبنت الباحثة المنهج الوصفي التحليلي واعتمدت على الاستبانة كأداة أساسية لجمع البيانات والمعلومات المتعلقة بالبحث، إضافة إلى إجراء مقابلات لجمع معلومات مكملة للبحث، وتكون مجتمع البحث من كافة العاملين والمدراء في مناشير الحجر في فلسطين حيث تم توزيع الأستبانة على 365 عامل و 242 مدير.

اظهرت نتائج الدراسة ان غالبية شركات الرخام والحجر مواجه نفس المشاكل المشتركة التي تؤثر على كفاءة عملها. كما اظهرت بان هناك جهل عام لدى العاملين والمدراء لمفهوم ادارة الجودة الشاملة و نظم إدارة السلامة، بالإضافة الى وجود ضعف في تطبيق معايير الامن والسلامة، حيث ان هناك بعض المعوقات الداخلية والخارجية التي تحول دون تطبيق الجودة الشاملة ونظم إدارة السلامة في مناشير الجحر، وأظهرت الدراسة أيضا أن منشات الرخام والحجر في الخليل وبيت لحم هي أكثر عددا وأكبر حجما، كما أنها أكثر تقدما من الناحية التكنولوجية و تعمل بطاقة إنتاجية وقوى عاملة أكبر.

من بين التوصيات التي توصلت اليها الباحثة :الحاجة الى تثقيف الموظفين و المديرين عن اهمية ادارة الجودة ونظم السلامة في مناشير الحجر والرخام في فلسطين، واعداد وتنفيذ برامج تعليمية تدريبية حول نظم السلامة والجودة الشاملة لجميع المستويات في مناشير الرخام والحجر. بالإضافة الى مراقبة مدى تطبيق المعايير والقواعد المتعلقة بنظم السلامة وادارة الجودة الشاملة في قطاع مناشير الحجر والرخام.