Ilgar Khalilov
Azerbaijan State University of Economics (UNEC), Azerbaijan
ORCID: 0000-0001-7617-9439
E-mail: Ilgar_Khalilov@unec.edu.az

Elshan Mammadov
Azerbaijan State University of Economics (UNEC), Azerbaijan
ORCID: 0000-0002-3219-946X
E-mail: elshan_mammadov@unec.edu.az

Fatih Hakan Dikmen
Ankara Hacı Bayram Veli University, Türkiye
ORCID: 0000-0001-6390-2501
E-mail:fatih.dikmen@hbv.edu.tr

Ecological Aspects of the Development of Ecological, Circular and Green Economy and Azerbaijan Realities

Abstract
The article analyzes issues related to the environmental aspects of the application of the principles of ecological, circular and green economy and provides an overview of the current state of affairs in Azerbaijan. It also pays attention to the historical aspects of the formation of the stages of economic development of Azerbaijan. The article describes the ecological and economic aspects of the impact of the development of industry, agriculture and other economic sectors on the environment. Studies show that resource constraints, the use of consumption and production waste have always existed. However, these issues have been solved differently in different historical periods. The solution to these accumulated problems consists in the transition to an ecological and circular economy model, which ultimately means a "green" economy. The introduction of more advanced technologies not only reduces the negative impact of current production activities on the environment, but also reduces the volume of waste accumulated from past production periods. Special attention is paid to government initiatives and institutional reforms aimed at reducing environmental impacts and improving the efficient use of natural resources. The advantages of investment activities in the green sector and the relationship between environmentally friendly projects and the dynamics of economic growth are determined.
The article examines a special approach to the economic structure of modern society, which has been known in recent years as the "green" economy. The green economy aims to ensure sustainable socio-economic development of society through the efficient use of natural resources, their protection and restoration.
The article notes that the rapidly changing climate, the irreversible destruction of animals and plants, the increase in pollution-related diseases, and the impact of industrial waste, water and soil pollution and depletion clearly indicate that the old economy has led to a crisis in the relationship between humanity and the world.

Keywords: ecological economy, circular economy, green economy, environment, waste, sustainable development

Introduction

The ecological aspects of the development of ecological, circular and green economies are associated with minimizing negative impacts on the environment through the efficient use of natural resources, reducing waste and implementing sustainable production and consumption models. In

modern times, the increase in environmental problems on a global scale, processes such as depletion of natural resources and climate change have necessitated a rethinking of economic development models. In this regard, the concept of "circular economy" comes to the fore as an alternative to the traditional brown economy model. Azerbaijan has also taken important steps in this direction in recent years, trying to achieve sustainable development goals by protecting ecological balance and restoring ecosystems.

The relevance of writing the article stems from the fact that modern economic development is associated with increasing negative impacts on the environment, depletion of natural resources, and disruption of the balance of ecosystems. The consequences of climate change are noticeable not only in the world, but also in every region of Azerbaijan. All this exacerbates ecological, economic and social problems and limits future development opportunities. Only the implementation of sustainable development and the transition to an ecological and circular economy can stop these processes. The purpose of writing the article is to examine the advantages of the transition to an ecological and circular economy in sustainable development, its current application, development prospects, and to assess the sustainability and difficulties of their implementation in Azerbaijan.

The methodological basis for solving the tasks set in the article is the use of systematic analysis, historical, chronological, dialectical and comparative methods, as well as the analysis of economic and statistical data. The database for writing the article is the works of well-known foreign scientists, statistical materials of the UN, the World Bank and the Republic of Azerbaijan, and normative and legal documents prepared by international and national legislative bodies in the field of sustainable development.

The essence of ecological, circular and green economy

The need to develop new paths for human and economic development has long been recognized by the world community. As early as the late 1980s and early 1990s, the feasibility of transforming the traditional development model had a profound impact on the discussion of new conceptual and methodological approaches to assessing the development of society and the economy, in particular, new development models, which laid the foundation for two new theories that emerged within the framework of the UN structures. These are sustainable development and human development. The need to solve environmental problems for the progress of humanity is reflected in the UN Millennium Development Goals for 2000-2015, adopted by all countries of the world, one of which is related to ensuring environmental sustainability. In September 2015, the UN Summit adopted a new agenda and Sustainable Development Goals, which will serve as the main benchmark for the world from 2016 to 2030. It is clear that a new economic model is also needed for Azerbaijan. This situation is due to the obvious exhaustion of the raw material-exporting development model. In the conditions of modern industrialization, there is a need for continuous research to develop theoretical models for the direct application of cyclical technologies and practice-oriented concepts for the application of closed-loop systems in the production processes of enterprises *(UNEP 2023. Report of the United Nations Conference on the Environment and Development, 1992).*

The international community has adopted the circular economy model as an alternative to the development of the economic system. It eliminates the use of harmful chemicals that hinder reuse and aims to completely eliminate waste through improved design of materials, products, systems and business models. The circular economy is characterized as a complex economic system that is restorative in terms of design and structure. It will replace the concept of "life cycle" with the concept of "transition to the use of renewable and renewable energy sources" and is characterized by its closed nature *(Varkholova, Dubovitska, 2015; Skripnyuk, Kikkas, Didenko, 2018).* An ecological economy is an economic model that takes into account the carrying capacity of nature, reconciling social well-being with ecological stability. Various trends in the development of the modern economy - knowledge economy, low-carbon economy, energy-efficient economy, circular economy and others

- emphasize the importance of various aspects of the main trend. Solving socio-economic problems while minimizing environmental damage is today called the "green" economy. Its goal is

to ensure the "greening" of all areas of the economy and our lives, from industry to households. The "green" economy is built on two main principles and pays special attention to the environment. These are the "double win" policy, which requires economic and environmental efficiency in the implementation of any project, and the principle of "decoupling" the processes of economic growth and natural capital depletion, which were previously closely linked. The circular economy is the practical application of this approach. It is based on extending the life of products, remanufacturing, and using renewable energy sources. According to the classical definition, ecology is the economy of nature. Today, it is increasingly common to hear that ecology is an economy. This means that the modern economy must increasingly meet the environmental requirements of people and society, harmonize the relationship between people and nature. This is the goal of the "green" economy. The term "green" economy itself is to determine the current directions of economic development and modernization. Its goal is to ensure that environmental requirements are taken into account and to "green" the economy *(Ellen MacArthur Foundation 2021, Henning Wilts. 2021).*

This does not apply to any specific area, part or sector of the economy, but to the general trend of its future development. Therefore, it is already difficult to accurately assess the share of the "green" economy. In addition, the fate of the "green" economy is predetermined by the simultaneous, equal existence of the traditional "brown" economy, which aims to ensure economic growth at all costs, without taking into account the consequences of the new "green" economy for people and nature. This is currently more expensive and implies investments in future crisis-free development. Therefore, an economy based on ecological requirements will most likely be increasingly referred to not as a "green" economy, but simply as a modern economy with no alternative, and this will become even clearer in the future. Currently, the features of the "green" economy are clearly visible in the global economy. Certain trends in this direction are beginning to manifest themselves to some extent in the economy of each country *(Management of Green Development of the National Economy 2017).* Such trends are also evident in the Azerbaijani economy. These include measures to ensure energy efficiency and energy saving, the development of renewable energy, the decision to limit greenhouse gas emissions, the direction of development towards innovative development and modernization. All these are steps of the country towards a "green" economy.

According to UN reports, a "green" economy is defined as an economy that improves human well-being and ensures social justice, while significantly reducing environmental risks and degradation. This requires a number of measures aimed at the efficient use of natural resources, the protection and enhancement of natural capital, the reduction of pollution and carbon emissions, the prevention of the loss of ecosystem services and biodiversity, and the increase of incomes and employment *(Pearce, D., Turner, R. K. 1990).*

Not to mention the ecosystem services that ensure the existence of life on Earth, no economy in the world today can function without natural resources. Any economy faced with environmental problems is forced to stop and spend a lot of money to improve the situation.

Directions for the formation and environmental advantages of an ecological, circular and green economy in Azerbaijan

The development of an ecological, circular and green economy in Azerbaijan covers several areas - the development of renewable energy, reducing water consumption, waste management, increasing energy efficiency and the use of green technologies. At the same time, it provides environmental benefits such as reducing greenhouse gas emissions, improving air and water quality, reducing pressure on natural resources and minimizing waste generation. For this, the transition to renewable energy sources such as solar and wind, increasing energy efficiency in industry, housing and utilities, implementing water-saving technologies in agriculture from water resources, switching to less water-intensive agriculture and cooperation with neighboring countries for the protection of large water bodies such as the Caspian Sea are of great importance.

Waste management is also one of the pressing problems in Azerbaijan. In this regard, on June 30, 1998, the Law "On Production and Municipal Waste" was adopted in Azerbaijan. The

development of systems for separate collection, recycling and disposal of waste, as well as the implementation of the principles of a circular economy, in which waste from one production enterprise becomes raw material for another, is considered an important link in the transition to a "green" economy in the country *("Green Growth Concept" of the Republic of Azerbaijan, 2022).* Stimulating the application of innovative and environmentally friendly technologies in various sectors of the economy in the country, supporting projects aimed at reducing negative impacts on the environment also play a special role in ensuring environmental sustainability. According to the report of the State Statistical Committee, in 2024, 4365.0 thousand tons of waste were generated in the country, of which 69.3 percent were solid household waste, and 30.7 percent were various types of waste generated as a result of the production activities of enterprises.

Of the 3,025.4 thousand tons of solid household waste generated in 2024, 80.5 percent were transported to landfills for disposal, 19.2 percent were used for energy generation, and 0.3 percent were sold within the country. 232.5 million kWh of electricity was generated through the use of household waste *(Azerbaijan State Statistical Committee, 2024).*

Including residues generated in previous years in industry and other sectors of the economy, 22.2 percent of production waste last year was used as raw materials in enterprises, 15.3 percent was sold within the country, 1.4 percent was exported, 11.6 percent was transported to landfills for disposal, and 49.5 percent remained in the yards of enterprises. As a result of the production activities of enterprises, 260.2 thousand tons of hazardous waste were generated in 2024, and their share in the total amount of waste was 6.0 percent. 71.9 percent of waste was generated in mining enterprises, the majority of which was generated in Baku. Including residues from previous years, 115.7 thousand tons of hazardous waste were completely neutralized in 2024 *(Azerbaijan State Statistical Committee, 2024).* Azerbaijan has significant untapped potential for waste-to-energy conversion, which might be crucial for improving energy security and economicresilience. But to reach this potential, we need a plan that includes investments ininfrastructure, changes to policies, and programs that encourage people to alter theirbehavior *(Elshan & Hacar, 2025).*

Since regaining its independence and signing oil contracts in 1994, Azerbaijan has succeeded in creating one of the leading economies in the region. While the country's economy benefits from the export of natural resources, it has also begun to benefit from a steady inflow of investment. However, there are still certain social, economic and environmental challenges that threaten the long-term sustainability of the country's development model. The country's transition from an oil-dependent economy to inclusive "green" development remains a key priority at the highest level.

In the national priority plan "Azerbaijan2030: National Priorities for Social and Economic Development", approved on February 2, 2021, one of the five main priorities is called "A Country of Clean Environment and Green Growth". The declaration of 2024 as the "Year of Solidarity for a Green World" in the country within the framework of "COP29" is an indicator of giving priority to recycling, the use of renewable energy sources, and the application of ecological technologies within the framework of the "transition to a green economy". The "Social and Economic Development Strategy of the Republic of Azerbaijan for 2022–2026" is a strategy prepared on the basis of these priorities. As a continuation of this, the "Social and Economic Development Strategy of the Republic of Azerbaijan for 2027–2030" dated May 30, 2025 will give a significant impetus to the country's ecological and economic development. At the same time, the Strategy tasks the relevant institutions with the preparation of the "II State Program on the Great Return to the Liberated Territories" *(https://president.az/).*

Azerbaijan faces serious environmental problems that affect the country's economy and shape new realities. These include land degradation and desertification, which negatively affect both the population and economic development, poor management of urban infrastructure, industrial and domestic waste, air pollution, and depletion of water resources. It is reasonable to say that future economic development in Azerbaijan will be closely linked to the application of environmentally friendly technologies, the use of clean energy sources, waste recycling, and increased work in the field of remediation of contaminated areas. In accordance with the National Priorities, environmental

sanitation, rapid restoration and increase of greenery, and efficient use of water resources and sustainable energy sources will be ensured.

More than 20% of irrigation water in the country is lost due to deterioration of irrigation infrastructure, and the melting of more than 30% of existing glaciers will lead to a decrease in water resources. At the same time, current policies and investments in climate change adaptation, sustainable waste and water resource management, and biodiversity conservation are insufficient and require more resources *(Ministry of Ecology and Natural Resources. 2024).*

Azerbaijan's National Priorities for the transition to a "green" economy envisage the establishment of an economy capable of raising the standard of living of the population, using natural resources prudently and efficiently in the interests of present and future generations, in accordance with the country's international environmental obligations. The "Green" economy in Azerbaijan is an economy aimed at protecting the well-being of society through the efficient use of natural resources, as well as ensuring the return of end-use products to the production cycle. First of all, the "green" economy is aimed at the economical consumption of resources such as oil, gas and other minerals in the country, which are currently subject to depletion. Also, reducing emissions of harmful substances into the atmosphere, resulting in improved air quality, more efficient use of water and restoration of aquatic ecosystems, reducing wind and water erosion, minimizing waste through recycling and reuse, reducing energy and water consumption in production and consumption, and strengthening the economy's resilience to climate change and other environmental problems are the basis for ensuring an ecological, circular and "green" economy in Azerbaijan *(Ministry of Ecology and Natural Resources. 2024, Azerbaijan State Statistical Committee, 2024).*

The goal of the formation of an ecological and circular economy is to decouple economic growth from primary raw materials by creating a cyclical production and consumption system with minimal waste. Resources should be managed efficiently throughout their entire life cycle, from production and consumption to disposal and recycling, and they should create added value from existing resources while reducing waste generation. In addition to reducing environmental impact, the effective application of circular economy principles allows companies to reduce costs, increase growth potential and improve their corporate image. Therefore, the transition to a resource-efficient circular economy is of paramount importance in the interests of competitiveness and sustainable economic growth. The transition to a circular economy requires changes in the entire product value chain, from product design to new business models and the development of consumer habits. For new and existing products, the main focus is on the selection of sustainable materials, product quality, optimization of the distribution chain, and full life cycle development, with an emphasis on recycling and reuse. Along with smart design solutions, ecological innovations and technological development play an important role in facilitating the transformation of economic development *(Henning Wilts. 2021).*

The principles of the green and circular economy cover all areas of activity, so cooperation between businesses and international agreements cannot be underestimated. Successful commercial cooperation is characterized by industrial symbiosis; its goal is a closed production cycle in which the waste, residual heat and other by-products of one enterprise are consumed by another.

The way we consume goods and services also requires significant changes. The daily choices of millions of consumers have a significant impact on the environment. Increasing consumer awareness and creating demand for environmentally friendly products contribute to the development of an environmentally friendly economy *(Ellen MacArthur Foundation 2021).* The role of government in the transition to a green and circular economy is to create favorable conditions for the implementation of the principles of the “green” economy and to remove obstacles to its implementation.

As can be seen from Figure 1, the 5 main principles of the circular economy have an equal share of 20%. This approach shows that the circular economy is not based on a single stage, but on the entire chain of processes. The graph also shows that all stages of the life cycle of a resource are continuously interconnected.

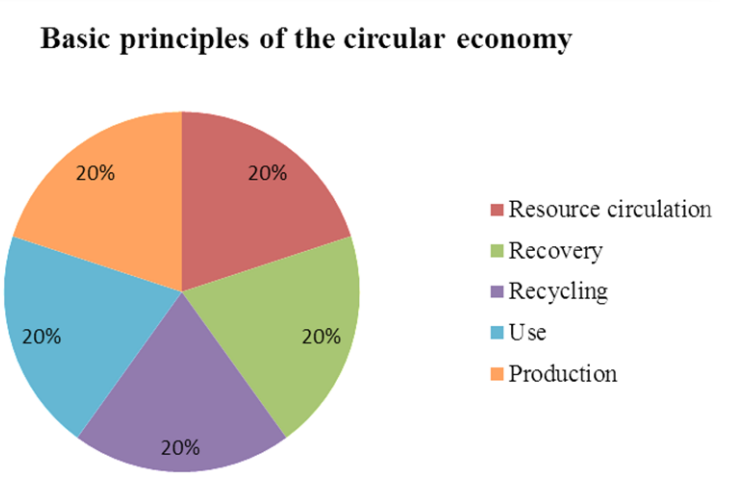

Figure 1. Basic principles of the circular economy
Source: Ellen MacArthur Foundation 2021

An ecological and circular economy is a production and consumption model that promotes the sharing, renting, reuse, repair, improvement and recycling of existing materials and products for the longest possible time. This extends the life cycle of products. In practice, this means minimizing waste. When a product reaches the end of its useful life, its materials are retained in the economy through recycling, where possible. They can be reused productively, creating added value. Although the new model is based on a large amount of cheap and easily available materials and energy, it contradicts the traditional linear economic model.

On the contrary, the reuse and recycling of products will slow down the use of natural resources, the destruction of landscapes and habitats, and help limit the loss of biodiversity. Another benefit of the ecological and circular economy is the reduction of total annual greenhouse gas emissions. According to the European Environment Agency, 9.1% of greenhouse gas emissions in the EU are caused by industrial processes and product use, and 3.32% by waste management *(Вархолова Т., Дубовицка Л. 2015).*

The ecological and circular economy should use climate protection instruments and the synergies resulting from their application. The decarbonization of the economy is inextricably linked to circular production and consumption patterns *(Скрипниук Д.Ф., Киккас К.Н., Диденко Н.И. 2018).*

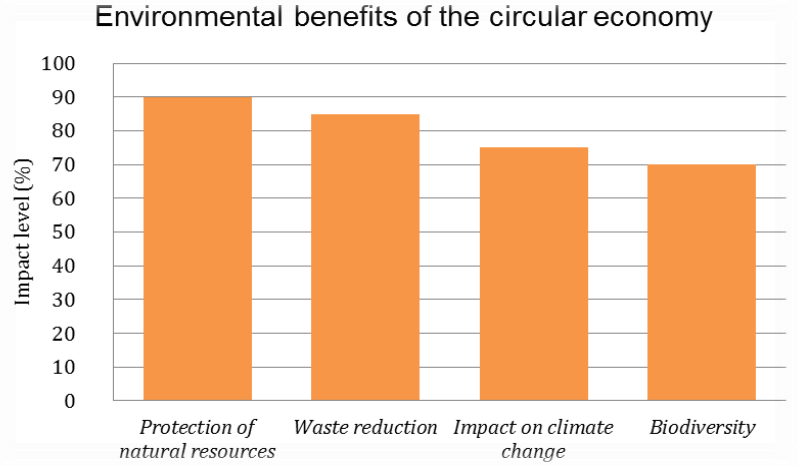

Figure 2. Environmental benefits of a circular economy
Source. *Ellen MacArthur Foundation 2021, Korhonen, J., Honkasalo, A.,Seppälä, J. 2018*

According to the data provided in the diagram of the environmental benefits of the circular economy (Figure 2), the protection of natural resources has the highest indicator (90%) in terms of environmental benefits. This can be mainly explained by the reuse of resources, optimization of the production process and prevention of waste. The indicator for waste reduction is estimated at 85%, which indicates the efficiency of the waste management system and the application of a closed loop in the production process. The impact on climate change at 80% reflects the positive impact of the circular economy on reducing greenhouse gas emissions and increasing energy efficiency. The positive impact of the circular economy on biodiversity protection at 75% proves that this model contributes to the stability of ecosystems as a whole and the protection of the natural environment.

The results obtained in recent years confirm the effectiveness of the circular economy approach in terms of environmental sustainability. The transition to a circular economy provides complex benefits related to the protection of natural resources, climate change mitigation, waste reduction and biodiversity preservation.

Restructuring the economy in Azerbaijan will require solving a number of key problems.

This is because the linear economic model has created numerous dependencies that need to be eliminated for many years to make circular solutions and products competitive. It must be frankly admitted that restructuring the existing system will lead to high operating costs. Therefore, it is necessary to continue an innovation and investment-oriented policy to ensure the success and preservation of the necessary transformation. Therefore, it is absolutely clear that the transition to an ecological and circular economy cannot be achieved through environmental policy alone. Such an economy is a classic issue that requires a revision of both tax legislation and scientific and industrial policy. In the Republic of Azerbaijan, the transition to a "green growth" model has been identified as one of the priority directions of state policy since 2022.

Measures are being taken in this area in the following areas:

- **Creation of green energy zones:** Implementation of renewable energy projects in the Karabakh and East Zangezur economic regions (especially hydro, wind and solar power plants).
- **Waste management:** Expansion of household waste sorting and recycling as a result of the activities of "Tamiz Shahar" OJSC.
- **Ecological technologies in industrial parks:** Acceleration of the implementation of waste-free production and energy efficiency principles in the Sumgayit Chemical Industrial Park.
- **Resource circulation in the agricultural sector:** More efficient implementation of measures such as soil fertility protection, use of organic fertilizers and reuse of irrigation water *("Green Growth Concept" of the Republic of Azerbaijan, 2022, Ministry of Ecology and Natural Resources. 2024).*

The transition to a "green growth" model has been identified as one of the priority directions of state policy in the Republic of Azerbaijan. As a result of the implementation of an ecological and circular economy in the country, a number of environmental benefits are achieved, including reducing the pressure on production from the reuse of resources, reducing the burden on the environment as a result of recycling processes, the role of production efficiency and energy saving in reducing CO2 emissions, and improving the quality of soil, water and air, which creates conditions for the restoration of ecosystems, which is considered the path to a "green" economy. For example, in Baku, waste recycling in the "Balakhani Industrial Park" prevents thousands of tons of waste from being released into nature per year, which has a significant impact on the health of ecosystems.

Synthesis of sustainable development and ecological economy in Azerbaijan

The synthesis of sustainable development and ecological economy in the Republic of Azerbaijan is achieved through the integration of the UN Sustainable Development Goals (SDGs) into national policies and business practices, the application of environmental, social responsibility and governance principles in production sectors, and the promotion of green development that creates

conditions for a balance between economic development, environmental protection, and social justice. On October 6, 2016, a Decree was signed on the establishment of the National Coordination Council for Sustainable Development of the Republic of Azerbaijan. According to that decree, a coordination mechanism was formed to ensure sustainable development until 2030, the activities of the Council, the responsibilities of state bodies, and the reporting system were determined. The country also undertook to work together with International Organizations to support the implementation of the Development Concept "Azerbaijan 2020: A Vision for the Future", as well as the implementation of key development issues after 2015 and the Sustainable Development Goals. This will address the country's development priorities in collaboration with national partners, international development partners, civil society, the private sector, international financial institutions, and other stakeholders *(https://president.az/, UNEP 2023).*

The concept of sustainable development is based on the understanding of the need to meet the growing needs of humanity within the limits of the planet's natural resources. The synthesis of sustainable development and ecological economics involves finding a balance between economic growth, social progress and environmental protection. This is achieved by integrating ecological principles into economic models and making decisions that do not harm future generations.

According to the United Nations Development Programme (UNDP), 40% of land is degraded due to soil erosion, loss of fertility and depletion. Up to 1 billion people lack access to clean drinking water, 2.6 billion people lack basic sanitation, and 1.4 million children under the age of five die each year due to lack of clean water and sanitation. Forest cover is decreasing by 13 million hectares each year, and climate change could affect about 2 billion people in coastal areas *(Sustainable Development: Ecology, Economy, Society and Culture: 2023).*

The current environmental problems of resource depletion, ecosystem degradation, pollution, loss of biodiversity, climate change, disruption of the biosphere balance and risks to human health are also relevant for Azerbaijan. Thus, increasing consumption due to the unlimited exploitation of natural resources in the country, which increases every year, leads to an aggravation of environmental problems. As a result, processes such as environmental pollution, the negative impact of climate change on ecosystem components, depletion of natural resources, including freshwater shortages, deforestation and loss of biodiversity occur. As a result, the disruption of the overall balance of the biosphere and the established harmony and interaction of its components leads to more and more unexpected consequences, including epidemic diseases. At the same time, a clear distinction between the roles of natural and social factors both at the level of causation of ongoing anomalies and at the level of their consequences is becoming an increasingly complex task. All this demonstrates the need to ensure harmony between man and nature when determining the paths of economic development.

Currently, international organizations, summarizing the experience of implementing the concept of sustainable development, have been forced to note that in practice the relationship between the three fundamental elements differs from that assumed in theory. Despite all the political declarations and justifications for prioritizing environmental problems, minimal attention is paid to environmental issues, which form the basis of the initially proposed development concept, the third, economic aspects are the most important, and social aspects are the second. This has created difficulties in ensuring that environmental requirements are taken into account not as separate programs, but primarily by including them in the solution of socio-economic problems that concern everyone *(Pearce, D., Turner, R. K. 1990; Управление зеленым развитием национальных економики 2017).*

As the experience of implementing sustainable development ideas shows, it is difficult to meet environmental requirements without achieving the main socio-economic goals, primarily poverty eradication. As there is an urgent need to solve long-term sustainable development goals, the problems related to ensuring people's survival and development are becoming increasingly urgent. The threat of ecological crisis, scarcity of natural resources, and negative consequences of human activity for future generations are already manifesting themselves today. In Azerbaijan, the synthesis of sustainable development and green economy is achieved through the transition to a "green"

economy, which includes the development of renewable energy (wind, solar, bioenergy and hydroelectric power plants) and the solution of national environmental problems. The country gives greater priority to environmental protection and minimizing the impact of climate change, and seeks to integrate economic and social goals with environmental problems *(Administration of Green Development of the National Economy 2017, Ministry of Ecology and Natural Resources. 2024)*.

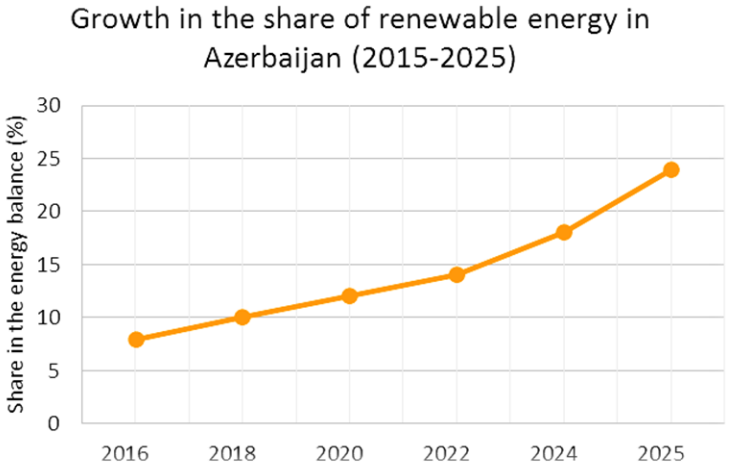

Figure 3. Growth of the share of renewable energy in Azerbaijan
Source. *Azerbaijan State Statistical Committee, 2024*

As can be seen from the given graph (Figure 3), the share of renewable energy in Azerbaijan has increased from 7 percent in 2015 to 23 percent in 2025. That is, an increase of about 3.3 times over 10 years. This increase was achieved as a result of greater technological progress and, at the same time, the state's "green energy" policy. The growth trend is sustainable and this growth shows that Azerbaijan can significantly increase the share of renewable energy in the energy balance in the near future. Also, the linear increase in growth starting from 2020 should be explained by the implementation of new projects in the country in the field of renewable energy, especially the construction and commissioning of plants based on wind and solar energy.

Azerbaijan has set the establishment of a "green economy" model as a priority target by 2030 within the framework of the UN's "Sustainable Development Goals" (SDGs). In this strategy, the principles of the circular economy – waste-free production, resource recycling, eco-innovations and "green business" initiatives – are considered as key components. The results achieved and the ongoing qualitative changes in the economy, society and politics already allow us to set goals for the transition to the next stage, aimed at achieving sustainable development goals in the long term. At the same time, it is important to fully and comprehensively take into account and address global trends and challenges when developing a long-term development strategy. In this context, one of the effective tools for ensuring sustainable development is to achieve the full transition of the country to a "green" economy (*Вархолова Т., Дубовицка Л. 2015*).

Structural changes in the Azerbaijani economy in recent years, state support for the development of entrepreneurship, undoubtedly affect the use of natural resources and the level of environmental pollution. Therefore, in this period, the economic aspects of environmental decision-making, that is, the integration of environmental and economic policies, are especially important. In these conditions, the Azerbaijani state, using a wide range of economic instruments, pays special attention to the implementation of policies aimed at the introduction of resource-saving and low-waste technologies, new types of services, entrepreneurship and other measures. Nevertheless, the development of an ecological and circular economy in the country faces a number of problems:

- The culture of waste sorting has not yet been fully formed in society;
- The high cost of environmental technologies and the limited potential of local production;

- Inadequate legal and regulatory framework in some cases;
- Weak implementation of environmental awareness and innovations at the regional level.

Joint action of the state, private sector and civil society is necessary to overcome these problems (*The "Green Growth Concept" of the Republic of Azerbaijan, 2022, Ministry of Ecology and Natural Resources, 2024*).

In order to successfully solve environmental protection issues in the country, to ensure efficient use of natural resources and to prevent negative impacts on the environment, economic methods of environmental management and regulation of the use of natural resources are applied based on the principles of paid use of natural resources, that is, the "polluter pays" principle. Thus, the development of an ecological, circular and green economy plays the role of a guarantor of both economic stability and environmental security in the country.

Conclusion

The analysis of the sources shows that a successful ecological-economic policy mix largely depends on the effectiveness of the measures. An ecological, circular and "green" economy will have a positive impact on climate and resource protection, balancing and coordinating various economic interests and ecological processes. On the one hand, climate protection will be ensured, and on the other hand, resource protection will be ensured through an ecological and circular economy. Therefore, it can be argued that any concepts and approaches currently used in climate policy can be applied to the development of an ecological and circular economy.

The consequences of economic growth based on the unlimited exploitation of natural resources in Azerbaijan limit the opportunities for further development on this path. The deterioration of ecological problems and the disruption of the overall balance of ecosystems lead to consequences such as increasing pollution, climate change and epidemics. If ecological problems are not resolved, this will further exacerbate ecological crises, which will lead to an aggravation of socio-economic problems. Distinguishing the role of social and natural factors in ongoing changes is becoming increasingly complex. The development of an ecological, circular and "green" economy in Azerbaijan is of strategic importance in terms of ecological stability, efficient use of resources and environmental protection. Strengthening state programs, renewable energy projects and recycling infrastructure in this direction will contribute to the restoration of ecological balance and economic modernization in the country. In the future, the widespread application of the ecological and circular economy model in the country will ensure not only sustainable economic growth, but also the protection of ecosystems. One of the most effective tools for ensuring sustainable development in Azerbaijan is the country's transition to a "green" economy. The country's green transition strategy is based on the results achieved and the more rapid development of economic sectors such as energy, water resources, land resources and waste. The application of ecological and circular economy principles should be expanded in the national economic strategy. Specific incentive mechanisms should be developed for the efficient use of resources at the production and consumption stages, waste reduction, increasing the share of renewable energy sources and the application of ecological technologies. This approach will serve both to preserve ecological balance and to ensure the sustainability of economic growth.
Educational measures should be strengthened to form the ecological mindset of society. It is important to develop environmental education at all levels, promote a culture of "green behavior" among the population and business entities, and increase public participation in environmental initiatives. This will allow for increased environmental responsibility and strengthening the social foundations of the green economy.

Reference

1. *Green Growth Concept of the Republic of Azerbaijan. (2022).*
2. *Ministry of Ecology and Natural Resources. (2024). Report on the state of the environment for 2024*
3. *Ellen MacArthur Foundation. (2021). Circular economy in action. London.*

4. *Pearce, D., & Turner, R. K. (1990). Economics of natural resources and the environment. Harvester Wheatsheaf.*
5. *Elshan, A., & Hajar, Sh. (2025). Assessing the impact of waste management on the green economy: A case study of Azerbaijan. UNEC Journal of Economics and Management Advances, 1(1), 130–139.*
6. *United Nations Environment Programme (UNEP). (2023). Green economy progress report. Nairobi: United Nations Environment Programme.*
7. *Azerbaijan State Statistical Committee. (2024). Ecology and environmental indicators. Baku.*
8. *Korhonen, J., Honkasalo, A., & Seppälä, J. (2018). Circular economy: The concept and its limitations. Ecological Economics, 143, 37–46.*
9. *Varholova, T., & Dubovitska, L. (2015). Strategies of the European Union: Emphasis on competitiveness. Scientific Dialog, 1(37), 160–170.*
10. *Skripniuk, D. F., Kikkas, K. N., & Didenko, N. I. (2018). Influence of traditional linear economy on the environment. In Processes of global economy: Collection of scientific works of the International Scientific and Practical Conference (pp. 24–36). St. Petersburg.*
11. *Wilts, H. (2021). Cyclical economy: Transition to cyclical economy. December 2021, 30 ct.*
12. *Zakharov, V. M., Semenov, A. V., & Trofimov, I. E. (2023). Sustainable development: Ecology, economy, society and culture (2nd ed., revised). Moscow: Moscow University im. S.Yu. Witte / Center for Sustainable Development and Health of the Russian Academy of Sciences.*
13. *United Nations. (1992). Report of the Conference of the United Nations on Environment and Development: Rio de Janeiro declaration on environment and development, August 12, 1992. http://www.un.org/russian/documen/declarat/riodecl.htm*
14. *Dorina, E. B., & Bukhovets, T. V. (2017). Management of green development of the national economy: Konspekt lektsiy. Minsk: Belsens.*
15. *President of the Republic of Azerbaijan. (n.d.). https://president.az/*