

## **Green innovation is an approach to achieving environmental sustainability - with a presentation of some experiences**

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### **Abstract:**

Developments in the last decade have led to serious discussions about the environmental problems experienced by the globe, and the issue of environmental sustainability has become one of the most important issues of concern to business organizations, as among the most important causes are the scarcity of resources, the increasing degree of consumer awareness and the emergence of a new pattern of consumers looking to obtain products Green, healthy and environmentally friendly, which led to the need to find new production methods, including the adoption of green innovation, which has attracted the attention of many business organizations, due to its benefits that reflect positively on the environment and on achieving profitability; On this basis, organizations have tended to search for innovative ways that lead to the introduction of green products, the use of green processes and the creation of environmentally friendly regulatory practices, and thus expressing their orientation towards adopting environmental responsibility and achieving sustainability in it, by adopting and spreading a culture of green innovation to have an active role in expressing Adopting environmental responsibility and achieving outstanding environmental performance.

**Keywords:** green innovation, green product, green process, environmental sustainability, presentation of experiences.

**JEL Classification:** O40; O44;Q55.



## **Introduction**

The process of adapting to the accelerating environmental conditions requires high creative capabilities, enabling the development of new solutions, ideas and opinions to enable business organizations to continue and grow; There are various forms of innovation in business organizations, including green innovation, which has emerged in light of the growing interest in preserving the environment and its resources from waste and negative uses of them, which led to the need to search for new environmentally friendly production methods.

Green innovation is centered in light of the tendency of business organizations to assume their environmental responsibility, through their orientation towards offering green products that are not harmful to the environment, through green processes that revolve around recycling waste and reducing the level of pollution, which is reflected positively on the organization significantly because concern for the environment has become one of The competitive foundations that are focused on, and one of the forms of expression of the organization's desire to assume its social and environmental responsibilities towards the community to which it belongs, which makes it more acceptable and positively reflected on improving its image.

### **The problematic for the study:**

From the above, the following question can be raised that highlights the problematic of this research paper, "How can green innovation contribute to achieving environmental sustainability?, and how to benefit from pioneering experiences in this field?"

### **The importance of studying:**

The research is important through exposure to both themes of "green innovation and environmental sustainability", as these two concepts have become of interest to many researchers and decision-makers, as green innovation expresses modern practices that revolve around the development of non-traditional solutions in the field of offering green products and adopting manufacturing processes Environmentally friendly, in addition to the issue of environmental sustainability, which has become a demand for many consumers and environmental protection groups, as many international and local organizations have become demanding organizations need to conserve resources and energy, protect the environment and preserve environmental wealth, in order to achieve the goal of sustainability.

### **Objectives of the study:**

We can summarize the objectives of the study as follows:

- Introducing the concept of green innovation and its various dimensions and the importance of adopting it in business organizations;
- Addressing the concept of environmental sustainability and identifying the benefits of adopting it;
- A review of the experiences of some organizations that relied on green innovation as an entrance to achieving environmental sustainability, and as one of the manifestations of their responsibilities.

**Study Approach:**

To achieve the objectives of the study, the analytical approach was followed, by reviewing the literature related to each of the topics of green innovation and environmental sustainability, in addition to reviewing some successful experiences of countries and organizations in the context of their adoption of green innovation, which was reflected in improving their image and achieving the goal of environmental sustainability. The study was also divided into three main axes, the first included everything related to the concept of green innovation, the second axis dealt with the issue of environmental sustainability, and the third axis reviewed experiences related to the adoption of innovation to provide green products and environmentally friendly production processes, which are pioneering experiences for some organizations within the framework of Its orientation to achieve outstanding environmental performance, expresses its desire to transform into a sustainable organization.

**1- Introduction to green innovation**

Innovation is an important input to create value for the organization, as it is a source of its distinction compared to the rest of the competitors, and the source of this distinction appears through green innovation that is more considerate of the environmental requirements of customers; The organization's interest in the ecological and environmental aspect of the innovation process is positively reflected on its environmental and social performance.

**1-1 The concept of green innovation:**

Innovation is defined as the ability to reach what is new and provide greater and faster value addition to the organization compared to its competitors, meaning that the organization is innovative compared to its competitors in reaching the new idea, new concept or product, or the first to reach the market (Abboud Najm, 2003, p. 22), and the concept of innovation is a broad concept and includes all What is new and different, whether it is in the field of product or methods of administrative, financial, marketing or production performance, they are related to anything new that may be in the

form of a new solution to an existing problem through innovative thinking (Serrar, 2017, p. 360).

Green innovation includes innovation in “hardware and software for green products, technology innovation for energy savings, pollution prevention and waste recycling, green product design, and everything related to environmental management” that can demonstrate positive impacts on environmental performance.

Green innovation from the point of view of strategic management helps both institutions, banks and government to achieve external development, as the application of green processes and green products in enterprises increases their competitiveness, and creates environmental friendliness through efficient production processes using raw materials and energy efficiently, in order to reduce Production costs, as the presence of green product innovation is a unique tool for marketing activities due to the increasing market share of the organization (Boutarfa & Farhi, 2020, p. 240).

In general, green innovation refers to innovation in products, processes, administrative aspects, structures, and expresses organizations' commitment to the environmental aspect and its adoption to achieve environmental sustainability, as well as increasing its competitiveness (sustainable innovation).

### **1-2 The importance of green innovation**

Organizations are subject to increasing pressures from external parties to behave in an environmentally responsible manner, by giving the environmental dimension a prominent importance within their strategies based on green innovation, as it represents a vital solution to overcome pressures from customers, competitors and official bodies. In general, the importance of green innovation emerges through (Aichouch & Tabakhi, 2020, p. 93):

- Improving environmental performance and increasing energy efficiency;
- Creating added value by entering new and emerging markets, where green innovation contributes to finding appropriate solutions to meet the needs of the growing market with the aim of outperforming competitors;
- Green innovation allows the entry of new consumer groups along with the supply chains of large organizations to international markets. It represents an important stepping stone towards establishing partnerships to facilitate the process of market penetration;
- Allows to increase productivity and technical capacity, based on organizational change based on green innovation programs, allowing the

exchange of common information and participation in the innovation process in various departments within the organization, as well as knowledge acquisition through cooperation with value chain partners;

- It is a source of investment attraction, as financial opportunities are increasing for organizations that adopt the green innovation program;
- Green innovation plays a key role in promoting and activating green growth, and achieving a number of goals, the most important of which are energy conservation and reduction of emissions and greenhouse gases;
- Green innovation is a way for organizations to express their environmental awareness, because many local and international customers demand the production of products that do not contain hazardous and toxic substances, and in return, the organization is also looking for the least use of materials and energy in the production of products.

### **1-3 types and dimensions of green innovation:**

There are many types related to green innovation, as there are many classification criteria, and among the most important types we include the following (Khannous & Abid, 2020, p. 171):

- **Environmental technologies:** These include technologies used to control pollution, such as cleaner treatment technologies, wastewater treatment technologies, or green energy technologies;
- **Regulatory innovation for the environment:** the introduction of organizational methods and management systems to deal with environmental issues in production and products.
- **Innovating green system:** These are alternative production and consumption systems that are more environmentally friendly than the conventional or enforced systems.
- **Innovating products and services that provide environmental benefits:** These include new or improved environmentally friendly products and environmentally beneficial services, including the following:
  - Decreased use of materials per unit of production;
  - decrease in total carbon dioxide;
  - Low energy use per unit of output;
  - Decreased soil, water, air pollution or noise;
  - Substitution of resources with alternatives those are less polluting or dangerous;
  - Recycling of waste, water or materials.

With regard to the dimensions of green innovation, it consists of three basic dimensions:

- **Green product innovation:** The green product is called an environmentally friendly product, as recycling strategies are relied upon that lead to improving products and transforming them into safe products;
- **The green process:** the innovation of the green process is linked to technological development, and includes all procedures and steps that promote the adoption of new products of value in the market, and take into account all environmentally friendly activities; (Arak Aboud & Ahmed Dhiaa Eddine, 2018, p. 94);
- **Administrative innovation:** it is represented in the practices, processes, structures and methods that represent a new case within the framework of achieving organizational goals (Govindarajan, 2005, p. 47).

## **2. Environmental sustainability:**

The environment has an enormous natural capacity for regeneration, and can protect itself and conserve its resources; However, human interference in the balance of its systems and its use of its natural resources has led to its harm, and the emergence of many serious environmental problems. Scientists have realized the size and importance of these problems for decades, and the issue of environmental protection has recently become an important national and international issue, which has occupied and continues to preoccupy researchers.

### **2-1 The concept of environmental sustainability**

The concept of environmental sustainability varies according to the different entity that defines it, either a governmental entity, or environmental organizations and agencies, due to the difference in the methodology used by each entity to deal with this issue, and on this basis there are three different definitions of sustainability, which are (Ghunaimat, 2021):

- **First definition:** Sustainability is the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs according to the definition formulated by the United Nations Committee on Environment and Development, and it has been expanded over the years to include human needs and well-being because the possibility of human survival on this planet is linked The extent to which it preserves nature and its resources.
- **Second definition:** Sustainability is the ability to improve the quality of human life while living within the carrying capacity of the ecosystems that support the earth, according to the definition formulated by the

International Union for Conservation of Nature (IUCN), and it came due to global production and consumption patterns that destroy nature at high, continuous, and dangerous rates. Because the increase in human dependence on natural resources with an increase in the population changed the natural balance of nature, and negatively affected both humans and other living systems, and caused a decrease in the natural resources in them.

- **The third definition:** Sustainability is maintaining a balance in the human relationship with the world of living creatures on Earth, according to environmentalist Paul Hawkin, who showed that humans use the Earth's resources and destroy them in a way that exceeds their ability to renew.

## **2-2 Manifestations of concern for environmental sustainability:**

The organization's concern for the environment is reflected on three different levels, which are "green communication, green production and green research"; They can be explained as follows (Kourichi, 2014, p. 343):

### **First - green communication:**

It is called "green communication", to refer to the communication between the organization and individuals who adopt the concept of the green product in most areas of their lives, and green communication takes several forms, including:

- **Green advertising communication:** It is considered an easy way to persuade the public, as it includes communication that reflects the good effects of regulation, taking into account and estimating the environment; The green advertising communication can be inferred by the example of phosphate-free washing powders produced by the company "Henkel", which received a demand that doubled its profits by selling these types, and in "Algeria" by broadcasting an advertisement prohibiting the use of black plastic bags based on a decision of the Ministry of Environment .
- **Green sponsorship:** The organization makes contacts in a non-commercial field, such as financing environmentally friendly activities, which reduces public distrust of its products and gives it a competitive advantage.
- **Written communication:** It is based on the need to write down the environmental policies adopted by the organization, as well as the results reached through their application, and this is to satisfy and inform partners and shareholders who are interested in improving the green aspect in their organizations.



### **Second - green production:**

Organizations that adopt environmental responsibility seek to provide what is best for their consumers, and to make continuous environmental improvements to their products, whether in terms of prices, performance, suitability or safety, to achieve these products the best possible satisfaction while not harming the environment, and production methods, either they depend on less raw materials or recycled materials, and the use of environmental terms such as recyclable in product packaging.

### **Third- Green Search:**

Green research is the collection of data and information and the analysis of the totality of factors affecting the relationship of the organization with the surrounding environment, by conducting a field survey of trends and attitudes and determining the trends of public opinion of the organization's internal and external audience, ideas and inclinations towards the organization and its goals, then defining the environmental strategies and policies that the organization will adopt towards the public based on these results.

The success of environmental work in general depends on the integration of efforts and initiatives, and economic organizations constitute a basic nucleus in this because of their responsibility to preserve the natural environment through (Adaissan Ibrahim, 2007, p. 183):

- Increasing environmental awareness and motivating its employees to participate in environmental conservation and development programs;
- Supporting environmental research and studies;
- Contribute to environmental awareness campaigns;
- Providing information and data to bodies based on scientific research and data collection;
- Adherence to environmental standards and criteria in the implementation of development and industrial projects;
- Taking into account environmental considerations when dealing with natural resources, especially non-renewable resources;
- Establishing industries that employ technologies that do not pollute the environment.

### **2-3 Challenges to Achieving Environmental Sustainability:**

The challenges that organizations face in the context of achieving environmental sustainability are represented in four main issues, which are as follows (Mehri, 2016, p. 46):

**a- Ensuring a healthy, environmental and ethical product:** The process of producing and distributing products with wide consumption has become

subject to strict standards, as the products must be characterized by the following specifications:

- **Healthy and safe products:** by respecting the international conditions and standards set by standardization organizations such as the ISO system, which seeks to find healthy products.
- **Environmentally designed products:** by integrating environmental sustainability into the production process, by following the life cycle analysis method for products, which is to know the environmental impact of the product at all stages of its use.
- **Ethical products:** Organizations are currently socially responsible, and this responsibility extends to the supply chain, as it guarantees fair and responsible partnership with all parties to the chain of suppliers or intermediaries, and the organization is subject in this context to a social audit in accordance with international standards.

**b- Positioning in new markets and reconsidering the economic model:**

The development of consumer trends obliged organizations to rethink certain things such as:

- Locating products in new markets (fair or equivalent product, bio product, green product), where there are recent organizations entering these markets, so they tend to create a portfolio of products with environmental labels;
- The location of these organizations in the markets that know a growing demand for this type of product.

**c- Reducing the environmental impact during all stages of the logistics chain:**

During the logistics chain, the stage of packaging, transportation and storage of goods, the product presents environmental effects and the organization seeks to control these side effects, through environmental design, and optimal solutions such as sustainable transportation and energy efficiency of equipment, and finally the end Product life (recyclable materials, awareness of the need for recycling)

**d- Adopting responsible communication and marketing:** The stakes related to economic, environmental and social quality are only completed through responsible communication based on transparency, characterized as being purposeful, clear and not misleading.

**3. Pioneering experiences in green innovation and environmental sustainability**

Major international organizations seek to develop strategic plans to preserve the environment. Many of them have devised ways and mechanisms to reduce pollution, through several projects as part of environmental responsibility programs, which aim to reduce the use of polluting resources

to the environment, affecting the depletion of extracted raw materials. The following are the most important organizational experiences in the field of green innovation that achieves environmental sustainability.

### **3-1 The NESTLE Experience:**

The Swiss company NESTLE is a multinational company with many branches across the world; It should be noted that the company holds an environmental management system certificate on several levels, including (Mawai, 2016, p. 84):

- ISO 14001 Environmental Management System Certificate;
- Environmentally friendly building certificate from LEED, USA. The Kit Kat factory in Dubai holds this certificate, because it was built in compliance with the specifications of environmentally friendly building and the standards of local authorities;
- The Environmental Award, presented by the Ministry of Environment and Water in the United Arab Emirates, which was won by the NESTLE Dubai branch for its environmental performance twice, in 2012 and 2013;
- The company also raised the slogan "Our commitment to environmental sustainability", which was the title of a group of initiatives that reflect interest in environmental behavior aimed at preserving the environment, and it has undertaken many initiatives, the most important of which are:
  - Effectively improve material consumption in its operations through:
    - Reducing energy consumption by 4.1% per ton of production in 2014, as the company was able to achieve a total reduction in the amount of energy consumption that reached 26% per ton of production in food factories in the Middle East;
    - Improving the environmental performance of product packaging by setting limited measures to reduce consumables with regard to carton boxes, shipping boxes, and the plastic used in "Nido" bags, which led to a saving of approximately 462 tons in packaging materials;
    - The company plays a leading role in the field of climate change, by achieving a 25% reduction in greenhouse gases per ton of production, and the company in the Middle East uses natural refrigerants and ammonia, in all its industrial cooling systems.

### **3-2 The Eco Distrib experience**

Eco to Distrib was established in 2007 in France, and it belongs to the retail trade of consumer products, where it was able to develop innovative solutions to counter the negative environmental impacts resulting from packaging, and its business strategy is to change the consumption patterns

of consumer goods, as well as meet the needs of the market. Of the products required by product manufacturers, retailers and the final consumer, to reduce packaging, and to reach its goals, this organization has (Aichouch & Tabakhi, 2020, p. 99):

- Innovation in green products, where an electronic vending machine was invented, which sells liquid products directly through a distributor, and replaced the individual packaging process to prevent the generation of waste and its transportation to landfills; This machine can also be reused and all parts made of reusable plastic can be repaired.
- Innovating in green processes, by eliminating waste from the production process or parts that come from the closest possible location, and using a machine that requires low voltage and automatically turns off when not in use;
- The environmental performance of this organization has been improved through the green innovation of manufacturing machines equipped with an electronic system that dispenses liquid consumer products, such as detergents in retail stores, which are able to sell the products without the cost of packaging;
- The organization achieved an improvement in its overall and environmental performance, by reducing waste management costs, by transporting large quantities of products in containers with a capacity of 1000 liters to increase efficiency and save costs, and the increasing consumer concerns about plastic waste affected an average increase in sales of 200% within 3 years, at an average Annual sales growth reached 15%, and resulted in savings in production, which amounted to almost 80%.

### **3-3 Toyota's (TOYOTA PRIUS) environment-friendly experience**

TOYOTA PRIUS is a hybrid car called the green car and also called the environment friendly, medium-sized, the company began producing in 1997 in Japan to be the first hybrid production car. The green car is distinguished from others by its availability on technologies that reduce emissions of toxic gases and carbon dioxide CO<sub>2</sub>, as it is economical in fuel consumption and does not make annoying sounds, as it works on a modern technology called HSD - Hybrid Synergy Drive, which is a combination between a gasoline engine and an electric one. . In such a technique, the appropriate engine is adopted at the right time until the required efficiency is achieved. While the vehicle is driving at slow speeds, the electric motor works and thus the use of fuel is zero, and the car is hardly audible, as at high speeds, the gasoline engine works to move the car and drive the electric generator, which will provide the power needed for the electric motor; The traditional engine

operates on the internal combustion system and the electric motor stores the energy generated by the movement of the internal combustion burner and converts it into movement. It also consumes only one liter of gasoline per 25 km compared to a consumption between 05 and 10 liters in ordinary cars. The eco-friendly TOYOTA PRIUS has been marketed to global markets at the turn of the new millennium and is now sold in more than 40 countries and regions, with its main market now concentrated in Japan and North America. (Nouri & Lajlat, 2012, p. 08)

### **3-4 The experience of Mc Donald's restaurants:**

The McDonald's chain of restaurants replaced fast food packaging with paper instead of vellum covers mixed with polyester, after noticing the growing concern of consumers about it, because it causes negative effects when disposed of later, and damages the ozone layer when burned in landfills (Zahra & Qassi, 2018, p. 182).

### **3-5 Inter-face experience**

This organization was established in 1973 in the United States of America specialized in the manufacture of carpets, and in its quest to increase its revenues by penetrating the markets and eliminating negative environmental effects, it discovered that approximately 80 to 90% of the environmental impacts resulting from the carpet industry result from the process of incorporating nylon threads, so The organization began studying solutions on how to spin the thread, use it in smaller quantities, and choose different types of thread; The organization took the following steps (Aichouch & Tabakhi, 2020, p. 100):

- Innovating a green product: by devising a new system that enables it to repair old carpets and separate the threads, where the worn out carpets were collected through a partnership with thread suppliers, and then converted into raw materials used in the production of new carpets, and it also engaged its value chain partners to find innovative solutions with the aim of reusing raw materials; It has also manufactured square carpets extracted from the seeds of the castor bean plant, which is a fast-growing and rapidly renewable species;
- Green process innovation: developing the supply chain system and using green technology represented by the Reentry program that enables the repair of old carpets, by separating the yarns from the back layer and rotating them completely, which reduces the use of precision cutting machines, reduces waste by 80%, and lowers the total energy Used in factories at a rate of 39% per unit;

- This organization has been able to improve its environmental performance, by using its potential to drive change in consumer behavior, and by manufacturing carpets from recycled thread, including discarded fishing nets; By adopting these innovative activities, Interface has become one of the leading organizations in its field, with an estimated share of 35% of the total global carpet market estimated at 3 billion US dollars.

### **Conclusion**

Organizations have realized the need to improve their environmental performance as an expression of their social and environmental responsibilities, so many of them have tended to find methods that enable them to improve their processes and products, and among these methods is the adoption of green innovation, which refers to the innovation of technologies, products, services, and organizational structures, which is reflected in Improving the organization's environmental performance, contributing to increasing its competitiveness, maximizing its profitability, and reducing environmental burdens. Green innovation effectively contributes to eliminating pollution, achieving efficiency in the use of resources and reducing costs resulting from excessive use and waste, which leads to the realization of concepts of environmental sustainability.

Based on the overall findings of this study, we suggest the following:

- Giving more attention to green innovation, which contributes to strengthening the position and image of the organization, by adopting a culture of green orientation as a new work method;
- The necessity of researching the development of green production and green processes, because it opens up new horizons and attractive market opportunities for business organizations, and makes a difference in the face of traditional competition;
- Adopting scientific and practical methods in disposing of waste and rationalizing the consumption of materials and energy;
- Establishing clear metrics to measure the environmental performance of the business organization, demonstrating its commitment to moving towards environmental responsibility;
- Providing more channels of communication with various parties to exchange experiences and knowledge related to the dimensions of green innovation;
- Encouraging research and development in the field of developing green ideas and environmentally friendly products, and not considering them as costs;

- Simulating and benefiting from successful experiences, within the framework of adopting green production methods and rationalizing costs;
- Benefiting from the experiences of leading organizations in the application of green innovation in order to achieve environmental sustainability.

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