

Green economy and sustainable development

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Abstract The study of green economy and sustainable development is one of the important studies that has received the attention of researchers and scientists for its importance in the development and growth of society in all its aspects, as it is the nucleus of sustainable development and its main pillar for growth, development and prosperity. The green economy is considered a vivid and ideal model of sustainable development, especially economic development, which affects all aspects of life. Its concept emerged in the recent years due to its importance in reducing the manifestations of poverty and destitution and to raise the standard of living of the population and ensure their welfare. It is worth noting that the role of sustainable development can only be activated by implementing the green economy program and providing a healthy environment. This can only be executed by replacing the means of economy that are harmful to the lives of individuals with other healthy means such as generating thermal energy from healthy sources instead of from fuel sources as the fuel sources lead to environmental pollution therefore harm all forms of life. As for the concept of sustainable development, it is the exploitation of material and human energies, support and employment in an optimal manner, and work to develop them and increase their effectiveness in a way that guarantees the rights of everyone in the present and future , and includes people and natural resources, and affirms that the human being invested natural resources perfectly without depletion and leaves to future generations their right , and ensures the just distribution for the wealth.

Keywords: environment, pollution, poverty, development, investment, economy, energies.

1. Introduction

The study of the green economy and its impact on sustainable development is one of the important and vital topics for most researchers, especially in recent years. Green economy is the mechanism that results in mainly improving and developing human well-being, reducing environmental risks. In terms of environmental benefits, it improves the climate by reducing pollution. It also has a significant role in providing employment and investment opportunities, providing material and human resources and capabilities which results in eliminating poverty and destitution, and disparities between social classes which in return preserves resources in a way that serves future generations to ensure their future. It is a long-term strategy for the national economy in order to overcome crises and achieve economic recovery, as the green economy seeks to provide suitable job opportunities for all. The green economy requires efficient and skilled workers and professionals, who have a wise mind, and work to refine and develop their skills through enrolment in training and professional courses to give them the required experience.

One of the most important goals of the green economy is the need to reform policies and regulations that would impede or achieve the green economy.

Achieving a green economy requires fundamental changes in the structure and strategies of most companies, in order to achieve sustainable physical and human development.

The research will shed light on important aspects, including the concept of the green economy, its importance, objectives and levels, the most important green jobs, the necessity of moving to a green economy and the most important obstacles that prevent its achievement, as well as an indication of the impact of the green economy on sustainable development.



The research dealt with the concept of green investment, its importance, motives and impact on the sustainable environment and the importance of environmental benefits in the green economy.

The most important goal of the research is to show the importance of the green economy in sustainable development through the optimal investment of energies and resources in order to achieve prosperity for all and raise the economic level while preserving the environment from pollution.

2. The concept of the green economy and its objectives

The United Nations Environment Program (UNEP) defines a green economy as mechanism resulting in an improvement in human well-being while significantly reducing environmental risks and scarcity of ecological resources. In simple terms, it is an economy in which emphasises on producing lower carbon emissions and on resourcefully accommodating all social groups. It aims to reduce pollution and carbon emissions by increasing the efficiency of resources and energy consumption. The green economy also aspires to growth in income and job opportunities that must be driven by public and private investments. These investments need to be stimulated and supported by targeted public spending, policy reform and changing regulations. The development path must preserve and improve natural capital. Indeed, its construction is restricted when needed, as it is a source of public benefit, especially for the poor, whose security and lifestyle depend on nature [1].

The concept of green economy appeared on the scene in the past few years. Its idea was discussed in the context of sustainable development and poverty reduction. The United Nations Environment Program defined green economy as that which arises with the improvement of human existence by reducing environmental risks, and it has a small percentage of Carbon gas, in which resources are used efficiently. It also enhances the growth in income and offers employment in public and private investments. Its main mission is to reduce carbon emissions and pollution, while enhancing the efficiency of resource and energy use, and preventing the loss of biodiversity. This can only be achieved through reforming policies and legislation governing this [2]. In addition, the principle of "green economy" does not replace sustainable development as some might assume. Instead, achieving sustainability is based almost entirely on reforming the economy. On the other hand, creating new wealth through the "brown economy" model have not dealt with social marginalization and resource depletion, and is still far from achieving the Millennium Development Goals Sustainability. Although it might appear to be a long-term goal, but we must work on "greening" the economy in order to reach this goal [1].

The green economy aims to significantly reducing environmental risks and scarcity of resources. So, low levels of carbon, rational use of resources and social integration can be introduced. In this context, the green economy can use new alternatives such as the exploitation of wind energy. Wind energy can meet 47% of the electricity needs and 25% for heating and 22% for transportation. As for the levels of solar energy, it has developed by 66% compared to 2009 while at the end of 2010, the photovoltaic installations reached a capacity of 35,000 megawatts in the world, equivalent to 35 nuclear reactors, at a small, short cost. Green economy is known to mean the importance of nature and the benefit of investment. This is in addition to encouraging the rational use of natural resources and the activation of energy, which requires conservation [3].

The green economy is based on the knowledge of environmental economics, which is balanced with the interdependence between the economic systems and the group of natural systems, as the green economy is a clean economy that depends on green development. It uses resources and energies for optimal use, as it is not produced in a way that is not unfairly produced, but rather in a manner that harmonizes and preserves the environment. On the other hand, the black economy is an oppressive one that harms the environment where the race prevails to increase wealth. The green economy is a clean economy that depends on green development optimization, while avoiding pollution, environmental degradation, depletion of natural resources therefore, help solving the problem of climate change (global warming). Thus, achieving sustainable economic growth, and promoting the green economy saves the global economy from a long stage of recession, job loss, and exacerbation of poverty [4].

It is a system of economic activities related to the production, distribution and consumption of goods and services that lead in the long run to improving human well-being. On one hand, it does not expose future generations to environmental risks or major ecological scarcities. On the other hand, it is an economy in which growth in income and employment is directed by investments in both public and private sectors. This can lead to enhancing the efficiency of resource use, reducing carbon emissions, waste, and preventing biodiversity loss and ecosystem degradation [2].

The green economy has been described as a long-term strategy for national economies to overcome crisis. With the goals of economic recovery, the eradication of poverty, and aims to promote economic growth and development while ensuring the use of natural assets for sustainable development and it supports progress in social development [5].

Scientists link green growth to the green economy by promising changes in the environmental industry sector. This can be achieved by converting final environmental protection technology into resource saving techniques, based on innovation and competitive markets. They pointed to the growing interest in reconsidering lifestyles that go beyond sustainability. At a higher level, scientists link green growth and green economy to the environmental industrial sector by moving from environmental protection technology to resource saving technologies, based on innovation and competitive markets. Scientists also note that there is a growing interest in rethinking lifestyles that go beyond the sustainable consumption agendas. The need to transcend the classic dichotomy of individual and systemic methodologies and the role of technological and cultural factors and innovations [6]. The green economy creates jobs and enhances social justice in various sectors. Most studies indicate a profit of 0.5 to 2%, which means 15 to 60 million additional jobs around the world. Other green growth strategies can be achieved by creating a new wave of investments in the actual economy where emerging or developing countries have great potential. An example of this is international investments estimated at \$ 230 billion annually to reduce waste removal, and it can finance an additional 8 million full-time jobs in developing countries [3].

The green economy requires a new mindset for doing business, a new level of skilled workers and professionals who have the ability to work across sectors, and work as part of multidisciplinary teams. The transition to a green economy requires preparing these staffs through formal training and education. Vocational training packages should be developed with an emphasis on greening the sectors. Then, the education system should also be integrated with environmental and social considerations in various disciplines [7].

Climate change constitutes an obstacle to economic development and combating poverty in Africa. Adapting to this phenomenon is a priority. It goes hand in hand with developing several issues that are no less important, such as global warming, activating new and renewable energies, and effective energies. Added to that is waste management and preserving ecosystems strategies such as combating desertification and land degradation as well as preservation on the coastal strip and climate change. Thus, the biggest challenges in the African continent can be summarized into poverty eradication, social integration, as well as combating unemployment [3].

3. Levels of the green economy

The green economy is similarly characterized in the general economy in two levels, namely the micro level, which represents the institutional level as the basic unit in the economy, and the macro level, which represents the macroeconomic level or on a national scale [8].

A. Micro Green Economy: It revolves around the institution's economy, which cares and analyzes the institution's relationship with the natural environment, the qualitative development of the surrounding environment and the impact of environmental policies on the institution. The functions of the partial green economy are represented in the following matters [8]

- 1- Studying and analyzing the procedures and effects of environmental protection on the institution, its objectives and profit maximization
- 2- Providing publications and advice to the established institution that is in harmony with environmental protection organizations

- 3- Contributing to directing production in accordance with the requirements of directions and instructions and environmental regulations.
- 4- Studying environmental investments that reduce the environmental risks.
- 5- Providing information about environmental protection costs, investment expenditures and the impact of environmental protection on profit and loss accounts, and analyzing the environmental feasibility of projects.
- 6- Giving interests, analyzing problems, and studying future prospects for some branches of the national economy in light of environmental developments, such as service institutions, transportation, environmental protection (A friend of the environment), commercial and insurance industries.

B. Macro Green Economy: This branch of the green economy deals with environmental problems and their reduction at the level of the economy as a whole or nation, and aims to reach higher levels of sustainable social welfare and takes into account the preservation of the quality of the environment at higher levels, and deals with the material and monetary evaluation of environmental damage, the evaluation of the environmental improvement resulting from the environmental policy in the activity of the public and private sectors, as well as it identifies the existing relations between the environment and macroeconomic objectives and study it, and the existing relations between economic policies on one hand and environmental policies on the other hand [8].

The most important jobs under the macro green economy are to provide information and advice on the basis of which decisions can be made, through the following evaluation [8].

- 1- Environmental damage and environmental protection measures, and the results of those measures at the macro level.
- 2- Developing environmental policy tools, whether local or global, and determining to what extent they can solve the existing problems.
- 3- The impact of environmental protection and its tools on macroeconomic goals, specifically on economic growth and the level of employment.
- 4- The impact of environmental protection and its tools on other policy goals, as the environmental policy affects transport policy, energy policy, commercial political resources ... etc.

4. Green jobs

Green jobs refer to ensuring the reduction of the environmental impact of companies and economic sectors and lead to reducing its levels to bearable limits. Examples of these jobs are those that exist in many sectors of the economy, such as energy, waste recycling, agriculture, construction and transportation. All of these jobs would contribute to reducing energy consumption and optimization of raw material and water through strategies that work to rid the economy of carbon gas, reduce emissions of greenhouse gases, reduce or eliminate all forms of waste and pollution, and protect and repair ecosystems and biodiversity [9].

It aims to combine poverty reduction goals with those related to reducing greenhouse gas emissions by creating decent job opportunities. This initiative constitutes a strategy in response to the negative effects of climate change resulting from work. It also aims at the same time to reduce the environmental reality of the enterprise and economic sectors to reach permissible levels [9].

5. Moving to a green economy

The transition to green development is not an instant event that can be achieved with a single decision at a high level. It is rather a long and arduous process, guided by a political outlook from the top to the bottom and public participation from the base to the top. This approach gives political and social legitimacy the shift required to ensure the mobilization of efforts on a large scale, to make this transformation a reality [2].

The comprehensive transformation to a green economy would achieve a higher per capita income compared to its counterpart under the current economic models while reducing the environmental footprint by approximately 5.0% in the year 2050 as compared to the usual business approach. Thinking of moving to a green economy came from the disappointment of the current prevailing global economic

system, and the multiple crises concurrent with market crashes, financial and economic crises, high food prices, high unemployment, climatic fluctuations, rapid decline in natural resources and acceleration of environmental change, and the growing scarcity of productive lands [2].

In order to move to a green economy, the following measures must be taken [2].

- 1- Reviewing government policies and redesign them to stimulate shifts in production, consumption and investment patterns.
- 2- Paying attention to rural development with the aim of alleviating poverty in the countryside with increasing resources.
- 3- Paying attention to the water sector, controlling its use and rationalizing it, and preventing its pollution.
- 4- Working on sustainable investments in the field of energy and measures to raise energy efficiency.
- 5- Establishing low-carbon strategies for industrial development and adopting more efficient production technologies in new factories.
- 6- Supporting the mass transit sector.
- 7- Adopting land classification systems and mixed-use development and adopting environmental standards in construction.
- 8- Addressing the problem of municipal solid waste and investing it in a beneficial and environmentally friendly way.

6. Obstacles to the transition to a green economy

There are several obstacles to the transition to a green economy. The most prominent of which are [2]:

- 1- Lack of sound planning in the field of development policies.
- 2- The spread of unemployment among many segments, foremost among which is the youth, and the shift of jobs from one sector to another, and an increase the jobs in certain sectors offset by a decrease in the number of jobs in other sectors, especially in the transitional phase.
- 3- The possibility of green protectionism and additional technical barriers in front of trade.
- 4- Poverty still affects nearly seventy million people in the Arab world, including the lack of health services and clean water for more than forty-five million of Arabs, and the lack of efficient use of fresh water and energy resources and investment in the Green Economy Organization, its technologies and management.
- 5- An expensive option that may not result in an automatic and equal victory on the economic and environmental levels, and this may be at the expense of achieving other development goals.
- 6- The high cost of environmental degradation in Arab countries, which annually amounts to ninety-five billion dollars, equivalent to five percent of the total gross domestic product for 2010.

7. Benefits of moving to a green economy

The green economy invests with natural capital, including agriculture, fresh water, fisheries, and forestry. With the passage of time, it results in improving the quality and quality of soil and increasing returns from the main crops.

The increased efficiency in the agricultural, industrial and municipal sectors works from the demand for water, which reduces the pressure on ground and surface water in the short and long term alike. So, the green economy contributes to alleviating poverty through the wise management of natural resources and ecosystems. This is in order to flow benefits from natural capital and deliver them directly to the poor, as well as the creation and increase in new jobs, especially in the sectors of agriculture, plants, energy and transportation. The green economy involves a separation between resource use, environmental impacts and economic growth. As it is characterized by a significant increase in investments in green sectors, backed by empowering policy reforms in public and private investments. This is done by providing the necessary mechanism for redrawing the features of businesses, infrastructure and institutions, and paving the way for the adoption of sustainable consumption and production processes. The redrawing of these features will lead to an increase in the share of green

sectors in the economy, an increase in the number of green and decent jobs, and a decrease quantity of energy and materials in production processes, reduced waste and pollution, and a significant decline in greenhouse gas emissions [2].

8. Green economy and sustainable development

Development is a dynamic process consisting of a series of structural and functional changes in society that occur as a result of the intervention in directing the volume and quality of the resources available to society. In order to raise the level of well-being of the majority of community members. It is necessary to increase the effectiveness of its members in investing the energies of society to the maximum which in return develops human energies to the maximum extent possible and to fulfil the social needs by improving the individuals' standard of living [10-11]. -see The Figure 1-

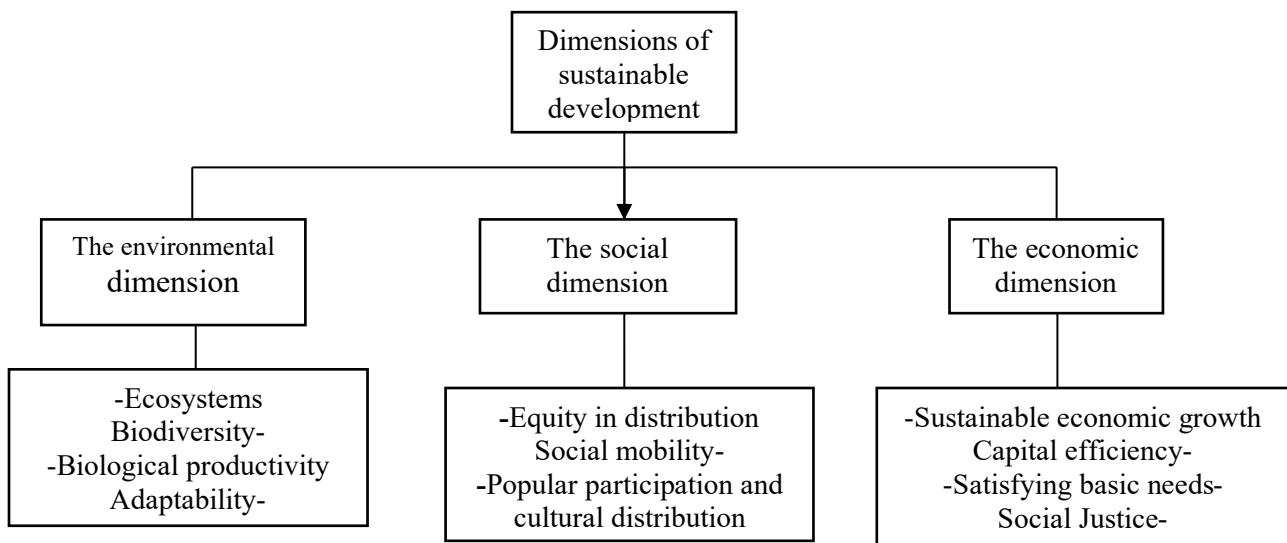


Figure 1. Dimensions of sustainable development and its components.

The World Commission on Environment and Sustainable Development defined it as development that meets the needs of the present without compromising the capacity of future generations [12].

Economic development is defined as advancing society by devising new and better production methods and raising production levels, by developing skills and human energies and creating better organizations. This is through which we are trying to increase the average per capita gross national product and the average per capita share of gross national product during a specific period of time by raising the average Per capita productivity and the use of available resources to increase production during that period [10].

In general, economic development is defined as the process by which the transition from a state of underdevelopment to a state of progress takes place. It requires a change in the economic structures, and therefore it proceeds to bring about an increase in the production capacity of economic resources. The economic development is considered as a process of raising the level of national income. This will result in an increase in the average per capita income. One of its implications is to raise the productivity of the existing branches of production, especially in the third world countries, such as the agricultural sector and the primary resource sector [10].

The main goal of human development is to improve and develop human well-being and to open wider and wider fields for a comfortable and happy life. Human development goals can be summarized in the following [10].

- 1- Building human beings' capability of facing life challenges that occur around them in a positive and effective manner.

- 2- Helping the individual to think positively and creatively by changing his outlook from superficial to a deeper view of life.
- 3- Teaching the individual to master the skills of effective communication in order to enrich the individual's communication with society in an ethical and influential manner in which the individual expresses himself with everyone.
- 4- Helping the individual to develop his performance and capabilities in order to find a suitable job.
- 5- Teaching people, the value and importance of time, training them in the skills and arts of management, teaching them how to use their energies and talents and setting life goals, and teaching how to deal with the problems they face in a positive and effective way.

The relationship between human development and economic development stems from the fact that one of them depends on the other in an unacceptable way. Experiences in many countries have shown that the economic development that lack the proper investment plans for human capital was a failure. That the person who is prepared to manage and lead the development processes in his country, on the one hand, economic development cannot take place without a scientific, educated and qualified human resources in all the stages of economic development in all respects. Experiences of some developing countries have proven that their adoption of the imported human capital with its cost caused a loss of its resources and opportunities due to not exploiting and rehabilitating the national human resources. This relationship has been realized by the planners in developed countries and they have prepared theoretical and practical rules to carry out a well-studied development renaissance based on the factors of success and good application. In their wake, they established solid economic base relied on human development, and from it to achieve social development. In order to ultimately achieve comprehensive economic development [10], from the beginning they applied basic foundations in establishing development, for example [10]:

- 1- Wealth alone does not mean development. Rather, human energies must be mobilized for the advancement of society and people.
- 2- Paying attention to educational and technical care for the population and developing their skills to be able to keep pace with development.
- 3- Real economic development is manifested in the establishment of a human development reality commensurate with the country's need.
- 4- Development human capacities must come before establishing factories and institutions.

Therefore, it is possible to transform into a green economy to achieve sustainable development and eliminate poverty on a large scale, especially since the world today is witnessing many risks that require a radical rethinking of economic approaches and policies. Everyone should know that a green economy does not replace sustainable development at a time when decades of creating new wealth with the "brown economy" model have failed to put an end to social marginalization and resource depletion. Sustainable development remains a vital long-term goal, accompanied by greening the economy [3].

Achieving a greener and environmentally friendly economy based on sustainable production and consumption patterns requires changes in the practices of most companies. Structural changes in the nature of the economy gives institutions the ability to invest and adopt new production patterns. In addition, the green economy is strengthened based on the appropriate labor market and progress. In the field of social development and for reference, there are approximately 1.3 billion people in developing countries who do not have access to clean energy. This requires more efforts to improve access to renewable energy and to contribute to overcoming energy scarcity and fluctuation in the finance [3].

The move towards environmental sustainability and greener economies is accelerating, as tens of millions of green jobs have been created. For example, in the United States in 2010, 3.1 million people took a job in environmental goods and services, equivalent to 2.4%, and in Brazil 2.9 million green jobs were counted which was equivalent to 6.6% of formal employment in 2010. Employment growth was particularly strong in the renewable energy sector, rising at a rate of 21% annually, employing nearly 5 million workers, more than double the number of workers a few years ago [3]. Poverty still characterizes most developing countries, which is characterized by social inequalities and inequality in access to education services, health and property rights. Among the characteristics offered by the green economy

is its ability to provide various options for economic development and combating poverty without diminishing the country's natural resources. Economic greening provides an opportunity to achieve social inclusion by addressing the challenges of energy scarcity, and often low-income individuals spend a significant portion of the budget on obtaining energy and a significant share in purchasing goods and services such as food and transportation. This is evident in some remote areas of Asia, Africa and Latin American region. The percentage of energy costs for low - income families is three times and sometimes 20 times compared to high - income families. The situation is exacerbated for many poor families who do not have access to energy - efficient housing and transportation [3,13] (see Figure 2)

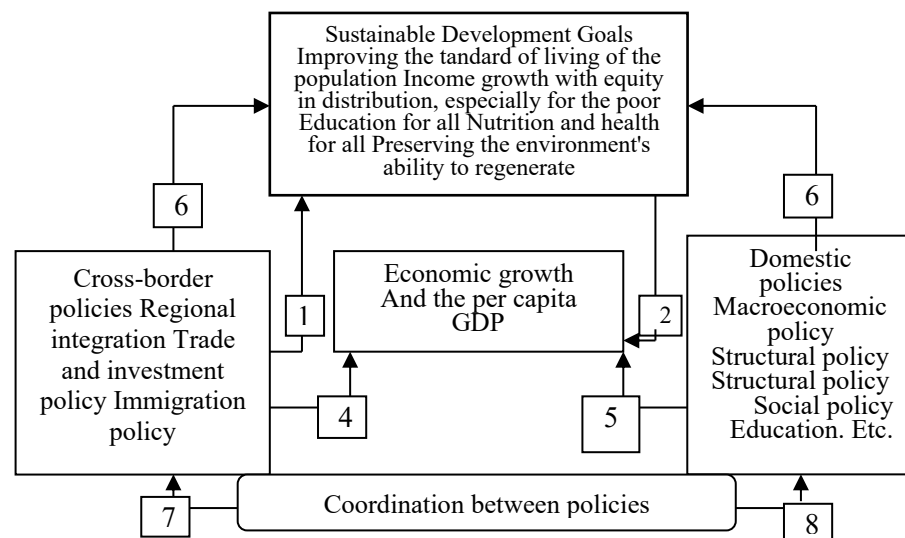


Figure 2. Coordination between economic integration and sustainable development.

9. The concept of green investment

The concept of green investment revolves around the ability of the financial contribution by various financial institutions, whether governmental or private, in respecting and preserving the environment. The concept of green investment consists of counting the financial requirements of any project and employing them in light of the environmental contribution such as using clean energy, raising the level of support for green products and green space in various countries of the world. This is in addition to generating millions of new jobs in large and micro projects [14].

The (UNEP) program emphasized that green investment includes several things. The most prominent of which directing returns to people living below the poverty line. Green investment also provides a great opportunity for employment through jobs for the local population near their residential areas and transforming areas that need reform into green spaces. It is necessary to reduce environmental-related harm, reorganizing agricultural subsidies for sustainable agriculture, forestry and fisheries, and reduce global warming by increasing energy's efficiency [14]

Green investment is the modern trend in the twenty-first century for decision-makers, companies and investors who are branding in a new green world to meet environmental challenges, use innovative technologies to produce environmentally friendly products, contribute to global growth and create natural capital, and invest it in environmental and social fields. The misuse by states, companies and individuals of natural resources in order to achieve economic development has led to their decline and scarcity over time, passing through the current generation, and consequently the rise in poverty rates worldwide. Statistics indicate that 50% of the world's population lives on less than \$ 2 a day [14].

10.Green investment and sustainable environment

Green investment, taking into account environmental problems, is an advanced practice that has a rich history. The idea of environmental sustainability was taken as a general focus of the United Nations Human Environment Conference in Stockholm in 1972. This concept was specifically formulated to prove the possibility of economic growth and industrialization without negative effects on the environment. In the following decades, the idea of sustainable development developed through several events including the Global Strategy for Nature Conservation in 1980, the Portland 1980 Land report in 1987, the United Nations Conference on Environment and Development in Rio in 1992 and finally the World Economic Forum in 2009. The later emphasized improving drinking water and basic sanitation services and improving the condition of 100 million people in slum dwellers. It is the new global green bargain where world leaders pursue relates the environment to economic development and sustainable development events [14].

According to the Global Trends in investment in renewable energy for the year 2008, issued by the program, in 2007, 502 billion dollars in the field of clean energy, and the total generation capacity of wind farms worldwide exceeded enough to supply 75 million houses with electricity. It is expected that renewable energy sector will grow and increase the green areas to 450 billion dollars in 2012 and to 600 billion dollars in 2020. Most of these investments went to the United States, Europe and Japan. In addition, the environment has become an opportunity to increase business and an opportunity to increase profits. It is at the core of any project, whether it is for individuals, companies, banks or countries to invest in friendly projects for the environment, through the establishment of micro, medium or large projects, and in a way that achieves many economic, social and environmental benefits [14].

Biodiversity, which represents the living tissue of this planet, includes life at all levels: genes, species, and ecosystems. Biodiversity contributes to human well-being at all these levels and provides economies for which inputs of precious resources are available and have regulatory services available to reach a safe work environment. Often these services, which are the so-called "ecosystem services" in the form of public goods and services were economically invisible before. This was a major reason for their underestimation, mismanagement and resulting loss in the end. Natural resources such as forests, lakes, wetlands, and river basins are essential components of natural capital at the ecosystem level and are extremely important in ensuring the stability of water cycle which benefits agriculture and homes, the carbon cycle which overcome climate challenges, the soil fertility with its value in crop production, the microclimate necessary for safe residence, and the fisheries needed. To obtain protein, all of which are important components of a green economy [1]. (see Figure 3)

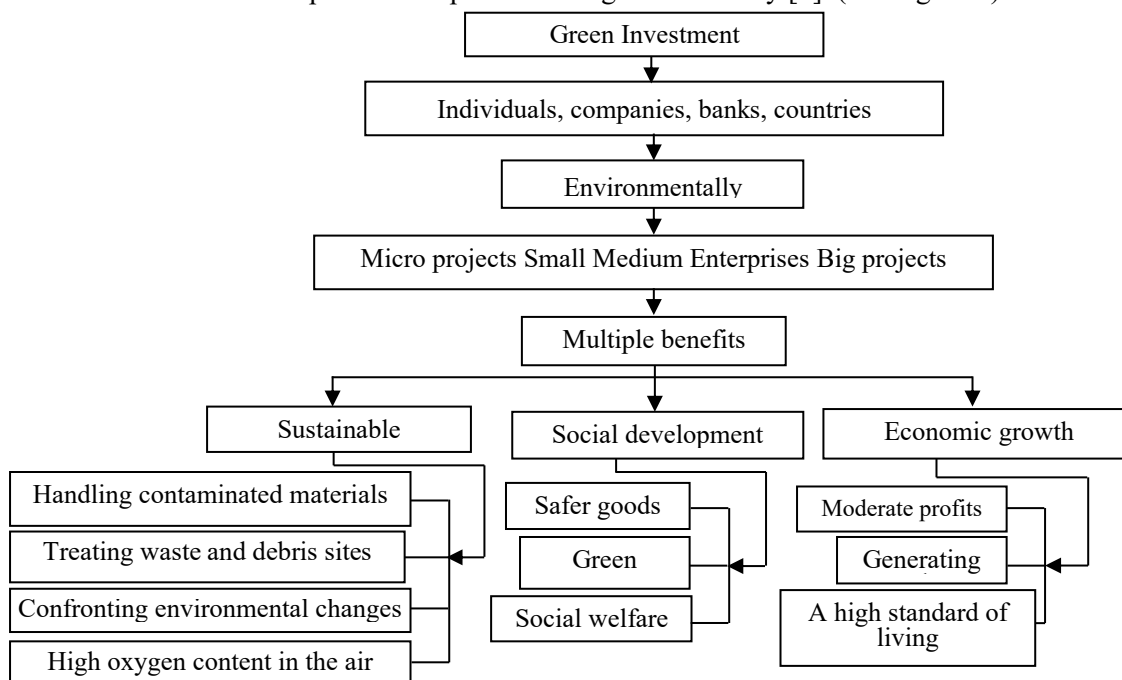


Figure 3. The economic, social and environmental benefits of green investment.

11.Environmental benefits on green economy

Environmental Development is a type that we are empowered to preserve and maintain natural resources and protect them from pollution. It aims to achieve a balanced and continual diversity and satisfy the needs of the current generations, while working at the expense of future or future generations. Among the foundations of environmental development are self-reliance which the achievement of mutual coexistence between humans and the environment, harmonization between social and economic progress and the rational management of resources and the environment [15].

The shift to a green economy could lead to a noticeable reduction in greenhouse gas emissions. In the investment scenario, in which 2% of GDP is invested in key sectors of the green economy. More than half of that investment is allocated to increasing energy efficiency and expanding the production and use of renewable energy resources, and the result is a 36% reduction in global energy intensity, measured in millions of tons of oil per unit of GDP by 2030. In the investment scenario, energy-related carbon dioxide emissions would decrease from 30.6 giga tons in 2010 to 20.0 giga tons in 2050. Therefore, investment in the low-carbon economy has great potential to meet the challenges it poses. Climate change, although additional investment and policy measures are necessary to reduce atmospheric concentrations of carbon dioxide to 450 parts per million or less [2].

Among the additional environmental benefits to be reaped from a green economy are those that can be derived from the sustainable use of so-called ecosystem services. Research conducted for the UNEP report on the green economy shows how significant progress can be made towards this goal by undertaking initiatives aimed at managing demand for services utilized from ecosystems, supplemented by investments to enhance the supply of those services and supply it throughout the period, from the medium to the long term. This is because it is a better and more sustainable approach, which contributes to increasing soil fertility, water availability and carbon emissions storage services. Furthermore, improving water use efficiency can greatly reduce water consumption, and improving water supply and access management can also improve and help to maintain groundwater and surface water. The economic modeling studies conducted for the report show that investments in managing, increasing supplies and improving access to water can support the preservation of both groundwater and surface water, and sustainable agriculture can lead to upgrading, yields, soil fertility improvement and fresh water use [2].

12.Environmental Kuznets Curve:

The Kuznets curve took a new direction in the 1990s after he tested the Kuznets curve hypothesis, which studied the nature of the relationship between economic growth and income inequality in 1955. It showed that there is an inverted U-shaped relationship between economic growth and income inequality. In order to analyze the nature of the relationship between economic growth and environmental degradation. The results indicate that environmental pollution rises as the country's economic growth increases until it reaches the maximum point on the curve, which is known as the turning point, and then begins to decline, thus showing an inverted U-shaped relationship between economic growth and environmental degradation [16].

There are three explanations for the trend of the Kuznets curve, which are:

- 1- The effect of size: The effect of size is evident in the decrease in the quality of the environment resulting from economic growth. As a first stage, it is more important for any country to accelerate the achievement of economic growth without paying attention to the environmental damage that accompanies it, which leads to a high environmental footprint, meaning that there is a positive relationship between growth and pollution. Environmental [16].
- 2- The effect of the composition: The negative impact of the composition on the environment is evident through the process of transition from an agricultural economy to an industrial economy, as the process of promoting the heavy manufacturing sector requires the intensive exploitation of

natural resources, which leads to an increase in environmental pollution as a first stage, but the importance of the services sector and light industries It increases in a later stage of growth and the environment becomes one of the main services, and accordingly the negative effects on the environment decrease and the effect of the positive structure of the transition to the green economy appears[16].

- 3- Technical impact: The technical impact appears through the contribution of technological development in the production processes that enable rational consumption of resources and the reduction of greenhouse gas emissions, in addition to encouraging investment in research and development in the field of sustainable development[16].
- 4-

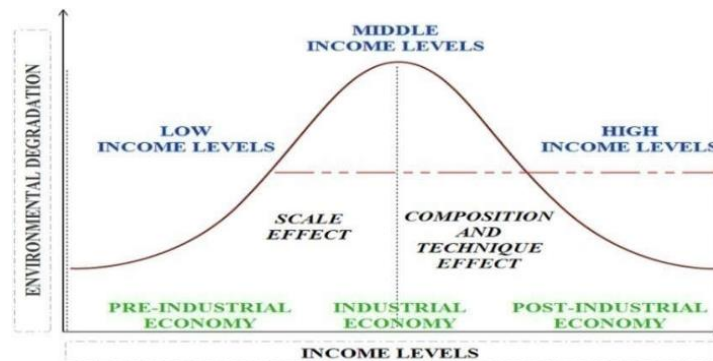


Figure 4. The Kuznets Environmental Curve

13.Applications of Nanotechnology in the field of the environment

The tremendous progress that took place in Nanotechnology motivated the United Nations to pay attention to it, and to set a plan to benefit from its applications in various fields. Nanotechnology enables it to have the potential to increase energy efficiency, helps regulate the environment, and solves many health problems. Nanotechnology is also able to dramatically increase industrial production at very low costs. Nanotechnology is expected to make progress in many areas. Such as: the medical field, industry, energy, agriculture, food, environment, and space, in addition to the military field [17].

Nanotechnology has been used to solve, or at least mitigate, environmental pollution problems; Nanotechnology has been used to develop new methods of providing and treating drinking water and detecting air pollution. This, in turn, provided a great opportunity to develop some strategies to protect the environment from pollution, produce regulated energy sources, and solve the problem of water and air pollution and other environmental problems [17].

14.Conclusion

Our study yielded several important results, the most prominent of which are:

- 1- The concept of green economy has emerged in recent years and has gained great importance among researchers in most fields.
- 2- The concept of green economy revolves around improving the standard of living for the human being and achieving prosperity and achieving sustainable development in its various forms.
- 3- Describing the green economy as a long-term strategy aimed at achieving economic recovery in various sectors.
- 4- The green economy encourages the reduction of pollution and the use of energy in new ways that preserve human and material resources and reduce carbon emissions, and it also supports social development.
- 5- The green economy has two levels. The first is partial. One of the most important objectives is to study environmental investments to reduce the dangers of pollution, and the second level is the macro one that deals with studying and reducing environmental problems.
- 6- Achieving and moving to the green economy is not an easy process. Rather, it is a long and arduous process that requires wide public participation, and it will achieve higher per capita income.

- 7- The concept of green investment is the ability to contribute financially by most financial institutions, whether private or governmental, while preserving the environment, exploiting green spaces, providing job opportunities and employing them in mega projects.

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