

Estimating Factors Affecting the Sustainable Environmental Development

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Abstract—An issue of sustainable environmental development has occupied a wide range of interests of researchers and economists in some developing countries. The environmental issues are tightly linked to the development policies and the environmental grasp is no longer a matter of social welfare but rather is a matter of economical, social, and human dimensions. The research presents the concept of sustainable development and an assessment of the factors influencing sustainable development. The research will give an economic development and the ecosystem vitality in some countries, such as Iraq. Increasing demand for foods in these countries has led them toward the intensive usage of natural resources which has, eventually, impaired the rates of development and contributed in the deterioration of environmental system. The results of the analysis showed that the environmental ecosystem variable has a greater impact on sustainable environmental development than the economic development variable, which means that the environmental situation of some countries, especially the developing countries, continues to deteriorate, requiring all specialists and governments to make efforts to preserve the ecosystem for future generations.

Keywords—Development, Environment, Sustainable environmental development.

I. INTRODUCTION

More recently, the definition of disasters was no longer limited to natural disasters but included a completely new concept that reflected environmental disasters. Global warming, environmental degradation, population degradation, poverty, hunger, loss of biodiversity, desertification, drought, etc., have changed the perception that these problems cannot be separated from social welfare problems or problems of economic and social development. The reciprocal relationship between environment and development has prompted many countries to reconsider development patterns that are incompatible with environmental balances.

The demand for development has grown from the demand for environmental protection when the world realized that it was neglecting the environment and was being degraded. Since the 1970s, and as a reflection of increasing environmental problems and increasing human awareness, economists and scientists have become more interested in the relationship between environment and development. The United Nations Development Strategy for the 1980s states that hunger and malnutrition must be eliminated before the end of the 20th century. The interrelationships between poverty, underdevelopment, economic resources, environment, and population are interlinked within the

framework of the development process called sustainable development. UNESCO has defined sustainable development that every generation has to leave the water, soil, and other resources to the next generation, in the form, it has acquired, and to leave behind the species of organisms found on the ground without being endangered (Al-Kubaisi, 2005).

A. Research Problem

The problem of research is that some countries, especially the developing countries and with conditions and characteristics similar to Iraq, are suffering from imbalances between the use of limited natural resources to achieve economic growth and which pay no attention to the deterioration of environment and then meet the needs of population for products in contexts that ensure sustainability of these resources and preserve the environment to meet the needs of future generations and work to reduce the negative effects on environment.

B. Importance and Purpose of Research

The importance of research is to identify the concepts of economic growth and sustainable development, then to study the relationship between the economic growth and vitality of the ecosystem in one hand, and the environmental sustainability on the other hand in some developing countries.

C. Hypothesis

The growing demand for food and products in developing countries has led to their intensive use of natural resources and, consequently, to engage in production activity in a manner that does not take into account the sustainability of environment, which has weakened their economic growth rates and contributed to the degradation of their ecosystems.

D. Methodology

The research includes the definition of economic growth, economic development, and their relation to the environmental sustainability. The first chapter deals with the economic growth and environmental development in the developing countries. The second chapter deals with the impact of economic growth on sustainable environmental development. The research uses the descriptive method and quantitative indicators to present the facts about sustainable development in the developing countries and the main factors affecting them.

Data required were obtained from the various sources according to their availability at the publications of some international organizations. It was necessary to contact these organizations through their websites to check some figures, especially in respect to the figures of Environmental Sustainability Index (ESI). The last attempt to assess the ESI of the developing countries as well as the vital indicators of the ecosystem in the developing countries was conducted in 2005 and its results are still supported by researchers. Data of the gross domestic product (GDP) and population were calculated by the World Bank (WB) and International Monetary Fund; however, the data published by Wikipedia in 2017 were used.

II. LITERATURE REVIEW

Economic growth is an increase in GDP with the potential of increasing per capita income and thus improves the social status of individuals. The search for economic growth in the developing countries leads to research in economic development. Economic development indicates that the state has reached an economic situation that can continue to allocate certain amount of its surplus to the economic growth. The developing countries are suffering from the structural imbalances that must be addressed to rise the level of economic growth due to constraints on production processes. Therefore, there is a close relationship between the two concepts, economic growth and economic development and the extent to which they are overlapped.

A. Economic Growth and Economic Development

Economic growth is defined as the long-term increase in production. It can also be defined as the result of successive economic expansion. The economic growth is reflected in the increase in real GDP between two periods and the increase in per capita income. It can be accompanied by the economic progress if the growth of domestic output is greater than the rate of population growth. Economic growth is achieved with the following conditions:

1. Increasing production: Which means increasing the volume of productive activity or economic expansion. The real increase in production as well as increasing per capita income accompanied with the production increased must be mentioned during a particular period compared to the previous periods.
2. Change in the level of organization methods: Since the objective of the production processes is to satisfy human needs, investors are seeking to find new organization methods to facilitate the dynamic of work and the circulation of factors of production easier and search for factors less cost and more profitable. This leads to find new regulatory methods that are more efficient than those prevailing to achieve greater surplus and continuation of the process of growth.
3. Economic progress: It is a feature of economic growth and its continuation in achieving social goals of the entire community (Abu Joudeh, 2011).

Elements of economic growth are labor, capital, and technological progress. Work is the sum of the physical, scientific, and cultural capacities that individuals can use to produce goods and services necessary to meet their needs. Capital is the sum of goods that exist within a given period of time in a particular economy, while technological progress represents a new system that allows producing more quantities of production with the same quantities of elements or producing the same quantity of production in fewer quantities of elements. It also means the optimal use of the elements of production in the production process, and therefore, even if the quantities of these elements remain unchanged and with technological progress, this will inevitably lead to increase production and economic growth (Al-Kenani, 2008).

Economic development is a series of changes without which economic growth depends. It can be defined as the sum of the policies adopted by a given society which lead to increase rates of economic growth on the basis of its own potential, ensuring that this growth is sustained and balanced to meet the need of society in addition to achieve social justice as much as possible. Therefore, the concept of economic development is more comprehensive than the concept of economic growth.

In addition to increasing output and improving efficiency, economic development requires change in the production structure which, in turn, requires redistributing production elements among the different sectors of economy. The difference between growth and development is that economic growth means more production, while economic development means increasing and diversifying production. Development can be described as growth accompanied by changes in the structure of the national economy which seeks to diversify sources of income. The developing countries need not only growth but also the development, as they need to increase quantity, quality, efficiency of productivity, and making real changes in the economic and social structures (Al-Ghamdi, 2004).

Economic development focused on efforts of people of the developing countries. These efforts focused on economic

aspects without paying attention to the other aspects. The development experience until the 1970s showed an unsatisfactory picture of the standard of living of most people in these countries, despite the existence of some positive signs of economic growth. Therefore, attention has been paid to the social aspects of development. In the later step, the concept of development expanded to cover the economic, social, and environmental aspects. It was then called the comprehensive development. The WB adopted the Comprehensive Development Initiative, which includes the economic, social, environmental, and humanitarian aspects (The World Bank, 2016).

B. Sustainable Environmental Development

The World Commission for Environment and Development defined “sustainable development as the development which encompasses broader dimensions that require change in the content of growth to become less material, less energy use, and more effective.” These changes must be achieved in all countries as part of a package of measuring environmental capital, improving income distribution, and reducing sensitivity to the economic crises (Donato, 2004). Economic development and conservation of environment are both integrated processes, that is, sustainable development recognizes the need to achieve economic growth appropriate to the capabilities of the environment (Ghneim and Abu Zant, 2004). Sustainable development is not focused only on the environmental aspect but also on economic, social, and technological aspects, which can be clarified as follows:

1. Economically: It includes stopping the waste of natural resources by improving their efficiency and consumption patterns that threaten biodiversity.
2. Socially: It includes the transition from ensuring on meeting the needs of the current generation to ensure the needs of future generations through the equitable distribution of wealth, combating poverty and increasing the level of employment.
3. Technologically: It includes a shift toward cleaner technology and reducing energy consumption and other natural resources.
4. Environmentally: It includes the ability of earth to bear human element through providing all the resources he needs from natural resources and the absorption of waste and radiation left by him.

In 2002, the Economic Forum for sustainable development indicators was presented five key characteristics in a country that achieves sustainable development: (1) It can maintain its natural systems at advanced levels, (2) human pressures are low on the environment, (3) its social systems and population are not vulnerable to the environmental degradation, (4) be able to establish institutional and social systems that have the potential to respond to environmental challenges, and (5) be cooperative with other countries in achieving common goals in protecting the environment internationally (Al-Ghamidi, 2004).

C. Growth and Sustainable Environmental Development

Study the relationship between economic growth and environment is not new. It comes back to Aristotle, who

stated that “poverty is inevitable when there are no limits on the rate of population growth.” It was followed by the classical economists who emphasized that economic activities should be subject to the environmental constraints and considered that growth is a function of the environment and natural resources play a key role in economic growth and development (Al-Batat and Ahmad, 2005). The research then developed by that published by Kuznetes who analyzed the relationship of economic growth with income inequality distributed. He suggested that as income increases, the disparity of income distribution increases and begins to decline with the continuation of economic growth. This analysis accurately describes the relationship between per capita income and environmental sustainability, wherein the early stages of economic growth, both the GDP and environmental pollution, move in the same direction and when the level of income reaches a certain level, people started to be interesting in the health and environment, in which they are living.

The early stages of growth in developing countries started with the intensive use of natural resources, putting pressure on the environment. When the production expands and the citizens of these countries become richer than before, they move to another level of the need scale and then environmental values become more important. As a result of the growth of wealth, investment, and technological development, the methods of production and consumption of natural resources become more economic so that environmental pressure stabilizes with increasing economic growth (Yandle, 2002). The positive relationship between economic growth and environmental sustainability is reflected in a balanced economic growth. The rapid and unbalanced growth often leads to environmental problems that increase the misery of society. This can be seen in various fields such as the steady increase in the development projects that are polluting environment and their impact on public health, or may appear in the form of instability of productivity through the improper exploitation of water and arable land.

D. Estimating the Impact of Economic Growth on Sustainable Environmental Development

The multiple linear regression models for cross-section data selected from the average data of the years 2005–2016 with respect to the ESI and from the years 2009 to 2016 for the average data of per capita GDP. The ecosystem efficiency data were used for 16 countries, “mainly the Arab developing countries which their conditions are nearly similar to Iraq.” They were selected as a sample from among 142 developing countries around the world and can be seen as a model for the other developing countries in the world. They are divided between the continents of Asia and Africa, which are the two continents with the highest percentage of developing countries.

E. ESI

The selected countries are varied in their environmental performance and thus vary in their ability to preserve their

natural environmental resources for future generations. ESI is a measure of overall evolution toward environmental sustainability, and its points are based on a set of 20 standard indicators each consisting two to eight variables with a total of 68 variables. ESI compares locally with environmental progress both quantitatively and qualitatively and represents the first step toward further analytical methods of environmental decision-making. ESI allows comparison to the local level of environmental progress from an organizational and environmental perspective and represents a first step toward more analytical methods of environmental decision-making. This indicator takes into account not only the country's environmental achievements, its institutional structure, and other key indicators but also the economic capacity as a factor that reflects sustainable environmental development. In other words, the achievements of countries at the environmental level are seen as having the economic potential to reach those achievements. The Sustainability Index is the result of a concerted effort between the World Economic Forum, the Yale Center for Policy and Environmental Legislation, and Columbia University for the International Information Network (Environmental Sustainability Index, 2005). A review of ESI in the selected countries in 2005 shows that they were in descending order starting with Tunisia, which achieved the highest model in preserving the environment. The index of sustainability reached 51.8, while Iraq came last with a value of 33.6. Perhaps, the circumstances experienced by Iraq in that period of time had a significant impact in the emergence of this result.

F. Economic Development Index (EDI)

For the purpose of estimating the impact of economic growth, it was expressed in per capita GDP of the developing countries. As mentioned earlier, economic growth is achieved when an increase in the GDP or gross national income is raising real per capita income of individuals. Therefore, the concept of economic growth is the same as the economic well-being, which does not mean only an increase in GDP but must result in an increase in the real per capita income. This means that the rate of economic growth must exceed the rate of population growth resulting in an increase in the level of well-being of society. However, the growth of the population at a higher rate prevents the increase in the average per capita income, despite the increase in the GDP, but did not achieve economic growth.

The average per capita income is calculated according to the following equation:

$$\text{Average per capita income} = \frac{\text{GDP (income)}}{\text{Population}}$$

Which is an indicator of the level of economic growth or economic well-being. An increase in average per capita income means increased levels of growth or social well-being and vice versa (Elfatih and Al Otaibi, 2011).

Data on per capita GDP in the developing countries (Appendix 1) indicate a very large disparity between

them. The Group of Gulf Countries has a very high per capita share compared to other countries because they have large wealth and less population, while per capita in Lebanon (15.5 thousand dollars/year) is higher than in all other countries. The per capita income in Jordan (5.9 thousand dollars/year) outperforms richer countries such as Libya (5.8 thousand dollars/year) and Iraq (3.9 thousand dollars/year).

G. Bioecological System Index

One of the most important factors affecting environmental sustainability is the vitality of the ecosystem. An ecosystem is a community of organisms that live and interact with each other in a particular place such as forests and lakes. It is also known as organism, where it is located, and its components. The ecosystem reflects the dynamic interaction of all parts of the environment, with particular emphasis on the exchange of materials between living and non-living parts (Bin Jumaan, 2004).

The environment, its issues, its management, and protection have become the focus of attention of the world as the countries face problems of decline of their savings from natural and vital resources, in addition to problems of the environmental pollution and the risk of extinction of many organisms. Countries have given great importance for protecting the environment and finding a kind of balance between the environment requirements and the use of their available resources. The environment was seen from its physical and vital aspects only, but the view now has its social, economic, and cultural aspects, which constitute the natural foundation of the human environment, which calls for realizing the importance of preserving natural resources and protecting them from corruption (Environmental Sustainability Index, 2005).

Data on the vitality of the ecosystem in the selected developing countries, mostly the Arab countries (Appendix 1), were derived from a table of all developing countries presented in the percentages) between 0 and 100). We found that the figures in those countries bear a negative signal, with the exception of Sudan, which showed a positive sign. The index provides rate for the values of the variable components in the form of z-scores, which is zero for the mean and then (+1) or (-1) standard deviation higher or less than the arithmetic mean and (+2) or (-2) standard deviation higher or lower than the arithmetic mean. They are naturally distributed, where 68% of which are below standard deviation by one degree, 95% are below the standard deviation by two degrees, and 99.7% fall below the standard deviation by three degrees. Therefore, the negative figures in the table indicate the degree of deviation of these values from the general arithmetic mean. The largest negative number is a positive deviation higher than the global arithmetic mean. This is shown by all countries except Sudan, which means that it is a negative deviation from the global arithmetic mean in maintaining the efficiency of the vital system (Environmental Sustainability Index, 2005).

The standard model used to analyze the relationship between economic growth and sustainable development is as follows:

$$Y = a + b_1 X_1 + B_2 X_2 + e$$

Where, Y is the index of sustainable development, X_1 is an indicator per capita share of GDP, and X_2 is a vital ecosystem indicator, then the random variable.

III. RESEARCH ANALYSIS AND DISCUSSION

Statistical analysis package (SPSS) was used in data analysis. The results shown that the linear model is best in interpreting the relationship between variables according to the following equation:

$$Y = 0.065 + 0.032X_1 + 0.440X_2$$

$$t = (4.980) (12.206)$$

$$R^2 = 0.599, F = 16.002, DW = 1.348$$

The parameters of model are statistically significant by calculated t values which are higher than their tabular values at a level of 5%. The value of F indicates statistical significance of the function as it is higher than the tabular value at a level of 5% and indicates a significance linear relationship between the dependent and independent variables. The DW value indicates that the model does not suffer from the problem of autocorrelation between its random variables and is located outside the critical area. Furthermore, there is no multicollinearity problem among variables. The independent variables explain about 60% of the change in the dependent variable, while 40% fall within the effect of the random variable.

It is also clear that an increase in the economic growth rate of 1% will increase the level of environmental sustainability in the developing countries by about 0.032%. Furthermore, stimulating environmental vitality by 1% will lead to increase environmental sustainability by about 0.440%. This indicates that the effect of the ecosystem dynamic variable was much higher than the effect of the variable economic growth on environmental sustainability.

IV. CONCLUSIONS

1. Development in general and the economic development in particular in any country completely dependent on the general environmental situation. The relationship between environment and development is a reciprocal. Preservation of environment ensures the continuation of economic development and economic growth.
2. Achieving sustainable and natural environment at any of the developing countries requires permanent cooperation between researchers and the research institutions in relation to the exchange of information on the economic and social effects of human activities that they leave on the environmental content surrounding them.

3. There is a positive relationship between per capita GDP and environmental sustainability. Increasing per capita income by 1% leads to increase of 0.032% in ESI.
4. Furthermore, the results shown that increasing the level of ecosystem vitality by 1% will raise the level of environmental sustainability by 0.440%, which means that the selected countries have to pay great attention to preserving elements of the vitality of ecosystem and raise the efficiency of this system due to its significant impact on sustainability environmental issues.

A. Recommendations

1. Environmental awareness should be continually intensified in all the developing countries and remind of the dangers of environmental degradation to communities caused by production and manufacturing processes that do not take into account the preservation of the vitality of environment.
2. The international organizations, especially the United Nations and its affiliated institutions, should intensify their efforts to achieve environmental balance by issuing instructions on alleviating the environmental problems facing the natural resources in the developing countries such as the desertification, drought, erosion, and lack of water, to ensure the sustainability of these resources for future generations. Moreover, emphasizing the efficient use of clean technologies that reduce the consumption of natural resources and, thus, reduces pollution in the environment.
3. The UN should also expand conferences, symposiums, and meetings that bring together local and international experiences in the field of environmental conservation and sustainability. The first Conference on Environment and Sustainable Development, entitled "Water and Energy" which was held in Beirut (2013), has presented important recommendations to ensure ecological restraints to preserve the environment and sustainability.

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