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# APPLYING CLEANER PRODUCTION STRATEGIES TO ACHIEVE GREEN HUMAN RESOURCE MANAGEMENT PRACTICES-A FIELD STUDY IN THE STATE COMPANY FOR DRUGS INDUSTRY AND MEDICAL APPLIANCES

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## Abstract

**Purpose:** To identify cleaner production technology and its impact on the state company for drugs industry and medical appliances' adoption of green human resources management practices.

**Design/ Methodology/ Method:** A questionnaire form was developed to ensure the existence of a relationship between the research variables, and based on the comprehensive inventory method, (89) questionnaire forms were distributed in the state company for drugs industry and medical appliances, and their data were analyzed using the (SPSS V.24) program.

**Results:** The research results showed that there is a knowledge gap related to determining the nature of the relationship between the application of cleaner production technology and green human resource management practices, and it was confirmed that there is a statistical relationship between the research variables. Therefore, the researched company needs to apply cleaner production technology to adopt green human resource management practices.

**Practical implications:** The results of the research can be benefited by applying cleaner production technology to adopt green human resources management practices, thus increasing the company's chances of achieving its goals and objectives.

**Originality/ value:** This is the first research to combine current variables (cleaner production and green human resources management) in one hypothetical model. This means that there is no knowledge product that determines the relationship between these variables, whether at the level of Iraqi or other organizations, or at the level of Arab and foreign studies, so the current research came to fill that gap.

**Keywords:** cleaner production, green human resources management.

## Introduction

The topic of cleaner production is one of the most important topics in the field of production and operations, but it is less covered in the administrative sciences literature. Therefore, most organizations now need to apply this concept because it achieves a competitive advantage for them, in addition to expressing their interest in their social and ethical responsibilities towards their customers, and also adopting a manufacturing strategy. Clean and provide

products free of environmental pollution factors. This requires the implementation of green human resources management practices, which are based on green job analysis and design, green selection and recruitment, green performance evaluation, green training and development, green compensation and motivation systems, and green occupational health and safety management.

## **1. Research methodology**

### **1.1. Research problem:**

The research problem can be summarized in the difficulty that organizations face in thinking about converting their current human resources into human resources with green orientations or attracting human resources that have green interests and an ethical orientation towards the environment through the application of cleaner production technology, and this requires a collective effort of human resources in the organization as a whole. Therefore, the current research attempts to reveal the relationship between its variables and dimensions and determine the extent of application of cleaner production technology and the most important problems of its application, in addition to identifying and knowing the extent to which the researched company applies green human resources management practices, as there are no discussions about the extent to which the application of cleaner production technology contributes to the adoption of human resources management practices. Green as far as the researcher knows. This indicates a knowledge deficiency in how to bridge the gap between the variables of the current research.

Based on the research problem mentioned above, the current research seeks to answer the following cognitive and practical questions:

- A. What are the conceptual considerations for cleaner production technology and green human resource management practices?
- B. Can the application of cleaner production technology contribute to adopting green human resources management practices in the researched company?
- C. Is it possible to diagnose the difficulties facing the application of the proposed conceptual model?

### **1.2. Research aims:**

- A. Develop a conceptual model for cleaner production technology and green human resource management practices.
- B. Determine the extent of applying cleaner production technology in adopting green human resources management practices in the researched company.
- C. Diagnosing the limitations and difficulties faced by the proposed conceptual model.

### **1.3. Research importance:**

The importance of the research is centered on the cognitive and applied level as follows:

- A. The cognitive level: Through a cognitive framing around the research variables, as there is no Arab or foreign study that combines its variables into one hypothetical model according to the researcher's knowledge, and therefore it will be of benefit to researchers when conducting studies in this field.

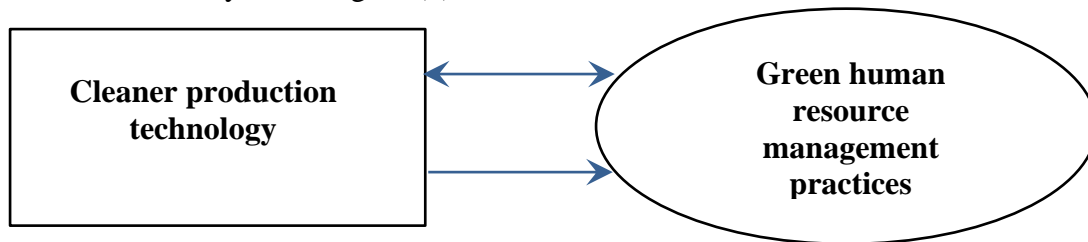
- B. Applied level: The applied importance of the research emerges from the benefits that are achieved when the researched company applies cleaner production technology in adopting green human resources management practices.

**1.4. Research hypotheses:**

H1: There is a positive, statistically significant correlation between the application of cleaner production technology and the adoption of green human resource management practices.

H2: There is a statistically significant effect of applying cleaner production technology on adopting green human resource management practices.

The researcher designed a hypothetical plan for the research based on the problem and objectives of the study, as in Figure (1).



**Fig. 1:** Research framework.

Figure (1) shows the nature of the relationship between the main variables of the research. The independent variable (cleaner production technology) was drawn in a rectangular shape, and the dependent variable (green human resource management practices) was drawn in an oval shape by relying on (Sekarna & Bougie, 2010).

**1.5. Research community**

The state company for drugs industry and medical appliances consists of (89) individuals distributed in its various departments and units. The researcher relied on a comprehensive inventory method by distributing questionnaire forms to all human resources in senior, middle, and executive management, because the research problem assumed that the effort would be collective. Table (1) shows the characteristics of community members in the researched company.

**Tab.1:** Characteristics of individual respondents

| Description      | Details              | No. |
|------------------|----------------------|-----|
| Sex              | Male                 | 62  |
|                  | Feminine             | 27  |
| Certificate      | High school or below | 53  |
|                  | Initial study        | 32  |
|                  | Postgraduate study   | 4   |
| Career           | Technical            | 61  |
|                  | Administrative       | 28  |
| Years of service | 5 years and less     | 20  |
|                  | 6-10 years           | 21  |
|                  | 11 years or more     | 48  |

## **2. Theoretical framework**

### **2.1. Cleaner production**

#### **2.1.1. The concept of cleaner production**

Cleaner production methods are widely applied in advanced industrial countries, which is considered one of the important components in many industries as it improves environmental conditions by rationalizing the use of resources, preventing pollution, and recycling waste.

With increasing awareness of environmental problems, issues related to pollution resulting from factories and various industries must be seriously and urgently considered, and pollution mitigation must become a top priority for management in this sector by relying on the philosophy of cleaner production (Kolk & Pinkse, 2006: 372). Many organizations have sought to apply the idea of cleaner production technology to obtain economic, technical and financial savings to sustain environmental management at an optimal cost by developing manufacturing methods and introducing improvements to the life chain of products, which include extracting raw materials, manufacturing them, storing and using the products, then disposing of them by environmentally safe means (Mazriq, 2011: 19).

He defined it (Tahoun, 2005: 101) as the continuous application of an integrated preventive strategy on processes and products to reduce risks to humans and the environment. (Maghrawa and Hafifi, 2010: 5) see it as the development of industrial processes, products and services with the aim of reducing the consumption of natural resources and preventing air, water and soil pollution at the source in order to reduce the risks to humans and the environment. (Fore & Mbohwa, 2010: 315) referred to it as a method of producing goods and providing services with limited impacts on the environment in light of the current technological and economic challenges. It is not against industrial development and expansion, but it emphasizes sustainable development and expansion in addition to being an environmentally oriented approach. It is also linked to economic issues. It is every effort to reduce the consumption of materials and energy and prevent or reduce the generation of waste. It also enhances productivity and also leads to economic benefits for the company, in addition to protecting the environment, which enables the consumer and workers to improve industrial efficiency as well as competitiveness, and thus leads to increased profits for any organization that undertakes In such an effort.

The concept of cleaner production is based on three main principles that distinguish it from other environmental management strategies: (Staniškis, et al., 2001: 67)

- A. The Precaution Principle: Precaution is not limited to avoiding being illegal, but it is also a guarantee that workers are protected from irreversible ill health and that the factory is protected from irreparable damage. The precautionary principle calls for reducing human inputs into the environment, and this call is essentially a request to redesign the industrial system of production and consumption that currently depends on the intensive production of materials.
- B. The principle of prevention: Prevention is as important as the precautionary principle, especially in cases where a known product or process causes harm. The prevention principle is to look at changes in the causal network of the production and consumption system. The preventive nature of CP calls for a new approach to reconsider product design, consumer

demand, material consumption patterns, and in fact is the entire material basis of economic activity.

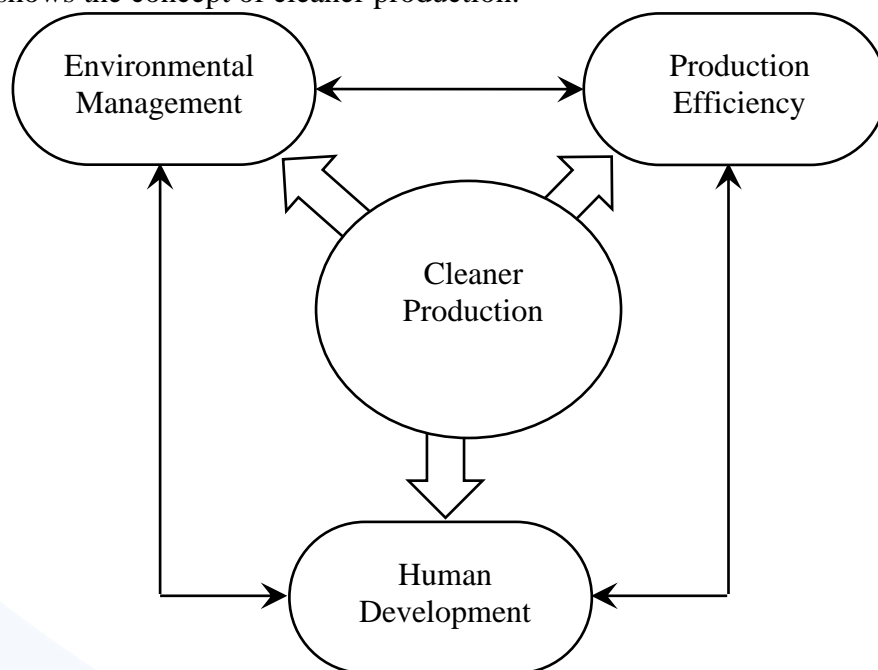
C. The principle of integration: Integration involves adopting a comprehensive view of the production cycle, and one way to present the idea is through life cycle analysis.

One of the difficulties of the preventive approach is to fully integrate environmental protection measures and procedures within the system, unlike traditional regulation that is at the end of the pipe (i.e. at the end of production processes) on a specific scale by calling for integrated measures and procedures to reduce the generation of pollutants. By reducing the need for the emission of these substances into the environment, these measures and procedures provide integrated protection for all environmental areas (Staniškis & Arbačiauskas, 2013: 5).

Cleaner production continuously applies preventive environmental strategies to processes, products and services. This increases the efficiency of material and energy use and reduces risks to humans and the environment. Specifically, cleaner production improves the following: (Staniškis & Arbačiauskas, 2013: 3)

- A. Production efficiency: through optimal use of natural resources (materials, energy, and water) in all stages of the production cycle.
- B. Environmental management: by minimizing the harmful effects of industrial production systems on nature and the environment.
- C. Human development: by reducing the risks to which individuals and communities are exposed, and supporting their development.

Figure 2 shows the concept of cleaner production.



**Fig. 2:** The concept of cleaner production (UNIDO, 2010).

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From the above, the researcher defines cleaner production as a strategy to improve productivity and environmental performance in light of ethical, social and economic considerations. From the productivity aspect, it provides a comprehensive framework for continuous improvement of production processes and optimal exploitation of energy sources, while environmental performance provides the basis for achieving sustainable development.

### **2.1.2. The importance of applying cleaner production**

The importance of applying the cleaner production philosophy can be determined at three levels: the individual, the organization, and society, and he defined it (Al-Jubouri, 2012: 32) as follows:

- A. Achieving productive efficiency in the use of natural resources and energy: by reducing waste and recycling waste.
- B. Reducing costs: through reducing waste and waste and their treatment and increasing the overall coefficient of utilization of raw materials, which is reflected in increased profitability and competitiveness.
- C. Reducing the negative effects on humans and the environment: by reducing the dangerous effects resulting from the release of waste and rubbish into the environment and the contribution of cleaner production techniques in making industrial and economic progress an effective tool for improving the individual's standard of living and ensuring a clean environment for him.

The importance of cleaner production is also evident in the context of increasing the efficiency of environmental management as follows: (UNEP, 2001: 1)

- A. Increasing productivity: This is done by improving industrial processes with low production efficiency with alternatives that are more efficient in using raw materials and energy and less productive of pollutants.
- B. Reducing operating costs: This is done by reducing the consumption of raw materials, water, and energy, and paying attention to maintenance to reduce energy as a result of leaks, malfunctions, and poor storage, which establishes the principle of increasing efficiency by reducing the cost of inputs.
- C. Improving the level of production technology: by keeping pace with global development in contemporary production methods.
- D. Protecting workers and the environment: Cleaner production works to solve the problem of pollution, which is reflected in improving the internal work environment and reducing environmental degradation as a result of reducing pollution rates in the air, water and soil.
- E. Avoiding legal accountability and improving the image of the project: Pollution prevention measures enable the project to bring its environmental conditions into line with environmental protection laws, and highlight a good image of it to society.
- F. Providing additional revenues for the project: by working on recycling waste.

### **2.1.3. Cleaner production techniques**

Cleaner production requires extensive knowledge of the production method, the technology used, and the pollutants resulting from it, in order to diagnose the problems that are expected to occur and address them according to plans and tools that are compatible with them. There

are multiple techniques for applying cleaner production, and Table (2) shows a summary of the main techniques related to cleaner production.

**Tab. 2:** Cleaner production techniques

| Technologies                     | Definition   | Characterization   | Purpose  |
|----------------------------------|--|--|--|
| Good internal management         | Follow internal administrative methods that support cleaner production   | Waste isolation, material leakage prevention, production scheduling, and good hygiene.   | Building and consolidating a culture of environmental awareness. |
| Changes in raw materials         | Replacing harmful materials or modifying some of them with materials that are less hazardous to the environment                              | Replacement processes for health reasons include replacing certain solvents and compounds that can cause cancer and using other, non-carcinogenic materials instead. They also include paint materials and paints containing lead, and the use of other safe materials.      | Reducing pollutants and waste at the source.                     |
| Changes in production technology | Developing production equipment and replacing it with others with less discharge of environmental pollutants and high production efficiency. | Eliminate processes that produce substances harmful to health or the environment: such as avoiding mercury discharges in the chlorine and caustic soda product industries through plants using the membrane cell method instead of the mercury cell method used in the past. | Reducing pollutants and waste at the source.                     |
| Product changes                  | Restructuring the product and designing it to meet the customer's ambitions and environmental requirements together.                         | Design the product in a way that enables it to be dismantled and its parts recycled, or to use materials that are biodegradable when destroyed and do not pose a threat to the environment, such as using metal or glass bottles instead of plastic in filling soft drinks.  | Producing safe and environmentally friendly products.            |
| Recycling and reuse              | Treating the waste of the production process in order to prepare it for use again and in other fields.                                       | It includes recycling industrial water and energy in its various forms to benefit from it in industrial processes or to use it as inputs again.  | Reducing pollutants and waste.                                   |

#### 2.1.4. Challenges of applying cleaner production technology

Despite the new trends towards adopting cleaner production, there are still works that must cross this critical stage and a series of basic determinants. These challenges can be summarized as follows: (Patacioni: 2002: 24; Mamery, et al., 2005: 7)

- A. Administrative challenges: Some decision-makers may be unfamiliar with preventive methods as a result of legislative systems, and this may slow down the introduction of technological improvements in the industry, in addition to the uncertainty that may exist in the business environment, which may discourage decision-makers' determination to adopt innovative methods related to production. Cleanliness and environmental performance. In general, the regulatory climate is not designed to encourage technological change towards production as it focuses on industrial and economic fields.
- B. Information challenges: The lack of information and experience about clean technology may create a sense of risk in applying this technology and skepticism towards it. There may be a lack of awareness and organizational culture of the principles of cleaner production and its importance.

- C. Financial challenges: Despite the benefits that accrue from implementing cleaner production in terms of achieving financial savings, preventing pollution in organizations faces real obstacles with regard to internal financing. The risk and uncertainty aspect of the performance of some technologies and management practices can hinder industrial organizations from investing in cleaner production. The internal financial determinants that can hinder the application of cleaner production are the difficulty of anticipating the costs that the organization will bear in the future, such as the costs of waste disposal, as well as the focus on the benefit achieved in the short term and the impact of this on reluctance to make an investment in which the payback time is long, in addition to the sense of risk when... Investing in modifying production processes, as it may not produce the desired results for establishments that use traditional technology. Just as the limited ability to provide internal financing is one of the determinants of investment in cleaner production, the difficulty of obtaining external financing and the absence of appropriate financing mechanisms represents another obstacle.
- D. Technical challenges: Many organizations lack the technical knowledge to evaluate their shortcomings to identify practices that waste resources and opportunities for development and improvement. They may not have the technology required to implement cleaner production strategies, and this problem is more evident in small and medium enterprises that lack resources. Technical and financial capabilities that may be available to larger organizations.

## **2.2. Green Human Resource Management**

### **2.2.1. The concept of green human resources management**

Organizations are trying to adopt environmentally friendly green human resource management practices with the aim of increasing efficiency within operations, reducing environmental waste, reducing costs, and identifying tools and procedures to create green environmental behavior for employees (Masri, 2016: 3).

Green human resources management is a way to reduce environmental abuse by making many changes, liberating work from traditional human resources management activities and practices, and providing opportunities for employees to present and share green ideas to implement related initiatives such as greening the workplace and encouraging social responsibilities (Yusoff, et al. , 2015: 159; Sriram & Suba, 2017: 388).

The term green human resources management has become of great importance in the field of business administration, and includes a number of strategies to enhance the sustainable use of resources within organizations in general and the environment in particular.

Sudin (2011: 81) defined it as intangible assets that help organizations build competitive advantages by attracting, developing and maintaining human competencies. As (Marhatta & Adhikari, 2013: 65) referred to it as human resources practices that have environmentally friendly orientations that lead to achieving better efficiency, lower cost, and increased employee attachment to their organizations. (Arulrajah, et al., 2015: 2) described it as all activities related to the development, implementation, and ongoing maintenance of the system for the purpose of transforming the organization's employees into individuals with green orientations, that is, transforming the behavior of the ordinary individual into



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environmentally friendly behavior with the aim of achieving the required environmental goals. Deshwal (2015: 176) sees it as the use of human resource management strategies to support the sustainable use of resources within organizations, which helps to sustain the environment and thus reduces various costs by recycling materials. (Aykan, 2017: 159) indicated that it is defining duties and tasks for public individuals to fulfill their environmental responsibilities and increasing their awareness of environmental issues, as it is an important step in building a competitive advantage.

Based on what was presented, the researcher defines green human resources management as a set of practices and activities related to human resources within the organization to direct their behaviors and increase their awareness towards adopting the green approach to achieve the organization's goals of environmental sustainability.

### **2.2.2. Green human resource management practices**

Human Resources Management's adoption of the green approach in all its practices leads to a significant preservation of the internal and external environment. Some green human resources management practices will be reviewed in this paragraph, which were relied upon as dimensions in the current research:

- A. Green job analysis and design: The green job analysis and design process helps plan green human resources by predicting the number of working individuals and the competencies and skills needed to implement environmental orientation programs such as social responsibility, ISO 14001, and lean production (Aykan, 2017: 165). (Opatha & Arulrajah, 2014: 108) defined it as the process of including the environmental dimension in job descriptions and identifying green competencies as an essential element in job specifications.
- B. Green recruitment and recruitment: This is the process of attracting and employing new talents who have knowledge and attitudes about green practices (Ullah, 2017: 14). This indicates that the organization has practices to consolidate the culture of the green approach in it and appoints new employees on environmental foundations and standards to achieve social responsibility (Sayed, 2015: 722). Which leads to individuals heading towards that organization with green, environmentally friendly values and culture (Renwicka, et al., 2015: 3).
- C. Green training and development: It includes a set of practices that provide individuals with work methods that reduce waste, proper use of resources, and conserve energy, involving them in solving environmental problems and encouraging them to come up with new ideas that limit environmental degradation (Bangwal & Tiwari, 2015: 48). . Green training programs also aim to motivate individuals to learn about environmental issues, integrate best practices in the field of environmental training, and ensure full cooperation between the organization's departments (Jabbour, et al., 2010: 836).
- D. Green performance evaluation: Green human resources management should blend environmental indicators into the performance evaluation process and provide periodic and regular results to working individuals on the extent to which they have achieved environmental goals, as green feedback enables them to enhance their skills and knowledge by revealing the results of their evaluation regarding the required environmental behavior. of them to direct them towards continuous improvement (Masri, 2016: 7). The green

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performance evaluation process requires the organization to educate employees regarding environmental fields, which includes two main fields: environmental performance and competitive advantage (Mirghafoori, et al., 2017: 2).

- E. Green rewards and incentives system: The green rewards and incentives system is an essential element to attract, retain and motivate individuals to achieve environmentally oriented organizational goals. Compensation, rewards and incentives should be provided to the employee in exchange for his commitment to the environmental management program and carrying out duties related to environmental responsibility (Ahmad, 2015: 6), and his acquisition of new green skills, error-free work, and the ability to generate environmental initiatives in recycling, reducing waste, reducing waste, etc. ( Cheema, 2015: 235; Bangwal & Tiwari, 2015: 49).
- F. Green occupational health and safety: The scope of work of this function is broader compared to the traditional health and safety function in the organization, and its role includes ensuring a green workplace for everyone by reducing employee stress and occupational diseases resulting from a hazardous work environment (Arulrajah, et al., 2015). : 11). Green occupational health and safety is also considered a comprehensive approach to achieving well-being for employees at work by implementing procedures that provide a healthy work environment with the aim of protecting them from physical injuries and various diseases (Jilcha & Kitaw, 2016: 2).

### **2.2.3. Requirements for applying green human resources management**

The growing global awareness of the importance of the green environment, reducing pollution, and the necessity of scientifically addressing its problems has become inevitable for industrial organizations that seek to grow and survive in a competitive environment. This requires gradually including environmental considerations in their strategies, and this is always coupled with the need to secure a set of requirements that form the foundations that they adopt to become green organizations. This paragraph provides the basic requirements for implementing green human resources management as follows:

- A. Supporting senior management: Senior management should stimulate the energies of individuals and activate the mind, which is the source of implementing green ideas (Jabbar & Abid, 2015: 71). Senior management's support for green practices by human resources may lead to providing environmentally friendly products, reducing emissions and waste, and reducing waste of resources and thus lead to sustainable environmental performance (Lather & Goyal, 2017: 34).
- B. Organizational culture: Organizational culture plays a role in adopting green concepts by individuals working in the organization, and the nature of the culture existing in the organization determines the results and benefits expected from applying green human resources management. Culture performs four basic functions: giving individuals the identity of belonging to green organizations, increasing collective commitment to achieving sustainable development, supporting the stability of the collective system, and building environmental behavior by helping individuals understand their surroundings (Margaretha & Saragih, 2013: 7).

- C. Customers, trade unions, and stakeholders: Customers, trade unions, and stakeholders play a role in applying green human resources management practices by exerting great pressure on organizations to adopt the green approach and support environmental conservation efforts (Guerci, et al., 2015: 9).

**2.2.4. Obstacles to implementing green human resources management practices**

Green human resources management practices in organizations face many obstacles or restrictions, perhaps the most prominent of which are: (Margaretha & Saragih, 2013: 6; Deshwal, 2015: 180)

- A. The high cost of implementing green human resources management practices, the need for high investments during the first stage, and a relatively slow rate of return.
- B. The difficulty of changing the behavior of working individuals in a short period of time to adopt green practices.
- C. Difficulty in recruiting new green individuals and talents.
- D. Lack of support from senior management to adopt green human resources management practices in the organization.
- E. Organizations do not have sufficient knowledge about green human resources management practices.

**3. Analytical procedures and results**

**3.1. Descriptive statistics for the research variables:**

This paragraph seeks to present the results of the research variables and paragraphs based on some statistical methods and tools, such as the standard deviation and rate of variation for each variable and item in order to determine the dispersion of answers, in addition to the arithmetic means of the variables and items to determine the level of response for each of them, as follows:

**3.1.1. Description of the variables of the independent dimension (cleaner production) in the researched company**

Table (3) shows the arithmetic mean (Mean), standard deviation (Std. D.), and coefficient of variation (C.V.) for the cleaner production items.

**Tab. 3:** Description of the items of the independent variable (Cleaner Production)

| No. | Paragraphs  | Mean | S.D. | C.V.  |
|-----|---|------|------|-------|
| 1   | The company has sufficient experience to apply cleaner production technology.                                   | 2.32 | .87  | 33.95 |
| 2   | The company's management encourages technological change to implement cleaner production.                       | 1.38 | .51  | 36.44 |
| 3   | The company uses highly efficient technology in production that generates less pollutants.                      | 2.68 | 1.13 | 28.34 |
| 4   | The company saves energy by reusing waste.  | 2.98 | .93  | 31.38 |
| 5   | The company eliminates production processes that produce harmful substances to individuals and the environment. | 2.01 | .54  | 31.84 |

|                 |   |      |      |       |
|-----------------|---|------|------|-------|
| 6               | The company works to treat waste on scientific grounds.   | 2.21 | .53  | 30.81 |
| 7               | The company uses the best methods and procedures in production systems.                                       | 2.91 | .78  | 29.87 |
| 8               | The company works to replace harmful materials used in production with less harmful materials.                | 2.25 | .92  | 34.42 |
| 9               | The company reduces pollutants by reusing waste in production processes.                                      | 2.38 | .77  | 31.48 |
| 10              | The company reduces pollutants by developing technology used in production processes.                         | 1.25 | .68  | 30.79 |
| 11              | The company reduces pollutants by replacing the technology used in production processes.                      | 2.63 | 1.07 | 37.78 |
| 12              | The company has an internal policy to train and educate employees about the importance of cleaner production. | 1.89 | 1.04 | 33.81 |
| General Average |   | 2.32 | 0.81 | 32.57 |

The results of the table above regarding the descriptive statistics for the items of the independent variable (cleaner production) show that there is consistency in the answers of the respondents regarding the items, and this is evident from the arithmetic means that ranged between (1.25-2.98), the standard deviations that ranged between (0.51-1.13), and the coefficient of variation that ranged between (28.34-37.78). The general arithmetic mean of the independent variable (2.32) indicates the lack of positive acceptance and great importance from respondents towards cleaner production technology, which is lower than the value of the hypothetical mean of (3). This reflects the actual reality in the Maysan Dairy and Refreshment Production Company Limited regarding the weak application of production technology. Cleaning by the administration and the individuals working in it, and the value of the general standard deviation of (0.81) and the general coefficient of variation of (32.57) indicates that the answers of the respondents are not dispersed from the arithmetic mean, and that there is harmony between the answers and understanding and awareness of the paragraphs.

### **3.1.2. Description of the variables of the dependent dimension (green human resources management practices) in the researched company**

Table (4) shows the arithmetic mean (Mean), standard deviation (Std. D.), and coefficient of variation (C.V.) for the green human resources management items.

**Tab. 4:** Description of items for the dependent variable (green human resources management practices)

| No. | Dimensions and paragraphs   | Mean | S.D. | C.V.  |
|-----|---|------|------|-------|
|     | Green Job Analysis and Design:  |      |      |       |
| 13  | The company relies on the environmental dimension in the job description.   | 1.12 | 1.18 | 29.95 |
| 14  | Jobs in the company are designed according to green concepts.   | 2.38 | .80  | 27.56 |
| 15  | The company adopts green competencies when conducting job descriptions.   | 2.98 | 1.07 | 35.36 |
|     | Green attraction and recruitment  |      |      |       |
| 16  | The company's environmental performance achieves attracting competent human resources.  | 2.27 | .73  | 35.21 |
| 17  | Applicants for the job are selected who have sufficient knowledge in environmental fields.  | 1.20 | 1.09 | 32.95 |
| 18  | Selection steps focus on the applicant's environmental considerations.  | 2.22 | .80  | 31.82 |
|     | Green training and development:   |      |      |       |
| 19  | The company emphasizes the environmental dimension in the training steps.   | 2.40 | .76  | 28.26 |
| 20  | The company adopts training of individuals using information technology (such as the Internet and Intranet) to reduce the use of paper.                               | 3.25 | .89  | 33.24 |
| 21  | The company's approved training and development programs achieve skills that achieve harmony between the employee and the environment.                                | 3.38 | .85  | 34.78 |
|     | Green performance evaluation:   |      |      |       |
| 22  | The company adopts environmental management objectives in the performance evaluation form.  | 1.18 | .95  | 32.69 |
| 23  | The company's human resources management depends on specific environmental goals through which the working individuals are evaluated.                                 | 3.05 | 1.05 | 38.71 |
| 24  | The Human Resources Department provides continuous feedback to employees on the extent to which they achieve environmental goals.                                     | 1.90 | .95  | 33.85 |
|     | Green rewards and incentives system   |      |      |       |
| 25  | The company provides material and moral rewards to working individuals based on environmental achievements.   | 2.25 | .75  | 29.33 |
| 26  | The company's incentive system ensures the maintenance of efficient and environmentally conscious human resources.  | 2.93 | 1.25 | 36.63 |
| 27  | The company's incentive system encourages environmental initiatives.  | 2.27 | 1.02 | 37.91 |
|     | Green occupational health and safety  |      |      |       |
| 28  | Providing a safe work environment in the company has led to a decrease in the incidence of occupational injuries.   | 2.22 | 1.32 | 29.39 |
| 29  | The company provides guidelines and instructions regarding the environment to ensure the health and safety of working individuals.                                    | 3.33 | .82  | 36.84 |
| 30  | The company adopts improving physical working conditions (such as lighting, ventilation, temperature, appropriate tools, etc.) to reduce work accidents and injuries. | 3.28 | .98  | 39.83 |
|     | General Average   | 2.42 | 0.95 | 33.57 |

It is clear from the results of the table above regarding the descriptive statistics for the paragraphs of the dependent variable (green human resources management practices), that

there is consistency in the respondents' answers to some of the paragraphs, and this is evident from the arithmetic means that ranged between (1.12 - 3.38), and the standard deviations that ranged between (0.73 - 1.32), and the coefficient of variation ranged between (27.56-39.83). The general arithmetic mean of the dependent variable, which is (2.42), indicates the lack of positive acceptance and great importance from respondents towards green human resources management practices, which is lower than the value of the hypothetical mean of (3). This reflects the actual reality in the state company for drugs industry and medical appliances regarding the weakness of practices. Green human resources are managed by the administration and the individuals working in it. The value of the general standard deviation of (0.95) and the general coefficient of variation of (33.57) indicates that the answers of the respondents are not dispersed from the arithmetic mean, and that there is harmony between the answers and understanding and awareness of the paragraphs.

### 3.2. Hypothesis testing

Table (5) indicates the results of the correlation relationships between the research variables, and it shows that there is a positive correlation with a statistical significance at (0.05) between the application of cleaner production technology and green human resource management practices at the variable and dimensional level. This result indicates that the application of cleaner production technology It is one of the basic pillars that the researched company should adopt to enhance its green human resources management practices.

Thus, the first hypothesis of the research will be accepted, which states (there is a positive correlation with statistical significance between the application of cleaner production technology and the adoption of green human resource management practices).

**Tab. 5:** Results of correlations between research variables and dimensions

|                    | Green job analysis and design | Green attraction and recruitment | Green training and development | Green performance evaluation | Green rewards and incentives system | Green occupational health and safety | Green human resource management practices |
|--------------------|-------------------------------|----------------------------------|--------------------------------|------------------------------|-------------------------------------|--------------------------------------|---|
| Cleaner production | *0.58                         | *0.48                            | *0.38                          | *0.54                        | *0.23                               | *0.65                                | *0.67                                     |

\* A significant correlation at the level of (0.05).

Table (6) indicates the results of analyzing the impact of applying cleaner production technology on adopting green human resource management practices. At the overall level, it is clear that there is a significant effect of the cleaner production technology variable on the adoption of green human resources management practices. This is evident from the calculated (F) value of (28.65) at a significance level of (0.05), and the value reached ( $\alpha = 1.68$ ), which means the presence of practices Green human resources management amounted to (1.68), even if the application of cleaner production technology was equal to zero, and it amounted to ( $\beta=0.72$ ). This means that any change in the application of cleaner production technology by one unit will lead to a change in the adoption of green human resources management practices by (72). %, and the value was ( $R^2 = 0.45$ ), which means that (45%)

of the variance occurring in adopting green human resources management practices is variance explained by the application of cleaner production technology that entered the model, and (55%) is variance explained Among other factors that were not included in the regression model. At the level of the sub-dimensions, all of them achieved a significant impact on adopting green human resources management practices.

Thus, the second hypothesis of the research will be accepted, which states (there is a statistically significant effect of applying cleaner production technology on adopting green human resources management practices).

**Tab. 6:** Results of the impact of applying cleaner production technology on green human resource management practices

|   | $\alpha$ | $\beta$ | R <sup>2</sup> | F     | Sig. |
|---|----------|---------|----------------|-------|------|
| Green human resource management practices | 1.68     | 0.72    | 0.45           | 28.65 | 0.05 |
| Green job analysis and design             | 1.24     | 0.73    | 0.57           | 21.54 | 0.05 |
| Green attraction and recruitment          | 1.92     | 0.57    | 0.65           | 23.68 | 0.05 |
| Green training and development            | 1.68     | 0.65    | 0.37           | 33.61 | 0.05 |
| Green performance evaluation              | 2.15     | 0.91    | 0.61           | 34.02 | 0.05 |
| Green rewards and incentives system       | 1.86     | 0.89    | 0.46           | 31.08 | 0.05 |
| Green occupational health and safety      | 1.57     | 0.64    | 0.59           | 32.11 | 0.05 |

#### 4. Conclusions

Cleaner production technology is widely integrated with green human resource management practices in the intellectual and cognitive aspect, as it largely agrees in achieving a basic goal, which is its orientation towards environmental sustainability. The results of the descriptive statistical analysis showed weak application of cleaner production technology in the surveyed company. The results of the descriptive statistical analysis revealed a weakness in the adoption of green human resources management practices in the surveyed company. The results of hypothesis testing showed that the application of cleaner production technology has a direct and significant correlation with the adoption of green human resource management practices and its dimensions. It became clear from the results of hypothesis testing that cleaner production technology has a significant impact on the adoption of green human resource management practices.

Based on the above, working individuals must be encouraged and motivated with the aim of preserving the work environment or submitting creative proposals that enhance the application of cleaner production technology through material and moral incentives. Incorporating the green approach and the culture of environmental sustainability into the human resources management activities and practices of the researched company through the application of cleaner production technology. Formulating criteria and standards that determine the extent of individuals working's commitment to the green approach and linking them to evaluating their performance. It is necessary for the company's management to involve everyone in preserving the environment and not limit it to a specific department or unit, and to activate collective efforts by giving roles to individuals working in all departments. It is necessary for the company to abandon traditional production methods, adopt cleaner production technology, pay attention to producing green products that do not

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permanently harm the environment and the customer, and recycle the waste resulting from production processes.

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