QUALITY OF LIFE AND ENVIRONMENT SUSTAINABILTY-YES OR NO?

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ABSTRACT

Quality of life and preserved eco-systems are important characteristics of sustainability and well-being. The aim of the paper is to analyze the relationship between the Legatum Prosperity Index, as the measure of quality of life and Environmental Performance Index, as a measure of the multidimensional ecological achievement. The research has covered 27 EU countries and applied statistical methods: simple linear correlation and cluster analysis. In this regard, the analysis showed the existence of a statistically significant relationship between these two composite indices. In other words, economically developed countries in which the quality of life is at a high level have better environmental performance, and vice versa.

Introduction

The issue of quality of life represents a multidimensional and complex question with both objective and subjective dimensions, and it can be measured at the individual or societal level on a global scale (Milivojević et al., 2015). Therefore, understanding the determinants, measurement techniques, and strategies for improving quality of life is crucial for promoting holistic well-being and social progress (Costanza et al., 2007). The most important fact about quality of life indicators is that they measure and reflect the true state of the matters we assess (Cobb, 2000). Accordingly, the measurement and evaluation of quality of life are essential for understanding the well-being of individuals and society.

Numerous instruments have been developed to measure and describe quality of life, and one of the more recent and comprehensive measures is the Legatum Prosperity

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Index. This index includes not only economic indicators but also social, institutional, and environmental indicators, thereby combining measures of subjective well-being and economic indicators. It represents a useful tool that contributes identifying the steps necessary to reduce poverty and achieve a better standard of living (Legatum Institute, 2014).

The environment represents a very important determinant of quality of life and has a profound impact on the well-being of individuals and society as a whole, affecting various aspects of life (Van Kamp et al., 2003). The combined effects of rapid population growth, urbanization, technological advancement, industrialization, and limited awareness of the finite nature of natural resources make environmental preservation a challenging goal (Keles, 2012). In a situation where the planet is facing the increasingly prevalent problem of pollution and the necessity of transitioning to more environmentally friendly energy sources, clean technologies become the main hope for building a sustainable future (Jefferson, 2006). In this regard, the Environmental Performance Index has been developed in practice. This indicator is used globally to measure the degree of environmental achievements and assess sustainability at the economic level.

The aim of this paper is to examine the degree and strength of the dependency between the Legatum Prosperity Index and the Environmental Performance Index. While the Legatum Prosperity Index emphasizes social and economic well-being, the Environmental Performance Index focuses on sustainability and environmental performance. However, both indexes are interconnected, as social well-being arises from environmental achievements, and neglecting one aspect can have negative effects on the other. In other words, both indices highlight the link between economic, social, and environmental spheres as important determinants of sustainable development. By jointly considering the Legatum Prosperity Index and the Environmental Performance Index, policymakers and researchers can gain a more comprehensive understanding of the multidimensional nature of social progress and work towards more sustainable and inclusive development strategies.

Legatum Prosperity Index

The use of composite indexes has gained significant popularity as a means of monitoring the advancement of economies on a national scale. One such index that has emerged is the Legatum Prosperity Index, a comprehensive and relatively new indicator that provides a distinct perspective on the level and fluctuations of prosperity in countries worldwide (Gligorić at al, 2018). This composite index offers valuable perspectives on different facets of societal well-being and the progress of economic development.

Khan et al., (2019) claim that Legatum Prosperity Index may be assumed as genuine indicator of prosperity because it covers broad prospects of life than GNI, GDP or *per capita* income frameworks. According to (Günay at al., 2021) Legatum Prosperity Index can be considered as a valid source of welfare assessment as it expresses dimensions that are fundamental to individual or national well-being.

As prosperity is a multidimensional concept that the Legatum Prosperity Index aims to measure, explore, and explain as comprehensively as possible, its analysis is conducted through the monitoring of three domains that form the foundations of economic well-being: inclusive societies, open economies, and empowered people. Each domain contains four pillars of prosperity, and key elements that best define each pillar have been identified. As a result, a set of 67 elements is created to reflect the quality achieved in various spheres. These indicators will provide policymakers with a detailed insight based on which they can take appropriate steps to achieve the desired level of quality of life. It is important to note that not all elements are equally important for the pillars of prosperity, and each element is assigned a weight that reflects its importance within the pillar. Additionally, each element of the Legatum Prosperity Index is defined by several indicators, and each indicator is assigned a weight expressed as one of the following four values: 0.5, 1.0, 1.5, and 2.0. The initial weight of each indicator is 1.0, and in accordance with its significance, the weight can be adjusted up or down.

To obtain the index score for each country, the average of the 12 pillars of prosperity is calculated, which can be represented by the following expression:

$$Prosp = \frac{1}{12}\sum_{j=1}^{12} P_j$$

where P_j represents the score of the i-th pillar of prosperity. Based on this formula, we can easily conclude that all pillars of prosperity are equally important for calculating the Legatum Prosperity Index, meaning that all pillars of prosperity have the same weight.

The Legatum Prosperity Index ranges from 0 to 100. Logically, the higher a country's index, the better its quality of life. In the literature, there is still no clear classification of countries according to the achieved values of the Legatum Prosperity Index, but each year a ranking list of countries is formed based on the results of this indicator.

Enviromental Performance Index

The Environmental Performance Index presents environmental achievements and ranks 180 economies in terms of three dimensions: climate change, ecosystem health and vitality. In this regard, the Environmental Performance Index is constructed using 40 different indicators that are grouped into 11 units. For example, air quality and the state of water resources are measured by the presence of PM particles, the concentration of NO_x, SO and CO_2, the degree of wastewater treatment, etc. Also, the efficiency of waste management is assessed by the recycling rate, while the prevalence of climate change is assessed through the intensity of GHG emissions.

According to (Szymczyk et al., 2021) the Environmental Performance Index has global significance in the context of creating green policies and decisions making to improve the environmental image. The environmental performance index provides insight into the progress, current achievements and lagging of specific economies in the implementation

of green policies (Zhang & Wu, 2021). The Environmental Performance Index detects priority areas for defining future steps and actions with the aim of achieving a green transition. This index can take values in the range of 0-100 (Zhang & Wu, 2021). Higher values of the Environmental Performance Index indicate better results.

According to (Jefferson, 2006), environmental protection is an important element of sustainable development. The Environmental Performance Index is closely related to the Sustainable Development Goals (Hsu & Zomer, 2014). Pimonenko et al. (2018) showed that countries with a better Environmental Performance Index score have a higher degree of achievement of sustainable development goals. In other words, more efficient environmental achievements imply a better level of sustainable social well-being. A preserved environment is not only an important feature of sustainability, but can be seen as a factor of economic growth. Various studies (Ave & Babolsar, 2010; Alam et al., 2013; Duasa et al., 2013; Tamim et al., 2016; Fakher et al., 2017) have shown that there is a positive correlation between the Environmental Performance Index and GDP growth or GDP *per capita* as a measure of the total economic activity of the economy. The aforementioned relationship is essentially „two-way street", because economies with a higher level of income will invest more in cleaner technologies and renewable energy sources, which will result in less ecosystem degradation and climate change mitigation.

The authors Chowdhury & Islam (2017) observed that there is no clear relationship between the Environmental Performance Index and the GDP growth rate in developing countries. The focus of the research was on BRICS[3] countries, where the only exception to the rule was precisely the economy of Russia.

Raza et al. (2021) went a step further in their analysis, showing that the quality of the environment measured by the Environmental Performance Index declines with greater trade liberalization, especially in developing economies. The distinction compared to developed countries arises as a result of low energy efficiency in production, suboptimal energy use, and significant GHG emissions. However, trade and export growth will stimulate economic growth, thereby creating conditions for better environmental performance and a reduced impact on the environment.

Materials and methods

Empirical research covers 27 member states of the European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Malta, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden. The aforementioned economies are characterized by different levels of quality of life satisfaction, as well as the state of the environment, so they are therefore relevant for examining the strength of the relationship between the selected determinants.

3 BRICS countries are: Brasil, Russia, India, China and South African Republic.

In this regard, the last available data are used in empirical analyses[4] Legatum index (2023. year) as an indicator of the overall quality of life and EPI index (2022. year) as aggregate measures of environmental performance of the economy. According to (Freudenberg, 2003), it is possible to use indicators belonging to different ages. The data were taken from the official databases of the mentioned indexes[5]. Both indicators have the same direction, in the sense that higher values indicate a higher quality of life and better ecological health of the economy.

The paper defines the premise of the research based on the idea that there is a statistically significant relationship between the Legatum Prosperity Index and the Environmental Performance Index. Understanding the correlation between quality of life and the environment is crucial for developing effective strategies to improve well-being and create sustainable communities. By addressing economic inequality, improving access to basic services, and implementing environmental initiatives, we can work towards enhancing the quality of life for the entire society (Portney, 2013).

Simple linear correlation analysis was conducted in the study in order to analyze the existence and strength of the relationship between the observed variables. Furthermore, the statistical significance of the obtained coefficient has been tested. Additionally, cluster analysis was performed, and an EPI-LPI[6] matrix was created. In the final stage of the research, the main conclusions of the study were defined based on the obtained values and graphical representation.

Correlation analysis

Simple correlation analysis is a fundamental statistical technique widely applied in various fields, involving the examination and quantification of the relationship between two variables, providing insights into how they interact with each other (Cohen et al., 2013). It is important to emphasize that simple correlation analysis does not imply causation, meaning that even if two variables are correlated, it does not necessarily mean that one variable causes the change in the other. Instead, correlation measures the degree to which changes in one variable are associated with changes in another (Schober et al., 2018).

The value of the correlation is measured by the correlation coefficient, which represents a numerical value indicating the degree of dependency between the observed variables. This indicator takes values in the range from -1 to 1. The closer absolute value to 1 indicates the stronger the mutual dependency of the observed phenomena (Vuković, 2013). In the case of a positive correlation, the observed phenomena move in the same direction, while in the case of a negative correlation, the phenomena are inversely proportional.

4 In the moment of collecting date (april, 2024) the last available date was from 2022 and 2023. year.

5 Source: https://epi.yale.edu/ [access: april, 2024] and https://www.prosperity.com/rankings [access: april, 2024]

6 EPI is abbreviation of Environmental Performance Index and LPI is abbreviation of Legatum Prosperity Index.

Cluster analysis

In the study, cluster analysis was also conducted to group EU member countries into homogeneous clusters, taking into account quality of life and environmental sustainability. The clustering of EU member countries was performed based on the aforementioned variables[7].

Cluster analysis can be defined as a statistical interdependence technique whose primary purpose is to group observed units based on the similarity or dissimilarity of pre-selected variables (Šoja et al., 2023). Groups are formed in such a way that the observed units within a group are similar to each other, aiming to minimize within-group variance and maximize between-group variance (Carvalho et al., 2019). The effective use of clustering algorithms depends heavily on the choice of an appropriate distance metric. The task of determining a suitable distance measure for a given dataset is indeed a challenging one (Kumar et al., 2014). The distance between observed units can be quantified using various measures that take into account all analyzed features. One of the most frequently utilized measures is the Euclidean distance (Elmore & Richman, 2001). In this paper, we use this measure obtained according to the following formula (Kovačić, 1994):

$$d_{rs} = \sqrt{\sum_{j=1}^{p} (x_{rj} - x_{sj})^2}$$

where x_{rj} and x_{sj} are values of indicator j for observed units r and s, respectively.

Once the convenient distance measure has been determined, the subsequent stage involves the selection of the grouping method. Numerous techniques have been developed for grouping units of observation, and they can be categorized into two distinct groups: hierarchical and non-hierarchical. Hierarchical methods are more often used in the literature, and most often Ward's method of connection (Šoja et al, 2020). Ward's connection method is built upon the intergroup sum of squares. This technique entails merging two groups into one if their combination results in the minimal increase in the sum of squares between groups, relative to the increase that would occur from merging any other pair of groups (Kovačić, 1994).

Results

A correlation coefficient value of 0.69 indicates a significant positive correlation between the observed indicators, and the significance testing of this value has shown that the correlation coefficient is statistically highly significant. The substantial positive

7 The value of the Legatum prosperity index is obtained as the arithmetic mean of 12 pillars of prosperity that measure the achieved quality in various spheres, and the value of the environmental performance index is obtained as the arithmetic mean of 3 pillars: climate change, health. and ecosystem vitality.

correlation between the Legatum Prosperity Index and the Environmental Performance Index suggests that economically wealthier countries and those with a high quality of life tend to prioritize environmental sustainability and allocate more resources for the preservation and protection of the environment.

Table 1. Correlations

		Legatum Prosperity Index	Enviromental Performance Index
Legatum Prosperity Index	Pearson Correlation	1	,690**
	Sig. (2-tailed)		<,001
	N	27	27
Enviromental Performance Index	Pearson Correlation	,690**	1
	Sig. (2-tailed)	<,001	
	N	27	27

** Correlation is significant at the 0.01 level (2-tailed).

Source: Authors' calculations

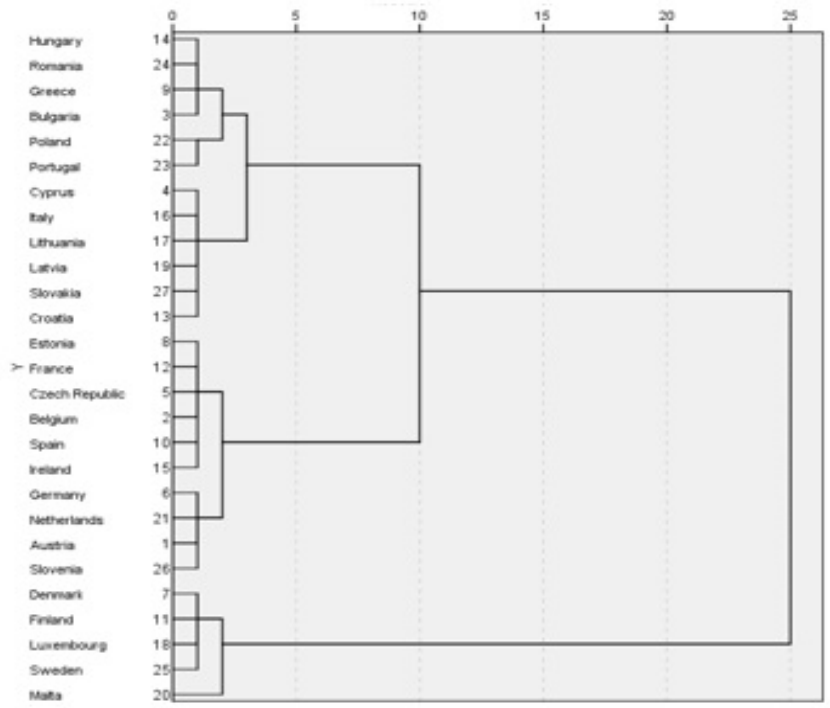
On the basis of the obtained results, the solution with four clusters was selected as the most appropriate. According to the Ward's linkage method, EU countires were grouped as follows in table 2.

Table 2. Distribution of EU countries by clusters

Cluster 1	**Cluster 2**	**Cluster 3**	**Cluster 4**
Hungary	Cyprus	Estonia	Denmark
Romania	Italy	France	Finland
Greece	Lithuania	Czech Republic	Luxembourg
Bulgaria	Latvia	Belgium	Sweden
Poland	Slovakia	Spain	Malta
Portugal	Croatia	Ireland	
		Germany	
		Netherlands	
		Austria	
		Slovenia	

Source: Authors' calculations

Figure 1. Dendrogram using Ward Linkage



Source: Authors' calculations

Discussions

Based on the results of the cluster analysis, we come to the conclusion that within the first cluster there are EU member states with the worst results in terms of satisfaction with the quality of life and achieved environmental performance. The common characteristic of this group of countries is the low level of well-being of the inhabitants, which is the result of the absence of efficient functioning of institutions, inadequate health care, non-transparent business conditions, as well as pronounced macroeconomic instability (especially Greece). Based on the value of the EPI index, the mentioned economy is characterized by unsystematic implementation of green policies, absence of appropriate infrastructure, conventional linear model of production, reliance on fossil fuels, as well as suboptimal forms of financing environmental projects. In other words, it is of great importance to realize the green transition, as well as to create innovations to encourage cleaner production, and to change consumption models in favor of a circular economy. More efficient enforcement of environmental laws and regulations focused on the use of alternative sources is necessary, as well as the internalization of negative externalities through the system of green taxes and thus less devastation of natural resources (Gavrić & Mitrović, 2019). Current achievements do not a priori represent bad performance, but can be seen as a development opportunity and a signal to policy makers for defining future steps.

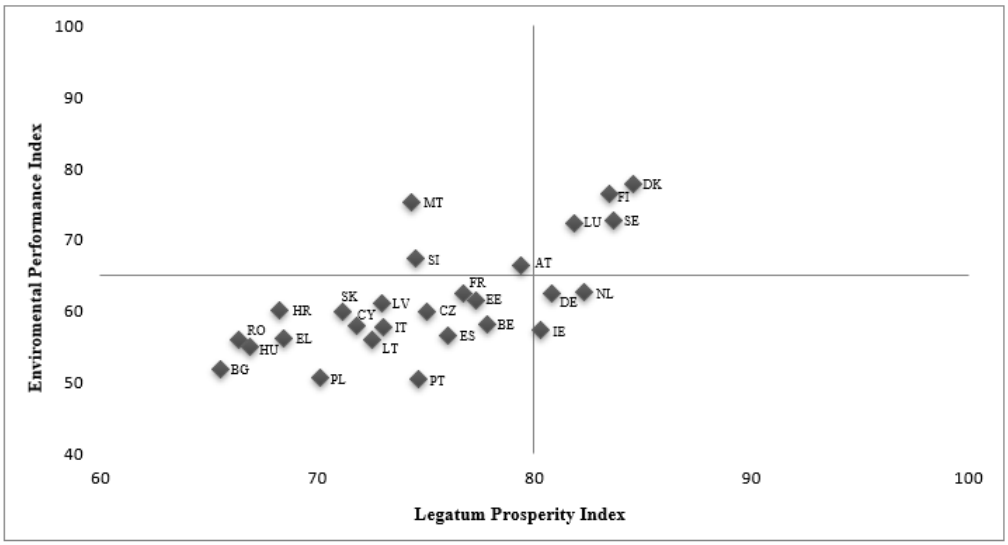
The population of EU member states classified within the fourth cluster is characterized by a high degree of satisfaction with the quality of life and very notable results in the field of environmental achievements. What these countries have in common are good living conditions, opportunities for education, the degree of personal freedom, as well as safety and security of life, which determine the well-being of citizens. In other words, freedom of speech and expression, great social tolerance, good quality of basic services and nutrition, availability of resources, absence of violence and educational institutions that function at a high level contributed to the high values of the Legatum Prosperity Index. This group of countries is also characterized by a high living standard, i.e. financial well-being (D'agostino, Rosciano & Sarita, 2020) and are leaders in the implementation of the Europe 2020 strategy, which aims at economic development based on knowledge, nature conservation, high productivity and social cohesion (Simonescu et al., 2019). On the other hand, the Northern European countries also excelled in environmental achievements. In particular, Denmark has the most fixed mitigation and management of climate change by reducing the carbon footprint and total GHG emissions by 50%. Also, Denmark invests in clean technologies, energy efficiency, uses the benefits of renewable energy sources and green transport models. Sweden and Finland have minimized large amounts of waste through the circular transition and the use of the total potential of recycling, while Luxembourg leads the way in terms of ecosystem health. For example, 46% of municipal waste in Sweden is used to generate new energy (EPI report, 2022). Bearing in mind the aforementioned facts, the conclusion is that countries with a higher degree of life satisfaction and social well-being also have better environmental efficiency.

The second cluster consists of Slovakia, two Baltic countries (Lithuania, Latvia) and three Mediterranean countries (Cyprus, Italy, Croatia). The common specificities of the mentioned cluster are reflected in the form of an efficient system of all levels of education, satisfactory living conditions and achieved general safety and security of citizens. On the other hand, there was room for improving the ecological image and overall green performance. An analysis of the eco-performance of each of the mentioned economies can point to specific weaknesses that can be seen as the backbone of future green strategies.

The third cluster includes the largest number of EU member states, and the common feature of the observed economies are the relatively high values of the Legatum Prosperity Index and the Environmental Performance Index. That indicates the population of the third cluster, is characterized by a relatively high standard of living, high trust in public institutions, satisfaction with safety conditions and security, as well as commitment in the area of circular economy. Countries like Germany, the Netherlands and Ireland have slightly higher values of the Legatum Prosperity Index compared to the values of the Environmental Performance Index, and this is a consequence of a strong industrial sector and GHG emissions. On the other hand, the higher values of the Environmental Performance Index in Austria and Slovenia are the result of the synergistic effect of adopted and applied environmental laws and action plans, institutional support, investments in renewable energy sources and infrastructure for using their potential. Also, Slovenia has made the most progress in the area of circular economy and green innovations.

In order to provide a more detailed insight into the achieved values of the Legatum Prosperity Index and the Environmental Performance Index by EU member states, we designed a scatter plot (Figure 2) which is one of the most powerful and most widely used techniques for visual data exploration. By visually representing data points on a two-dimensional graph, a scatter plot helps researchers identify patterns, trends, and various deviations among observed countries.

Figure 1. Scatter plot



Source: Authors' own work

In Figure 2, the countries are graphically represented based on two criteria - the values of the Legatum Prosperity Index (x axis) and the Environmental Performance Index (y axis).

When naming the countries, official abbreviations were used[8]. The lowest value of the Legatum Prosperity Index is 65.55 and the highest is 84.55, while the Environmental Performance Index achieved values in the interval of 50.40-77.90. The diagram is divided into 4 squares for easier observation of the relationship between the observed variables.

Conclusions

Satisfaction with the quality of life, as well as the level of ecological achievements, are very important topics, especially in developed economies. In general, the complexity of both terms requires a multidisciplinary research approach. Consequently, in the research were used two composite indexes: Legatum Prosperity Index as a measure

8 Austria-AT, Belgium-BE, Bulgaria-BG, Cyprus-CY, Czech Republic-CZ, Croatia-HR, Germany-DE, Denmark-DK, Estonia-EE, Greece-EL, Finland-FI, France-FR, Hungary-HU, Ireland-IE, Italy-IT, Lithuania-LT, Luxembourg-LU, Latvia-LV, Malta-MT, Netherlands-NL, Poland-PL, Portugal-PT, Romania-RO, Slovenia-SI, Slovakia-SK, Spain-ES, Sweden-SE.

of quality of life and Environmental performance index as a comprehensive indicator of environmental condition and performance. Empirical research covers 27 member countries of the European Union, for which are specific different levels of realization of the selected determinants.

Within the research, it was proven that there is a very significant degree of dependence between the Legatum Prosperity Index and the Environmental Performance Index, which indicates that countries with a higher level of income have a more pronounced satisfaction with the quality of life, as well as better achievements in the field of the environment, and the reverse is also true. In other words, economies with a higher standard of living are characterized by excellent conditions in the context of education and health care, a transparent and stimulating environment for investments and business operations, efficient institutions, as well as a high degree of personal freedom and general safety and security. Also, these economies effectively manage resources and challenges caused by climate change, use the benefits of clean technologies and alternative energy sources, and implement green innovations.

Furthermore, a cluster analysis was conducted based on the values of the Legatum Prosperity Index and the Environmental Performance Index, and as a result were obtained four homogeneous units (clusters) and certain similarities among the EU member states were observed.

The analysis of the work pointed to a group of economies characterized by devastation of the ecosystem, as well as a low level of social well-being: Hungary, Romania, Greece, Bulgaria, Poland and Portugal. The common feature of the separated countries that belong to the first cluster is reflected in: unfavorable living conditions of citizens, macroeconomic instability, unsystematic implementation of environmental policies, pollution and the dominant application of the conventional linear model of production. The actual situation does not mean a priori bad performance, but can be seen as a backbone for defining future development strategies and activities.

The fourth cluster includes the Scandinavian countries (Denmark, Finland, Sweden) as well as Luxembourg and Malta, which are characterized by the best results of the observed indicators. In addition to being leaders in the implementation of the Europe 2020 strategy, these economies are characterized by financial well-being, high productivity, nature conservation, economic development based on knowledge and social cohesion. Furthermore, the countries of the fourth cluster have achieved significant results in the context of the green transition seen through the reduction of total emissions and carbon footprint, the effective application of green taxes and the principle of lung pollutants, as well as the use of the potential of the circular economy, eco-friendly products and green technologies.

The broad framework and multidimensionality of the Legatum Prosperity Index and Environmental Performance Index can be useful for economic policy makers to define steps with an emphasis on inclusiveness, sustainability and well-being.

Conflict of interests

The authors declare no conflict of interest.

References

1. Alam, M. S., & Kabir, N. (2013). Economic growth and environmental sustainability: empirical evidence from East and South-East Asia. *International Journal of Economics and Finance, 5*(2). doi: 10.5539/ijef.v5n2p86
2. Ave, P., & Babolsar, I. (2010). Environmental Performance Index and economic growth: evidence from some developing countries. *Australian Journal of Basic and Applied Sciences, 4*(8), 3098-3102.
3. Carvalho, P. R., Munita, C. S., & Lapolli, A. L. (2019). Validity studies among hierarchical methods of cluster analysis using cophenetic correlation coefficient. *Brazilian Journal of Radiation Sciences, 7*(2A). doi: 10.15392/bjrs.v7i2A.668
4. Chowdhury, T., & Islam, S. (2017). Environmental Performance Index and GDP growth rate: evidence from BRICS countries. *Environmental Economics, 8*(4), 31-36. doi: 10.21511/ee.08(4).2017.04
5. Cobb, C. W. (2000). Measurement tools and the quality of life. *Redefining Progress*. San Francisco: www.rprogress.org/pubs/pdf/measure_qol.pdf
6. Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2013). *Applied multiple regression/correlation analysis for the behavioral sciences (3rd ed.)*. Routledge.
7. Costanza, R., Fisher, B., Ali, S., Beer, C., Bond, L., Boumans, R., ... & Snapp, R. (2007). Quality of life: An approach integrating opportunities, human needs, and subjective well-being. *Ecological Economics, 61*(2-3), 267-276. https://doi.org/10.1016/j.ecolecon.2006.02.023
8. D'Agostino, A., Rosciano, M., & Starita, M. G. (2020). Measuring financial well-being in Europe using a fuzzy set approach. *International Journal of Bank Marketing*. https://doi.org/10.1108/IJBM-03-2020-0114
9. Dimoska, T., & Dimoska, S. (2019). Prosperity Index as a measure of quality of life in Macedonia. *Knowledge - International Journal Scientific Papers, 30*(6), 1557-1563. doi: 10.35120/kij30061557D
10. Duasa, J., & Afroz, R. (2013). Modeling environmental performance and economic development. *International Journal of Trade, Economics and Finance, 4*(6), 384-387. http://dx.doi.org/10.7763/IJTEF.2013.V4.322
11. Elmore, K. L., & Richman, M. B. (2001). Euclidean distance as a similarity metric for principal component analysis. *Monthly Weather Review, 129*(3), 540-549. doi: 10.1175/1520-0493(2001)129<0540:EDAASM>2.0.CO;2
12. Fakher, H. A., & Abedi, Z. (2017). Relationship between environmental quality and economic growth in developing countries (based on environmental performance index). *Environmental Energy and Economic Research, 1*(3), 299-310. https://doi.org/10.22097/eeer.2017.86464.1001

13. Freudenberg, M. (2003). Composite Indicators of Country Performance: A Critical Assessment. *OECD Science, Technology and Industry Working Papers, 2003/16*. OECD Publishing. https://doi.org/10.1787/18151965
14. Gavrić, O., & Mitrović, D. (2019). Development of Green Economy and Competitiveness of EU countries: Macro-level empirical analysis. *Ekonomika preduzeća, 67*(7-8), 415-425. http://dx.doi.org/10.5937/EKOPRE1908415G
15. Gligorić, M., Gavrilović, B. J., & Savić, L. (2018). Prosperity index as a measure of wellbeing in European Union ans Wester Balkan countries. Teme: *Casopis Za Društvene Nauke*, *12*(4), 1253-1275.
16. Günay, E. K., & Sülün, D. (2021). The evaluation of the impact of social capital on economic development within the framework of the Legatum prosperity Index: The case of OECD countries. *Elektronik Sosyal Bilimler Dergisi*, *20*(80), 1982-1996.
17. Hsieh, C. T., & Liu, B. C. (1983). The Pursuance of Better Quality of Life: In the Long Run, Better Quality of Social Life Is the Most Important Factor in Migration. *American Journal of Economics and Sociology, 42*(4), 431-440. https://doi.org/10.1111/j.1536-7150.1983.tb01730.x
18. Hsu, A., & Zomer, A. (2014). Environmental performance index. *Wiley StatsRef: Statistics Reference Online*, 1-5.
19. Index, L. P. (2015). Legatum Prosperity Index 2014
20. Jefferson, M. (2006). Sustainable energy development: performance and prospects. *Renewable Energy, 31*(5), 571-582. https://doi.org/10.1016/j.renene.2005.09.002
21. Joković, S., Pavlović, J., Hadživuković, N., Đević, R., & Vilotić, S. (2017). Methods of Examination and Indicators of Quality of Life. *Biomedical Research, 8*(1), 90-94. http://dx.doi.org/10.7251/BII1701090J
22. Keles, R. (2012). The quality of life and the environment. *Procedia-Social and Behavioral Sciences, 35*, 23-32. https://doi.org/10.1016/j.sbspro.2012.02.059
23. Khan, A. J., & Ahmad, H. R. (2019). Prosperity and instability: an evaluation of legatum prosperity index. In *Papers and Proceedings,* 407-431.
24. Kovačić, Z. (1994). Multivariate Analysis. Faculty of Economics, University of Belgrade, Belgrade, Serbia.
25. Kumar, V., Chhabra, J.K., & Kumar, D. (2014). Impact of Distance Measures on the Performance of Clustering Algorithms. In: Mohapatra, D.P., Patnaik, S. (eds) Intelligent Computing, Networking, and Informatics. Advances in Intelligent Systems and Computing, vol 243. Springer, New Delhi. https://doi.org/10.1007/978-81-322-1665-0_17
26. Milivojević, J., Đorđević, A., & Stojanović, S. (2015). Functional relationship between quality of life and value systems. In *Proceedings of the 42nd National Conference on Quality of Life*.

27. Møller, V. (1996). Life satisfaction and expectations for the future in a sample of university students: A research note. *South African Journal of Sociology, 27*(1), 16-26. http://dx.doi.org/10.1080/02580144.1996.10430699

28. Pimonenko, T., Lyulyov, O., Chygryn, O., & Palienko, M. (2018). Environmental Performance Index: relation between social and economic welfare of the countries. *Environmental Economics, 9*(3), 1-11. http://dx.doi.org/10.21511/ee.09(3).2018.01

29. Portney, K. E. (2013). *Taking sustainable cities seriously: Economic development, the environment, and quality of life in American cities*. MIT Press. Cambridge, MA.

30. Raza, A., Sui, H., Jermsittiparsert, K., Żukiewicz-Sobczak, W., & Sobczak, P. (2021). Trade Liberalization and Environmental Performance Index: Mediation Role of Climate Change Performance and Greenfield Investment. *Sustainability, 13*(17), 9734. http://dx.doi.org/10.3390/su13179734

31. Schober, P., Boer, C., & Schwarte, L. A. (2018). Correlation Coefficients: Appropriate Use and Interpretation. *Anesthesia & Analgesia, 126*(5), 1763-1768. https://doi.org/10.1213/ane.0000000000002864

32. Simionescu, M., Bilan, Y., Krajňáková, E., Streimikiene, D., & Gędek, S. (2019). Renewable Energy in the Electricity Sector and GDP per Capita in the European Union. *Energies, 12*(13), 2520. http://dx.doi.org/10.3390/en12132520

33. Szymczyk, K., Şahin, D., Bağcı, H., & Kaygın, C. Y. (2021). The Effect of Energy Usage, Economic Growth, and Financial Development on CO2 Emission Management: An Analysis of OECD Countries with a High Environmental Performance Index. *Energies, 14*(15), 4671. http://dx.doi.org/10.3390/en14154671

34. Tamim, R., & Sheesh, S. K. (2016). Environmental Performance and Economic Growth: Evidences from Selected South Asian Countries. In *1st AISD International Multidisciplinary Conference*.

35. Van Kamp, I., Leidelmeijer, K., Marsman, G., & De Hollander, A. (2003). Urban environmental quality and human well-being: Towards a conceptual framework and demarcation of concepts; a literature study. *Landscape and Urban Planning, 65*(1-2), 5-18. https://doi.org/10.1016/S0169-2046(02)00232-3

36. Vuković, D. B. (2013). Correlation analysis of indicators of regional competitiveness: The case of the Republic of Serbia. *Ekonomski Horizonti, 15*(3), 197-211. http://dx.doi.org/10.5937/ekonhor1303197V

37. Zhang, Y., & Wu, Z. (2021). Environmental performance and human development for sustainability: Towards a new environmental human index. Science of the Total Environment, 812, 151345. https://doi.org/10.1016/j.scitotenv.2022.156491

38. Šoja, S. J., Pavlović, N., & Ristić, N. (2023). Analysis of the quality of life in rural areas of the Republic of Serbia measured by the availability of public services. *Agribusiness, Food and Rural Areas: Perspectives and Challenges of Agenda 4.0*, 32, 88.

39. Šoja, S. J., Ristić, N., & Pavlović, N. (2020). Agri-environmental indicators as a tool for classifying European Union member countries. P*roceedings of the XI International Scientific Agricultural Symposium* "*Agrosym 2020",* 941-949.

Internet sources:

40. https://sedac.ciesin.columbia.edu/data/collection/epi/sets/browse [accessed: april 15th, 2024]
41. https://epi.yale.edu [access: april 29th, 2024]
42. https://www.prosperity.com/rankings [access: April 29th, 2024]