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Comparison of Balkan Countries Regarding Sustainable Development Goals (SDGs) About Environment

Harun Hurma¹, Gökhan Unakıtan¹, Çağdaş İnan²

¹Namık Kemal University, Faculty of Agriculture, Department of Agricultural Economics

²Namık Kemal University, The Vocational School of Social Sciences, Department of Tourism and Hotel Management

Abstract: The concept of sustainability has entered the World Literature at the beginning of the 1970s. Since then, "sustainability" has become the most fundamental element in economic development strategies and processes. In the 1980s, 1990s, and 2000s, the concept of "sustainable development" took place in development debates and policies to be implemented.

From 1987 to the present day, many conferences, meetings, and agreements have been made on this issue for the future generations to live in a healthy environment. 17 goals for sustainability were identified in the Transforming our world: The 2030 Agenda for Sustainable Development Summit in 2015. While 12, 13, 14,

and 15 of these goals are entirely related to the environment; goals 2, 6, and 7 are partially related to the environment regarding their objectives.

Various indices are used to evaluate whether the countries have reached these goals. One of these indices is the Environmental Performance Index, and the other is the Sustainable Development Goals Index and Dashboard. These indices, which contain many indicators, reveal the situation of the countries.

In this study, the performance of the Balkan countries according to the sustainable development goals of the environment was evaluated. According to the Sustainable Nitrogen Management Index, which envisages sustainable agriculture, all Balkan countries perform deficient performance. In SDG 14 (Life Below Water) Balkan countries have similarly low score in general.

Keywords: Sustainable Development Goals (SDGs), Environmental Performance Index, Sustainable Development Goals Index, Balkan Countries

Introduction

After the Industrial Revolution, there was a tremendous economic difference between the countries that implemented this revolution and the other countries. In particular, after the Second World War, almost all of the underdeveloped countries have tried to apply the "modernization" process by implementing various development strategies. Comparisons of countries in the 1950s were determined according to the gross domestic product, but comparisons were started considering social welfare by the 1980s.

The term "Development" has entered into the world economic literature, which is a concept that includes not only economic growth and the increase in the national income, but also the improvement of the welfare and social elements. The pressure on natural resources along with development strategies has paved the way for sustainable development.

The sustainable development approach, which represents a dynamic process, will pave the way for the economic development process by preserving human health and natural equilibrium, providing rational orientation and balanced use of natural resources, leaving an unspoiled and healthy environment for future generations.

For the past 45 years, world countries have held numerous conferences and meetings on sustainability and sustainable development. In this context, roadmaps have been drawn out, and various objectives have been determined.

This process initiated in 1972 with the report "Limits to Growth" published by the Roman club. In this report, traditional development methods and environmental pollution were criticized, and it was emphasized that the environment should be protected for economic development (Meadows et al., 1972). Following this, the "Human Environment Conference" was held in Stockholm the same year. The concept of sustainability was also emphasized in this conference (UN, 1972). In the "Our Common Future" report published by the United Nations in 1987, the definition of sustainable development was made. According to this, sustainable development is defined as "ability to make development sustainable-to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987).

The conscious elements of the international community have seen that the problem can be overcome by producing conscious and sharing policies that exceed the national borders, and after the maturation period, the 1992 Rio Summit was

reached (Günsoy, 2006). 189 countries declared the “United Nations Millennium Declaration” in September 2000. Eight Millennium Development Goals (MDG) have been identified regarding sustainability in the Declaration (UN, 2000). These eight MDGs have been developed for each country to show progress in sustainable development and fight against poverty by 2015 in a measurable and traceable way (Peskircioğlu, 2016).

The year 2015 has been a significant year for global climate change and sustainable development. Under the leadership of the United Nations, the Treaty of Paris was signed on 12 December 2015 as part of climate change framework conferences. The Paris Treaty is crucial for a new roadmap to global climate change efforts with a history of nearly 20 years (UN, 2015a). The Paris Treaty is an agreement on a global scale adopted by 196 member states. It has been decided that the earth's temperature difference, which has reached 1°C until today, is kept below 2°C and as high as 1.5°C as possible.

The 2030 Sustainable Development Goals in the UN Sustainable Development Summit in New York on 25-27 September 2015, in the same year, were accepted by the signature of 193 countries. These key objectives will serve as the international community and national governments to act as joint welfare action for the next 15 years (UN, 2015b).

In this study, we want to give comparatively the situation of the Balkan countries regarding sustainable development targets about the environment. In this context, what needs to be done in order to reach 2030 goals will also be discussed.

Material and Methods

In the study, the status and comparison of the Balkan Countries were made using 2 index data prepared by various institutions. These are Environmental Performance Index and Sustainable Development Goals Index.

The Environmental Performance Index (EPI) lists countries' performance in areas related to human health and ecosystem protection. For this purpose, there are more than 20 indicators in 9 different areas. These indicators are health, air quality, water quality and water resources, agriculture, forests, fisheries, biodiversity, climate, and energy (EPI, 2016).

Another index is the Sustainable Development Goals Index (SDG index), which was first published in 2016. This index contains close to 100 indicators. The purpose of this index is to give an idea and make comparisons about the achievement of the 17 SDGs. Thus, the difficulties and shortcomings of the countries in essential applications can be revealed (Bertelsmann Stiftung and SDSN, 2017).

Sustainable Development Goals (SDGs)

The 17 Sustainable Development Goals (SDGs) and 169 targets are announced in the "Transforming our world: the 2030 Agenda for Sustainable Development" declaration published in 2015. The Agenda is a commitment to eradicate poverty and achieve sustainable development by 2030 worldwide, ensuring that no one is left behind. The adoption of the 2030 Agenda was a landmark achievement, providing for a shared global vision towards sustainable development for all (UN, 2015b). The 17 goals identified on this agenda are shown in Figure 1.



Figure 1. Sustainable Development Goals

These objectives mainly cover people, planet, prosperity, peace, and partnership. Goals 12, 13, 14, and 15 are based on the sustainability of the natural environment entirely. Goal 2, 6 and 7 contain the environmental targets partially. For this reason, the comparison of the Balkan countries was established in the indicators of 2, 6, 7 partly, and indicators of 12, 13, 14, 15 entirely.

Comparison Balkan Countries

Firstly, scores and rankings were given according to the countries' environmental performance index. According to the table 1, Slovenia ranks first in the Balkan countries Slovenia is in fifth place in the World rankings. This is followed by Croatia, Greece, and Romania. Among the Balkan countries, Bosnia and Herzegovina have the lowest score (63,3) in Environmental performance index.

Table 1. Environmental Performance Index

	Environmental Performance Index (2016) (score)	Environmental Performance Index (2016) (rank)
Slovenia	89,0	5
Croatia	87,0	15
Greece	85,8	21
Bulgaria	83,4	33
Romania	83,2	34
Montenegro	78,9	47
Serbia	78,7	48
Macedonia, FYR	78	50
Albania	74,4	59,0
Turkey	67,7	92
Bosnia and Herzegovina	63,3	110

Source: EPI, 2016 and Bertelsmann Stiftung and SDSN, 2017.

The SDG index is scoring and ranked globally according to the achievement of 17 goals for countries. Table 2 gives the ranking of the countries by scores. According to the Table 2, Slovenia, Croatia, Romania, Serbia and Balkan countries are among the top four countries in the SDG index of 157 countries and in the order of 17 goals in 2017.

Table 2. SDG Global Rank

2017	(of 157)
Slovenia	9
Croatia	24
Romania	35
Serbia	37
Greece	38
Bulgaria	40
Macedonia, FYR	57
Albania	63
Turkey	67
Montenegro	69
Bosnia and Herzegovina	84

Source: Bertelsmann Stiftung and SDSN, 2017.

SDG 2: Zero Hunger, which aims to end hunger, achieve food security and improved nutrition and promote sustainable agriculture, has a "sustainable Nitrogen Management Index" indicator regarding the environment. This index, which measures agricultural sustainability, is based on two essential production activities: nitrogen use activity and land use activity (Zhang et al., 2015).

When the purpose of SDG 2 (Zero Hunger) is examined the situations about the environment that are relevant to countries are shown as below. According to the Sustainable Nitrogen Management index, all Balkan countries seem to have a scarcely worst score (Table 3).

Table 3. SDG 2: Zero Hunger

		Sustainable Nitrogen Management Index (0-1)			
Albania		1,0			
Bosnia and Herzegovina		0,9			
Bulgaria		0,8			
Croatia		0,7			
Greece		0,7			
Macedonia, FYR		0,8			
Montenegro		1,1			
Romania		0,7			
Serbia		0,7			
Slovenia		0,8			
Turkey		0,8			
Best Value					Worst Value
0,0	<=0,3	0,3 < x <=0,5	0,5 < x <=0,7	>0,7	1,2

Source: Bertelsmann Stiftung and SDSN, 2017.

Table 4 shows the comparison between Balkan countries for SDG 6 (Clean Water and Sanitation), which ensure availability and sustainable management of water and sanitation for all. According to this indicator, freshwater withdrawal (% of total renewable water resources), Bulgaria and Turkey have more water usage than other Balkan countries.

Table 4. SDG 6: Clean Water and Sanitation

		Freshwater withdrawal (% of total renewable water resources)			
Albania		4,3			
Bosnia and Herzegovina		0,9			
Bulgaria		28,7			
Croatia		0,6			
Greece		13,9			
Macedonia, FYR		16,1			
Montenegro		-			
Romania		3,2			
Serbia		2,5			
Slovenia		2,9			
Turkey		18,9			
Best Value					Worst Value
12,50%	<=25%	25%<x<=50%	50%<x<=75%	>75%	100%

Source: Bertelsmann Stiftung and SDSN, 2017.

Table 5. SDG 7: Affordable and Clean Energy

	CO2 emissions from fuel combustion and electricity output (MtCO2/TWh)	Share of renewable energy in total final energy consumption (%)
Albania	0,9	38,2
Bosnia and Herzegovina	1,4	15,3
Bulgaria	1,0	15,8
Croatia	1,2	20,0
Greece	1,4	13,9
Macedonia, FYR	1,6	16,5
Montenegro	0,7	46,2
Romania	1,1	21,7
Serbia	1,1	19,6
Slovenia	0,8	19,3
Turkey	1,3	12,8
Best Value	0,0	94,20%
	<=1	>=20%
	1<x<=1,25	20%>x>=15%
	1,25<x<=1,5	15%>x>=10%
	>1,5	<10%
Worst Value	3,3	0,30%

Source: Bertelsmann Stiftung and SDSN, 2017.

SDG 7 (Affordable and Clean Energy) goals related to the environment, contains indicators such as CO2 emissions from fuel combustion and electricity

Output and Share of renewable energy in total final energy consumption (Table 5). CO₂ emissions from fuel combustion and electricity provide a complete analysis of emissions from energy usage (IEA, 2016). The share of renewable energy in total final energy consumption allows the calculation of the share of renewable energy using the energy data available for final consumption. Consequently, the calculated result using the energy available for final consumption underestimates the share of energy from renewable sources (SE4All, 2016).

SDG 12, which aims to sustain production and consumption, has 7 indicators. Electronic waste is an essential part of the process of global waste consumed nowadays. Efforts are being made to recycle and reduce this waste. E-waste compares the amount of per capita electronic waste. (UNU-IAS, 2015). Wastewater treatment is a process used to convert wastewater into water that can be recycled or reused in the water cycle with minimum environmental problems. It is expressed as a percentage by this indicator (Hsu, A. et al., 2016). When the indicators of sustainable consumption and production are examined, it is seen that the worst scores are at the wastewater treated indication. In addition, the e-waste indicator is not sufficient in terms of Balkan countries. According to "net imported emissions of reactive nitrogen" indicator Montenegro and Greece are worse than the other countries (Table 6).

Table 6. SDG 12: Responsible Production and Consumption

	E-waste (kg/capita)	Municipal solid waste (kg/person/year)	Production-based reactive nitrogen emissions (kg/capita)	Production-based SO ₂ emissions (t/capita)	Net imported emissions of reactive nitrogen (kg/capita)	Net imported SO ₂ emissions (t/capita)	Wastewater treated (%)
Albania	6,1	0,8	15,6	7,8	-24,8	7,8	5,1
Bosnia and Herzegovina	5,3		16,5		-19,2	-10,9	0,0
Bulgaria	10,7	1,3	20,0	98,2	-200,3	-31,0	60,8
Croatia	10,8	0,3	23,2	16,9	53,5	11,7	50,2
Greece	15,1	2,0	56,9	45,3	215,0	16,8	77,6
Macedonia, FYR	6,1	1,1	17,8			-10,9	4,4
Montenegro	7,1				329,3	-10,9	6,7
Romania	9,2	1,0	39,5	30,9	18,5	-1,2	15,4
Serbia	7,3	0,8	n.d.			-10,9	6,4
Slovenia	15,0	1,2	34,7	8,1	125,0	17,4	59,8
Turkey	6,5	1,8	25,2	22,4	35,2	3,1	31,6
Best Value	0,2	0,1	2,3	0,5	0	0	100%
	≤5	≤1	≤8	≤10	≤1,5	≤1	≥50%
	5 < x ≤ 7,5	1 < x ≤ 1,5	8 < x ≤ 29	10 < x ≤ 20	1,5 < x ≤ 75,75	1 < x ≤ 8	50% > x ≥ 32,5%
	7,5 < x ≤ 10	1,5 < x ≤ 2	29 < x ≤ 50	20 < x ≤ 30	75,75 < x ≤ 150	8 < x ≤ 15	32,5% > x ≥ 15%
	>10	>2	>50	>30	>150	>15	<15%
Worst Value	23,50	3,7	86,5	68,3	432,4	30,1	0%

Source: Bertelsmann Stiftung and SDSN, 2017.

SDG13 has indicators that include climate actions. These are Climate change vulnerability index (0-1), Imported emissions, tech-adjusted (tCO₂ / capita) and CO₂ emissions from energy (tCO₂ / capita). The climate change vulnerability index (0-1) measures the vulnerability of countries to climate change. The total vulnerability score is calculated as a simple average of three distinctive signs normalized from 0 to 1.7. Therefore, this indicator assesses countries' relative vulnerability to major climate change effects rather than full impacts (HCSS, 2015). According to CO₂ emissions from energy indicators, other Balkan countries except Albania have an average score (Table 7).

Table 7. SDG 13: Climate Action

	Climate change vulnerability index (0-1)	Imported emissions, tech-adjusted (tCO ₂ /capita)	CO ₂ emissions from energy (tCO ₂ /capita)
Albania	0,3	0,7	1,7
Bosnia and Herzegovina	0,0	0,2	5,7
Bulgaria	0,0	0,8	5,4
Croatia	0,0	0,3	4,2
Greece	0,1	1,5	6,3
Macedonia, FYR	0,0	0,6	4,0
Montenegro	0,1	2,1	3,6
Romania	0,0	0,2	3,5
Serbia	0,0	1,1	6,3
Slovenia	0,0	-1,4	7,0
Turkey	0,0	0,7	4,2
Best Value	0%	0	0
	≤0,1%	≤0,5	≤2
	0,1% < x ≤ 0,15%	0,5 < x ≤ 0,75	2 < x ≤ 3
	0,15% < x ≤ 0,2%	0,75 < x ≤ 1	3 < x ≤ 4
	>0,2%	>1	>4
Worst Value	0,40%	3,20	23,7

Source: Bertelsmann Stiftung and SDSN, 2017.

SDG 14 is a goal with the objectives on water life and sustainability. It seeks to protect the oceans, seas and aquatic life, and to use them in a sustainable way. This goal includes indicators such as biodiversity, clean waters, marine sites, fisheries.

Ocean Health Index - Biodiversity estimates how successfully the richness and variety of marine life are being maintained around the world. The score for this Goal: Biodiversity is 91 out of 100. The global average score is 71 out of 100. Clean waters measure contamination by chemicals, excessive nutrients (eutrophication), human pathogens and trash. Water pollution harms human health, livelihoods, and recreation, as well as the health of marine life and habitats. The score for this Goal: Clean Waters is 74 out of 100. The global average score is 71 out of 100. The Fisheries sub goal measures the sustainability of wild-caught seafood harvests, with the aim of maximizing the amount that can be harvested year after year (Ocean Health Index, 2016).

Ocean Health Index - Clean waters and Ocean Health Index - Fisheries indicators are below the required values in all Balkan countries. The Ocean Health

Index - Biodiversity indicator is lower in Bosnia and Herzegovina than others (Table 8).

Table 8. SDG 14: Life Below Water

	Ocean Health Index - Biodiversity (0-100)	Ocean Health Index - Clean waters (0-100)	Marine sites, mean area protected (%)	Ocean Health Index - Fisheries (0-100)
Albania	93,7	53,5	66,1	28,1
Bosnia and Herzegovina	79,3	40,6	0,0	32,5
Bulgaria	94,0	42,7	99,4	36,3
Croatia	94,5	64,0	69,3	40,7
Greece	94,9	59,6	71,8	54,3
Macedonia, FYR				
Montenegro	92,6	60,1	0,0	36,8
Romania	94,3	56,4	99,6	57,8
Serbia		n.d.	n.d.	n.d.
Slovenia	95,8	28,4	99,9	49,7
Turkey	91,7	50,4	4,6	66,5
Best Value	100	100	100	100
	≥90	≥70	≥50%	≥70
	90> x ≥ 85	70> x ≥ 65	50%> x ≥ 30%	70> x ≥ 65
	85> x ≥ 80	65> x ≥ 60	30%> x ≥ 10%	65> x ≥ 60
	<80	<60	<10%	<60
Worst Value	76	28,6	0%	19,7

Source: Bertelsmann Stiftung and SDSN, 2017.

Table 9 shows SDG 15 indicators for sustainability of terrestrial life. These indicators are freshwater sites, terrestrial sites, the annual change in forest area (%), imported biodiversity impacts (species lost per million people) and red list index of species survival (0-1).

According to the indicator freshwater sites and mean area protected scores, Croatia and Bulgaria are far better than others but Montenegro and Turkey are in a bad situation.

Table 9. SDG 15: Life on Land

	Freshwater sites, mean area protected (%)	Terrestrial sites, mean area protected (%)	Annual change in forest area (%)	Imported biodiversity impacts (species lost per million people)	Red List Index of species survival (0-1)
Albania	95,4	68,5	5,0	0,2	0,85
Bosnia and Herzegovina	40,0	12,5	0,8	0,2	0,90
Bulgaria	98,6	95,6	2,1	0,2	0,94
Croatia	100,0	65,2	1,9	0,2	0,90
Greece	86,1	72,5	4,0	0,3	0,85
Macedonia, FYR	86,0	21,1	4,0	0,3	0,97
Montenegro	0,0	2,1	1,8	n.d.	0,81
Romania	66,1	77,8	3,3	0,2	0,95
Serbia	31,1	26,1	1,2	0,2	0,96

	Freshwater sites, mean area protected (%)	Terrestrial sites, mean area protected (%)	Annual change in forest area (%)	Imported biodiversity impacts (species lost per million people)	Red List Index of species survival (0-1)
Slovenia	93,1	85,5	1,6	0,6	0,94
Turkey	4,1	2,3	3,3	0,2	0,88
Best Value	100%	100%	0,60%	0	1
	≥50%	≥50%	≤3%	≤0,1	≥0,9
	50% > x ≥ 30%	50% > x ≥ 30%	3% < x ≤ 4,5%	0,1 < x ≤ 0,225	0,9 > x ≥ 0,85
	30% > x ≥ 10%	30% > x ≥ 10%	4,5% < x ≤ 6%	0,225 < x ≤ 0,35	0,85 > x ≥ 0,8
	<10%	<10%	>6%	>0,35	<0,8
Worst Value	0%	2,10%	18,40%	1,10	0,6

Source: Bertelsmann Stiftung and SDSN, 2017.

Results and Interpretation

The SDG Index gives an initial indication of the state of play and helps raise public awareness of the 2030 Agenda and its implementation in individual states. Available data for SDG 2 show that all Balkan countries also need to shift towards more environmentally sustainable agricultural practices and improve nutrition outcomes.

Balkan countries also face major challenges in decarbonizing their energy systems to fight climate change (SDG 13), and in conserving marine (SDG 14) and terrestrial (SDG 15) ecosystems.

As described in the methodology section, the 2017 SDG Index contains new indicators and updated values for those indicators for which new data are available. As a result, the 2017 scores and rankings are not comparable with the 2016 results.

Unfortunately, it has not been possible to estimate time series trends for many variables, so the available data do not tell us whether and how fast countries progress towards the SDGs.

References

1. Bertelsmann Stiftung and SDSN, 2017. SDG Index and Dashboards Report 2017, International spillovers in achieving the goals Global Responsibilities, Sustainable Development Solutions Network, Paris and New York.
2. EPI, 2016, Global Metrics For The Environment, The Environmental Performance Index, Ranks Countries' Performance On High-Priority Environmental Issues. 2016 report, www.epi.yale.edu
3. Günsoy, B., 2006, Piyasa Dostu Sürdürülebilir Kalkınma Politikaları: Eleştirel Bir Yaklaşım, Mevzuat Dergisi, Sayı:101
4. HCSS, 2015. Climate change vulnerability monitor. The Hague Centre for Strategic Studies, The Hague.
5. Hsu, A., et al., 2016. The 2016 Environmental Performance Index. Yale Center for Environmental Law and Policy, New Haven, CT.
6. http://ec.europa.eu/eurostat/statistics-explained/index.php/Calculation_methodologies_for_the_share_of_renewables_in_energ_consumption

7. IEA, 2016. CO2 Emissions From Fuel Combustion (2016 Edition). International Energy Agency, Paris.
8. Meadows, D.H., Meadows, D.L., Randers, J., Bahrens, W.W., 1972, The Limits To Growth, A Report For The Club Of Rome's Project On The Predicament Of Mankind, Newyork
9. Ocean Health Index. 2016. Ocean Health Index Assessment Manual. National Center for Ecological Analysis and Synthesis, University of California
10. Peşkircioğlu, N., 2016, 2030 Sürdürülebilir Kalkınma Hedefleri: Küresel Verimlilik Hareketine Doğru, Verimlilik Dergisi, Kasım 2016, Yıl 28, Sayı 335
11. SEE4All (Sustainable Energy for All). 2016. <http://www.se4all.org/>
12. UN, 1972, Report of the United Nations Conference on The Human Environment, Stockholm
13. UN, 2000, Millennium Development Goals, <http://www.un.org/millenniumgoals/index.shtml>
14. UN, 2015a, Paris Agreement, United Nations Framework Convention on Climate Change, http://unfccc.int/paris_agreement/items/9485.php
15. UN, 2015b, Transforming our world: the 2030 Agenda for Sustainable Development, <http://www.un.org/sustainabledevelopment/summit/>
16. UNU-IAS, 2015. The Global E-Waste Monitor 2014: Quantities, Flows, and Resources. United Nations University, IAS – SCYCLE, Bonn, Germany.
17. WCED, 1987, Our Common Future, also known as the Brundtland Report, World Commission on Environment and Development, Oxford University Press, ISBN 019282080X
18. Zhang, X., Davidson, E.A., Mauzerall, D. L., Searchinger, T.D., Dumas, P., Shen, Y., 2015. Managing nitrogen for sustainable development. Nature, 528, pp._51–59.