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THE RELATIONSHIP BETWEEN CIRCULAR ECONOMY AND SUSTAINABLE DEVELOPMENT

DÖNGÜSEL EKONOMİ VE SÜRDÜRÜLEBİLİR KALKINMA İLE ARASINDAKİ İLİŞKİ

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ABSTRACT

The main purpose of this study is to clarify the basic but strong relationship between the circular economy and sustainability. By the increase in the world population, the globalization rate has increased and the global economy has grown rapidly. As a result, short-term economic policies focused on issues such as growth in economies, reducing unemployment and accelerating economic development, especially in the second half of the 20th century, have been given priority. However, as all of this was realized, criticism of the development economy began to increase, and the increase in population growth and industrialization, as well as the demand for natural resources and the pressure on these resources, highlighted the need for questioning about the continuity of global wealth and production-consumption activities. At this point, instead of the economic evaluation of the continuity of the development of societies, a more comprehensive evaluation is carried out, which includes economic, social and environmental factors. The aim of this study is to enlighten the relation between circular economy and sustainability.

Keywords: Circular Economy, Sustainability, Productivity, Operations Management

ÖZ

Bu çalışmanın temel amacı, döngüsel ekonomi ve sürdürülebilirlik arasındaki temel ancak güçlü ilişkiyi örneklerle literatüre katkı sağlamaktır. Dünya nüfusunun artmasıyla birlikte, küreselleşme oranı artmakta ve küresel ekonomi hızla büyümektedir. Sonuç olarak ekonomilerde büyüme, işsizliği azaltma ve ekonomik kalkınmayı hızlandırmaya, özellikle de 20. yüzyılın ikinci yarısında da bu konulara odaklanan kısa vadeli ekonomik politikalara öncelik verilmiştir. Ancak, tüm bunlar gerçekleşirken, kalkınma ekonomisine yönelik eleştiriler artmaya başlamış, nüfus artışı ve sanayileşmenin artması, doğal kaynaklara olan talep ve bu kaynaklar üzerindeki baskı, sürekliliği sorgulamanın gerekliliğini vurgulamıştır. Küresel zenginlik ve üretim-tüketim faaliyetlerinin sürdürülebilirliği açısından bu olgular üzerine çalışmalar yapılması gereksinimi ortaya çıkmıştır. Bu noktada, toplumların gelişiminin sürekliliğinin ekonomik değerlendirmesi yerine, ekonomik, sosyal ve çevresel faktörleri içeren daha kapsamlı bir değerlendirme yapılması gerekmektedir. Bu çalışmanın amacı, döngüsel ekonomi ve sürdürülebilirlik arasındaki ilişkiyi aydınlatmaktır. Ayrıca döngüsel ekonomi ile ilgili detaylı açıklamalar ve değişik sektörler ölçeğinde sürdürülebilir kalkınma ile ilişkisi açıklanmıştır. Sonraki çalışmalarda bu sektörel incelemelerin derinleştirilmesi ve farklı sektörlerin incelenmesinin de literatüre faydalı olacağı düşünülmektedir.

Anahtar kelimeler: Dairesel Ekonomi, Sürdürülebilirlik, Verimlilik, Operasyon Yönetimi

1. INTRODUCTION

With the increasing world population, the globalization rate has increased and the global economy has grown rapidly. As a result, short-term economic policies focused on issues such as growth in economies, reducing unemployment and accelerating economic development, especially in the second half of the 20th century, this issue have been gained priority. However, as all of this was realized, criticism of the development economy began to increase, and the increase in population growth and industrialization, as well as the demand for natural resources and the pressure on these resources, highlighted the need for questioning about the continuity of global wealth and production-consumption activities. At this point, instead of the economic evaluation of the continuity of the development of societies, a more comprehensive evaluation is carried out, which includes economic, social and environmental factors. Thus, sustainable development at a multi-dimensional concept, was proposed (Cabuk, 2008).

In order to understand the concept of sustainable development, it is necessary to understand the aims and objectives of this concept. The objectives of sustainable development are listed as follows in our Common Future Report approved at the United Nations General Assembly:

1. To stimulate growth
2. Change the quality of growth
3. To meet basic needs in employment, food, energy, water and health
4. Ensuring a sustainable population level
5. Maintaining and enriching the welding base
6. Redirect technology and manage risk
7. Combining environment and economy in decision-making process

Looking at these goals, it is appropriate to evaluate the goals and objectives of sustainable development in terms of economy, human, environment and technology. Increasing productivity by changing the lifestyle in the economic sense, using the energy and natural resources more carefully, using clean production technologies to minimize the use of resources, improving the unbalanced income distribution and improving the health conditions, education and social services is to provide justice in transportation (Yaylalı, 2010). The most important fact is to examine the environmental dimension in terms of the success of sustainable development. While providing economic development, issues such as not to pollute the ecosystem, to minimize the use of natural resources, to minimize the use of fossil fuels, to make energy resources sustainable, to support natural systems and to give importance to recycling should be emphasized.

It is foreseen that the biological and physical systems are balanced in the environmental dimension of development. An environmentally sustainable system should avoid the exploitation of renewable resource systems or environmental investment functions by keeping the resource base constant, and consume only those that have been adequately replaced by investments and not renewable sources. In today's world, it is inevitable that other countries will directly or indirectly be affected by the activities carried out by a country or firm. In other words, from an environmental perspective; it is seen that the wastes produced by the industrialized countries or the non-sensitive enterprises spread all over the nature and threaten humanity and natural life regardless of the country and nation. This is an indication of how industrialization efforts in both developed and developing countries threaten future generations (Alagöz, 2008).

With a comprehensive definition of sustainable development, a new concept of economy has been started to take into account the importance of environmental protection. If human welfare is to be continuously increased, it is necessary to ensure the continuity of the environment and natural resources. In this context, environmental sustainability comes to the fore and means to ensure the sustainability of natural resources. The level of utilization of resources, the rate of self-renewal of these resources; the rate of pollutants released must exceed the rate at which natural sources process these contaminants. The conservation of biodiversity, human health, air, water and soil quality, animal

and plant life is also included in environmental sustainability. When all these analyzes are taken into account, the concept of circular economy developed to achieve these goals is seen.

2. CIRCULAR ECONOMICS

There are many different definitions of circular economy. Among these, the most simple and strategic definition of circular economy was made by the European Union. In the definition of the European Union, circular economics is defined as an economic approach in which the value of products, materials and resources are kept as long as possible in the economy and the waste amount is the lowest (Akkucuk, 2015). Circular economy is based on three key elements based on both system and resource issues. These elements can be listed as follows:

- Protect and improve natural capital
- Optimize resource efficiency
- Maintain system activity

3R(Recycle, Reuse, Reduce) concept is used in order to define circular economic system. This concept which is an abbreviation of Recycle, Reuse and Reduce concepts are created by using the initials. These concepts, which respectively, are defined as follows:

- Recycling: Recycling of wastes for reuse and making recycling of waste functional
- Reuse: Reuse, reuse or reuse of waste, or use of other products as material in production
- Reduction: Reduction of wastes and pollutants in production and consumption processes

The main objective of the process implemented by the circular economy is to minimize the amount of waste to be released into the environment. In this context, waste management is becoming an important issue within the scope of the circular economy.

Waste management defines the process of collecting, processing (waste treatment), recycling or disposal of waste materials (Gencer, 2016) in order to protect people's health and to maintain social life in an order.

The European Union is making a special effort in the implementation of the circular economy. In this context, the European Union has prepared a detailed road map covering all the structural and technological changes required for sustainable economy by 2050. The most important plan prepared by the European Union in this field is the so-called Plan of Action for Circular Economy. With this plan, it is emphasized that a product should be connected to the principles of recycling, reuse and reduction in the period from the design phase to its consumption.

Another program about Circular Economy is the Zero Waste Program, in which the European Union aims to support the circular economy, and the main issues is the strategy about waste-minimization. Through this program, the European Union sets important targets for the reduction of packaging waste in particular. This program advocates priority on green products.

In addition to the activities carried out by the European Union in the field of circular economics, the member states make efforts in this field. For example, France has established the Institute of Circular Economics. This institute is planning the legislative work for the transition to the circular economy of France (Bonviu, 2014). Denmark by 2050 declared its goal of being independent of fossil fuels. In addition, important steps are taken in the field of circular economics with the project Zero Waste in Denmark. Austria has developed a building passport project as a waste prevention project. It is aimed to increase the use of recyclable materials in buildings as much as possible by operating the maintenance plans of the buildings regularly (Reichel, 2016).

According to the Kantian approach, sustainable development does not have a value in terms of environmental-centered ethics since the responsibility of the principle of sustainable development does not include the systematic relationship between other living and inanimate beings and the generations of future generations. Because whatever the outcome of the action, its aim is not only to protect the ecology as a whole, but to protect the next generation of human beings (Alagöz, 2008).

3. CIRCULAR ECONOMY AND EXAMPLES FOR SUSTAINABLE DEVELOPMENT

3.1. Circular Economics in Europe

There are many reasons that push the European Union companies into a circular economy. Entrepreneurs aim to continuously save on the cost part of their activities due to their constant price changes and different products. The objective of the circular economy is to increase access to secondary raw materials and to ensure the quality of raw materials. This increases the competitiveness of Europe as less use of resources means more efficient use.

Examples of different sectors can be given:

- An automobile manufacturer has redesigned some of the components of the vehicle, such as gearboxes, and has worked to increase the re-use rates. Reproduction requires more workforce than zero production. However, the company can make a net profit as it does not require an extra investment expense. In addition, less waste generation and more efficiency can be achieved by this method.
- In the cement sector, waste can be used as fuel instead of coke and coal in cement production. However, the mineral content of the waste can also be recycled and the raw material can be produced with this. This material recycling and energy recovery are called co-processing. The concrete obtained as a result of the cement production is very durable and can be fully recycled.
- In the forest industry, the use of renewable raw materials instead of fossil materials is emphasized. The majority of the energy used in the process is obtained from the remains of the trees used during the production.
- The paper sector can also work with different resources. Paper raw material can be obtained from some products such as corn, lemon, apple, hazelnut and orange. This way, food waste can be used in this sector in the best way.
- Process gases used in the production of electricity and slag help to reduce CO₂ emissions in cement production and in many civil engineering applications that reduce the consumption of natural resources such as minerals and fuels.
- The Dutch company, Volkerwessels, proposes to build a road that is light in weight, has a shorter road time, does not need any maintenance which is 3 times more normal than normal.
- In the textile and apparel industry, H & M is the first brand to produce new collections by recycling recycled clothing. Thousands of tons of garments are disposed every year. 95 percent of this can be recycled.
- Adidas has stopped using plastic bags all over the world. It uses the strategy of good cotton in production. In 2018, it aims to use 100 percent sustainable cotton and recycled polyester. The company has previously attracted interest in the production of shoes from ocean waste.
- IKEA allocates \$ 1 billion to the environment. With this plan, IKEA will exceed the Swedish state's sustainability budget for the whole country. The company has decided to re-use its renewed catalogs every year instead of sending it back for recycling.
- Unilever has set up a garbage bank in Indonesia. It has led to the establishment of a bank for the income from the sale of inorganic waste collected by the local population.

3.2. Circular Economies in Turkey

On the other hand, in the re-use, production and repair sectors, for example, if the mobile phones that are not used are easily dismantled, the costs associated with the production of new ones from the mobile phones that become waste can be halved. If 95 percent of the out-of-use mobile phones can be collected, 1 billion euros can be saved per year from material production costs in Turkey. Other organizations involved in activities covered by a circular economy in Turkey is also ÇEVKO. Last year, ÇEVKO Foundation included recycled packaging waste consisting of 638 thousand tons of glass, metal, plastic, paper, cardboard, wood and composite materials.

4. CONCLUSION

Resources need to be used smartly and sustainably for sustainable growth. The linear economy, "production-use-at" model, has become obsolete, and its place is to take the circular economy that follows the "sustainable production-sustainable consumption-recycling" processes. From the first day on which humanity has begun to live on earth, it has always been in interaction with nature. He usually tried to shape his environment according to his own goals.

This interaction has increased considerably, particularly with the transition to mechanization and mass production, which is defined as the industrial revolution. Now more resources are consumed and more are left to the environment. This process has caused more deterioration of the natural environment and more pollution of the environment. Especially in the developed and developing countries after the second world war, the development of industrialization by adopting the development approach has increased the pollution of the environment and the resource consumption (Alagöz, 2008).

Nowadays, the number of enterprises that participate as a producer or consumer in the circular economy is quite high. It can be given as an example of circular economic activities in the different sectors of the clothing industry retailers collecting old clothes in their stores, some companies making coffee sales renewable coffee cups, or companies that do business on technological products such as phones, computers and tablets.

The fact that a sustainable development approach cannot be solved in the current economic approach has led to new maturation in this field. Circular economy is the result of these quests. It is aimed to reduce the amount of resource used in the economy with the circular economy by reuse, recycling and reduction. Of course, it is not enough to change only the manufacturer's behavior in order for this system to function. Consumer behavior should be influenced by the circular economy. For this purpose, some countries have started to prefer recyclable or green products in public procurement. It also maintains similar initiatives in the private sector. For example, most of the international sports apparel companies produce garments from recycled materials. Some automobile manufacturers are also trying to place this behavioral pattern as a new luxury perception by introducing green and recycled vehicles.

By changing the patterns of production and consumption within the basic processing principles of the circular economy, it will be possible to use natural resources in some extent without reducing the prosperity of future generations. (Alagöz, 2008) However, it is wrong to insist on the linear economic structure. For this purpose, efforts should be supported by the circular economy.

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