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THE POTENTIAL

OF THE GREEN ECONOMY TO IMPACT SOCIO-ECONOMIC WELL-BEING IN THE REPUBLIC OF AZERBAIJAN

EL POTENCIAL DE LA ECONOMÍA VERDE PARA INCIDIR EN EL BIENESTAR SOCIOECONÓMICO EN LA REPÚBLICA DE AZERBAIYÁN

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ABSTRACT

The transition to a green economy has become a strategic imperative for sustainable development, particularly in countries like the Republic of Azerbaijan, where environmental degradation and economic dependency on fossil fuels present significant challenges. Despite global discourse on green development, limited empirical analysis has focused on the socio-economic implications of green policies in the Azerbaijani context. This study explores the potential of green economy initiatives—such as renewable energy deployment, eco-friendly technologies, and efficient resource utilization—to enhance social welfare and economic resilience. We used the Toda-Yamamoto causality test on time series data from 1990 to 2020, to identify a unidirectional causal relationship from employment to carbon emissions, highlighting the critical role of labor market dynamics in environmental outcomes. Our results underscore those green economic strategies can contribute to job creation, social equity, and the development of innovative ecological sectors, thereby fostering long-term improvements in quality of life. These insights support the formulation of integrated policies that align environmental sustainability with socio-economic goals. Therefore, we advocate for increased investment in green technologies and cross-sectoral collaboration to facilitate Azerbaijan's transition to a low-carbon, inclusive economy. As global environmental concerns intensify, Azerbaijan's green transformation offers a model for other resource-dependent economies seeking to balance growth with ecological responsibility.

Keywords: Azerbaijan, Green economy, Social welfare, Impact, Opportunities, Innovation.

RESUMEN

La transición a una economía verde se ha convertido en un imperativo estratégico para el desarrollo sostenible, especialmente en países como la República de Azerbaiyán, donde la degradación ambiental y la dependencia económica de los combustibles fósiles plantean importantes desafíos. A pesar del discurso global sobre el desarrollo verde, el limitado análisis empírico se ha centrado en las implicaciones socioeconómicas de las políticas verdes en el

contexto azerbaiyano. Este estudio explora el potencial de las iniciativas de economía verde "como el despliegue de energías renovables, las tecnologías ecológicas y el uso eficiente de los recursos" para mejorar el bienestar social y la resiliencia económica. Se utiliza la prueba de causalidad de Toda-Yamamoto con datos de series temporales de 1990 a 2020 para identificar una relación causal unidireccional entre el empleo y las emisiones de carbono, destacando el papel crucial de la dinámica del mercado laboral en los resultados ambientales. Los resultados subrayan que las estrategias de economía verde pueden contribuir a la creación de empleo, la equidad social y el desarrollo de sectores ecológicos innovadores, impulsando así mejoras a largo plazo en la calidad de vida. Estos conocimientos respaldan la formulación de políticas integradas que alineen la sostenibilidad ambiental con los objetivos socioeconómicos. Por lo tanto, se aboga por una mayor inversión en tecnologías verdes y la colaboración intersectorial para facilitar la transición de Azerbaiyán hacia una economía inclusiva y baja en carbono. A medida que se intensifican las preocupaciones ambientales globales, la transformación verde de Azerbaiyán ofrece un modelo para otras economías dependientes de los recursos que buscan equilibrar el crecimiento con la responsabilidad ecológica.

Palabras clave: Azerbaiyán, Economía verde, Bienestar social, Impacto, Oportunidades, Innovación.

INTRODUCTION

A paradigm of economic growth known as the "green economy" is predicated on a conscientious approach to resource management. It seeks to strike a fair balance between the preservation of natural resources and economic expansion. This is sustainable development, and for many nations, including the nation, it continues to be the most essential long-term objective. However, the economy must be greened in order to do this. For many years, the nation's development, like that of the majority of nations worldwide, was primarily focused on generating economic expansion through the extensive and wasteful utilization of natural resources. It has been evident in recent years that economic expansion alone, without adequate consideration of social and environmental considerations, is a threat to current and future generations (İmanov, 2016).

The term "green economy" in Azerbaijan refers to an economy that considerably lowers environmental hazards, preserves and improves natural capital, uses resources effectively, and promotes conservation while also improving human well-being and social justice. Public and private efforts to lower carbon emissions and pollution, develop green jobs and a healthy environment that are accessible to both men and women, and increase the efficiency of energy, resource, and ecosystem services are what propel income and employment growth in a green economy.

"A 'green economy' must be founded on sustainable development in order to enhance people's quality of life," argues Juan Dusic, Regional Director of the United Nations Environment Programmer (UNEP). For instance, the "green economy" is defined by the OECD, UNEP, and other international organizations as the production and consumption of products and services that guarantee environmental safety as well as a concept (theory) that forecasts economic investments. It is clear from the perspectives of the above-mentioned organizations that there is no single definition that clearly defines what the green economy theory means and is universally accepted. When approaching the green economy conceptually, it can be expressed as a new economic theory or, in modern conditions, as an addition to classical economics, which consists of human and nature relations (Topal & Özer, 2014). In this regard, today, various ways are being sought in all countries of the world to ensure the development of a green economy, and economic experiments are being conducted. The "greening" of the economy and the solution of environmental problems have become global in nature all over the world and have now become one of the main topics of discussion in the scientific community and international organizations (Blesl et al., 2010).

From the general assessments we consulted from various approaches of international organizations and scientists, it is understood that the green economy is based on sustainable economic development, production and consumption of goods, which form the basis of the pillars of ecological and social development. The development of the green economy declares the health of people, their intellectuals, culture, in short, the health of the environment. In this regard, when we pay attention to the content of the concept of "green" economy and the process it refers to, the appropriate conclusion we come to is as follows: The "green" economy is an economic paradigm that envisages the economic use of the existing economy. But beyond that, we are determined to organize programs at the same level (Gasimli et al., 2022).

Green economy is an economic development model aimed at the efficient use of natural resources, the application of environmentally friendly technologies and environmental protection. For the Republic of Azerbaijan, the development of a green economy has significant potential in both the economic and social spheres. Protecting the environment is one of the core tenets of the green

economy. The foundation of this strategy is the expansion of renewable energy sources, the promotion of resource efficiency, and the reduction of environmental pollution (Ismail et al., 2021). This would improve Azerbaijan's energy security and contribute to environmental cleanliness. The green economy would create new areas of economic growth. In these areas, especially sectors such as renewable energy, green construction and environmentally friendly technologies develop, leading to the creation of new jobs. Also, the state's support for green investments will help attract foreign investment.

Given the above, the main objective of this paper is to analyze the potential of the green economy to improve socioeconomic well-being in the Republic of Azerbaijan, highlighting its capacity to generate employment, protect the environment, and promote sustainable development. To achieve this objective, qualitative methods of conceptual analysis and document review were employed, as well as an econometric approach based on the Toda-Yamamoto causality test, applied to time series between 1990 and 2020, to examine the relationship between employment, carbon emissions, and economic growth.

DEVELOPMENT

The development of a green economy is important in terms of reducing unemployment and increasing social welfare. For example, the creation of new jobs in the field of renewable energy, as well as the application of green technologies, will make it possible to adapt the labor market to new requirements. This will contribute to ensuring social equality and the development of local communities. Human health can also benefit from the preservation of the environment through the adoption of a green economy. Air and water purification, the application of environmental standards in agricultural and production processes will not only protect human health, but also increase the quality of life. The green economy is closely related to innovation and technological development. Progress in this area leads to the optimization of production processes and more efficient use of natural resources through the application of new technologies. Azerbaijan's investment in technological innovations creates conditions for the further development of the green economy.

The development of a green economy supports social equality and sustainable development. It also helps to improve living conditions in rural areas and strengthen local economies. At the same time, the application of renewable energy and green technologies can also have a positive impact on solving social problems (Jänicke, 2012). The development of a green economy in the Republic of Azerbaijan creates broad opportunities for increasing socio-economic well-being. This approach has a positive impact in many areas, from environmental protection to economic growth and job creation. By strengthening the state's strategies related to the green economy, attracting new investments and harmonizing social policies, it is possible to ensure the sustainable development of the country. This will also ensure that Azerbaijan contributes to environmental protection and sustainable development goals on an international scale.

Speaking about the necessary conditions for the implementation of the "Green Economy" in Azerbaijan, the UN representative said that the "Green Economy" is a means to improve the standard of living and its quality. "We are trying to ensure that this is formed as a long-term concept in Azerbaijan and that other states struggling with environmental problems take your country as an example and benefit from it. This is also a good opportunity for Azerbaijan's leadership in UNEP programs."

The green economic paradigm is a qualitatively new approach and combines the solution of the following 3 main problems (Creech et al., 2013):

a) life support.

b) support not only for the present generation, but also for future generations. At the same time, a fair distribution should be made between humans and other biological species.

c) Resources should be allocated in a timely and efficient manner, taking into account natural capital adequately.

The conclusion from the logic of the above question is that the most important issue characterizing the healthy lifestyle of humanity, and therefore of various societies, is to maintain a clean environment and the existence of robust ecosystems that ensure environmental protection. To attain a green economy, countries must adopt modern, scientifically grounded technologies, with a particular emphasis on renewable energy sources, where this need becomes even more evident. In this regard, more support should be given to scientific research on the green economy in order to achieve faster technology transfer. For example, "In New Zealand, the advancement of the green economy aims not only to safeguard the environment but also to promote sustainable development, with ongoing reforms focused on this goal" (Bell & Stellingwerf, 2012).

The modern ecological situation and new climatic conditions confront Azerbaijan with certain challenges in the long-term perspective in the policy of "green economy". One of the main goals of "Azerbaijan 2020: a look into the future" and "National Development Strategy Concept for 2014-2020" is to ensure environmentally sustainable

socio-economic development. In this regard, the decision of the President of the Republic of Azerbaijan, Ilham Aliyev to declare 2010 the "Year of the Environment" was determined in accordance with the principles of the "green" economy of the environmental policy in the country. In this regard, the green economy is a bridge connecting not only the level of macroeconomic indicators, but also man and nature, more precisely ecosystems and socio-economic phenomena. The green economy strengthens international relations by bringing countries and people closer together, and contributes to the development of economic and cultural ties.

The urgency of combating global warming and environmental degradation is becoming more and more evident. In order to adequately respond to these challenges that affect the fate of all humanity, international dialogue and cooperation are needed more than ever. This is one of the main goals of the Conference of the Parties (COP) to the UN Framework Convention on Climate Change. Azerbaijan, which will host the 29th Session of this Conference, is carrying out large-scale activities to provide an appropriate platform for international dialogue. COP29 will undoubtedly be the beginning of an important stage in terms of achieving global climate goals. Against this background, 14 major initiatives have been included in the COP29 agenda. The Climate Finance Action Fund, the Baku Initiative on Climate Finance, Investment and Trade, the COP Ceasefire Call, the Baku Global Climate Transparency Platform and other initiatives will pave the way for important innovations in the history of the COP. For this reason, there is a high level of interest in the initiatives put forward by Azerbaijan on an international scale.

COP29 is a platform that will demonstrate to the whole world that Azerbaijan, known for its rich hydrocarbon resources, is already transforming into a country of green economy and green technologies. This is also very important for presenting to the world a successful model created by Azerbaijan in terms of transition to a green economy. There are several other important reasons why Azerbaijan presents to the world its achievements in transition to a green economy. The point is that as concerns about climate change, environmental degradation and resource depletion increase around the world, the green economy is becoming more important. This is because such an economy promotes economic progress without harming ecosystems. At the heart of this transformation is the development of green technologies designed to reduce carbon emissions, save resources, and minimize the environmental impacts of production and consumption. The development of a green economy and green technologies reflects a fundamental change in the solution of the intertwined problems of environmental sustainability and economic well-being in societies.

In general, a green economy is an economic model that prioritizes sustainability and inclusion. According to the United Nations Environment Program, a green economy significantly reduces environmental risks and problems, while also significantly improving human well-being. This model differs from traditional economic systems that prioritize short-term profits and growth at the expense of long-term environmental sustainability. It promotes industries that reduce carbon emissions, protect biodiversity, and use energy and natural resources efficiently, and the creation of new jobs accordingly. For example, the transition to renewable energy not only helps reduce carbon emissions, but also creates new job opportunities in sectors such as wind, solar, and hydropower. A clear example of this can be seen in the case of Azerbaijan. The widespread adoption of this model is a priority for Azerbaijan, as it greatly supports the elimination of the negative consequences of climate change.

Green technologies, which are considered environmentally friendly, also aim to minimize the environmental impacts of human activities by increasing energy efficiency, reducing waste, and supporting the use of renewable resources. One of the most important sectors of such technology is renewable energy. The transformation of solar, wind, water and other renewable energy technologies into the main energy sources is a necessary condition today. Large-scale activities are being carried out in Azerbaijan in this direction, and successful work is being carried out with foreign partners. At the same time, significant achievements are being made in green energy production in Azerbaijan due to foreign investments. The most striking example of the above is the 230-megawatt Garadagh Solar Power Plant, which was commissioned on October 26 last year. Foreign investment in this plant, built by the United Arab Emirates company "Masdar", is worth 262 million US dollars. It is the first industrial-scale solar power plant implemented in our country with foreign investment. The plant produces 500 million kilowatt-hours of electricity annually, which means saving 110 million cubic meters of natural gas and reducing carbon emissions into the atmosphere by 200 thousand tons (Hao et al., 2021).

Large-scale activities are being carried out in our country to transform Karabakh, East Zangezur and Nakhchivan into green energy zones. In this direction, close cooperation is being carried out with foreign partners, including BP of Great Britain, ACWA Power of Saudi Arabia, and China Gezhouba Group Overseas Investment. By using natural resources such as sunlight, wind and water, renewable energy technologies eliminate dependence on

non-renewable sources and help reduce the effects of climate change. Another important area of development of green technologies is energy efficiency. Technologies that increase the efficiency of energy use in buildings, transport and industrial processes play an important role in reducing overall energy demand and emissions.

Among Asian countries, South Korea and China are in the lead in terms of the volume and usefulness of economic incentive packages aimed at "green" growth. In China, the campaign package for the development of "green" sectors amounts to only 3% of the Gross Domestic Product (GDP), and this amount is aimed at creating 1.8 million new jobs by 2020. China has decided to spend 3% of GDP by 2020 on the development of efficient lighting systems such as high-speed trains, wind and solar energy. For comparison, the US's spending on the "green" campaign amounts to 0.7% of the Gross Domestic Product, and the EU's spending is 0.7% of the GDP.

The important thing here is not to take into account the attitude of the state to the green economy of the US, Korea or China, but to compare the prospects of Azerbaijan as the first state to support the development of the green economy in the past Soviet space, with the states we have mentioned. For example, UNEP Regional Director Juan Dusik, along with the President of Azerbaijan, spoke at an event on the "green economy" organized by the Center for Strategic Studies (SAM) and spoke about the importance of the green economy, stating that "Azerbaijan, as a leading state in the region, will play an important role in the development of the 'green economy'."

The Azerbaijani economy, which is an integral part of the global world economy, should benefit from the "greening" mechanisms of the post-sector economy and achieve the "greening" of the development of the non-oil sector by using modern technologies. For example, at the conference titled "Greening the Economy is an Important Factor in Ensuring Sustainable Development", it was stated that "for the transition of European countries to a 'green' economy, various mechanisms such as environmental tax reforms, penalties for heavy pollution, 'green' incentives, grants and loans to reward environmental projects, and a preferential tariff called FIT (Feed-in) for the development of this sector, direct state spending and indirect support for the development of the 'Green' economy are being used in the United Kingdom. While Germany uses the environmental tax (Eco Tax) reform, Sweden is a world leader in terms of government incentives in the form of tax breaks and car insurance discounts." In the globalizing world, Azerbaijan's emergence as a leader in terms of meeting the growing energy demand with its rich hydrocarbon reserves, as well as its location at the intersection of strategic transport lines in this area (Huang & He, 2023).

The importance of the green economy in Azerbaijan–Turkey relations, particularly in cooperation with Turkey, provides new directions for the development of the green economy. Is it possible to create green economic zones within Turkey–Azerbaijan cooperation? What effects does the implementation of the green economy have on the development of tourism? Before addressing these questions, it should be noted that Azerbaijan, which draws attention due to its strategic position, energy resources, and dynamic development, has turned the South Caucasus into one of the regions that garner global interest in world politics. However, it should be noted with regret that the occupation of 20% of Azerbaijani lands by Armenia has resulted in part of the region being excluded from the green corridor policy. The Turkish state has always supported Azerbaijan's legitimate demands since the early days of the Nagorno-Karabakh conflict and has consistently sought to eliminate the ecological crisis in the region by demanding Armenia's immediate and unconditional withdrawal from the occupied historical Azerbaijani lands.

Moreover, the rapid construction of TANAP (Trans-Anatolian Natural Gas Pipeline), which connects Azerbaijan, Georgia, and Turkey with all of Eurasia, represents a historic achievement that positively impacts the green economy in the region and can be regarded as a new and innovative project. TANAP and TAP are rare and valuable initiatives for Azerbaijan, and they play an important role in the green economy not only of the two brotherly states but also of the broader region. The development of a green economy, alongside other contributing factors, should serve the protection and preservation of the environment, which is crucial for safeguarding public health. The protection and enhancement of the human environment is one of the key conditions influencing people's well-being and the development of ecotourism.

In this context, the unique natural environments of Turkey and Azerbaijan offer wide-ranging opportunities for the establishment of green economic zones. The natural rapprochement between the two states, based on the unity of historical and ethnic roots and the alignment of efforts around common interests, has created opportunities to overcome both existing and potential challenges in the modern globalized world and to build a future on solid foundations. Furthermore, the acceptance of utility as the main criterion in mutual relations within the new world order is one of the primary goals that the political agendas of both states aim to achieve.

For example, "In 2034, it is estimated that 7.8 million passengers and 21.5 million tons of cargo will be transported by rail. The European corridor will become a reliable option." In this regard, issues such as the search for new forms of cooperation in the field of tourism, the participation of regional actors in enhancing tourism opportunities, and the consideration of tourism prospects in the context of green economy development are highly relevant today (Tüysüz & Öncel, 2022).

In order to conserve the environment and ensure sustainable growth based on current natural resources and knowledge, it is imperative to establish a "green" economy. According to experts, the creation of green economic zones is one of the most effective ways to attract tourists to the country. Therefore, improving Azerbaijan–Turkey relations in every aspect and ensuring the establishment of green economic zones is very important for the region, not only economically but also politically.

Because of global developments, particularly those concerning security, the development of tourism has become inevitable and brings these countries closer together both culturally and economically.

Current situation in Azerbaijan: Context of green policy in Azerbaijan

Azerbaijan's environmental policy has developed over the years, beginning in the former Soviet Union era and focusing more on national characteristics during the years of independence. These developments include the adoption of various state programs and laws, improved governance, the expansion of national park networks, enhancements in the population's water supply, and measures to combat environmental pollution. Although there is no specific document formally declaring a national environmental policy, the state's stance is reflected in several documents, including the national development policy. In the final decision of the third meeting of the European Council of Ministers of Environment and Health, held within the framework of the "Green Week" project, it was stated that "Azerbaijan is the first country in Eastern Europe to undertake and complete the study of the 'green economy'" (Gasimli et al., 2022).

As is well known, environmental degradation is a global concern, but it disproportionately affects the poor for clear and compelling reasons. Vulnerable populations often occupy precarious positions, limiting their ability to respond effectively when environmental crises arise—be it local pollution or the more widespread threat of rising sea levels. In this regard, inequality must be a central consideration in the formulation of environmental policies. Policies designed to reduce pollution levels can influence firm behavior by altering factor demands, which in turn affect key factor prices such as wages and interest rates. In a general equilibrium setting, these changes in factor prices have broader implications for income distribution. When productive factors are unequally distributed across society, such effects may result in varying preferences regarding the level of taxation on pollution.

Numerous studies have investigated the distributional consequences of environmental policies. Most of this research employs a partial equilibrium framework, focusing on the expenditure side—specifically, how environmental policies impact commodity prices. The prevailing conclusion is that pollution taxes tend to be regressive, as they raise the prices of polluting goods, which comprise a larger share of expenditures for lower-income households. However, a growing body of literature has begun to employ a general equilibrium approach, thereby incorporating the income side as well. This approach aligns more closely with the analytical framework presented here. For example, studies such as Huang & He (2023) explore the incidence of environmental taxation within a general equilibrium framework, emphasizing the significance of substitution elasticities between polluting and clean goods in both production and consumption. Their findings highlight how pollution taxes influence not only product prices but also factor prices, thereby shaping income distribution across society.

Consequently, in the context of empirical analysis, the Toda-Yamamoto causality test retains all time series variables regardless of their stationarity. In the first stage of this test, the optimal lag length (k) is determined using a Vector Autoregressive (VAR) model. In the second stage, the lag length corresponding to the maximum order of integration (dmax) is added to k. The resulting augmented VAR model is then used to conduct the causality analysis. The specific model structure for the Toda-Yamamoto causality test is provided below:

$$Y_t = \delta_0 + \sum_{i=1}^{k+d_{\max}} \alpha_{1i} Y_{t-i} + \sum_{i=1}^{k+d_{\max}} \beta_{1i} X_{t-i} + \varepsilon_{1t} \quad (1)$$

$$X_t = \delta_0 + \sum_{i=1}^{k+d_{\max}} \alpha_{2i} Y_{t-i} + \sum_{i=1}^{k+d_{\max}} \beta_{2i} X_{t-i} + \varepsilon_{2t} \quad (2)$$

In this paradigm, the greatest integration degree $d_{\max}$ is added to the lag length k to create VAR $[k + d_{\max}]$. The following are the assumptions for equation (1):

Hypothesis 0: Y and X are not causally related. H1: Y and X have a causal link.

The following are the assumptions for equation (2):

Hypothesis 0: Y and X are not causally related. H1: Y and X have a causal link.

The given hypotheses are tested using the adjusted WALD test statistic.

The results obtained from the unit root tests, which represent the first step of the analysis and are performed to determine the stationarity of the series, are given in Table 1. The findings of the Augmented Dickey-Fuller and Phillips-Perron Unit Root Tests show that the GDP and I (0) variables are stationary at the first difference, whereas the CO2 variable is stationary at level.

Table 1: Extended Dickey Fuller and Phillips-Perron unit root test results.

		ADF		PP	
Variables		Level	The First Difference	Level	The First Difference
LGSYH	Fixed	0,104	-5,423*	0,2628	-5,612*
	Fixed and Trend	-2,490	-5,331*	-2,528	-5,866*
CO2	Fixed	-0,842	-6,005*	-0,772	-8,438*
	Fixed and Trend	-3,327***	-5,917*	-3,176	-8,312*
IO	Fixed	-1,873	-3,910*	-1,653	-3,910*
	Fixed and Trend	-1,840	-3,853**	-1,590	- 3,862**

Source: own elaboration.

Before proceeding with the Toda-Yamamoto test, the optimal lag lengths must be determined and the VAR model must be created (Table 2 and 3). The appropriate lag lengths for the VAR model were determined using the Akaike Information Criterion (AIC) and the Schwarz Information Criterion (SC).

Table 2. VAR lag lengths.

VAR	Lag	LogL	LR	FPE	AIC	SC	HQ
LGSYH	0	83.6824	NA 133.8814*	4.05E-07	-6.206334	-6.061169	-6.164532
CO2 IO	1	162.794	13.40915	1.85e09*	-11.59955	- 11.01889*	- 11.43234*
	2	171.969	8.554957	1.89E+09	-11.61298	-10.59683	-11.32037
	3	178.92	8.098529	2.41E+09	-11.45536	-10.00371	-11.03734
	4	187.018	11.80124	3.06E+09	-11.38602	-9.498872	-10.84259
	5	202.36		2.58E+09	- 11.87383*	-9.551194	-11.205

Source: own elaboration.

Table 3. Results of the autocorrelation LM test.

VAR	Delay length	LM Statistical values	Opportunities
LGSYH-CO2- IO	1	7,064,518	0,6323
	2	1,148,247	0,8776
	3	2,002,976	0,8501
	4	4,939,612	0,1274
	5	5,193,265	0,4723

Source: own elaboration.

The normality test performed in the next step of the analysis is the Jargua-Bera normal distribution test, which is used to test the hypothesis H1 = not normally distributed against the hypothesis H0 = normally distributed. The H0 hypothesis is rejected and it is said that the error terms do not exhibit a normal distribution if the Jargua-Bera test findings are less than 0.05. The series is said to exhibit a typical distribution if its probability values are higher than 0.5. This outcome leads to the rejection of hypothesis 1. Details about the normalcy test are given in Table 4 below.

Table 4. Results of the normality test.

VAR	Jarqua-Bera	Df	Opportunities
LGSYH- CO2 - IO	8.542511	6	0.2010

Source: own elaboration.

The heteroscedasticity test is used to determine whether the error terms are constant. If the error terms are above 0.05, it is said that the VAR model does not have a heteroscedasticity problem. Table 5 shows the result that the error terms are not heteroscedastic.

Table 5. Results of the heteroscedasticity test.

VAR	Ki-Kare-Test	Degree	Opportunities
LGSYH- CO2 - IO	80.50553	72	0.2303

Source: own elaboration.

The analysis conducted in the study was conducted within the framework of the Toda-Yamamoto causality analysis steps. Aiming to determine the existence and direction of the causal relationship between the variables CO2, GDP and I(0), this analysis identified a one-way causal relationship from employment to carbon emissions. No causal relationship was found between the other variables. Table 6 provides information on the results of the Toda-Yamamoto causality test.

Table 6. Results of the Toda-Yamamoto causality test.

Direction of communication	Ki-kare	Opportunities	Toda Yamamoto
CO2→LGSYH IO →LGSYH LGSYH → CO2 IO → CO2 LGSYH → IO CO2→ IO	0,589898	0,4425	YOK YOK YOK VAR YOK YOK
	2,253,729	0,1333	
	1,000,042	0,3173	
	4,098,465	0,0429	
	0,100640	0,7511	
	0,119522	0,7296	

Source: own elaboration.

When the analysis results are compared with the literature, it is evident that similar outcomes are observed regarding the relationship between carbon emissions and economic growth (Justice et al., 2024; Saidi & Omri, 2020). The most original aspect of these findings, compared to the literature, is that the green economy and employment variables are examined together within the considered year range. According to some researches, there is a causal association between the non-renewable energy variable and the employment variable. Coal, oil, and natural gas are examples of non-renewable energy sources that harm the environment and increase carbon emissions. Thus, the causal link between the employment rate and carbon emissions in our study is comparable to the causative relationship between the employment rate and non-renewable energy sources. The green economy seeks to green the economy inclusively and create good jobs for society by structuring the interaction between the economy and the environment through a just transition.

This concept, which aims to use natural resources sustainably, reduce waste, increase national welfare, ensure energy efficiency, and establish social justice through a just transformation, is critically important to the current energy system. The main criticism is that the current energy system is not sustainable and will pose many environmental challenges in the future. Therefore, ensuring a just energy transition is expected to create a balance between costs and benefits and to be sustainable in the long term (Tiryakioğlu, 2021). This study examined data for Azerbaijan from 1990 to 2020 in order to investigate the link between the concepts of the green economy and employment. It was determined that there is a one-way causal link between the employment level and carbon emissions based on the Toda-Yamamoto causality test within the scope of econometric analysis. The results highlight the industrial sector, which currently accounts for a significant portion of Azerbaijan's expanding employment distribution.

CONCLUSIONS

Azerbaijan's greenhouse gas emissions, especially carbon emissions, are at a very high level. There are many reasons for this high level of emissions, primarily fossil fuel consumption. In Azerbaijan's growing industrial structure, energy-intensive sectors, in particular, have a significant share in employment. In this context, the expansion of green employment to the renewable energy sector, recycling, agriculture, forestry, transport, and construction sectors will lead to an increase in environmentally friendly and high-quality green jobs in the labor market. The concept of green transformation emphasizes responsibility toward nature in both production and consumption. This transformative movement aims to achieve the outcomes of economic activities in an environmentally friendly manner. Within the framework of the green transformation, important steps include accelerating the transition from fossil fuel consumption to renewable energy, ensuring eco-efficiency, promoting innovative clean production, establishing fair structures during the transition, prioritizing the circular economy, and implementing digital transformation. When a successful green transformation process takes place, energy supply will be derived from renewable sources, industrial waste will be reduced, materials will be designed to be recyclable, energy costs will decrease, efficiency will improve, and companies, governments, and society as a whole will gain awareness of green transformation.

Nowadays, opportunities for the growth of Azerbaijan's green economy are abundant. In this sense, the creation of green economic zones could address several issues impeding the development of the travel industry. In addition to encouraging the production of eco-friendly goods in every country, the expansion of the green economy also creates new opportunities for the travel and tourism industry. Increasing the production of eco-friendly items in Azerbaijan would not only boost tourism interest in the region but also stimulate regional development. Moreover, the friendship and strategic partnership between Azerbaijan and Turkey will benefit overall cultural integration in the South Caucasus and influence the creation of a green corridor.

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