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ENVIRONMENTAL SUSTAINABILITY: IMPLICATIONS AND LIMITATIONS IN WESTERN BALKAN COUNTRIES

Abstract

Environmental sustainability is one of the most important factors of sustainable development in recent years. Consequently, the improvement of environmental quality is a significant task of every national economy that strives to long-term social and economic development. The purpose of this paper is to analyse the environmental performances of six Western Balkan countries and to identify the critical factors for its improving in the future. The research is made using the data of Environmental Performance Index (2018) published by Yale University and Columbia University, in collaboration with the World Economic Forum. The research methodology is based on comparative analysis and benchmarking. The research findings of this study indicates many possibilities for improvement of environmental performances in Western Balkan countries, especially in Bosnia and Herzegovina. The conclusions of this paper provide recommendations to environmental policy-makers in Western Balkan countries.

Key words: *environmental performances, sustainability, Western Balkan countries*

JEL classification: Q56, O57

ЕКОЛОШКА ОДРЖИВОСТ: ИМПЛИКАЦИЈЕ И ОГРАНИЧЕЊА У ЗЕМЉАМА ЗАПАДНОГ БАЛКАНА

Апстракт

Еколошка одрживост представља један од најважнијих фактора одрживог развоја последњих година. Сходно томе, унапређење квалитета екологије представља значајан задатак сваке националне економије која тежи дугорочном друштвеном и економском развоју. Циљ овог рада је да анализира еколошке перформансе шест земаља Западног Балкана и идентификује кључне факторе за њихово побољшање у будућности. Истраживање се врши

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коришћењем података Индекса еколошких перформанси (2018), објављених од стране Јејл универзитета и Колумбија универзитета у сарадњи са Светским економским форумом. Методологија истраживања заснована је на компаративној анализи и бенчмаркингу. Резултати истраживања ове студије указују на велике могућности за побољшање еколошких перформанси у земљама Западног Балкана, посебно у Босни и Херцеговини. Закључци овог рада дају препоруке доносиоцима одлука у области еколошке политике у земљама Западног Балкана.

Кључне речи: еколошке перформансе, одрживост, земље Западног Балкана

Introduction

The concept of sustainable development had become an important object of scientific observation in the theoretical and empirical studies world wide. A large body of the modern literature in this field is based on three key dimensions of sustainable development: economic development, social development, and environmental protection. Each of these dimensions is examined in the literature from numerous aspects. Consequently, there are a number of different conclusions about every mentioned dimension of sustainable development that provide recommendations for policy implementation.

Every national economy in a globalized world conducts a series of policies that are focused on one or more dimensions of sustainable development. Environmental policy is one of them. It is a policy that focuses on problems arising from human impact on the environment, which retroacts onto human society by having (negative) impact on human values such as good health or a green environment (Rajput, Raghuwanshi, Thakur, 2015). It is obvious that the efficiency of the environmental policy has great impact on the life quality of the people. Thus, it is very important to continuously evaluate the results of each world country in the process of establishing environmental goals.

The ambition of this paper is to analyse the environmental performances of six Western Balkan countries and to benchmark them with the environmental performances of top six European countries. The purpose is to determine the global position of each country in the Western Balkan group and identify key factors for the improvement of their environmental performances in the future. The research findings of the study should give guidance to policy-makers of Western Balkan countries in the process of improving environmental performances.

The first section of the paper provides a theoretical background and literature review in the field of environmental sustainability. Research methodology and data basis are elaborated in the second part of the paper. The research results are shown and considered in the third section. The last part of the paper provides the conclusions and recommendations for improving the environmental sustainability in Western Balkan countries.

Theoretical background and literature review

Rapid and extensive industrialization and urbanization around the world in recent years have created a number of serious environmental problems in almost all countries across the globe. It made the need on the national economy level to create different strategies and plans of environmental development as an important prerequisite for the sustainability of human activities. It is important to note that „the term 'sustainability' should be viewed as humanity's target goal of human-ecosystem equilibrium (homeostasis), while 'sustainable development' refers to the holistic approach and temporal processes that lead us to the end point of sustainability" (Shaker, 2015, p. 305). The same understanding of those terms is applicable in the case of „environmental sustainability" and „environmental development".

Goodland (1995) considers that „we must save the remnants of the only environment we have and allow time for and invest in the regeneration of what we have already damaged" (p. 5). This author also concludes that „the goal of environmental sustainability must be reached as soon as humanly possible" (Goodland, 1995, p. 21). It refers to the importance of environmental sustainability in every national economy that strives to long-term survival. Unfortunately, the concept of environmental sustainability has special significance in the developed countries, but it has not adequate treatment in some of the developing countries (Aquilani et al., 2018). However, it must be acknowledged that almost every country in the modern world applies the concept of environmental sustainability, some in the larger and some to a lesser extent.

There is vast of literature on the different aspects of environmental performances and environmental sustainability. A huge part of that literature is related to corporate environmental performances in various industries (Jung, Kim & Rhee, 2001; Labuschagne, Brent & Van Erck, 2005) and countries (Latan et al., 2018). Latan et al. (2018) prove that the implementation of environmental strategies has been considered key competitive advantages for many companies and emphasize the importance of achieving better corporate environmental management. However, dominant part of the studies refers to the environmental sustainability on the country level. Some of them examine the relationship between economic growth and environmental sustainability (Almeida et al., 2017). The others are related to overall environmental policy (Botta, E., Kozluk, T., 2014). Furthermore, the great attention of the researchers in this field attracts evaluation of environmental performances of countries (Gallego-álvarez et al., 2014), which is also ambition of this paper.

There are numerous empirical studies that use or propose different indicators for evaluation of environmental performances and environmental sustainability (Azapagic & Perdan, 2000; Dewulf & Van Langenhove, 2005; Evans et al., 2009; Janković-Milić, Jovanović & Krstić, 2012; Singh et al., 2012; Yigitcanlar & Teriman, 2014; Dizdaroglu & Yigitcanlar, 2016; Hallstedt, 2017; Fraccascia et al., 2017). In addition, environmental experts at the Yale University and Columbia University have developed the methodology of measuring environmental performances of countries by Environmental Performance Index. It allows the comparison of the results of national economies according to indicators that correspond to environmental health and ecosystems. This paper uses the data of Environmental Performance Index to meet its goal.

Research methodology and data basis

The ambition of this paper is to analyse environmental performances of Western Balkan countries and to identify key factors for their further development in this field. The research is made by applying the comparative analysis and benchmarking method. The study refers to the following six Western Balkan countries: Albania, Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, and Serbia. Since the analysis includes six Western Balkan countries, the following group of top six European countries according to EPI global rank are defined as a benchmarking group: Denmark, France, Malta, Sweden, Switzerland, and United Kingdom.
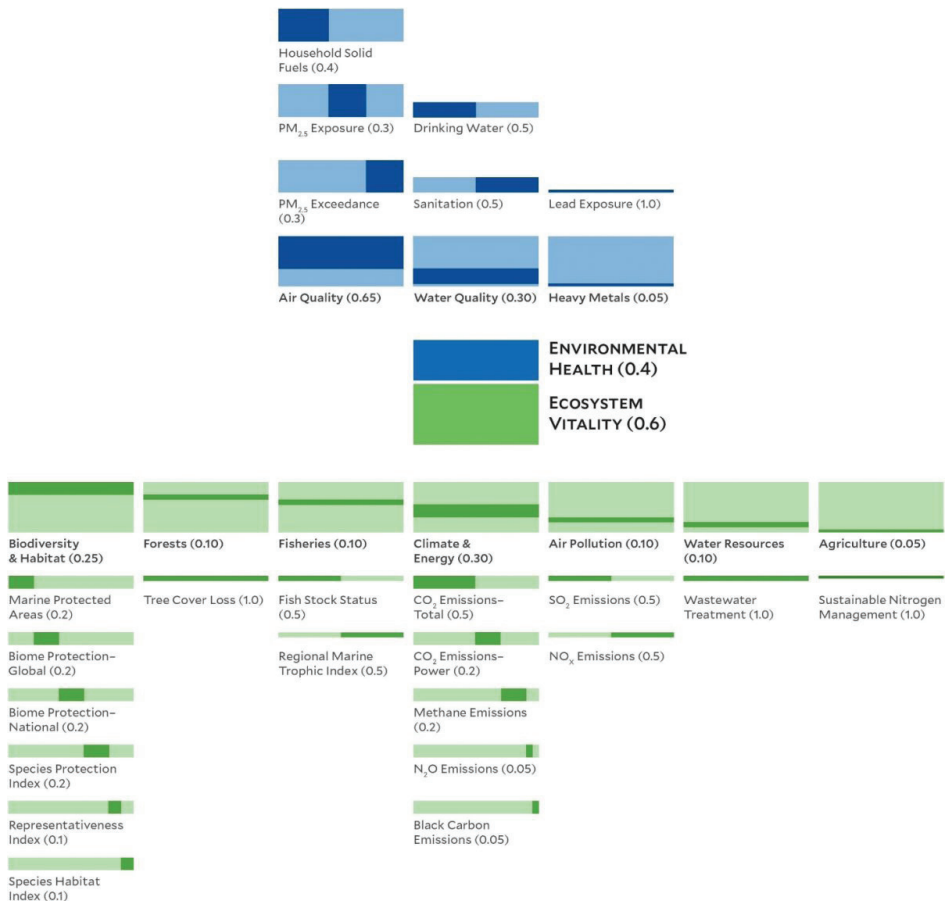
The data basis of the research includes the data of *Environmental Performance Index* (2018) published in the annual report by *Yale Center for Environmental Law and Policy of Yale University, Center for International Earth Science Information Network of Columbia University*, in collaboration with the *World Economic Forum*. As it is noted in the report, this index provides a measure on a national scale of how close countries are to established environmental policy goals. Thus, it proposes a global rank list of the national economies that highlights leaders and laggards in environmental performance, gives insight on best practices, and provides guidance for countries that aspire to be leaders in sustainability (Nardo et al., 2008; Hsu, Johnson & Lloyd, 2013).

Environmental Performance Index (EPI) is a composite index that includes two fundamental dimensions of sustainable development, i.e. *policy objectives* as it is named in the EPI report:

(1)   *Environmental health*, which rises with economic growth and prosperity and measures threats to human health, and

(2)   *Ecosystem vitality*, which comes under strain from industrialization and urbanization and measures natural resources and ecosystem services.

These two policy objectives of the EPI are consist of 10 *indicators* (that named *issue categories* in the EPI report) which are consist of 24 *sub-indicators* (that named *performance indicators* in the EPI report). The conceptual framework for measuring EPI is presented in Figure 1.

Figure 1: The conceptual framework for measuring EPI

Source: 2018 Environmental Performance Index Report

As it is presented in Figure 1, sub-indicator scores are aggregated into indicator scores, indicator scores into policy objective scores, and policy objective scores into final EPI scores. The score of all mentioned measures (sub-indicators, indicators, policy objectives, and EPI) ranges in the interval from 0 to 100. Each sub-indicator, indicator, and policy objective has own weight in the EPI calculation (see Figure 1).

The *2018 Environmental Performance Index Report*, as a data basis for the research, ranks 180 countries across the world. The authors of this paper analyse environmental performances of Western Balkan countries until the level of indicators. There are 10 following EPI indicators (see Figure 1):
   (1)   Air quality,
   (2)   Water and sanitation,
   (3)   Heavy metals,
   (4)   Biodiversity and habitat,

(5)   Forests,
(6)   Fisheries,
(7)   Climate and energy,
(8)   Air pollution,
(9)   Water resources, and
(10)   Agriculture.

Research results and discussion

The analysis of environmental performances of Western Balkan countries is based on data about rank and score of the EPI. Table 1 presents the position of each Western Balkan country according to the EPI score and EPI global and group rank in 2018, as well as the score and global rank of these countries in two EPI policy objectives: Environmental health and Ecosystem vitality.

Table 1: The score and rank of EPI for the Western Balkan countries (2018)

Country	EPI score (0-100)	EPI global rank (out of 180)	Rank on the list of isolated group of WBC	Environmental health		Ecosystem vitality	
				Score	Global rank	Score	Global rank
Albania	65.46	40	1	65.67	82	65.32	30
Croatia	65.45	41	2	67.04	77	64.39	34
Montenegro	61.33	65	3	72.61	55	53.81	87
Macedonia	61.06	68	4	67.43	74	56.82	64
Serbia	57.49	84	5	61.18	100	55.03	77
Bosnia and Herzegovina	41.84	158	6	63.87	89	27.15	179

Source: 2018 Environmental Performance Index Report

Table 1 shows that all Western Balkan countries except Bosnia and Herzegovina are positioned in the first half of the global list according to EPI (2018). Albania records the highest score in the Western Balkan group (65.46), followed by second-ranked Croatia (65.45), third-ranked Montenegro (61.33), fourth-ranked Macedonia (61.06), fifth-ranked Serbia (57.49), and sixth-ranked Bosnia and Herzegovina (41.84).

Albania, as a best-ranked Western Balkan country, is positioned at the 40th position in the world according to EPI (Table 1). It achieves better global rank in ecosystem vitality (30th place) than in the environmental health (82nd place). Bosnia and Herzegovina is the worst-ranked Western Balkan country. It is positioned at the 158th place in the EPI global list. According to EPI policy objectives, Bosnia and Herzegovina reaches better performances in environmental health (89th place) than in the ecosystem vitality (179th place out of 180). Haiti (180th place) is the only poor-ranked country in terms of global ecosystem vitality in relation to Bosnia and Herzegovina. Other Western Balkan countries (Croatia, Montenegro, Macedonia, and Serbia) are positioned from 41st to 84th global place according to EPI.

With the aim to compare the environmental performances of Western Balkan countries with the most developed economies, it is necessary to show the competitive position of the top six European countries with the best results in environmental performances. The top six European countries serve as a benchmarking group that will be compared with the six Western Balkan countries. Table 2 expresses the scores of top six European countries according to EPI indicators (2018).

Table 2: Top six European countries according to the score and global rank of the EPI (2018)

Indicator	Switzerland	France	Denmark	Malta	Sweden	United Kingdom	Average score of the top 6 European
I_1 Air quality	91.06	95.97	99.16	94.40	92.84	94.43	94.64
I_2 Water and sanitation	99.99	97.22	97.78	100.00	96.88	100.00	98.65
I_3 Heavy metals	87.77	83.29	88.30	48.74	100.00	93.09	83.53
I_4 Biodiversity and habitat	84.20	96.25	94.48	87.77	81.00	96.69	90.07
I_5 Forests	47.40	25.08	12.74	-	5.53	6.90	19.53
I_6 Fisheries	-	57.71	50.75	56.49	53.76	42.16	52.17
I_7 Climate and energy	90.55	70.46	67.56	67.04	86.80	63.06	74.25
I_8 Air pollution	98.70	96.82	71.00	57.32	64.17	82.87	78.48
I_9 Water resources	99.67	95.56	98.45	100.00	98.49	99.82	98.67
I_{10} Agriculture	43.87	67.77	67.02	32.62	55.12	57.34	53.96
EPI score	*87.42*	*83.95*	*81.60*	*80.90*	*80.51*	*79.89*	*82.38*
EPI rank	*1*	*2*	*3*	*4*	*5*	*6*	*-*

Source: 2018 Environmental Performance Index Report

With the seventeen countries in the world's top twenty, Europe is the absolute leader in the world according to EPI (2018). Moreover, all world's top sixteen countries are European countries. The best-ranked country in the world according to EPI (2018) is Switzerland, with the EPI score of 87.42 (Table 2). Switzerland is followed by the second-ranked France (83.95), third-ranked Denmark (81.60), fourth-ranked Malta (80.90), fifth-ranked Sweden (80.51), and sixth-ranked United Kingdom (79.89).

The data presented in Table 2 show that Denmark reaches the best score in Air quality indicator. Also, Malta and United Kingdom are the best in Water and sanitation indicator; Sweden in Heavy metals indicator; United Kingdom in Biodiversity and habitat; Switzerland in Forests, Climate and energy, and Air pollution indicators; France in Fisheries and Agriculture indicators; and Malta in Water resources indicator.

Table 3 shows the scores of Western Balkan countries in all ten EPI indicators. Beside that, Table 3 presents the highest score of Western Balkan countries (column 8),

the average score of Western Balkan countries (column 9), the highest score of top six European countries (column 10), and the average score of top six European countries (column 11) for each of ten EPI indicators. The ambition of this analysis section is benchmarking the results of Western Balkan countries with the top six European countries according to environmental performances in 2018.

Table 3: The scores of indicators within the EPI for Western Balkan countries (2018)

Indicator	Albania	Croatia	Montenegro	Macedonia	Serbia	Bosnia and Herzegovina	The highest score of WBC	Average score of WBC	The highest score of top 6 European countries	Average score of top 6 European countries
1	2	3	4	5	6	7	8	9	10	11
I_1	65.47	64.07	69.28*	66.43*	69.73*	60.37	69.73 Serbia	65.89	99.16 Denmark	94.64
I_2	66.56	70.01*	78.61*	69.16*	56.67	71.54*	78.61 Montenegro	68.76	100.00 Malta/UK	98.65
I_3	62.89	87.84#	79.89*	70.11	68.53	63.39	87.84 Croatia	72.11	100.00 Sweden	83.53
I_4	75.37*	95.25#	73.77*	64.85*	49.84	26.93	95.25 Croatia	64.34	96.69 UK	90.07
I_5	23.36#	34.36#	30.77#	30.62#	38.66#	49.31⁰	49.31 B&H	34.51	47.40 Switzerland	19.53
I_6	58.25⁰	54.55#	36.18	-	-	-	58.25 Albania	49.66	57.71 France	52.17
I_7	68.36#	54.41#	46.85	63.85#	61.77#	26.80	68.36 Albania	53.67	90.55 Switzerland	74.25
I_8	86.07#	43.23	59.22*	56.99*	59.76*	30.79	86.07 Albania	56.01	98.70 Switzerland	78.48
I_9	80.73*	86.58*	81.67*	52.07	60.49*	0	86.58 Croatia	60.26	100.00 Malta	98.67
I_{10}	22.61	47.68*	10.57	35.99*	52.95*	33.09	52.95 Serbia	33.82	67.77 France	53.96
E P I score	65.46	65.45	61.33	61.06	57.49	41.84	-	-	-	-
E P I rank	40	41	65	68	84	158	-	-	-	-

Source: 2018 Environmental Performance Index Report

Legend:

Indicates that the score is below the average score of the group of Western Balkan countries.

* Indicates that the score is above the average score of the group of Western Balkan countries.

\# Indicates that the score is above the average score of top 6 European countries.

0 Indicates that the score is above the score of the best country in the group of top 6 European countries.

Table 3 shows that the average scores of Western Balkan countries in all indicators of EPI except Forests (I_5) are much below the average scores of top six European countries (see column 9 and 11). The biggest backlog of average scores of Western Balkan countries is achieved in the following indicators: Water resources (I_9), Water and sanitation (I_2), and Air quality (I_1). However, there is one EPI indicator in which Western Balkan countries have advantage over the top six European countries. It is Forests indicator (I_5). Western Balkan countries reach the average score of 34.51 in Forests indicator, which is much better than top six European countries (19.53). Nevertheless, this impressive score of Western Balkan countries remained in the shadow of the rest (poor) scores of environmental performances.

Using the results of the previous analysis, the authors present the list of critical indicators for further development of Western Balkan countries in terms of environmental performances. It is presented in Table 4.

Table 4: Indicators within the EPI which require priority of development policy by Western Balkan countries (2018)

Country	The critical indicators which show the negative deviations from the average score of the group of WBC	Number of critical indicators
Albania	I_1, I_2, I_3, I_{10}	4
Croatia	I_1, I_8	2
Montenegro	I_6, I_7, I_{10}	3
Macedonia	I_3, I_9	2
Serbia	I_2, I_3, I_4	3
Bosnia and Herzegovina	$I_1, I_3, I_4, I_7, I_8, I_9, I_{10}$	7

Source: Author's presentation

Table 4 shows that Bosnia and Herzegovina is the worst positioned Western Balkan country according to the total number of the negative deviations of EPI indicators from the average score of the group (7 critical indicators). It is interesting that Albania as a best-ranked Western Balkan country has even 4 critical indicators. Next to the Albania, Montenegro and Serbia have poorer performances in 3 indicators, and Croatia and Macedonia in 2 indicators.

Beside previous analysis, Table 4 allows identification of indicators in which most Western Balkan countries record a negative deviation. Heavy metals (I_3) indicator requires intervention and improvement by the majority of Western Balkan countries (4 out of 6 countries). Air quality (I_1) and Agriculture (I_{10}) need urgent actions in 3 Western Balkan countries. Water and sanitation (I_2), Biodiversity and habitat (I_4), Climate and energy (I_7), Air pollution (I_8), and Water resources (I_9) must be improved in two Western Balkan countries, while Fisheries (I_6) need urgent actions in one Western Balkan country.

Above interpretation of research findings points to the critical indicators of Western Balkan countries in the first priority level (benchmark is the average score of Western Balkan group). Beside that, it is also relevant to identify critical indicators of

Western Balkan countries in the second priority level (benchmark is the average score of top six European countries) and in the third priority level (benchmark is the best score among top six European countries). Specification of indicators within the EPI according to priority and urgency of their necessary improvement by the Western Balkan countries is presented in Table 5.

Table 5: Specification of indicators within the EPI according to priority and urgency of their necessary improvement by the Western Balkan countries

Country	The first priority level – the benchmark is the average of WBC	The second priority level – the benchmark is the average of top 6 European countries	The third priority level – the benchmark is the best country among top 6 European countries
1	2	3	4
Albania	I_1, I_2, I_3, I_{10}	I_4, I_9	I_5, I_7, I_8
Croatia	I_1, I_8	I_2, I_9, I_{10}	I_3, I_4, I_5, I_6, I_7
Montenegro	I_6, I_7, I_{10}	I_1, I_3, I_4, I_8, I_9	I_5
Macedonia	I_3, I_9	$I_1, I_2, I_4, I_8, I_{10}$	I_5, I_7
Serbia	I_2, I_3, I_4	I_1, I_8, I_9, I_{10}	I_5, I_7
Bosnia and Herzegovina	$I_1, I_3, I_4, I_7, I_8, I_9, I_{10}$	I_2	-

Source: Author's presentation

The purpose of this analysis is to determine the priorities (based on the urgency) in environmental development policy of each country from the Western Balkan group (see Table 5). Firstly, every Western Balkan country need to improve its environmental performaces in the indicators that belong to the first priority level (see column 2). Benchmark standard for this priority level is the average score of Western Balkan group. When country reaches that result, the goal should be the average score of the top six European countries (see column 3). After achieving that goal, Western Balkan countries should strive to achieve a higher goal, i.e. to reach the score of the best country in the group of top six European countries (see column 4).

Table 5 show that all Western Balkan countris except Bosnia and Herzegovina have at list one indicator in each priority level. Unlike other countries, Bosnia and Herzegovina has seven indicators in the first priority level, one indicator in the second priority level, and no one indicator in the third priority level. That is another in a series of evidence that confirms very poor performances of Bosnia and Herzegovina in terms of environmental sustainability.

Conclusion

The analysis of data about the score and global rank of six observed countries of Western Balkan (Albania, Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, and Serbia) published in 2018 Environmental Performance Index Report point to the

global competitiveness of these countries in terms of environmental performances. The research findings of this study indicates many possibilities for environmental sustainability improvement in Western Balkan countries.

Analysis showed that all Western Balkan countries except Bosnia and Herzegovina are positioned in the first half of the EPI global list. The best-ranked country in the Western Balkan group is Albania with the highest EPI score of 65.46. It is followed by second-ranked Croatia (EPI score 65.45), third-ranked Montenegro (EPI score 61.33), fourth-ranked Macedonia (EPI score 61.06), fifth-ranked Serbia (EPI score 57.49), and sixth-ranked Bosnia and Herzegovina (EPI score 41.84).

Beside previous conclusion, it is very important finding of the study that the average scores of Western Balkan countries in all indicators of EPI except Forests indicator are much below the average scores of the top six European countries. The biggest backlog of average scores of Western Balkan countries is achieved in the following indicators: Water resources, Water and sanitation, and Air quality. Only indicator in which Western Balkan countries have advantage over the top six European countries is the Forests indicator.

The worst results of environmental performances among Western Balkan group are recorded in the case of Bosnia and Herzegovina. It is concluded that this country has seven indicators in the first priority level, one indicator in the second priority level, and no one indicator in the third priority level. In other words, it lags behind the Western Balkan group in even seven indicators, while exceeds the results of other countries in this group in only one indicator.

Based on the above analysis, the authors specify the indicators within the EPI according to priority and urgency of their necessary improvement by each Western Balkan country. It allows to the environmental policy makers of these countries to formulate its politics and actions in order to improve the results in this field in the future. The general conclusion of this paper is that all Western Balkan countries and especially Bosnia and Herzegovina need to make a lot of efforts in a future development of its environmental performances.

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