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Diagnosing the Reality of Cleaner Production Dimensions: An Exploratory Study of the Opinions of a Sample of Functional Staff at the Ready-Made Garments Factory in Mosul."

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A B S T R A C T

The current research aims to diagnose the dimensions of cleaner production, represented by (substituting raw materials, modifying technology and equipment, recycling waste, and good managerial practices) in the ready-made garment factory in Mosul. The study is based on a research problem that emerged from diagnosing the extent to which the surveyed organization adopts a cleaner production policy through its dimensions. The research hypothesis states that the ready-made garment factory in Mosul adopts cleaner production at a comprehensive level and in terms of its specific dimensions.A questionnaire was used as the primary tool for data collection, and the statistical program (SPSS V24) was employed to analyze the data from the surveyed sample, which consisted of **165** respondents from the organization's workforce. Using a five-point Likert scale, the study concluded with several findings confirming the presence of these dimensions at varying levels within the surveyed organization. Additionally, the study presented key recommendations, most notably the necessity of focusing more precisely on the cleaner production approach and its dimensions to achieve the organization's objectives.

1. Introduction

Cleaner production is one of the most important production systems that has gained popularity among organizations seeking to protect the environment, preserve resources, reduce waste, and avoid harming essential life components. In addition, it contributes to achieving economic, environmental, and social benefits. Organizations aiming to reduce environmental pollution adopt cleaner production policies to maintain a safe and sustainable environment.Through its key dimensions) substituting raw materials, modifying technology and equipment, recycling waste, and good managerial practices (cleaner production presents a preferred option for optimizing the use of raw materials and energy. It enables production processes that are waste-free or nearly waste-free, leading to high-quality outputs that enhance competitiveness, strengthen market presence, and secure a market share by meeting customer needs without harming the environment. The study is structured as follows: Chapter One, Research methodology, Chapter Two, Theoretical framework,Chapter Three, Field study,Chapter Four: Conclusions and recommendations...

2. Methodology

2.1. The study problem

The challenges of the business environment have noticeably increased in the recent period, and the intensity of competition has escalated, placing significant pressure on business organizations. This has necessitated their adaptation and adjustment to all that is new by adopting approaches that enable organizations in general, and the organization under study in particular, to survive and compete, focusing not only on the customer but also on society as a whole. The researchers find that the study of the subject of cleaner production has transcended national borders, as we have witnessed increasing international cooperation in this field, which has an impact on organizations that follow a cleaner production strategy. Therefore, the research problem arises from the question: Do the individuals surveyed recognize the importance of cleaner production in the organization under study, as embodied in its dimensions (substitution of raw materials, modification of technology and equipment, waste recycling, administrative management) in the organization under study"

2.2. Importance of the Research

"A. Theoretical Significance"

The theoretical significance of the current research lies in its representation of a qualitative addition to modern studies that address a topic of increasing importance in contemporary organizations. Cleaner production is considered a relatively recent field of study that is expected to be adopted in modern business organizations, as it is a crucial subject with a significant impact on various aspects of life. Additionally, it provides a theoretical framework for the dimensions of cleaner production in light of benefiting from previous cognitive efforts in this field.

"B. Practical Significance

The practical significance for the organization under study, represented by the ready-made garment factory in Mosul, is reflected by identifying the extent to which it adopts the topics presented in the study and benefits from them in achieving a competitive advantage that meets the objectives of the organization under study and generalizes its results to other organizations."

2.3. Research Objectives

The research primarily aims to diagnose the dimensions of cleaner production through its dimensions (substitution of raw materials, modification of technology and equipment, waste recycling, administrative management) in the organization under study, in addition to achieving a set of sub-objectives represented by the following

1. To provide a theoretical framework that includes the study topics of cleaner production in light of benefiting from previous cognitive efforts in this field.
2. To diagnose the reality of cleaner production in the organization under study in light of describing the respondents' answers about the dimensions expressing it and diagnosing them."

3. To indicate a set of conclusions based on the research results to build proposals that serve the organization under study by adopting the relevant implementation mechanism

2.4. Research Population and Sample

"The research is embodied in a main hypothesis stating that the ready-made garment factory in Mosul adopts cleaner production at the overall level, as indicated by its dimensions, which are (substitution of raw materials, modification of technology and equipment, waste recycling, good administrative management), according to the respondents' answers to the statements expressing them."

2.5.Data Collection and Analysis Methods

The current research required the researchers to adopt a set of research methods in order to obtain the necessary data to complete the research and reach results that achieve the desired objectives. Accordingly, the researchers relied on a set of tools in both their theoretical and field aspects, as follows:

Theoretical Aspect: In this aspect, available Arabic and foreign sources were used, represented by research papers, books, scientific journals, and conferences, as well as university theses and dissertations, and the internet.

Field Aspect: In this aspect, reliance was placed on the questionnaire as a primary tool for collecting data about the research variable from the organization under study (the ready-made garment factory in Mosul). The research population and sample included (functional staff), and there were (165) questionnaires valid for analysis, containing statements to answer the dimensions expressing cleaner production, which are (substitution of raw materials, modification of technology and equipment, waste recycling, good administrative management). A five-point Likert scale was adopted to measure the dimensions of the research variable, ranked from strongly agree, agree, neutral, disagree, strongly disagree, and the corresponding weights were given (1, 2, 3, 4, 5) respectively. SPSS V 26 software was used for data analysis.

2.6. Research Population and Sample

"The research population represents a sample of the functional staff at the ready-made garment factory in Mosul. The appropriate (number of questionnaires) for this study is (184) to obtain the required accuracy in the results of the structural equation modeling applied through SPSS V 26 software. Therefore, based on the foregoing and to obtain the highest accuracy in the results, we randomly distributed (190) questionnaires, of which (165) questionnaires were returned and valid for analysis, as shown in Table (1)

Table (1) Number and Percentage of Questionnaires Distributed to the Research Sample

Population Size	Distributed Questionnaires	Valid Questionnaires for Analysis	
		Count	%
2060	190	165	87%

Source: Prepared by the Researchers Based on Electronic Computer Outputs

3. The Theoretical Aspect

3.1. Concept of Cleaner Production:

According to(Abdali et al., 2024,178) in an effort to raise environmental awareness among organizations and society and to address pressures from environmental organizations to reduce pollution, a set of restrictions has been imposed on organizations in recent years in Iraq. The Iraqi Ministry of Environment contributed to enforcing these restrictions in 2009 to encourage organizations to take various measures to improve their workplaces and reduce pollution by implementing cleaner production. Moreover, its implementation enhances the organization's competitive position within its environment. As explained by(Wu & Chang, 2020,167) cleaner production is an integrated strategy aimed at improving the environmental

performance of products, processes, and services by applying sustainable initiatives that increase efficiency and reduce costs. (Al-Shahwani, 2022, 39)defined it as a comprehensive environmental strategy and a managerial approach for industrial organizations, designed to enhance business opportunities, improve production efficiency, and minimize risks to humans. The implementation process includes all stages of manufacturing, starting from design and operational methods, passing through the use of materials and technologies, and ending with the production of the final product.

Based on the above, researchers can establish an operational definition of cleaner production as a concept that focuses on prevention rather than treatment. This means reducing pollution at its source rather than addressing it after it occurs. It involves making improvements in product design, using more efficient and environmentally friendly raw materials, and applying modern technologies that enhance the environmental performance of industrial processes. This approach is not limited to environmental benefits but also contributes to improving the economic performance of organizations by reducing costs and enhancing productivity. Cleaner production is an integral part of sustainable development as it helps achieve a balance between economic growth and environmental preservation.

3.2.The Importance of Cleaner Production

The importance of cleaner production aligns closely with green practices, as highlighted by (Mekimah Sabri ,2024,1). This is particularly relevant for small and medium-sized enterprises (SMEs) aiming to achieve long-term competitive advantages. Integrating environmental considerations into marketing strategies through green marketing can provide differentiation, enhance operational efficiency, attract sustainability-conscious customers, and ultimately improve profitability and brand perception.

Additionally, (Abd El-Aal & Sayed ,2025,170) pointed out that the significance of cleaner production has emerged across various sectors due to the growing focus on environmental responsibility. This is achieved through the optimal use of resources, conservation efforts, adherence to proper manufacturing practices, the adoption of clean and green technologies, and the safe disposal of emissions. However, despite its importance, some countries struggle with limited resources and challenges in monitoring and controlling waste and emissions from industrial organizations, which can contribute to environmental pollution.

Based on the above, the researcher believes that the importance of cleaner production lies in its vital role in reducing negative environmental impacts and ensuring resource sustainability. It helps decrease harmful emissions, minimize energy and raw material consumption, and protect the planet for future generations. Furthermore, it enhances industrial efficiency and reduces long-term costs, achieving a balance between environmental and economic objectives. Additionally, it contributes to improving organizations' reputations and increasing their competitiveness in global markets, where sustainability has become a key priority.

3.3. Dimensions of Cleaner Production

Industrial organizations focus on adopting modern production methods to enhance their economic and environmental performance. These dimensions represent one of those approaches due to their role in improving environmental efficiency through a series of processes. Researchers have varied in defining them. Over time, industrial environmental applications have evolved, incorporating a set of practices, steps, concepts, and strategies aimed at reducing pollution and emissions. Several researchers, including (Al-Khashab,2018,50)(Al-Shahwani ,2022,45) (Al-Ubaidi,2015,50) (Borges,2021,299) and(Ismail ,2014,288), have agreed on the

following dimensions:

A- Raw Material Substitution

Organizations seek to adapt to environmental changes by producing products that meet customer needs and preferences. Replacing materials with negative environmental impacts with less harmful alternatives is a crucial step in this direction(Hamoody& Gajo,2023,15). This includes replacing hazardous materials with safer ones, toxic substances with less toxic alternatives, and carcinogenic materials with non-carcinogenic substitutes. These measures help reduce waste at the source, ensuring product alignment with customer expectations and providing a competitive advantage in the market.

According to (Nilsson et al. ,2007, 97) raw material substitution involves selecting alternatives based on efficiency and cost, driving organizations toward research and development to discover new solutions that ensure resource sustainability. This process helps eliminate or reduce hazardous materials used in production processes.(Al-Bakri & Al-Nouri 2007,180) and, Al-(Khashab ,2018,50) outlined key principles for selecting material alternatives in production processes:

➢ Designing recyclable products: Creating designs that allow future reuse of components.
➢ Using environmentally friendly materials: Studying material properties and replacing harmful or toxic components with safer, eco-friendly alternatives.
➢ Reusing materials: Collecting material residues and used products, processing them, and reintegrating them into production cycles.
➢ Optimizing energy consumption: Focusing on reducing energy use in production processes to enhance efficiency and sustainability.

B- Technology and Equipment Modification

This mechanism reduces pollutant formation by upgrading or replacing equipment with more advanced alternatives(Mustafa& Muhammad,2023,95). It leads to the adoption of new technologies that enhance production efficiency while minimizing environmental emissions. (Tschigge et al,2019,5) stated that modifying technology and equipment involves integrating advanced techniques to improve resource efficiency and minimize waste. These modifications may include replacing outdated equipment with more efficient alternatives, implementing smart control systems, conducting product life cycle analysis, and adopting the circular economy concept. Through these changes, organizations can significantly transition toward cleaner production and minimize their environmental footprint.

(Rahim et al,2020,27) highlighted that modification achieves this by adopting new tools that enhance productivity while simultaneously reducing material waste and energy consumption. Modern technologies can be integrated into existing systems as supportive additions or through partial or complete system replacement.(Abdali et al,2024,168) emphasized that technology modification involves adjusting machinery, removing polluting equipment (partially or completely), and identifying cost-effective machinery to ensure cleaner production, higher efficiency, and reduced environmental pollutants. This also includes eliminating processes that generate harmful substances.

C- Waste Recycling

According to(Norbu & Visvanathan ,2006,2-3), recycling is the process of altering a product's shape and purpose to transform it into a new product. Waste materials are converted into usable industrial products through recycling, recovery, or reuse, aiming to reduce waste and lower costs.

(Hanzal ,2017,93) stated that recycling significantly enhances the use of raw materials in production processes. Waste, initially deemed worthless, gains high value once processed and recycled, making it a profitable resource for organizations. (Ebrahimi ,2017,143) noted that recycling not only provides economic benefits but also improves the environment by reducing reliance on raw materials, decreasing pollution, conserving energy, and mitigating climate change effects.

Recycling operates at two levels:

1. Internal recycling: Conducted within the organization, where defective or waste materials from production are reintegrated into the production process in specified proportions to maintain product quality.

2. External recycling: Conducted outside the organization, involving the collection of used products discarded by customers and converting them into raw materials for new product manufacturing. (Da Silva & Gouveia ,2020,164) and (Norbu & Visvanathan ,2006,24) highlighted the main benefits of recycling: creation: Recycling generates new employment opportunities by requiring a workforce to manage and process materials that would otherwise be sent to landfills :

➢ Industry support: It fosters the growth of new industries that utilize recycled materials for innovative product development.
➢ Cost reduction and environmental conservation: Recycling is a cost-effective waste management solution requiring less governmental support compared to conventional waste disposal methods. It helps conserve natural resources, save energy, and protect the environment, making it cleaner and more sustainable. Governments prioritize recycling based on societal consumption behaviors and cultural values.

This approach alleviates environmental burdens by repurposing waste and materials, supporting industrial activities that create job opportunities. Additionally,(Abdali et al. ,2024,168) emphasized that preventing waste generation begins with reducing raw material and energy use while repurposing waste into valuable materials through various treatments. Recycling processes align with sustainable product reuse by altering its original function. Recycling involves reprocessing products or materials using chemical, biological, or physical treatment methods, thereby transforming previously useless waste into valuable materials. Some recycled waste can be sold to other industries either after processing or as raw materials.

D- Effective Administrative Management

Effective administrative management involves procedural and managerial practices that should be implemented across all organizational departments to reduce costs, emissions, and pollution while improving efficiency.(Abdali et al,2024,168) identified key aspects:

> ➢ Employee and management practices: Implementing employee training programs focused on cleaner production practices and creating incentive programs to minimize emissions and pollutants.

> ➢ Material storage and handling practices: Enhancing workforce capabilities in handling raw materials and improving storage conditions to minimize material degradation, leaks, and environmental impact. Regular warehouse monitoring and adopting modern storage techniques help reduce pollution risks.

> ➢ Policy dissemination and employee training: Educating employees on reducing emissions from aging equipment through regular assessments and implementing repair or replacement strategies. (Majid & Shakir ,2016,157) emphasized that proper management helps minimize waste through efficient operational processes, purchasing high-quality, eco-friendly materials, and enhancing regulatory oversight of production activities. This approach ensures high product efficiency and quality.

(Saeed ,2023,240) highlighted that procedural and administrative measures within economic units can be applied to reduce emissions, pollution, and costs while improving efficiency. These practices include management strategies, employee engagement, material handling, and cost allocation.

(Hanzal ,2017,92) and (Al-Qara Ghouli ,2021,41) agreed that administrative management involves implementing appropriate operational and managerial measures. Effective management ensures that internal organizational activities are optimized through best practices supporting cleaner production, such as waste segregation, leakage prevention, proper sanitation, and efficient use of raw materials and energy.

The focus on process optimization requires management to source high-quality materials as alternatives to hazardous ones, train employees on environmental risks, and enhance regulatory control over production processes.

4. Field Study

Testing the Research Hypothesis

This section describes and diagnoses the variable of cleaner production based on the dimensions representing it, in light of the respondents' answers to the corresponding survey items, as follows:

A. Raw Material Substitution

The data presented in Table (2) indicate an agreement among respondents regarding the items related to the dimension of raw material substitution (X11-X14). The overall agreement rate, including responses of "Strongly Agree" and "Agree," reached 68.83%, suggesting a considerable consensus among respondents on this dimension. This means that the respondents' opinions tend to be positive based on the five-point Likert scale.

Conversely, the overall disagreement rate ("Disagree" and "Strongly Disagree") stood at 15.70%, while neutral responses accounted for 15.48%. The mean score was 3.779, with a standard deviation of 1.071. The relative importance score for raw material substitution was 75.576%, indicating a moderately high level of importance, suggesting a generally positive agreement among respondents regarding these items based on their personal perspectives.

At the micro-level, item X12, which represents the replacement of hazardous materials with safer alternatives, achieved the highest relative importance score of 77.818%, with a mean score of 3.891 and a standard deviation of 1.042. In contrast, item X13, which pertains to controlling and treating pollutants and emissions generated by production processes, recorded the lowest relative importance score at 73.696%, with a mean score of 3.685 and a standard deviation of 1.070.

Table (2): Description of the Raw Material Substitution Dimension

Paragraphs	Response Scale										Arithmetic mean	Standard Deviation	Relative Importance%	Paragraph order
	Strongly Agree (5)		Agree (4)		Neutral (3)		Disagree (2)		Strongly Disagree (1)					
	number	%	number	%	Number	%	number	%	number	%				
X11	54	32.8	52	31.5	31	18.8	22	13.3	6	3.6	3.764	1.152	75.272	3
X12	52	31.6	70	42.4	18	10.9	23	13.9	2	1.2	3.891	1.042	77.818	1
X13	36	21.8	75	45.5	26	15.8	22	13.3	6	3.6	3.685	1.070	73.696	4
X14	40	24.2	75	45.5	27	16.4	19	11.5	4	2.4	3.776	1.020	75.516	2
Overall Average		27.6		41.225		15.475		13		2.7	3.779	1.071	75.576	
Total	68.83				15.48		15.70							

Source: The table was prepared by the researchers based on the outputs of statistical programming.

B.Technology and Equipment Modification

The data presented in Table (3) indicate an agreement among respondents regarding the items related to the Technology and Equipment Modification dimension (X21-X24). The overall agreement rate, including responses of "Strongly Agree" and "Agree," reached 65.93%, suggesting a considerable consensus among respondents on this dimension. This means that the respondents' opinions tend to be positive based on the five-point Likert scale.

Conversely, the overall disagreement rate ("Disagree" and "Strongly Disagree") stood at 16.95%, while neutral responses accounted for 17.13%. The mean score was 3.694, with a standard deviation of 1.045. The relative importance score for technology and equipment modification was 73.879%, indicating a moderately high level of importance, suggesting a generally positive agreement among respondents regarding these items based on their personal perspectives.

At the micro-level, item X21, which represents upgrading production units with more efficient and effective machines, achieved the highest relative importance score of 74.910%, with a mean score of 3.746 and a standard deviation of 1.010. In contrast, item X22, which pertains to building environmentally friendly production units by optimizing resource consumption, recorded the lowest relative importance score at 72.484%, with a mean score of 3.624 and a standard deviation of 1.038.

Table (3): Description of the Technology and Equipment Modification Dimension

Paragraphs	Response Scale										Arithmetic mean	Standard Deviation	Relative %Importance	Paragraph order
	Strongly Agree (5)		Agree (4)		Neutral (3)		Disagree (2)		Strongly Disagree (1)					
	number	%	number	%	Numbe	%	number	%	number	%				
X21	38	23	73	44.3	32	19.4	18	10.9	4	2.4	3.746	1.010	74.910	1
X22	31	18.8	74	44.9	32	19.4	23	13.9	5	3	3.624	1.038	72.484	4
X23	40	24.2	73	44.3	23	13.9	27	16.4	2	1.2	3.739	1.041	74.788	2
X24	40	24.2	66	40	26	15.8	30	18.2	3	1.8	3.667	1.089	73.334	3
Overall Average		22.55		43.375		17.125		14.85		2.1	3.694	1.045	73.879	
Total		65.93			17.13			16.95						

Source: The table was prepared by the researchers based on the outputs of statistical programming

C.Recycling of Waste

The data in Table (4) shows a consensus among the opinions of the surveyed individuals regarding the items of the waste recycling dimension for statements (X31-X34). The overall consensus rate for the responses of the surveyed individuals in agreement (strongly agree, agree) reached (57.93%), indicating a degree of agreement in the responses of the surveyed individuals on the items of the waste recycling dimension. This means that the opinions of the surveyed individuals tend towards positivity based on the five-point Likert scale. On the other hand, the overall disagreement rate (disagree, strongly disagree) for the responses of the surveyed individuals on the items of the waste recycling dimension was (24.05%), while the percentage of neutral responses was (18.03%). The arithmetic mean was (3.447), the standard deviation was (1.155), and the relative importance rate for the waste recycling dimension was (68.940%), which is a moderately high relative importance. This indicates that the surveyed individuals agree to a reasonably good degree on these items according to their personal viewpoints.

At the individual item level, item (X31), which represents the inventory and classification of waste and residues within production processes, achieved the highest relative importance of (71.394%), with an arithmetic mean of (3.570) and a standard deviation of (1.037). In contrast, item (X33), which represents benefiting from damaged products through recycling, achieved the lowest relative importance of (67.152%), with an arithmetic mean of (3.358) and a standard deviation of (1.249).

Table (4) Description of the Waste Recycling Dimension

Paragraphs	Response Scale					Arithmetic mean	Standard Deviation	Relative %Importance	Paragraph order
	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)				

	num ber	%	num ber	%	num ber	%	num ber	%	num ber	%				
X31	29	17.7	69	41.8	40	24.2	21	12.7	6	3.6	3.570	1.037	71.394	1
X32	31	18.8	58	35.2	33	20	36	21.8	7	4.2	3.424	1.148	68.484	3
X33	28	17	69	41.8	17	10.3	36	21.8	15	9.1	3.358	1.249	67.152	4
X34	27	16.4	71	43	29	17.6	23	13.9	15	9.1	3.436	1.186	68.728	2
Overall Average		17.475		40.45		18.025		17.55		6.5	3.447	1.155	68.940	
Total		57.93			18.03			24.05						

Source: The table was prepared by the researchers based on the outputs of statistical programming

D. Good Administrative Management

The data in Table (5) indicates a consensus among the opinions of the surveyed individuals regarding the items of the good administrative management dimension for statements (X41-X44). The overall agreement rate for the responses of the surveyed individuals in agreement (strongly agree, agree) reached (61.83%), indicating a degree of agreement in the responses of the surveyed individuals on the items of the good administrative management dimension. This means that the opinions of the surveyed individuals tend towards positivity based on the five-point Likert scale. On the other hand, the overall disagreement rate (disagree, strongly disagree) for the responses of the surveyed individuals on the items of the good administrative management dimension was (17.73%), while the percentage of neutral responses was (20.45%). The arithmetic mean was (3.576), the standard deviation was (1.113), and the relative importance rate for the good administrative management dimension was (71.515%), which is a moderately high relative importance. This indicates that the surveyed individuals agree to a reasonably good degree on these items according to their personal viewpoints.

At the individual item level, item (X41), which represents reducing the negative environmental impact within its production processes, achieved the highest relative importance of (72.484%), with an arithmetic mean of (3.624) and a standard deviation of (0.965). In contrast, item (X44), which represents being keen to provide a suitable and encouraging work environment for compliance with environmental legislation, achieved the lowest relative importance of (70.546%), with an arithmetic mean of (3.527) and a standard deviation of (1.161)

Table (5) Description of the Good Administrative Management Dimension

Paragraphs	Response Scale										Arithmetic mean	Standard Deviation	Relative %Importance	Paragraph order
	Strongly Agree (5)		Agree (4)		(3) Neutral		Disagree (2)		Strongly Disagree (1)					
	num ber	%	num ber	%	Nu mbe	%	num ber	%	num ber	%				
X41	23	13.9	85	51.6	35	21.2	16	9.7	6	3.6	3.624	0.965	72.484	1
X42	37	22.4	69	41.8	30	18.2	16	9.7	13	7.9	3.612	1.167	72.242	2
X43	35	21.2	63	38.2	34	20.6	22	13.3	11	6.7	3.539	1.161	70.788	3

X44	35	21.2	61	37	36	21.8	22	13.3	11	6.7	3.527	1.161	70.546	4
Overall Average		19.675		42.15		20.45		11.5		6.225	3.576	1.113	71.515	
Total	61.83				20.45			17.73						

Source: The table was prepared by the researchers based on the outputs of statistical programming

A. Summary Description of the Cleaner Production Variable

Based on the foregoing, it can be stated that all responses for all dimensions of the cleaner production variable were higher than the hypothetical arithmetic mean of (3). Table (6) illustrates the relative importance of the cleaner production dimensions from the perspective of a sample of functional staff at the ready-made garment factory in Mosul. Through the values of the arithmetic mean, standard deviation, and relative importance, it is evident that the most important dimension of the cleaner production variable is the raw material substitution dimension, as indicated by the arithmetic mean value of (3.779), the standard deviation of (1.071), and a relative importance of (75.576%). This is followed in relative importance by the technology and equipment modification dimension, with an arithmetic mean value of (3.694), a standard deviation of (1.045), and a relative importance of (73.879%). In third place is the good administrative management dimension, with an arithmetic mean value of (3.576), a standard deviation of (1.113), and a relative importance of (71.515%). In fourth place is the waste recycling dimension, with an arithmetic mean value of (3.447), a standard deviation of (1.155), and a relative importance of (68.940%).

Table (6) Relative Importance of the Cleaner Production Variable Dimensions

T	Dimensions of Cleaner Production	Arithmetic mean	Standard Deviation	Relative Importance	Paragraph
1	Raw Material Substitution	3.799	1.071	75.576	First
2	Technology and Equipment Modification	3.694	1.045	73.879	Second
3	Recycling of Waste.	3.447	1.155	68.940	Fourth
4	Good Administrative Management	3.576	1.113	71.515	Third

Source: The table was prepared by the researchers based on the outputs of statistical programming

5. lusions and Recommendations

This chapter includes a presentation of the most important conclusions reached by the research in its theoretical and field aspects, as well as the recommendations presented to the researched organization and their implementation mechanisms. Accordingly, the chapter includes two axes:

5.1. Conclusions

1. Through the results and diagnosis of the research from the respondents' point of view, we note that the answers are concentrated in the positive direction and a good response rate with varying percentages in the organization. This is attributed to the

fact that the researched organization focuses on cleaner production, observes it, works according to its perspective, and relies on the information it provides, emphasizing its endeavor to develop production within its competitive environment.

2. The analysis results of the study in the researched organization, according to its adoption of the study variable based on its arithmetic means and response rates, showed that it was in the positive direction with a variation between the variable's dimensions. The lowest value was for the waste recycling dimension.

3. The results also showed that the researched organization adopts cleaner production as a working mechanism to achieve competitiveness through a compatible relationship in the respondents' answers regarding the cleaner production dimension and its sub-variables

5.2.Recommendations

Based on the set of conclusions presented, the researchers provided a number of recommendations that enhance the work of the researched organization, including the following:

1. The organization under study can encourage its staff to adopt the cleaner production approach by allocating financial incentives or adopting an encouraging policy that creates an enabling environment for such an approach.

2. The researched organization should pay attention to all cleaner production variables, as a comprehensive system that works to gain the satisfaction of customers and society as a whole.

3. The researched organization should give the recycling variable greater importance because it did not take sufficient role compared to other production variables.

4. Urge the researched organization to give greater importance to technology and equipment modification by moving beyond traditional production methods to achieve temporal and spatial benefits for the new product at the lowest costs.

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