

Environmental Welfare: Quality of Policy vs. Society's Values

Środowiskowy dobrostan: jakość polityki a wartości społeczne

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Abstract

In the 21st century, in addition to the generally well-known indicators of material well-being, in the modern paradigm of the welfare state, the quality of the ecological environment is gaining an ever-increasing role. In the context of interdisciplinary research, the formation of the ecological consciousness as a way of being is important for today, in which citizens feel a direct connection with the natural environment, trying to preserve it for prosperity people. Studies of the connection between economic and environmental development are often confined to financial-economic interactions, leaving out the attention of the educational and scientific components of the problem. The article is devoted to the study of the ecological component of the social welfare, as well as the analysis of the impact of quantitative and qualitative indicators (governance quality, development of democracy, GDP per capita, value orientations) on the Environmental Performance Index as a comprehensive indicator of environmental welfare assessment. The hypothesis is that along with effectiveness indicators of the state policy (quality of governance, democracy index), the demand for the public good for the *environmental quality* is determined by the ability to invest in the environment (GDP per person) and the dominance of the self-realization values over the survival values. Using economic and mathematical modeling it is proved that the indicators of governance quality and the level of development of democracy play a key role in shaping the ecological component of well-being, while the level of GDP per person and values is influenced with less intensity. It is substantiated that public policy should be aimed directly at improving governance efficiency and the development of democracy and civil society.

Key words: environment, welfare, ecological policy, values, institutes

Streszczenie

W XXI wieku, oprócz powszechnie znanych wskaźników materialnego dobrobytu, w nowoczesnym modelu państwa socjalnego, coraz większą rolę odgrywa jakość środowiska naturalnego. W kontekście badań interdyscyplinarnych na dzień dzisiejszy ważne jest kształtowanie świadomości ekologicznej, jako sposobu bycia, w którym obywatele odczuwają bezpośredni związek ze środowiskiem, starając się zachować je dla dobrobytu ludzi. Badania związków między ekonomicznym i ekologicznym rozwojem często są zawężone do ekonomicznych interakcji, z pominięciem kwestii edukacyjnych i naukowych. Artykuł jest poświęcony ekologicznemu komponentowi zabezpieczenia społecznego, a także analizie wpływu ilościowych i jakościowych wskaźników (jakość zarządzania, rozwój demokracji, PKB na mieszkańca, wartości orientacji) na Indeks Wydajności Środowiskowej (Environmental Performance Index), jako kompleksowego wskaźnika oceny jakości środowiska. Założona hipoteza zakłada, że wraz ze wskaźnikami skuteczności polityki publicznej (jakość zarządzania, indeks demokracji) o popycie na dobro publiczne *jakość środowiska* decyduje zdolność do inwestowania w środowisko (PKB na osobę) i przewaga wartości samorealizacji nad wartościami przetrwania. Wykorzystując ekonomiczno-matematyczne modelowanie udowodniono, że wskaźniki jakości zarządzania i poziomu rozwoju demokracji odgrywają kluczową rolę w kształ-

towaniu środowiskowego elementu dobrobytu, podczas gdy poziom PKB na mieszkańca oraz wartości wpływają w mniejszym stopniu. Ponadto udowodniono, że polityka publiczna powinna być skierowana bezpośrednio na zwiększenie efektywności zarządzania i rozwój demokratycznego społeczeństwa obywatelskiego.

Słowa kluczowe: środowisko, dobrobyt, polityka ochrony środowiska, wartości, instytucje

Introduction

The beginning of the 21st century was marked by an increase in the interest of scholars, policymakers, public activists and ordinary citizens to solve the ecological problems of humanity, both at the micro and macro levels. From a microeconomic point of view, stakeholders are becoming more and more concerned about the negative environmental externalities of firms, which are an important investing considerations in minimizing their impact and contributing to reducing environmental damage. From a macroeconomic point of view, the development of countries is increasingly determined by the ability of national economies to produce environmental public goods (Duit, 2005), which are understood as *good or service in which the benefits to any party does not reduce the availability of these benefits to other parties, and access to the benefit cannot be limited* (UK NEA, 2014). Typical examples of environmental public goods are: air, groundwater reserves, forests, and so on. However, if in developed democracies access to them is guaranteed to each citizen by the laws of one or another state, then in oligarchic economies and countries with a lack of democratic values, the benefits of consuming economic social goods are most often assigned to groups of special interests, blocking access to them by ordinary citizens. And despite the fact that every country should be accountable to its citizens for the environmental policy pursued to ensure welfare, the realities of countries with hybrid regimes and the authoritarian style of public administration proves the existence of such phenomena as *punishment for poverty, environmental racism* (Dluhopolskyi, 2018), which prove the lack of existence of political and economic freedoms, social movements, developed civil society.

Literature Review

A number of studies conducted on the basis of empirical per capita income comparisons and the values of a certain set of representative environmental indicators confirm the conclusion on the positive impact of the economic growth factor on the environment (Arrow et al., 1996). This emphasizes the *U-like effect of interaction* (the growth of incomes is attributed to the degradation of the environment to a certain point, after which the quality of the latter improves). That is, at the initial stages of increasing pollution is considered as an acceptable side effect of economic growth. However, in the case of a country with a higher level of well-being, individuals begin to formulate requests for environmental me-

asures that lead to the emergence of environmental legislation, new environmental protection institutes, etc. Environmental degradation necessitates institutional reforms that would force private users of environmental resources to bear the full burden of social costs caused by their activities (Dasgupta, Mäler, 1990).

Another vector of research focuses on the concept of *environmental resource base*, which is reflected in a wide range of environmental systems, but is characterized by limitation. As a result, careless use of it will irreversibly be marked by a decline in economic potential. That is why there is a need to develop an ecological policy that would consist in preserving the sustainability of ecosystems, provided that the nature and extent of economic activity are uncertain (Kozlovskyi, et al., 2017). Scientists came to the conclusion that economic liberalization, as well as any other policy that contributes to the growth of the gross national product, do not substitute for environmental policy. Of particular significance in this context are reforms that are based on *signals* from resource users. Environmental damage, including the loss of environmental sustainability, is usually characterized by inevitable negative manifestations. Ignoring such *signals* is due not only to the ignorance of the dynamic effects of ecosystem changes (for example, their boundaries, marginal productivity, loss of sustainability), but also the existence of institutional barriers, such as the lack of clearly defined property rights. The development of the relevant institutions depends, among other things, on understanding the dynamics of ecosystems, based on the analysis of relevant indicators. Economic growth is not a panacea in the case of achieving an appropriate level of environmental quality, its nature – the composition of inputs (input characteristics, including environmental resources) and outputs (the end result, taking into account negative harms in the form of harmful effects) is considerably more important in this sense. In addition, the nature of growth is also determined by the activities of institutions that are designed to provide adequate incentives to protect environmental sustainability. Balancing measures in the framework of environmental policy will not only contribute to an increase in the efficiency of environmental resource allocation, but will also ensure sustainable levels of economic activity within the ecological systems. Protecting their potential, driven by the need to maintain well-being, is important for both poor and rich countries (Arrow, et al., 1996). Influence analysis of numerous indicators on the ecological state in the country is devoted to the work of many scientists (Clarkson, Li, et al., 2008; Al-Tu-

wajiri, et al., 2004; Duit, 2005; van den Bergh, Janssen, 2004; Klare, 2009; Wiesmeth, 2012; Dluhopolskyi, et al., 2018). However, various scholars investigated the impact of macroeconomic indicators on a fairly diverse environmental performance. So, in the work (Esty, Levy, et al., 2008) the emphasis is on The Environmental Sustainability Index, in works (Prescott-Allen, 2001a; Prescott-Allen, 2001b) – on the Ecosystem Wellbeing Index, in a study (Goedkoop, Spriensma, 2001) – on the Eco-Indicator 99, in the works (Roodman, 2004a; Roodman, 2004b) – on the Environmental Performance Index for Rich Nations, in the works (Adriaanse, 1993; Adriaanse, 2007) – on the Environmental Policy Performance Index, in the study (Puolamaa, Kaplas, et al., 1996) – on the Index of Environmental Friendliness. Despite the fact that the relationship between environmental indicators and some indicators of the development of socio-economic systems is partly described in the scientific literature, in this study we focused on how the environmental dimension is associated with a matrix of structural and institutional characteristics of social and economic systems, to which we include: 1) the volume of GDP per person; 2) the values and beliefs of the population; 3) the level of development of democracy; 4) the quality of governance.

Research Hypothesis

The article proposes hypothesis that, along with effectiveness indicators of the state policy (quality of governance, democracy index), the demand for the public good for the *environmental quality* is determined by the ability to invest in the environment (GDP per person) and the dominance of the self-realization values over the survival values.

Methodology

Researchers often use the index method to assess the state of the environment. In statistics, the index is relative value, which characterizes the ratio of a certain indicator values in time, space, as well as comparison of actual data with the plan or other norm (Halafyan, 2008). There are a number of international indexes that are successfully used to assess the state of the environment (The Environmental Sustainability Index, Ecosystem Wellbeing Index, Eco-Indicator 99, Environmental Performance Index for Rich Nations, Environmental Policy Performance Index, Index of Environmental Friendliness). However, based on the criterion of structural content, for this research, The Environmental Performance Index (EPI), developed by the Yale Center for Environmental Law and Policy (YCELP), was selected as a dependent variable, together with the Center for International Earth Science Information Network (CIESIN) of the Columbia University in collabora-

tion with Samuel Family Foundation and the World Economic Forum.

For the formation of the initial analytical matrix, available country ratings and databases, developed by renowned educational, scientific and financial institutions, were used. Thus, the ratings of 180 countries by the Environmental Performance Index (EPI) and its component criteria are taken from the report of the EPI (The Environmental Performance Index, EPI). The EPI indicator examines the state of the environment through the prism of two main areas: 1) protecting human health from adverse environmental conditions and 2) protecting the ecosystem. The first direction, which can be defined as *Ecology and human health*, is assessed from the standpoint of protecting the health of individuals in the context of continuously increasing pollution of the environment. The direction *Ecosystem Protection* is assessed in terms of environmental protection and the rational management of ecosystem resources. The methodology for the formation of the EPI index in the context of these two directions allows to group the performance indicators of the countries into nine main groups and twenty key indicators. These indicators demonstrate the degree of compliance (inconsistency) of the state environmental policy of the individual country with the global goals and objectives of environmental protection (Sustainable Development Goals).

The uniqueness of the EPI index is that it not only includes an assessment of the state of the environment but also takes into account factors influencing the modern civilization on human health. That is, it shows how favorable the state of the environment in the region (country) is, how much resources are spent and maintained on ecological safety at the required level, as all this in a complex influences human health, thus avoiding the incorrect assessment of the environment. For example, in economically underdeveloped countries of Africa, even in the absence of such a powerful factor as industrial pollution and the presence of virgin nature, the index of environmental efficiency will be low due to the lack of favorable living conditions for the population (unsanitary, uncontrolled consumption of natural resources, access restriction of the population to the benefits of civilization, etc.).

As a dependent variables, we selected several key indicators that we will consider more detailed:

1. Wealth or economic growth. According to a number of studies (Church, 1992; van den Bergh, Janssen, 2004; Wiesmeth, 2012), the effectiveness of environmental policy and the environment generally depend on economic indicators of the country development. Simply by some scientists (Arrow, Bolin, et al., 1996) it is argued that the most competitive countries in the world demonstrate unequivocally better results of the achievement of environmental development targets. Thus, in the work (Scruggs, 1999),

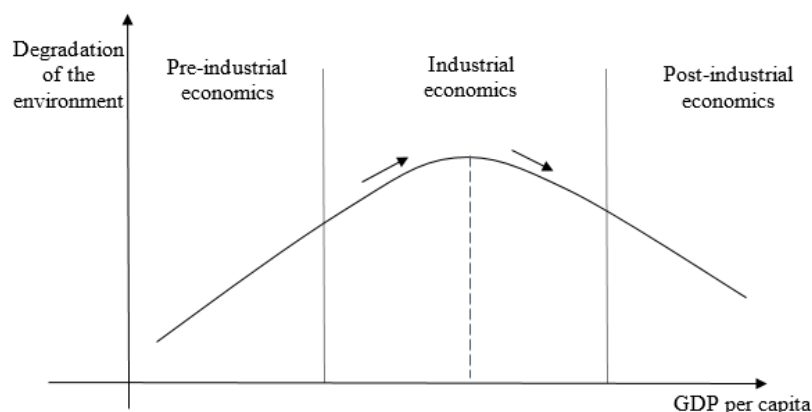


Figure 1. Kuznets Ecological Curve, made by authors based on (Panayotou, 2003)

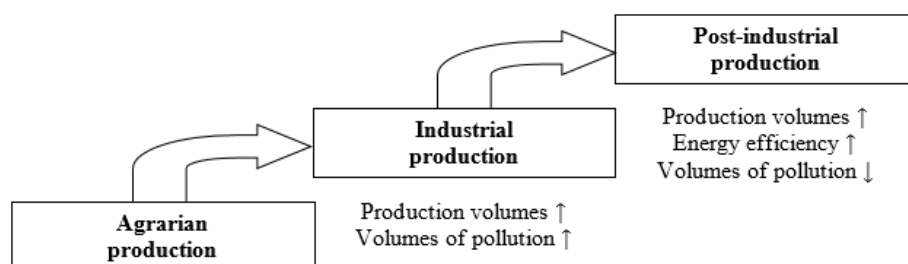


Figure 2. Logic of Kuznets Curve, made by authors based on (Dluhopolskyi, 2017)

Table 1. Correlation matrix of the Environmental Performance Index (EPI) and indicators characterizing the welfare, the system of values and beliefs of the population, the level of governance and democracy in the country, made by authors based on (Environmental Performance Index, 2018; The World Bank, 2018; World Economic and Financial Surveys, 2017; Democracy Index, 2017; The Worldwide Governance Indicators project, 2017; The World Values Survey, 2015)

Indicators	Indicators				
	EPI	GDPpc	WVS	GEI	DemI
EPI	1,000	0,711***	0,525***	0,810***	0,701***
GDPpc	0,711***	1,000	0,523***	0,752***	0,505***
WVS	0,525***	0,523***	1,000	0,646***	0,674***
GEI	0,810***	0,752***	0,646***	1,000	0,789***
DemI	0,701***	0,505***	0,674***	0,789***	1,000

Coefficient of correlation * – $p < 0,05$, ** – $p < 0,01$, *** – $p < 0,001$.

based on a sample of seventeen industrial democracies, it has been shown that higher per capita income is positively correlated with the ecological indicators of the countries of the world. However, other scholars (Kuznets, 1955; Porter, van der Linde, 1995) emphasize the existence of a certain threshold of economic growth, to which the degradation of the environment occurs, while beyond this limit, further economic growth is contributing to the improvement of the environment. This logic is laid down in the Kuznets model, which has the form of an inverted U-shaped curve (fig. 1-2). At a certain stage of societal development, consumers not only begin to invest more in environmental funds, but also exert political pressure on regulators in order to increase their responsibility for violating environmental legislation and to give it more rigor.

In order to represent economic wealth, the gross domestic product (GDP) per person (GDPpc), which

depends on several components, such as private consumption, investment, government expenditure, total exports and imports, has been selected (Blanchard, 2017). According to researches (Cracolici, Cuffaro, 2010; Cracolici, et al., 2018), GDP can be considered adequate in terms of its ability to provide good living conditions for citizens from an economic, social and environmental point of view. Increasing GDP per person is a prerequisite for improving living standards and providing better social services, as well as better access to education, working conditions and more sustainable environmental development. In our study, we will try to demonstrate that the higher the GDP per capita in the country, the better the environment for the lives of ordinary citizens.

2. Values and beliefs of the population. On the map of cultural values (Inglehart, Welzel, 2015) we have selected the meanings of survival and self-expression values that demonstrate the propensity of a par-

ticular population for economic and physical security, intolerance of dissent, xenophobia, low evaluation of freedom and respect for human rights, readiness to accept authoritarianism (survival values) or to the dominant role of the individual, the observance of key human rights and freedoms, the desire for success, gender equality (self-expression values). Negative meanings of values orientations show a propensity to survival values (the greater the negative value, the more population of the country professes such values), and positive values, respectively, - to the self-expression values (indicator WVS 6). It should be noted that there is a direct link between the commitment of population to the self-expression values and welfare state in country (see annex). However, the study will try to test the hypothesis about the negative impact of survival values on the state of the environment.

3. Development of democracy index. The Democracy Index (DemI), introduced by the Economist Intelligence Unit, ranked the countries according to the level of development of democratic procedures in them, separating countries into several groups: full democracy, incomplete democracy, hybrid regime, authoritarian regime. To calculate the DemI, 60 indicators are grouped into five different categories that measure the electoral process and pluralism, the government functioning, civil liberties, citizens' participation in political life and political culture (Democracy Index, 2017).

4. Governance effectiveness. The effectiveness of state administration and government can be an effective prerequisite for improving environmental performance. Such efficiency covers indicators of bureaucratic quality, the competence of civil servants, independence from political pressure, and trust in the government-elected policy (Kaufmann, Kraay, et al., 2009). The results of research on EPI creators show that there is a slight positive correlation between the effectiveness of the authorities and the good *fine ecology* (Esty, Levy et al., 2008), but given the relative preservation of the data received by other scientists and the systematic improvement of indicators methodology (accuracy) made us to check the nature of their correlation using the Government Effectiveness Index (GEI) as a measure that reflects the effectiveness of governance.

Results

An analysis of the level of stochastic dependence between the above variables (tab. 1) indicates that all the pair correlation coefficients between the variables are statistically significant (appendix). Strong direct correlation dependence (according to Chadock's table) was found between the environmental performance index and the government effectiveness index ($r = 0.810$), GDP per capita ($r = 0.711$), democracy index ($r = 0.701$). There is also a significant direct correlation between the dependent variable of

the EPI and the regressor, which characterizes the values and beliefs of the population, but its level is slightly lower ($r = 0.525$).

The visual analysis of scatter plot matrix between the regressant and the regressors was illustrated (fig. 3), which shows a linear dependence among all variables for the aggregate sample of countries. Well-detected paired dependencies between variables are illustrated by the corresponding scattering diagrams.

As a result of the multivariate regression analysis, an adequate linear regression model (tab. 2) is constructed, according to which 70.3% of the variation in the dependent variable is explained by the variation in the independent variables (predictors). The regression model has the following form:

$$EPI = 43,941 + 0,169GDPpc - 1,221WVS + 6,190GEI + 1,745DemI. \quad (1)$$

The significance of the obtained model indicates the calculated F-criterion value (47,921), which is considerably larger than the table value for the significance level of 1% (3,56). Significant in the model is a free member and three of the four regression coefficients (see tab. 2). Regarding the values, the initial assumption that the dominance of survival values over self-realization values negatively affects the state of the environment was not empirically confirmed, since the model parameter at the prediction index *World Values Survey* was insignificant. In addition, the p-value for the WVS indicator is significantly higher than for others (its statistical significance is low, since in over 28% of the cases the result is unreliable). This can be explained by the fact that not only values, but the quality of environmental protection policy are crucial for maintaining the good «fine ecology» on quality level. This result does not deny the fact that values are positively correlated with the quality of policy, but in combination with other variables, the WVS indicator has not demonstrated a significant and sustained impact on the value of EPI. This has important institutional implications, since it indicates the absence of socio-cultural determinism for such a factor of well-being as ecology.

Thus, the resulting model makes it possible to predict that with an increase in the value of GDP per person by \$1000 is expected growth of the EPI index by 0.169. By improving governance efficiency, which is reflected by the growth of GEI per unit, we can count on an increase in the environmental performance index by 6,190 points. An improvement in the level of democracy (an increase in DemI per unit) is likely to be accompanied by an increase in EPI by 1,745 points. The change in the value-based survival benchmark for self-expression is likely to affect the value of the EPI index on the logic of the Kuznets curve, in conjunction with the growth of welfare and the transition to a higher level of environmental consciousness (as example Scandinavian countries, Germany, etc.).



Figure 3. The scatter plot matrix between regressors and regressant, made by authors based on (Environmental Performance Index, 2018; The World Bank, 2018; World Economic and Financial Surveys, 2017; Democracy Index, 2017; The Worldwide Governance Indicators project, 2017; The World Values Survey, 2015)

Table 2. Statistical criteria of a multidimensional linear regression model, made by authors based on (Environmental Performance Index, 2018; The World Bank, 2018; World Economic and Financial Surveys, 2017; Democracy Index, 2017; The Worldwide Governance Indicators project, 2017; The World Values Survey, 2015)

Regression Summary: R= 0,838, R ² = 0,703, Adjusted R ² = 0,688, F(4,81) = 47,921, p < 0,0000, Std. Error of estimate: 7,0919						
	b*	Std. Err. - of b*	b	Std. Err. - of b	t(81)	p-value
Intercept			43,941	4,554	9,65	0,000
GDPpc	0,297	0,096	0,169	0,054	3,11	0,003
WVS	-0,092	0,086	-1,221	1,139	-1,07	0,287
GEI	0,431	0,133	6,190	1,909	3,24	0,002
DemI	0,272	0,109	1,745	0,701	2,49	0,015

A comparative analysis of standardized regression coefficients b* shows that the greatest contribution to prediction of a regressant is the efficiency factor of governance (0.431). A slightly lesser role is assigned to the GDPpc and DemI regressors.

For the quality confirmation of the regression model an analysis of its residues is carried out. As we see from the configuration of the residue distribution graph (fig. 4) and histograms of the residues (fig. 5),

the residues of the model are distributed by law, close to normal. The value of the calculated Durbin-Watson (1,879) statistics and the serial correlation coefficient between the residues of neighboring observations (0.052) indicate a lack of autocorrelation of the residues in the model. Thus, the actual value of the Durbin-Watson criterion is less than the critical table values DW1 (1.39) and DW2 (1.60) for 1% of the significance level.

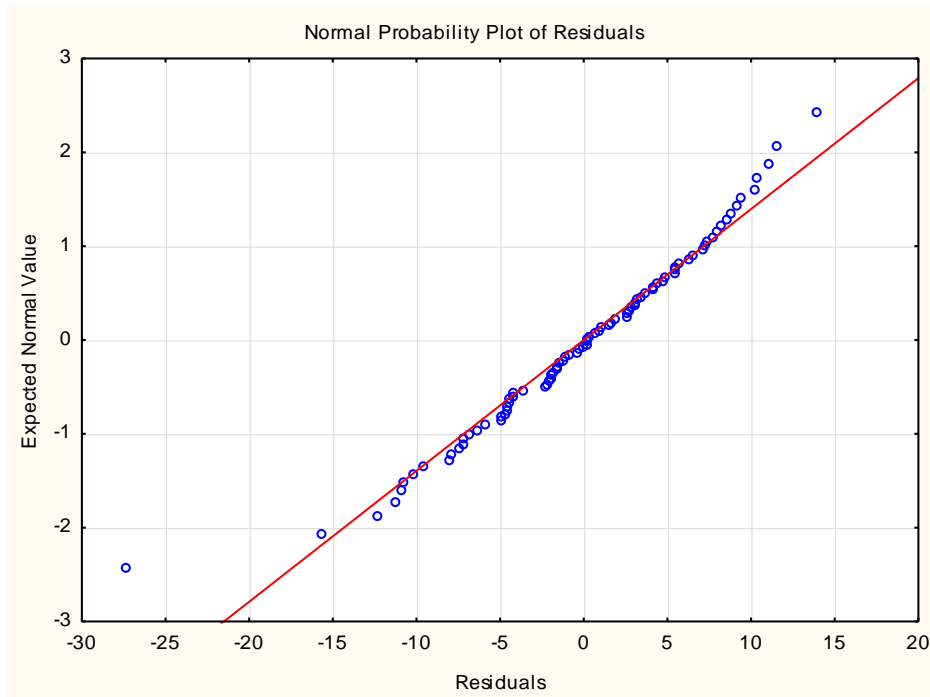


Figure 4. Distribution of residues of a regression model to a normal law, made by authors based on (Environmental Performance Index, 2018; The World Bank, 2018; World Economic and Financial Surveys, 2017; Democracy Index, 2017; The Worldwide Governance Indicators project, 2017; The World Values Survey, 2015)

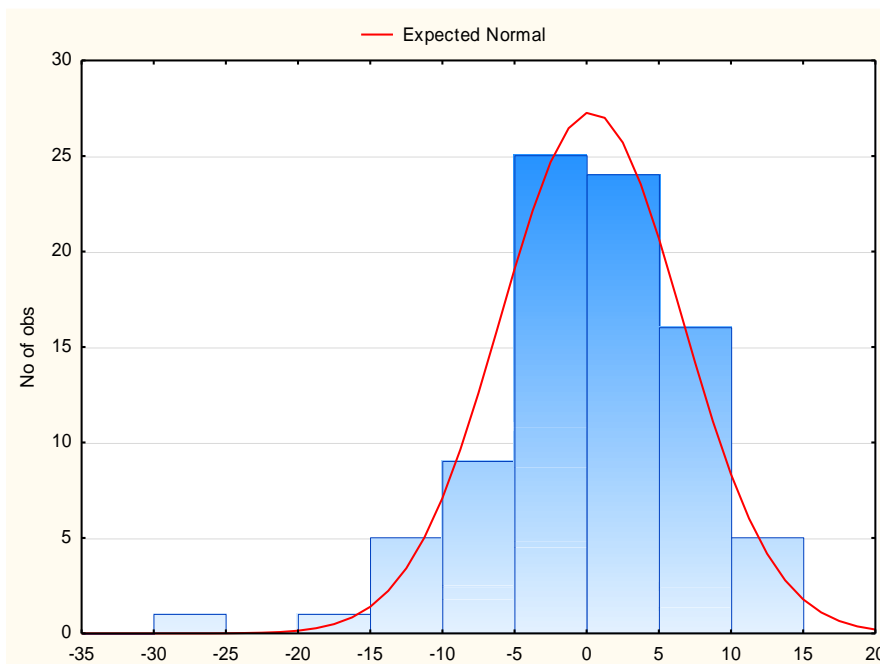


Figure 5. Distribution histogram of regression model residues, made by authors based on (Environmental Performance Index, 2018; The World Bank, 2018; World Economic and Financial Surveys, 2017; Democracy Index, 2017; The Worldwide Governance Indicators project, 2017; The World Values Survey, 2015)

Thus, as a result of the canonical analysis, a reliable link was found between the processes of implementation of the state ecological policy and a set of indicators that characterize the level of well-being, governance, democracy and value orientations. Moreo-

ver, the quality of governance and the level of development of democracy play a key role, while the level of well-being and values affect the EPI with less force.

Conclusions

To sum it up, we note that the research results allow to assess in different ways the influence of the complex of indicators on the environmental performance index. It is empirically confirmed that the quality of governance does not only affect the EPI value, but is more closely related to it ($b = 6,190$) than the level of democracy ($b = 1,745$). The results of the analysis confirmed the hypothesis about the direct influence of the institutional quality and state policy on the environmental conditions in the country. Regarding the level of well-being and values, they are more likely to have a complex impact on the environmental performance index, reflecting a rather insignificant value of the EPI compared to the previous figures. From this it can be concluded that investments in the quality of management, transparency, accountability and development of democratic institutions have a more significant impact on the state of the environmental situation than income growth and the change of values, the change of which can be affected in the long run, and therefore public policy should be aimed at increasing the governance efficiency and the progress of democracy.

Taken together, empirical evidence suggests that environmental friendliness in countries is determined primarily by the government effectiveness, rather than by the formal attribute of the welfare state as the scale of GDP redistribution through the budget. This situation can be characterized as the absence of a fatal character in the direct relationship between the level of income and the quality of environmental goods. In a wider sense, this confirms our hypothesis that environmental goods can be offered not so much by the quantitative parameters of such a state, but rather by qualitative as an attribute of the modern understanding of welfare state. Detected dependencies confirm that environmental friendliness as a manifestation of a modern, inclusive state-driven state is not the property of extremely wealthy countries. In other words, the more the society will generate pressure on the quality of institutions, the more likely it will be to improve governance, which will improve the environmental situation, and to a greater extent it will be coherently with a modern understanding of what social and individual well-being are.

In general, two important conclusions are drawn from the research: firstly, the level of country environmental performance index can be regarded as an important complementary criterion for the welfare state; secondly, the country environmental state is much more determined by the government efficiency, the quality of state institutions and their activities, rather than by an extensive increase in the funding of such institutions and environmental measures.

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References

- ADRIAANSE C.C.M., 1993, Environmental Policy Performance Indicators: A Study of the Development of Indicators for Environmental Policy in The Netherlands, in: *Import*, 175 p.
- ADRIAANSE C.C.M., 2007, Measuring residential satisfaction: a residential environmental satisfaction scale (RESS), in: *Journal of Housing and the Built Environment* 22.
- AL-TUWAIJRI S., CHRISTENSEN T., HUGHES K.E., 2004, The Relations Among Environmental Disclosure, Environmental Performance, and Economic Performance: A Simultaneous Equations Approach, in: *Accounting, Organizations & Society* 29, p. 447-471.
- ARROW K., BOLIN B., COSTANZA R., DASGUPTA P., FOLKE C., HOLLING C.S., JANSSON B., LEVIN S., MÄLER K., PERRINGS C., PIMENTEL D., 1996, Economic Growth, Carrying Capacity, and the Environment, in: *Environment and Development Economics* 1, p. 104-110.
- BLANCHARD O., 2017, *Macroeconomics*, The MIT Press.
- CHURCH D., 1992, *The Economy Vs. The Environment: Is There A Conflict?* http://www.ecoiq.com/dc-products/prod_conflict.html (1.05.2018).
- CLARKSON M.P., LI Y., RICHARDS G.D., VASVARI F.P., 2008, Revising the Relation between Environmental Performance and Environmental Disclosure: An Empirical Analysis, in: *Accounting, Organizations & Society* 33, p. 303-327.
- CRACOLICI M.F., CUFFARO M., 2010, The Measurement of Economic, Social and Environmental Performance of Countries: A Novel Approach, in: *Social Indicators Research* 95(2), p. 339-356.
- CRACOLICI M.F., CUFFARO M., LACAGNINA V., 2018, Assessment of Sustainable Well-being in the Italian Regions: An Activity Analysis Model, in: *Ecological Economics* 143, p. 105-110.
- DASGUPTA P., MÄLER K.-G., 1990, The Environment and Emerging Development Issues, in: *Proceedings of the Annual Bank Conference on Development Economics*.
- DLUHOPOLSKYI O.V., 2017, Ecological component of sustainable development: from theories to implementations, in: *World of Finance* 4, p. 7-23.
- DLUHOPOLSKYI O.V., 2018, Ecological racism and the movement for environmental justice, in: *Management of socio-economic development of the state and regions*, Collection of materials of the XII International Scientific and Practical Conference (26-27.04.2018), Zaporizhya, ZNU Publishing House, p. 91-93.
- DLUHOPOLSKYI O.V., DLUHOPOLSKA T.I., ALI BAZMI, 2018, Sustainable development, values and ecological policy, in: *Strategies and policy of territories development: international, national, regional, and local challenges*, Materials of International Scientific and Practical Conference (10-12.05.2018), Chernivtsi, p. 91-92.
- Democracy Index*, 2017, <https://www.eiu.com/topic/democracy-index> (1.05.2018).
- DUIT A., 2005, Understanding Environmental Performance of States: An Institution Centered Approach and Some Difficulties, *Working Paper Series* 7, Göteborg, Göteborg University, Sweden.

16. *Environmental Performance Index*, 2018, Palisades, NY, NASA Socioeconomic Data and Applications Center (SEDAC).
17. ESTY D., LEVY M.A., KIM C.H., de SHERBININ A., SREBOTNJAK T., MARA V., 2008, *Environmental Performance Index*, Yale Center for Environmental Law and Policy, New Haven, CT, USA.
18. GOEDKOOP M., SPRIENSMA R., 2001, *The Eco-Indicator '99: A Damage Oriented Method for Life Cycle Impact Assessment: Methodology Report*, <http://www.pre.nl>. (1.08.2018)
19. HALAFYAN A.A., 2008, *STATISTICA 6*, Statistical data analysis, M., 512 p.
20. INGLEHART R., WELZEL CH., 2015, *Inglehart–Welzel Cultural Map*, <http://www.worldvaluessurvey.org/WVSContents.jsp> (1.08.2018).
21. KAUFMANN D., KRAAY A., MASTRUZZI M., 2009, *Governance Matters VI: Governance Indicators*, World Bank Policy Research Working Paper 94280.
22. KOZLOVSKYI S., KHADZHYNOV I., VLASENKO I., MARYNCHAK L., 2017, Managing the sustainability of economic system as the basis of investment development in Ukraine, in: *Investment Management and Financial Innovations* 14(4), p. 50-59.
23. KLARE M.T., 2009, *Rising Powers, Shrinking Planet: New Geopolitics of Energy*, Henry Holt and Company, New York, 340 p.
24. KUZNETS S., 1955, Economic growth and income inequality, in: *American Economic Rev.* 49, p. 1-28.
25. PANAYOTOU T., 2003, *Economic Growth and the Environment*, Spring Seminar of the UN Economic Commission for Europe (March 3).
26. PORTER M.E., van der LINDE C., 1995, Toward a New Conception of the Environment-Competitiveness Relationship, in: *Journal of Economic Perspectives* 9(4), p. 97-118.
27. PRESCOTT-ALLEN R., 2001, *Measuring the Well-being of Nations*, <http://pratlif.com/economy/well-being.htm> (1.08.2018).
28. PRESCOTT-ALLEN R., 2001, *The Wellbeing of Nations: a Country-by-Country Index of Quality of Life and the Environment*, Washington DC, 342 p.
29. PUOLAMAA M., KAPLAS M., REINIKAINEN T., 1996, *Index of Environmental Friendliness: a Methodological Study*, Eurostat/Statistics, Finland.
30. ROODMAN D., 2004, Another Take on Free Market Environmentalism: A Friendly Critique, in: *PERC Reports* 22(1).
31. ROODMAN D., 2004, *Environmental Performance Index for Rich Nations*, Center for Global Development, 61 p.
32. SCRUGGS L., 1999, Institutions and Environmental Performance in Seventeen Western Democracies, in: *British Journal of Political Science* 29, p. 1-13.
33. The World Bank, 2018, *Indicators*, <https://data.worldbank.org/indicator> (1.08.2018).
34. *The Worldwide Governance Indicators project*, 2017, <http://info.worldbank.org/governance>.
35. *The World Values Survey*, 2015, <http://www.worldvaluessurvey.org> (1.08.2018).
36. *UK National Ecosystem Assessment*, 2014, <http://uknea.unep-wcmc.org>, (1.08.2018).
37. UN, Sustainable Development Goal, 2017.
38. van den BERGH J.M., JANSSEN M.A., 2004, *Economics of Industrial Ecology: Materials, Structural Change and Spatial Scales*, The MIT Press, 388 p.
39. WIESMETH H., 2012, *Environmental Economics. Theory and Policy Equilibrium with Contributions*, Springer-Verlag, Berlin, Heidelberg.
40. World Economic and Financial Surveys, 2017, *World Economic Outlook Database*, <https://www.imf.org/external/pubs/ft/weo/2017> (1.08.2018).

Appendix: Indicators of EPI, GDP per capita, WVS 6, GEI and DemI by country, made by authors based on (Environmental Performance Index, 2018; The World Bank, 2018; World Economic and Financial Surveys, 2017; Democracy Index, 2017; The Worldwide Governance Indicators project, 2017; The World Values Survey, 2015)

Country	EPI (2018)	GDP per capita (2017)	WVS 6 (2015)	GEI (2016)	DemI (2017)
Albania	65,46	12,472	-1,020	0,00	5,98
Algeria	57,18	15,150	-0,630	-0,54	3,56
Argentina	59,30	20,677	0,420	0,18	6,96
Armenia	62,07	9,098	-0,940	-0,15	4,11
Australia	74,12	49,882	1,915	1,58	9,09
Austria	78,97	49,247	0,665	1,51	8,42
Azerbaijan	62,33	17,433	-1,170	-0,16	2,65
Bahrain	55,15	51,846	-0,580	0,32	2,71
Belarus	64,98	18,616	-1,415	-0,51	3,13
Belgium	77,38	46,301	1,290	1,33	7,78
Bosnia and Herzegovina	41,84	11,404	-0,875	-0,43	4,87
Brazil	60,70	15,500	0,290	-0,18	6,86
Burkina Faso	42,83	1,884	-1,375	-0,55	4,75
Burundi	27,43	0,808	-0,250	-1,40	2,33
Canada	72,18	48,141	2,080	1,80	9,15
Chile	57,49	24,588	0,310	1,02	7,84
China	50,74	16,624	-1,100	0,36	3,10
Colombia	65,22	14,455	0,920	0,02	6,67
Croatia	65,45	24,095	-0,190	0,49	6,63
Cyprus	72,60	36,557	-0,415	0,98	7,59
Czech Republic	67,68	35,223	0,000	1,06	7,62
Denmark	81,60	49,613	2,185	1,89	9,22
Ecuador	57,42	11,234	0,500	-0,43	6,02

Estonia	64,31	31,473	-0,790	1,12	7,79
Ethiopia	44,78	2,113	-0,315	-0,64	3,42
Finland	78,64	44,050	1,250	1,85	9,03
France	83,95	43,550	1,000	1,41	7,80
Georgia	55,69	10,644	-0,875	0,51	5,93
Germany	78,37	50,206	0,685	1,74	8,61
Ghana	49,66	4,605	-0,335	-0,20	6,69
Greece	73,60	27,776	0,040	0,21	7,29
Guatemala	52,33	8,173	0,080	-0,60	5,86
Hungary	65,01	28,910	0,650	0,45	6,64
Iceland	78,57	52,150	2,020	1,41	9,58
India	30,57	7,174	0,390	0,10	7,23
Indonesia	46,92	12,378	-0,750	0,01	6,39
Iraq	43,20	17,004	-1,030	-1,26	4,09
Ireland	78,77	72,632	0,170	1,35	9,15
Japan	74,69	42,659	0,205	1,83	7,88
Jordan	62,20	12,487	-1,100	0,14	3,87
Kazakhstan	54,56	26,071	-0,770	-0,06	3,06
Kyrgyzstan	54,86	3,652	-0,580	-0,90	5,11
Latvia	66,12	27,291	-0,800	1,00	7,25
Lebanon	61,08	19,486	-0,750	-0,53	4,72
Lithuania	69,33	31,935	-1,200	1,09	7,41
Luxembourg	79,12	109,192	0,960	1,69	8,81
Macedonia	61,06	15,203	-0,125	0,09	5,57
Malaysia	59,22	28,871	-0,330	0,88	6,54
Mali	43,71	2,169	0,040	-0,99	5,64
Malta	80,90	42,532	0,420	0,95	8,15
Mexico	59,69	19,480	1,210	0,14	6,41
Moldova	51,97	5,657	-1,610	-0,62	5,94
Montenegro	61,33	17,439	-0,690	0,10	5,69
Morocco	63,47	8,612	-1,190	-0,10	4,87
New Zealand	75,96	38,502	1,710	1,86	9,26
Nigeria	54,76	5,927	-0,210	-1,09	4,44
Norway	77,49	70,590	2,040	1,88	9,87
Pakistan	37,50	5,354	0,040	-0,64	4,26
Peru	61,92	13,342	0,000	-0,17	6,49
Philippines	57,65	8,229	0,310	-0,01	6,71
Poland	64,11	29,251	0,750	0,69	6,67
Portugal	71,91	30,258	-0,080	1,22	7,84
Qatar	67,80	124,927	0,205	0,75	3,19
Romania	64,78	23,991	-1,000	-0,17	6,44
Russia	63,79	27,89	-1,250	-0,22	3,17
Rwanda	43,68	2,081	-0,460	0,11	3,19
Serbia	57,49	15,164	-0,835	0,09	6,41
Slovakia	70,60	32,895	-0,065	0,89	7,16
Slovenia	67,57	34,063	0,125	1,12	7,50
South Africa	44,73	13,403	0,125	0,27	7,24
South Korea	62,30	39,387	-0,630	1,07	8,00
Spain	78,39	38,171	0,335	1,12	8,08
Sweden	80,51	51,264	2,205	1,79	9,39
Switzerland	87,42	61,360	1,375	2,03	9,03
Taiwan	72,84	49,827	-0,710	1,37	7,73
Thailand	49,88	17,786	0,010	0,34	4,63
Trinidad and Tobago	67,36	31,154	0,290	0,22	7,04
Tunisia	62,35	11,987	-1,625	-0,21	6,32
Turkey	52,96	26,453	-0,250	0,05	4,88
Ukraine	52,87	8,656	-1,315	-0,58	5,69
United Kingdom	79,89	43,620	1,550	1,61	8,53
United States of America	71,19	59,495	1,165	1,48	7,98
Uruguay	64,65	22,445	0,705	0,55	8,12
Zambia	50,97	3,997	-0,625	-0,66	5,68
Zimbabwe	43,41	2,277	-0,460	-1,16	3,16
Viet Nam	46,96	6,876	-0,065	0,01	3,08