AMERICAN JOURNAL OF ECONOMICS AND BUSINESS MANAGEMENT

ISSN: 2576-5973
Vol. 5, No. 10, 2022

Total Quality Management and Its Role in Protecting The Environment

Salima Hadi Musa[1]
Al-Qasim Green University, E-mail: admin.mang21.6@qu.edu.iq
Mohammed Najm Abd [2]
Administration and Economics, University of Al-Qadisiyah. E-mail: mohamad.najim@qu.edu.iq

Abstract: The study aimed to identify the level of applying Total quality management , the level of environmental protection, and the role of Total quality management in protecting the environment at Al-Qasim Green University. The researchers used the descriptive approach in the survey method for its relevance to the nature and objectives of the research. The research community consisted of the employees of Al-Qasim Green University. 80 employees participated in this research and They were distributed according to gender, and the number of males was (30) male employees, at a percentage of (37.5%), and (50) female employees, at a percentage of (62.5%), Their ages ranged between (35-50) years, with a mean of (42.5) years and a standard deviation of (0.95). They were also distributed, according to their educational attainment, to eight male and female employees with a bachelor's degree at a percentage of (10%), (40) male and female diploma employees with at a percentage of (50%), and (30) male and female employees (37.5%). They are the research sample. The sources of data collection were represented by questionnaires as a measurement tool that was distributed to the research sample. The first part: includes demographic information represented by (gender, age, educational attainment). As for the second part: it includes the paragraphs related to the independent variable Total quality management in the six dimensions: (the extent of commitment to the principles of Total quality management - the reality of the applying Total quality management in environmental protection - the support provided by upper management to implement the Total quality management system - the role of members of Total quality management assurance in protecting the environment - the problems associated with Total quality management - Problems Facing Total quality management) with rate of (36) paragraphs and (6) paragraphs for each field. As for the third part: it includes the paragraph related to the adopted variable protecting the environment with rate of (20) paragraphs, and answer alternatives (not at all- never - sometimes - often - always). The researchers concluded: The reality field of applying Total quality management in environmental protection is considered one of the most important and strongest dimensions of Total quality management in terms of the positive impact on the level of environmental protection in the surveyed institution. The higher the level of reality of applying Total quality management in protecting the environment in the organization, the more positively it is reflected in enhancing the required level of performance - the reality of Total quality management in the organization is medium, where the sample members unanimously agreed that the level of environmental protection was generally medium in the surveyed institution and that there was a strong positive relationship between Total quality management and environmental protection. The study recommended (b) promoting the use of Total quality management among the various categories of workers in environmental protection - the university administration should increase the application of quality and overcome the obstacles that prevent environmental protection.

Keywords: quality - Total quality management - environment - environmental protection.

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 10 in October -2022
https://www.grnjournals.us/index.php/AJEBM

INTRODUCTION

Attention to quality is a global phenomenon, where institutions pay it special attention. Quality has become the first function of any organization, an administrative philosophy, and a way of life for any organization to enable it to achieve its goals. They are particularly interested in developing and improving the expected performance of the services provided in the various institutions. Perhaps the concept of Total Quality Management (TOM) is considered one of the most administrative concepts in which there are many concepts and ideas in every view, whether it is the view of a researcher, an academic, a specialist, an administrator, and others. Quality on a continuous basis, meeting and exceeding the requirements of the beneficiary, as well as searching for quality and applying it in any aspect of work, starting from identifying environmental needs with future goals and requirements (Al-Louzi, 2019). Since the environment is everything that surrounds us, where increasing awareness of environmental issues as a result of the increase and spread of these ideas in the media, such as warnings about the ozone layer and increasing pollution. Hence, managing the protection of the environment in a safe manner has become the biggest challenge that consumes time and money, and there are laws in order to secure the protection of the environment that made companies liable to accountability if any injustice or harm occurred to the environment, and despite that, securing the environment is not easy at all (Chirta et al., 2015:2). The environment must be preserved as it is without change because any economically productive and aesthetically attractive area will soon be invaded by weeds if neglected. Therefore, the orientation must be towards finding a relationship between humans and the environment, the basis of which is the mutual benefit that allows the person to continue comfortable living, and the environment has the continuity of balance, and this is what is known as (coexistence with the environment) (Al-Hamd and Sabar Yanni, 2019: 7-159), where this premise would be considered one of the main pillars that should be adopted when applying Total quality management, such as launching events, encouraging innovation and creativity, creating training, development, and incentive programs, and cultivating a spirit of self-participation, Strengthening the spirit of one team in most areas, including strengthening the preservation of the environment (Dean and Evans, 2014), The importance of the research lies in recognizing the role that Total quality management plays in protecting the environment.

• Research problem

Environmental sciences and studies and their importance are indisputable facts, and the need for sustainable development is the key to the future of the human race. Total quality management and its practices work on the integration and coordination between a number of different administrative methods and principles so that the practice of quality elements by all departments of the organization becomes a goal that everyone seeks to achieve (Jawdah, 2009). The long-term commitment to quality is considered one of the basic principles emphasized by means of continuous development and improvement. Therefore, continuous improvement is one of the most effective means of development and improvement, where the adoption of the accurate scientific method in the continuity of continuous improvement and development in the operational performance of production processes is considered one of the most important foundations, the most important of which is in stabilizing the product and achieving its relevance to developments and continuous changes to the needs of the growing environment. Continuous improvement in performance requires rapid response to changes on the one hand and simplification of procedures and operational activities to protect the environment on the other hand. The preventive duty to protect the environment constitutes a prior translation to face the repercussions that may affect the environment or human health from expected and certain damages that cannot be remedied in the future. These duties are binding on both persons and public authorities, so each of them has the duty to protect the environment from any confirmed aggression, or at least mitigate its consequences in the event that it is not possible to prevent its occurrence (Badr, 2002: 13). The research problem with the following question:

What is the role of Total quality management in protecting the environment.

research aims :

- Identifying the level of applying Total quality management at Al-Qasim Green University.
- Identifying the level of environmental protection at Al-Qasim Green University.
- Identifying the role of Total quality management in protecting the environment at Al-Qasim Green University.

Research hypotheses:

- There is a good level of applying Total quality management at Al-Qasim Green University.
- There is a good level of environmental protection at Al-Qasim Green University.
- Total quality management has a role in protecting the environment at Al-Qasim Green University.

Research limits

• Research limits

- Objective limit: The study is limited to two tools for measuring Total quality management and environmental protection

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 10 in October -2022
https://www.grnjournals.us/index.php/AJEBM

- **Spatial limit:** Al-Qasim Green University**.**
- **Time limit:** 2021-2022
- **Human limit:** the employees working at Al-Qasim Green University, Department of Environmental Pollution**.**

• Define terms

• Quality: it is the ability to meet the needs of the beneficiary, but rather to read his expectations, knowing that the expectations of the consumer differ from one person to another, and differ according to age, gender, personal and professional motives, geographic location, social class, and practical and scientific experiences (Aquilada, 2009, 78).

• Total quality management : It is a management system in the company that applies tools, technologies, and standard procedures related to preventing damage, improving processes and products, and creating an organizational culture and work ethic for excellence (Najm, 2010).

The environment is "everything that surrounds humans, plants, and animals of manifestations and factors that affect their emergence and development, and in its general meaning, the environment is related to human life and all the negative effects that affect it, the most important of which are the health risks resulting from pollution in its various forms and degrees, whether in the air, water or soil (Fatehi, 2013).

• Environmental protection: It is the space in the world that human influences and is affected by, that is, the space he uses, exploit, affect, and adapt to. (Al-Janabi, 2013: 208).

• The hypothetical scheme includes the study variables

- The independent variable Total quality management consists of (- Extent of commitment to the principles of Total quality management - The reality of applying Total quality management in the protection of the environment - The support of the higher administration for applying the Total quality management system in the protection of the environment - The role of the environment protection members in ensuring the Total quality management - Problems of Total quality management in the environment protection - problems of environmental protection members in implementing the Total quality management system

The dependent variable, environmental protection, consists of 20 paragraphs.

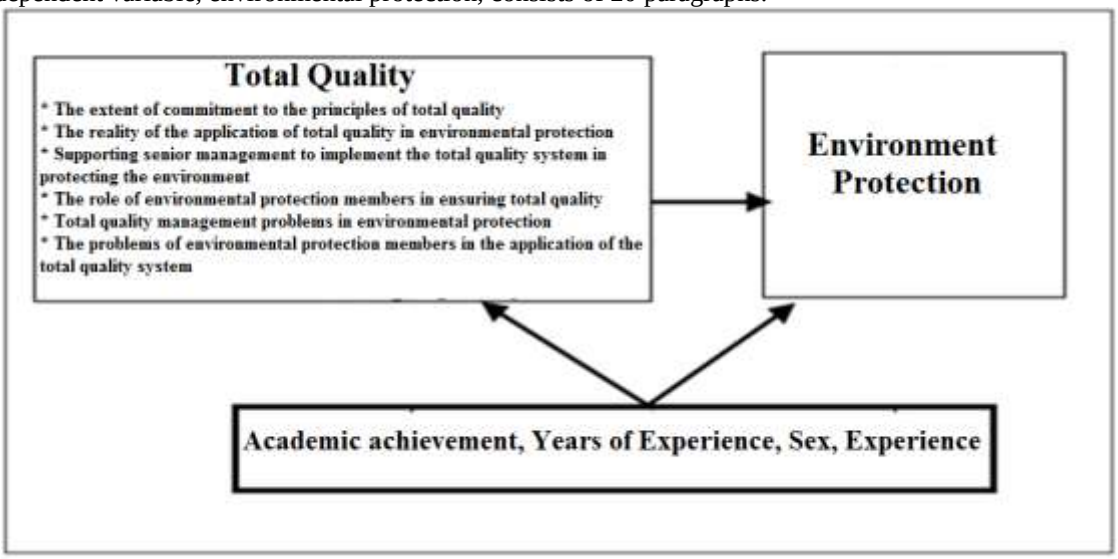

Figure (1): shows the hypothesis of the study. Reference: Prepared by the researcher.

The theoretical framework of the study:

First: Total quality management

• The concept of Total quality management

Quality is the total of the qualities and characteristics of a good or service that lead to its ability to fulfill stated or assumed desires. The American Federal Quality Institute defines it as the ability to carry out the right work in the right way from the first time with the ability to evaluate the work to know the extent of improvement in performance (Al-Dradakah, Al-Shibli, 2002, 18), While Jablonsky (1999) defines it as a joint collaborative method for implementing work procedures in a manner of participation between employees and management in order to improve quality and increase productivity, through specialized work teams. Quality is mainly focused on the vision of (Leeboy & Ersez). Total quality management is "comprehensive quality control, which requires the cooperation of the efforts of all employees, including managers, supervisors, and workers in all activities, planning, design, resource management, manufacturing, inspection, production, sales, services, financial control and personnel

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management (Al-Alam, 2010, p. 37). Al-Madhoun (2009) defined it as "a culture, behavior, and application, and accordingly, it is necessary to view it as a new, improved and developed system of management that is sustainable" (Al-Madhoun, 2009). Total quality management from the point of view of Al-Tamimi and Issa (2013) is considered one of the modern management concepts whose philosophy is based on a set of ideas and principles. Institutions that seek to achieve excellence in performance and achieve customer satisfaction or beyond their expectations must adopt these principles. It is a modern administrative approach that aims to achieve continuous improvement and development in service quality through the cooperation and concerted efforts of both management and workers within the institution or the administrative apparatus to perform business and activities correctly, with a constant focus on the beneficiary to achieve his desires and expectations through his involvement in the design of the service (Al-Tamimi, Issa , 2013).

• Advantages of Total Quality Management

Among the advantages of applying total quality management, according to what was mentioned in (Al-Ajez, 2008) are the following:

1. Increasing efficiency, productivity, profits, market share, stability and stability, as continuous improvement in quality is an indicator of increasing productivity.
2. Achieving customer satisfaction by specifying what should be provided to them and procedures for determining the activities performed by the various working individuals in order to determine the specifications to be approved for the service.
3. Increasing organizational effectiveness due to the fact that total quality management is based on the fact that it is the responsibility of all employees in the organization, so it seeks to pay attention to and encourage teamwork.
4. It is considered a fundamental key to addressing competition, which requires continuous improvement in the service provided, people, processes and interaction with the external environment in order to achieve the requirements of current and prospective customers and ensure stability and continuity in the activities of the institution.
5. Proving the inefficiency or effectiveness of partial or non-integrated methods and the importance of a comprehensive and integrated solution and advanced administrative methods and techniques to face the effects of variables.

• Obstacles of total quality management

Among the obstacles to total quality management are the following, according to what was mentioned in (Al-Ajez, 2008):

1- Adopting excellent quality programs without making modifications to them in line with the characteristics of the institution.
2- Weak link between quality objectives and financial returns.
3- The absence of team spirit or the formation of many work teams and the failure to provide the necessary resources to support this initiative and the required management to ensure its success.
4- Inadequate policies of motivation and encouragement followed, which are considered one of the most important obstacles.
5- Lack of necessary needs and weak allocated budgets. (Alkemishi, 2013).

• Dimensions of total quality

1. The first dimension: the extent of commitment to the principles of total quality:

The issue of awareness of the principles of total quality and familiarity with its international standards are indicators of belief in them as a means of quality management. Moreover, awareness of the principles of total quality and its standards leads to the tendency towards adopting them in protecting the environment, The commitment to apply these principles contributes to raising the level of workers, and thus increasing the return on society.

2. The second dimension: the reality of applying total quality in environmental protection

The process of applying total quality in environmental protection depends on the degree of awareness by the management process, its principles and standards, in addition to the level of skills needed to implement the system.

3.The third dimension: the support provided by upper management for the implementation of the total quality system:

The main requirements for the success of the total quality management process in protecting the environment are seen in the support provided by upper management to the centers and institutions in its various forms, whether it is logistical, technical, financial, or even psychological support. Enhancing trust between all parties in charge of it, strengthening professional affiliation, and doubling the success of the implementation of the total quality system, and then increasing the return from it in the outputs.

4.The fourth dimension: the role of total quality assurance members in protecting the environment

The Total Quality Assurance member is the main pillar in the management of environmental protection, and

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 10 in October -2022
https://www.grnjournals.us/index.php/AJEBM

therefore it must be in a degree that allows him to provide the best skills consistent with international standards of total quality, and in line with the dimensions of the application of total quality to protect the environment, through the members' commitment to quality controls.

5. The Fifth Dimension: Problems Related to Total Quality Management:

It means the dimensions associated with quality management problems from the administrative and bureaucratic aspects of the organization, which may constitute an obstacle at the same level that the obstacles associated with the workers who are entrusted with the application of quality principles and standards in protecting the environment.

6. The Sixth Dimension: Problems Facing Total Quality:

The comprehensive quality standards in order for the institution to implement its principles must provide a supportive environment for it so that it can achieve this, taking into account all the problems that the institution may face in protecting the environment.

Second: environment protection

Its concept: The environment is the spatial field in which man lives and is affected by all the elements and data possessed by this field, whether they are natural such as rocks and what they contain of minerals and energy sources ... etc. or climatic of heat, pressure, winds, rain, natural plants and animals ... and others or human data. Man has contributed to its existence in terms of construction, transportation, transportation, farms, factories, dams... and others. The protection of the environment is the translation in advance to face the repercussions that may affect the environment or human health from expected and certain damages that cannot be remedied in the future. These duties are binding on both persons and public authorities, so each of them has the duty to protect the environment from any confirmed aggression, or at least mitigate its consequences if it is not possible to prevent its occurrence (Badr, 2002: 13). These are the behaviors that can achieve tangible results in changing human behavior towards the environment, but it may take a long time, including education in a comprehensive sense for a person since his childhood to be environmentally concerned, and the use of legislation and incentives that prevent a person from bearing an additional burden of tampering with the environment, and this follows Also, the participation of civil society in planning and decision-making to achieve environmental goals, in addition to the fact that this participation builds and strengthens relations and trust between society and decision-makers, and gives a guarantee of speed of implementation (Lama,: 2013: 47).

- Elements of environmental protection (Abdul Kareem, 2012: 21)

1- Spreading environmental awareness: educating people about the dangers that threaten them through schools, universities, technology, media and organizations.

2- Granting a subsidy to producers of goods that pollute the environment: this motivates producers to reduce pollution rates by subsidizing them instead of imposing taxes on them, and giving them soft loans for investments.

3- Deterring environmental polluters: tightening penalties and imposing taxes on environmental polluters.

4- Establishing a special market for pollution rights: It is the creation of a market in which certificates sold in public auctions are traded, These certificates represent the right to use a part of the environment. The prices of certificates are estimated by the government by studying the degree to which the environment absorbs the level of pollution and estimating the costs of treating it.

Previous studies

1- Awda study (2017) entitled "Total Quality Management and its Relationship to Job Performance - A Field Study in Oran and (SIMAP) Institutions"

This study aimed to identify the nature of the relationship between total quality management and job performance in the two productive institutions in the state of Oran. In addition to identifying the dimensions of total quality represented in planning, quality control and continuous improvement, as seen by the scientist "Juran", and used the descriptive analytical approach and relied on the questionnaire, where the sample was (65) workers from both institutions. It was chosen by simple random method, and the statistical program (SPSS) was used to output the results. The study concluded that there is a positive, statistically significant correlation between all dimensions of total quality management and job performance. The study also showed that there is great interest on the part of the two institutions under study in applying the dimensions of total quality management, and keenness to raise the level of job performance. Among the recommendations of the study, it is necessary to pay attention to applying the dimensions of total quality management and to focus on the most important dimensions and impact on job performance. This study did not focus on all dimensions of total quality to achieve the required level of job performance, but rather focused on the three dimensions adopted by the scientist "Joran", namely (planning, control and continuous improvement).

- Mousa study (2016) entitled by "The Impact of Green Marketing Practices on Environmental Protection" An analytical study of the opinions of a sample of workers in the Kufa Cement Factory

The study aimed to

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 10 in October -2022
https://www.grnjournals.us/index.php/AJEBM

- Identifying the obstacles and restrictions that hinder the factory (the field of research) from applying the dimensions of green marketing and how to deal with the obstacles in order to benefit from this philosophy and preserve the environment.
- Identifying the dimensions of green marketing in the factory (the field of research) and its role in preserving the environment, and its ability to apply the dimensions during its activities.

For the purpose of achieving the objectives of the study, a sample of workers in the Kufa Cement Factory was tested as a field for the field side. The questionnaire was used as a main tool, in addition to personal interviews with members of the surveyed sample, which consisted of 145 employees in the Kufa Cement Factory. A set of statistical methods were relied upon for the purpose of arriving at indicators that serve the objectives and hypotheses of the study. Demographic data were analyzed, the study variables described, and the relationship between the variables stated. As for the fourth chapter, it referred to a number of conclusions and made several recommendations, the most prominent of which is (The factory (the field of research) must work in the field of research to use the latest scientific, advanced and modern methods in how to preserve the surrounding environment through the use of advanced machines and equipment to get rid of waste and pollutants- Finding a mechanism or system to measure and control the environmental effects resulting from the performance of organizations, including the factory (the field of research) on the environment. As for the most prominent conclusions, there was a direct positive significant correlation between the dimensions of green marketing and environmental protection -The dimension (making the environmental orientation profitable came first in terms of the strength of its impact on protecting the environment, then the dimension (the clarity of the relationship between price and cost) in the second place in terms of the strength of its impact on environmental protection, then the dimension (redesigning the product) in the third place in terms of the strength of its impact on protecting the environment and finally It occupied the dimension (eliminating and reducing waste) in terms of its strong impact on protecting the environment.

The third topic

Research methodology and field procedures

Research Methodology:

The researcher used the descriptive approach (which is one of the forms of organized scientific analysis and interpretation to describe a specific phenomenon or problem and depict it quantitatively by collecting codified data and information about the phenomenon or problem, classifying, analyzing, and subjecting it to a careful study" (Abu Allam, 2013, 76) in the form of a survey study, due to its relevance to the nature and objectives research.

Field research procedures:

The research community and its samples:

The research community consisted of the employees of Al-Qasim Green University, Faculty of Environment, and 80 employees participated in this research and They were distributed according to gender, and the number of males was (30) male employees, at a percentage of (37.5%), and (50) female employees, at a percentage of (62.5%), Their ages ranged between (35-50) years, with a mean of (42.5) years and a standard deviation of (0.95). They were also distributed, according to their educational attainment, to eight male and female employees with a bachelor's degree at a percentage of (10%), (40) male and female diploma employees with at a percentage of (50%), and (30) male and female employees (37.5%), which the research sample.

Data collection tools:

The research relied on a set of tools used in collecting data and information, namely:

A - Personal interviews:

Interviews were conducted with stakeholders within Al-Qasim Green University.

b - The questionnaire:

\The researcher adopted the questionnaire form as the main tool in collecting data related to the research variables, in addition, it is compatible with the title of the research. The questionnaire included two scales divided into three parts:

The first part: includes demographic information represented by (gender, age, educational attainment).

The second part: it includes the paragraphs related to the independent variable Total quality management in the six dimensions: (the extent of commitment to the principles of Total quality management- the reality of the applying Total quality management in environmental protection - the support provided by upper management to implement the Total quality management system - the role of members of Total quality management assurance in protecting the environment - the problems associated with Total quality management - Problems Facing Total quality management) with rate of (36) paragraphs and (6) paragraphs for each field.

The third part: it includes the paragraph related to the adopted variable protecting the environment with rate of (20) paragraphs, and Table (1) shows the components of the questionnaire and the number of paragraphs for each variable, as mentioned in the questionnaire.

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 10 in October -2022
https://www.grnjournals.us/index.php/AJEBM

Table 1: shows the components of the questionnaire, the number of paragraphs for each activity, and the references quoted from them, as mentioned in the questionnaire.

main variables	sub-variables	number of paragraphs	Paragraph sequence	References
1. General	Gender, chronological age, educational attainment	-	-	-
Total quality	The extent of commitment to the principles of total quality.	6	1-6	[1]
	The reality of applying total quality in environmental protection.	6	7-12	
	Support provided by upper management to implement the total quality system	6	13-18	
	The role of total quality assurance members in protecting the environment	6	19-24	
	Problems related to total quality management	6	25-30	
	Problems facing total quality	6	31-36	
Environment protection		20	37-66	[2]

The questionnaire that was designed for this research was subjected to a scientific and linguistic evaluation in order to reach an appropriate questionnaire for the current research objectives, which were according to a five-step scale, as shown in Table (2).

Table 2: five-step scale.

Scale	0	1	2	3	4
Paragraph answer alternatives	not at all	never	Sometimes	mostly	Always

Psychometric properties of the questionnaire

1- The validity of the questionnaire

The TQM has high Reliability and validity, and it has been used globally and widely (Bass & Avolio, 2000). It was done (Al-Momani and Al-Tahina, 2007). Total quality variable consisting of (36) paragraphs prepared by ( )

Environmental Protection Variable:

The researcher accepted the questionnaire prepared by (Al-Amidi, 2015), which consisted of (20) paragraphs. The questionnaire was presented to a group of specialized experts in the College of Environmental Sciences, which numbered (10) experts. For the purpose of evaluating it in terms of its formulation and validity, the researcher deliberately based on the statistical significance for the value of the chi-square to show the extent to which the arbitrators agreed on the paragraphs, as shown in Table (3).

Table 3: The results of the chi-square test for the arbitrators' opinions about the validity of the questionnaire paragraphs.

No	Scale	paragraphs	Number of paragraphs	Agrees	non-Agrees	value of calculated chi-square	Significant 0.05
1	Total quality	1 ،3، 4 ،5 ، 8 ، 9 ، 10 ، 11 ، 13 ، 15 ، 16 ، 18 ، 19، 20 ، 21 ، 22 ،23 ، 25،27،28،29 ،30،31،32،33،38	24	14	–	14	Significant
		2 ، 6 ، 7 ، 14،12 ، 17 ، 24،34،35،36،37	11	13	1	10,57	Significant
2	Environment protection	1 ،2،3، 4 ،5 ، ، 10 ، 11 ،12،14، 13 ، ، 16 ، ،17،18 ، 20 ،	16	12	2	7,142	Significant
		8 ، 9،19،15	4	13	1	10,57	Significant

Table (1) shows that the value of (chi-square), calculated for all paragraphs from the tabular chi-value is (3.84), at a

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significance level of (0.05) and a degree of freedom (1). Thus, no paragraph was deleted from the scale, but some of them need to be modified.

Statistical analysis of the scale paragraphs:-

This process is one of the basic steps in building any scale in order to reveal the psychometric properties of the paragraphs that help in choosing the paragraphs with good characteristics and this leads to achieving the validity scale and its Reliability (Anastasi A, Urbina, 2010).

- Validity of the scale: The types of the current validity scale were verified by presenting the scale to a group of specialized arbitrators, as was clarified in the paragraph of paragraphs validity, and the researcher verified by presenting the questionnaire to experts and specialists as shown in Table (2).

-Scale's Reliability: In order to extract the Reliability of the questionnaire, the degrees of the statistical analysis sample forms will be subjected to the Alpha Cronbach equation (Anastasi A.&, Urbina, 2010), where the Reliability coefficient of the total quality questionnaire was (0.89), and the Reliability coefficient of the environmental protection questionnaire reached (0.87). Therefore, the scale is considered internally consistent and has high Reliability, and this is confirmed by Cronbach that the scale with high Reliability is an accurate scale (Cronbach, L.J. (2002), as shown in Table (4).

Table 4: values of Reliability coefficients for the dimensions of the scales used in the research.

Scale	The dimension	Reliability coefficient
	The extent of commitment to the principles of total quality.	0.86
	The reality of applying total quality in environmental protection.	0.80
	Support provided by upper management to implement the total quality system	0.79
	The role of total quality assurance members in protecting the environment	0.84
	Problems related to total quality management	0.87
	Problems facing total quality	0.81
Environment protection		0.83

Source: Prepared by the researcher

Table (6) shows that the values of the Reliability coefficients for the dimensions of the total quality scale ranged between (0.74 - 0.86), and the values of the Reliability coefficients of the dimensions of the environmental protection scale ranged between (0.78 - 0.87), which are accepted scientific coefficients for the purposes of scientific research. The main experiment: After checking the validity and reliability of the used tools. The researcher personally distributed the questionnaires to the sample members at Al-Qasim Green University. Also, interviews were held with the sample to clarify the method of answering the paragraphs of the questionnaire.

Statistical analysis: The necessary statistical means were used that helped in processing the results and testing the research hypotheses through the use of the statistical package (spss), including the following:

Arithmetic averages.
Standard deviations.
Regression analysis.
Correlation coefficients.
- "F" value

The fourth topic

Results And Discussion:

• Presenting and discussing the results of descriptive statistics for the paragraphs of the studied variables-

First: Results of descriptive statistics for paragraphs of the independent variable total quality:

Measuring the main variable total quality and its component sub-variables according to the arithmetic mean: The research variables were arranged and classified according to the questions of the questionnaire, and using statistical indicators (arithmetic means and standard deviations of a variable according to the responses of the research sample members) according to each agency field:

1- The scope of the extent of commitment to the principles of total quality as shown in Table (5).

Table 5: shows the arithmetic means and standard deviations of the domain variable of the extent of commitment to the principles of total quality.

Number	paragraphs	Mean	standard deviation
1	There is clarity about the objectives of implementing the total quality system in environmental protection	2.907	0.028
2	The models used in applying the quality system at the college correspond to the high standards of total quality	2.15	0.456

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:5 Issue: 10 in October -2022
https://www.grnjournals.us/index.php/AJEBM

3	The current implementation of the quality system contributes to the improvement of the process of environmental protection	3.64	0.640
4	The objectives of the comprehensive quality programs applied in the protection of the environment stem from	2.62	0.583
5	The total quality system followed helps determine the affiliation to protect the environment	2.946	0.131
6	The application of total quality contributes to providing the principle of transparency.	2.917	0.278
total dimension		2.863	0.353

Source: Prepared by the researcher

Through the above table (6), it becomes clear to us:

A- The general arithmetic mean of the total quality variable reached the extent of commitment to the principles of total quality (2.863) with a standard deviation of (0.353), and in comparison with the hypothetical mean whose value is (2.5), this indicates the effectiveness of the extent of commitment to the principles of total quality.

B- Paragraph (3) obtained the highest arithmetic mean (3.64) and standard deviation (0.640), in comparison with the hypothetical mean of (2.5). This means that the department's management contributes to the current implementation of the quality system to improve the process of environmental protection.

C - The results recorded the lowest arithmetic mean related to Paragraph (1) related to the conformity of the models used in the application of the quality system in the college with the high comprehensive quality standards. The arithmetic means for this paragraph was (2.15) with a standard deviation of (0.456).

2. The reality of applying total quality in environmental protection: shown in Table (6)

Table 6: shows the arithmetic means and standard deviations of the variable of the reality of applying total quality in environmental protection.

Number	paragraphs	Mean	standard deviation
1	The colleges are committed to applying the principles of total quality to all administrative processes, especially those related to environmental protection	2.157	0.775
2	There is a periodic evaluation of the levels of workers' role in protecting the environment.	3.907	0.291
3	The appropriate tools and means are available to evaluate the progress of the environmental protection process	2.08	0.44
4	Professors, employees and workers have the skills to apply total quality in the process of environmental protection	3.39	0.583
5	The technical and administrative cadres necessary to implement quality management in environmental protection are available	2.75	0.948
6	There is coordination between the senior management and the college administration in the application of total quality	2.37	0.804
Total dimension		**2.78**	**0.64**

Source: Prepared by the researcher

Through the above table (6) it becomes clear to us:

A. The general arithmetic mean of the total quality variable amounted to the field of the reality of applying total quality in environmental protection (2.78) and with a standard deviation of (0.64), and in comparison with the hypothetical mean whose value is (2.5), this indicates the effectiveness of the reality of applying total quality in environmental protection.

B. Paragraph (2) obtained the highest arithmetic mean (3.39) and standard deviation (0.583), and in comparison with the hypothetical mean of (2.5), this means that the department's management adopts a periodic evaluation of the levels of the role of workers in protecting the environment.

The results recorded the lowest arithmetic mean for paragraph (3) related to the availability of appropriate tools and means to evaluate the progress of the environmental protection process, where the arithmetic mean for this paragraph was (2.08) with a standard deviation of (0.44).

3. The scope of support provided by the upper management for the implementation of the total quality system as shown in Table (7)

Table 7: shows the arithmetic means and standard deviations for the variable field of support provided by the upper management to implement the total quality system.

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Number	paragraphs	Mean	standard deviation
1	Upper management is keen to hold periodic meetings with members of environmental protection to achieve total quality	2.694	0.52
2	The Upper management conducts studies to improve the overall quality of protecting the environment	2.259	0.026
3	The Upper management has a conscious awareness of the rules of environmental protection management	2.031	0.64
4	Upper management is committed to providing supervisors with periodic bulletins on the applications of the total quality system in protecting the environment	2.671	0.42
5	The Upper Management of Training and Applied Education organizes regular courses on developments in the total quality system in environmental protection	2.01	0.32
6	Upper management is keen to hold periodic meetings to discuss environmental problems	2.11	0.65
Total dimension		2.296	0.429

Source: Prepared by the researcher

From the above table (7), it becomes clear to us:

A. The general arithmetic mean of the variable of total quality and related to the field of support provided by the senior management for the implementation of the total quality system was (2.296) and with a standard deviation of (0.429), and in comparison with the hypothetical mean whose value is (2.5), this indicates the effectiveness of the field of support provided by the upper management to implement the system comprehensive quality.

B. Paragraph (3) obtained the highest arithmetic mean (2.694) and standard deviation (0.52), and compared to the hypothetical mean of (2.5), this means that the department's management is keen on holding periodic meetings with members of environmental protection to achieve total quality.

C. The results recorded the lowest arithmetic mean related to paragraph (5) related to the organization of the higher management of training and applied for education regular courses on developments in the total quality system in the protection of the environment, where the arithmetic means for this paragraph was (2.01) and with a standard deviation of (0.32).

4. The scope of the total quality assurance members' role in protecting the environment as shown in Table (8)

Table 8: shows the arithmetic means and standard deviations of the variable field of the role of total quality assurance members in protecting the environment.

Number	paragraphs	Mean	standard deviation
1	Total Quality members are keen to continuously evaluate their training level	2.03	0.463
2	TQM members participate in TQM courses	2.361	1.054
3	Total Quality members are fully aware of the scientific standards of training facts	3.03	0.536
4	TQM members use modern technologies in the process of environmental protection	2.87	0.615
5	The TQM member possesses the administrative skills of the environmental protection process, in addition to the technical skill	2.75	0.431
6	The TQM member is interested in designing modern programs to improve the environmental protection process	2.64	0.671
Total dimension		2.86	0.63

Source: Prepared by the researcher

From the data in Table (8) above, it becomes clear to us the following:

A- The general arithmetic mean of the total quality variable reached the field of the role of the total quality assurance members in protecting the environment (2.86), with a standard deviation of (0.63), and in comparison with the hypothetical mean whose value is (2.5), this indicates the effectiveness of the field of support provided by the senior management to implement the quality system comprehensive.

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B - Paragraph (3) obtained the highest arithmetic mean (3.03) and standard deviation (0.536), and in comparison with the hypothetical mean of (2.5), this means that the total quality members are fully aware of the scientific standards of training facts.

C- The results recorded the lowest arithmetic mean related to paragraph (1) related to the keenness of the members of the total quality on the continuous evaluation of their training level.

5- The area of problems related to total quality management as shown in Table (9).

Table 9: shows the arithmetic means and standard deviations of the variable domain of problems associated with total quality management.

Number	paragraphs	Mean	standard deviation
1	Weak self-development, and follow-up to modern methods of total quality management	2.37	0.804
2	Poor efficiency of environmental protection supervisors	2.65	0.431
3	Lack of clarity about the application of the principles of total quality to them	3.45	0.671
4	Weak commitment to the principles of reward and punishment in the process of environmental protection	3.69	0.536
5	There are some errors in the practice of environmental protection management	2.42	0.615
6	Weakness of linking the promotion of the member to protect the environment with his efficiency in the application of total quality in protecting the environment	3.83	0.677
Total dimension		3.28	0.59

Source: Prepared by the researcher

Through the above table (9) it becomes clear to us:

A. The general arithmetic mean of the total quality variable reached the domain of problems associated with total and material quality management (3.28), with a standard deviation of (0.59), and in comparison with the hypothetical mean whose value is (2.5), this indicates the effectiveness of the domain of problems associated with total quality management.

B. Paragraph (6) obtained the highest arithmetic mean (3.83) and standard deviation (0.677), and in comparison with the hypothetical mean of (2.5), this means that the department's management seeks the college to organize the protection of the environment.

The results recorded the lowest arithmetic mean related to paragraph (5) related to the presence of some errors in the practice of the Environmental Protection Department, where the arithmetic means for this paragraph was (2.42) and a standard deviation of (0.615(.

6- The domain of problems facing total quality: shown in Table (10).

Table 10: shows the arithmetic means and standard deviations for the domain of problems facing total quality.

Number	paragraphs	Mean	standard deviation
1	The large number of administrative and technical burdens assigned to a member of environmental protection	3.02	0.690
2	Poor qualification of some members of environmental protection about the rules of total quality	3.11	0.746
3	Weak capabilities and facilities for applying total quality in environmental protection	3.75	0.795
4	Lack of training on total quality standards	3.09	0.760
5	Absence of specific rules for the work of environmental protection members in accordance with total quality	2.36	0.785
6	Weak scholarships for environmental protection training courses. Lack of moral and material incentives.	0.291	0.746
Total dimension		2.815	0.922

Source: Prepared by the researcher

Through the above table (10) it becomes clear to us:

A. The general arithmetic mean of the total quality variable amounted to the domain of problems facing total quality

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(3.11) with a standard deviation of (0.746), and in comparison with the hypothetical mean whose value is (2.5), this indicates the effectiveness of the domain of problems facing total quality.
B. Paragraph (3) obtained the highest arithmetic mean (3.75) and standard deviation (0.795), and in comparison with the hypothetical mean of (2.5), this means that the department's management has double the capabilities and facilities necessary to apply total quality in environmental protection.
The results recorded the lowest arithmetic mean related to paragraph (5) and related to the absence of specific rules for the work of members of environmental protection according to the overall quality, where the arithmetic mean for this paragraph was (2.36) and a standard deviation (0.785).

Second: Results of descriptive statistics for the variable (environmental protection):

The measurement of the dependent variable environmental protection and its sub-paragraphs according to the arithmetic mean: the research variables were arranged and classified according to the questions of the questionnaire, and using statistical indicators (arithmetic means and standard deviations of a variable according to the responses of the research sample members) shown in Table (11):

Table 11: shows the arithmetic means and standard deviations of the environmental protection variable.

Number	paragraphs	Mean	standard deviation
1.	The university administration is concerned with the requirements of environmental protection.	3.046	0.89
2.	The university administration is interested in the media to improve the requirements of environmental protection	2.704	0.459
3.	The university administration is interested in improving the image of the university from the perspective of environmental protection	3.45	0.552
4.	The university works to comply with the laws and legislations related to the protection of the environment	3.69	0.536
5.	The university resorts to improving production methods from the perspective of environmental protection, which is reflected on the local community	2.333	0.976
6.	The university uses modern technological methods in production for the purposes of environmental protection	3.83	0.677
7.	The university seeks to join new markets and is interested in protecting the environment	3.37	0.731
8.	The university uses raw materials that are not harmful to the environment	2.704	0.459
9.	The university produces and markets environmentally and socially friendly products	2.361	0.648
10.	The university bears the costs of protecting the environment	1.65	0.746
11.	The university emphasizes the reduction of defective and damaged in order to protect the environment	3.46	0.715
12.	There is a department in the university that specializes in environmental affairs	4.00	00.0
13.	There are functional departments in which a number of workers are interested in protecting the environment	3.64	0.671
14.	There are specialized workers to solve environmental problems	3.32	0.635
15.	Environmental protection is one of the most important pillars of the administration's values and the university's culture in general	3.815	0.855
16.	There are special regulations and laws to protect the environment in place at the university	2.861	0.347
17.	The legislation and laws issued for the protection of the environment are implemented and your company is committed to them	2.833	0.374
18.	The university has an environmental management system that complies with the requirements of IOS 14001	2.157	0.799
19.	The university continuously improves the effectiveness of the environmental management system	2.074	0.828
20.	The senior management provides all the basic means to implement the environmental management system	2.00	0.347
Total dimension		2.965	0.612

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Source: Prepared by the researcher

Through the above table (11) it becomes clear to us:

A. The general arithmetic mean of the variable total quality environmental protection was (2.965) with a standard deviation of (0.612), and in comparison with the hypothetical mean whose value is (2.5), this indicates the effectiveness of environmental protection,

B. Paragraph (12) obtained the highest arithmetic mean (4.00) and standard deviation (0.00), and in comparison with the hypothetical mean of (2.5), this means that there is a department in a specialist in environmental affairs. The results recorded the lowest arithmetic mean related to paragraph (10) related to the university bearing the costs of protecting the environment, where the arithmetic mean for this paragraph was (1.65) with a standard deviation of (0.746).

• Presenting and discussing the results of descriptive statistics for the paragraphs of the studied variables:-

1- View the results:

As for the first research objective, to know the total quality at Al-Qasim Green University, the arithmetic means and standard deviations of responses on the total quality scale were calculated, and the results are shown in Table (12).

Table 12: Arithmetic averages and standard deviations of the total quality domains

Field	**Mean**	**standard deviation**	Evaluation
The extent of commitment to the principles of total quality.	2.844	0.718	medium
The reality of applying total quality in environmental protection.	2.668	0.520	medium
Support provided by upper management to implement the total quality system	2.555	0.811	medium
The role of total quality assurance members in protecting the environment	2.546	0.748	medium
Problems related to total quality management	2.382	1.338	medium
Problems facing total quality	2.103	1.522	medium
Total	2.54	0.519	medium

Source: Prepared by the researcher

Table (16) shows that the degree of total quality practice is medium on its average, as the total arithmetic means of the responses reached (2.656). The table also shows that the extent of commitment to the principles of total quality obtained the highest degree of practice, as the arithmetic mean reached (2.844), followed by the field of the reality applying total quality in environmental protection with arithmetic mean (of 2.668), then the field of the role of total quality assurance members in protecting the environment with an average Arithmetic (2.555), and finally followed by the field of individual considerations, and it's mean was (2.546).

With regard to the second research objective, which aims to know the protection of the environment, the arithmetic averages and standard deviations of the employees' responses to environmental protection were calculated, and the results appear in Table (13).

Table 13: Arithmetic averages and standard deviations of environmental protection.

Mean	**standard deviation**	**field degree**
2.965	0.612	medium

Source: Prepared by the researcher

Table (14) shows that the level of environmental protection was average in general, where the value of the total arithmetic mean was (2.965) and the standard deviation was (0.612).

Table 14: Correlation coefficients between total quality, behavior, and environmental protection.

Field	**Environment protection**
The extent of commitment to the principles of total quality.	0.481**
The reality of applying total quality in environmental protection.	0.407**
Support provided by upper management to implement the total quality system	0.508**
The role of total quality assurance members in protecting the environment	0.251*
Problems related to total quality management	0.582**
Problems facing total quality	0.485**
Total	0.527**

Source: Prepared by the researcher

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** Significant at the level (R ≤ 0.01) * Significant at the level (R ≤ 0.05)

In order to clarify the role of total quality in achieving environmental protection, regression analysis was used, where the fields of total quality were used as independent variables and environmental protection as a dependent variable. The results of this analysis are shown in Table (15).

Table 15: regression analysis of the total quality variables in achieving environmental protection.

No.	Beta (β)	t	R	R^2	ΔR^2	F	Sig.
The extent of commitment to the principles of total quality.	0.230	3.030**	0.641	0.411	0.411	34.468	0.43
The reality of applying total quality in environmental protection.	0.031	3.251**	0.709	0.503	0.092	1.787	0.475
Support provided by upper management to implement the total quality system	0.096	3.196**	0.657	0.558	0.055	1.333	0.976
Problems facing total quality	0.19	0,707	0,256	0,707	0,256	0,310	0,767
Problems related to total quality management	0.09	0,731	0,911	0,731	0,211	0,597	0,714
The role of total quality assurance members in protecting the environment	0.02	0,650	0,914	0,650	0,814	0,731	0.001

Source: Prepared by the researcher

Tables (15, 14) show the impact of the fields of total quality in protecting the environment, where it appears that the field of commitment to the principles of total quality had the greatest impact on total quality in protecting the environment for employees, as the beta value corresponding to this field reached (β = 0.230), which is a statistically significant value at the level (R ≤ 0.01), and contributed to explaining 23.0% of the variance in environmental protection, followed by the area of problems facing total quality (β = 0.19) and contributed to explaining 19.2% of the variance in environmental protection. Then the field of support provided by the upper management for the applying total quality system (β = (0.096)) and contributed to explaining 9.6% of the discrepancy in environmental protection.

In general, the six domains contributed to explaining 66.68% of the role of total quality in achieving environmental protection for employees, where the calculated "F" value was (34.468), which is a statistically significant value at the level (R ≤ 0.01). The results contained in Table (19) also show that the role of total quality assurance members in protecting the environment did not have a statistically significant effect on the variable environmental protection variables.

Conclusions and Recommendations:

Conclusions:

1) The field of the reality of applying total quality in environmental protection is considered one of the most important and strongest dimensions of total quality in terms of the positive impact on the level of environmental protection in the organization in question.

2) The reality of total quality in the institution is average, where the sample members unanimously agreed on the enjoyment of the institution (the extent of commitment to the principles of total quality - the reality of applying total quality in environmental protection - the support provided by the upper management to implement the total quality system - the role of members of total quality assurance in protecting the environment - Problems associated with total quality management - problems facing total quality) which are sufficient to make any appropriate change process that the institution may need, and this confirms the strength of the relationship between total quality and environmental protection for employee responses.

3) The level of environmental protection was generally medium in the surveyed institution.

4) There is a strong positive relationship between total quality and environmental protection, especially the extent of commitment to the principles of total quality, and the problems facing total quality.

5) There is a positive relationship between the areas of quality and environmental protection, which contributed to explaining 66.6% of the variance of environmental protection among employees.

6) The role of total quality assurance members in protecting the environment is one of the weakest dimensions of total quality in terms of the positive impact on the level of environmental protection in the institution in question.

Recommendations:

1) Enhancing the use of total quality among the various categories of environmental protection workers.

2) The university administration should increase the application of quality and overcome the obstacles that prevent the protection of the environment.

3) Holding training courses for employees at various levels in order to develop their total quality skills, and to

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enhance their practice in the field of work to protect the environment.

4) Working on developing the characteristics of total quality and raising the performance level of the universities investigated by identifying the most important areas or influential dimensions, and cooperating to take appropriate decisions regarding the development of the institution and making changes in it that help achieve great successes for the institution.

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