COMPARATIVE ANALYSIS OF SUSTAINABLE DEVELOPMENT COMPONENTS FOR THE REPUBLIC OF SERBIA AND NEIGHBOURING COUNTRIES

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Abstract

In last few decades the significance of sustainable development is recognized by many international and public institutions. Climate changes and more frequent environmental degradation have influenced human awareness that their life and business style can seriously affect the quality of the environment, and therefore the future of the whole humanity. Developed countries have recognized the importance of sustainable development concept, but on the other side, developing countries still lag behind regarding the implementation of the sustainable development concept in all segments of society. Serbia and its neighbors are still at the beginning of implementation of the sustainable development concept, but through specific indicators the implementation of the sustainable development strategy can be successfully measured.

Key words: sustainable development, environmental protection, correlation analysis, EPI, SSI, HDI, GCI, Republic of Serbia.

КОМПАРАТИВНА АНАЛИЗА КОМПОНЕНТИ ОДРЖИВОГ РАЗВОЈА РЕПУБЛИКЕ СРБИЈЕ И СУСЕДНИХ ЗЕМАЉА

Апстракт

Одрживи развој током протеклих неколико деценија добија све више на значају од стране различитих међународних, али и националних институција. Климатске промене и све чешћа деградација животне средине утицали су на подизање свести људи у смислу да тренутни стил живота и пословања може озбиљно угрозити квалитет животне средине, а самим тим и будућност читавог човечанства. Развијене земље препознале су важност концепта одрживог развоја, а са друге стране, земљама у развоју потребно је време да би у потпуности укључиле одрживи развој у све сегменте свог друштва. Србија и њени суседи још увек су на самом почетку примене концепта одрживог развоја, а преко одређених показатеља може се пратити колико успешно спроводе стратегије одрживог развоја.

Кључне речи: одрживи развој, заштита животне средине, корелациона анализа, EPI, SSI, HDI, GCI, Република Србија.

INTRODUCTION

There are few examples in modern history that can show how human unconcern towards environment can cause huge disasters for whole human kind. Degradation of land, water and air had put environmental security on first place. Environmental security represents the ability of society to solve all possible problems, risks and dangers for human kind which can initiate society conflicts (Barnett, 2001). With all these problems ecology, as a scientific discipline, had become more important for modern society. With the need of exploring the whole economic development process, many experts from ecology department were included in the process of solving environmental problems. These ecology experts have a crucial role in the decision-making process and also in the environmental strategy implementation process. The purpose of their work is to turn things in positive direction. Better environmental quality can increase social welfare and establish a balanced ecosystem, which has to be a priority task for all modern economies. In developed countries economic reforms provided a full support for investments in cleaner technologies and also for reducing pollution and better waste management (Radukic et al., 2014, p. 312).

Sustainable development issue is very important for developing countries. These countries are currently facing transition process and from that position sustainable development can help them to improve economic development. Developing countries must solve economical, cultural and technical problems so that at the end they would not be facing a crisis which can produce huge economical, political and technical dependence, but also a social and environmental dehumidification and degradation (Hafner, 2007).

The paper is structured so that beside the introduction and conclusion it has two more sections. In the first section, sustainable development indicators, their structure and values in the Republic of Serbia and neighbouring countries will be presented. In the second section, a comparison of the indicators in the Republic of Serbia and its neighbouring countries will be made with the use of correlation analysis.

THE ANALYSIS OF SUSTAINABLE INDICATORS FOR THE REPUBLIC OF SERBIA AND NEIGHBOURING COUNTRIES

Regarding the implementation of sustainable development concept the Republic of Serbia is a little late in comparison to other countries. Due to many social and economic problems, sustainable development process was not in the centre of attention, although Serbian representatives had participated on many environmental conferences. The awareness of people is another factor that influenced late implementation of the sustainable development concept. Serbia is a developing country and improving

economic processes and increasing economic growth have to be in the centre of every development strategy. Because of that, there was not enough space for improving environmental policy.

The first bigger step was made with acceptance of the *United Nations Framework Convention on Climate Change* in 2001. In coordination with European legislature, Serbia has started to work on environmental legislature in 2004, when the Law on Environmental Protection has been adopted. With the implementation of this law all polluters were facing penalties for illegal actions, especially in public and private sector. They were all required to calculate costs of environmental protection before starting any new business. In 2008, the National Strategy of Sustainable Development has been adopted. This way Serbia became a part of the countries that had recognized the importance of the sustainable development concept. The first main task for these countries was the implementation of the National Strategy of Sustainable Development.

During 2009, Serbia adopted a package of the so called "green laws" that included the Law on Waste Management, Law on Air Protection, Law on Chemicals and Law on Protection from environmental noise. The aim, of having these laws adopted, was an improvement in the environmental policy, which is important for further European integration processes. Serbia, as a candidate country for the EU membership, has a right to use the EU funding finance programmes for financing sustainable development and environmental protection. EU funding finance programmes do not provide enough assets at the moment, but with the development of new environmental projects things will be different. With becoming a full member of the EU, more assets from funding finance programmes will be provided, but meanwhile our country has to find another way for financing sustainable development projects.

Sustainable development concept can be better analysed through the economic, environmental and social component. This way, sustainable development will be easily understood. Sustainable development components can help in the process of understanding the whole concept of sustainability. The environmental component can be analysed through the EPI index, and the economic component through the GDP *per capita* and the GCI index. At the end, the social component will be analysed through the SSI, HDI and IHDI index. Each of these indicators can give us a better view of the sustainable development concept.

Environmental Performance Index (EPI)

With the use of the Environmental Performance Index (EPI), the environmental component of sustainable development can be easily understood. The EPI allows a detailed analysis of every country's environmental performances. The EPI methodology is developed by the Universities of Yale and Colombia with the help of the World Economic

Forum (WEF). Governments around the world give data for further analysis and there is a huge database about ecological performances. For counting the EPI, few areas of environmental policy must be supervised through their indicators. Analysed areas include: health impacts, air quality, water and sanitation, water resources, agriculture, forests, fisheries, biodiversity and habitat and climate and energy.

The EPI methodology represents one of the modern ways for supervising the sustainable development concept. With a better view of particular areas, people can get better impression about environmental protection and all supporting processes. Also, this represents a good basis for developing new sustainable development strategies. A better view into some critical areas can help creators of economic policy to redefine their goals and start to use cleaner technologies and to make their business more sustainable.
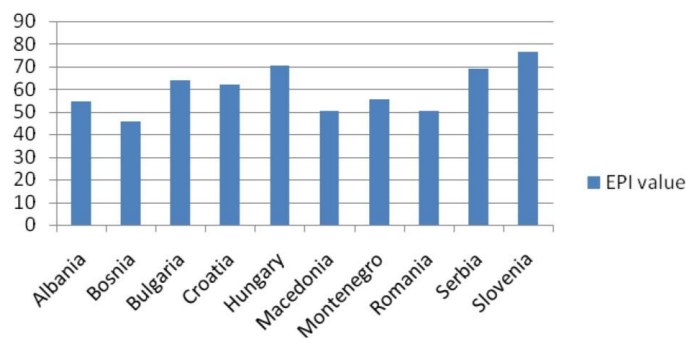

Chart 1. EPI values in Republic of Serbia and neighbouring countries for 2014
Source: Yale University, 2014

According to the 2014 EPI Report, out of 178 analysed countries worldwide, the best environmental performances in this region have been shown by Slovenia and Serbia. In last few years, Serbia has made a progress in this field, but there is still plenty of work to do, so performances would be at the same level as in developed countries. It is interesting that rankings showed that EU members such as Bulgaria, Croatia and Romania are behind Serbia. All these three countries use EU funding financing programmes for environmental protection and their results are still not good enough. In this region, the lowest score has Bosnia, which did not make any progress at all.

Table 1. EPI rankings and values for Republic of Serbia and neighbouring countries for 2014

EPI	Albania	Bosnia	Bulgaria	Hungary	Macedonia	Romania	Slovenia	Serbia	Montenegro	Croatia
EPI rank	67	107	41	28	89	86	15	31	62	45
EPI value	54,73	45,79	64,01	70,28	50,41	50,52	76,43	69,13	55,52	62,23
Health Impact	93,75	91,03	87,46	96,71	100	85,36	100	84,72	98,68	95,79
Air quality	68,24	69,53	77,23	70,24	64,26	68,88	78,13	67,17	76,19	76,67
Water and sanitation	55,91	72,15	95,02	99,99	70,51	31,32	95,96	78,19	60,08	77,71
Water resources	3,36	3,18	28,86	58,62	3,74	13,05	53,99	8,79	5,1	13,23
Agriculture	60	56	81,62	65,34	94	72,13	63,43	96	86	60,99
Forests	17,25	100	84,12	100,00	25,34	45,05	45,05	100,00	100,00	63,12
Fisheries	0	-	0	-	-	0	-	-	0	19,30
Biodiversity and habitat	63,19	2,5	68,85	29,57	27,54	63,51	100	99,78	68,85	79,87
Climate and energy	85,74	31,71	48,18	66,87	54,41	62,82	54,59	62,92	48,18	63,26

Source: Yale University, 2014

Effective comparative analysis can show weakness and strength of every side so proper environmental policy can be implemented. Health impacts are measured by child mortality and the highest scores had Slovenia and Macedonia. This information can bring concern due to a lack of younger population. This represents a sign for many countries to change direction of social policy if they want to improve this indicator. Air quality showed very weak results among the countries. Serbia, Albania and Bosnia have the biggest CO_2 emissions per capita in the region and they have to apply for environmental projects that can help in this issue. The indicator water and sanitation showed that EU members such as Bulgaria and Slovenia have the best scores, but on the other hand Albania and Bosnia do not have very impressive scores. Serbia has good results if we carefully follow this indicator. The main reason for this score is an improved access to water and many households in rural area becoming a part of a well-built sanitation system. Water resources are measured by water waste. Unfortunately, all countries from the region have a problem with this issue. Almost every one of them has the Law on Water Waste, but the problem is that the implementation is not effective enough so the problem with water waste still exists.

Forests and agriculture indicators showed that Serbia had the best scores in this area among other countries. Agricultural subsides have always represented an important part of the state budget and with their help

domestic agricultural products can be competitive on foreign markets. Organic production is also a good chance for domestic producers, because consumers want agricultural products with less chemicals and more natural composition. Forests indicator showed that Serbia takes good care of domestic forests. Their territory did not decrease in last few years, which is good because forests represent real fortune for Serbia. Fisheries indicator showed that none of the countries take a good care of fish and their habitats. One of the problems is that many countries in this region do not implement appropriate methodology for this area. Because of that, foreign agencies are paid for measuring this indicator. Section biodiversity and habitat showed that Serbia and Slovenia have the best scores. Both countries have many interesting animal and plant species whose protection is well regulated. Climate change and energy represent a concern for the most of the countries. If we look access to electricity sources every country has a good score, but all countries use technology that cause higher CO_2 emissions per capita. Countries like Albania, Serbia and Romania have serious problems with this issue and they need more time and assets for solving their problems. People are still not fully aware of environmental sustainability importance and investments in cleaner technologies, which can secure a better future for tehe entire population.

Human Development Index (HDI) and Injustice Human Development Index (IHDI)

The Human Development Index (HDI) was first introduced in the Development Report of the United Nations Development Programme, back in 1990. One of the reasons for introducing this indicator is the fact that developed countries increased life expectancy at birth from 46 to 62 years. Adult literal rate was increased from 43 to 60% and child mortality under the age of five had decreased. Primary health protection includes over two thirds of the entire population, and about 55% of people can drink good drinking water. Developing countries are faced with a deficit of highly educated labor force, shorter life expectancy, weak health protection and low quality of drinking water.

Human development represents the process of enlargement of human choices and achieving their level of welfare (UNDP, 1990, p.10). Main parts of human development are a long and healthy life, quality education and decent standard of living. Human development consists from people abilities to transform all opportunities into reality, and the final result should be improved welfare. Quality health protection is not good enough, especially if there are still many diseases. Also, it could be problematic if any country has a good water supply, but does not use it in a proper way. Developing countries must invest more in human development, because improved life quality means that the entire population has a good health protection and education.

The HDI consists of four components: life expectancy at birth, mean years of schooling, expected years of schooling and gross national income per capita (GNI per capita). If the HDI value is under 0,550, human development is at a very low level. Values between 0,550 and 0,699 show that human development is at a medium level. For values between 0,700 and 0,799 human development is at a high level and above 0,800 at a very high level.

Table 2. The HDI at the Republic of Serbia and neighbouring countries for 2013

HDI	Albania	Bosnia	Bulgaria	Hungary	Macedonia	Romania	Slovenia	Serbia	Motenegro	Croatisa
HDI value	0,716	0,731	0,777	0,818	0,732	0,785	0,874	0,745	0,789	0,812
HDI rank	95	86	58	43	84	54	25	77	51	47
Life expectancy at birth	77,4	76,4	73,5	74,6	75,2	73,8	79,6	74,1	74,8	77,0
Mean years of schooling	9,3	8,3	10,6	11,3	8,1	10,7	11,9	9,5	10,5	11,0
Expected years of schooling	10,8	13,6	14,3	15,4	13,3	14,1	16,8	13,6	15,2	14,5
GNI per capita	9,225	9,431	15,402	21,239	11,744	17,433	26,809	11,301	14,710	19,025
Change in rank 2012-2013	+2	0	0	0	+1	+1	0	+1	+1	0

Source: UNDP, 2014

Data from table no.2 showed big differences in this region. All countries have long life expectancy at birth, especially Slovenia and Croatia. Regarding education, there is little concern for the results in Albania, Bosnia and Serbia, where most of the population finished only elementary school. Slovenia has most persons with finished high school, but it also has a highly educated population. Serbia has a shorter life expectancy at birth and low educational profile. Because of that, something must be changed in the future. With all these scores, Serbia belongs to the countries with a high level of human development.

The HDI can show true value of human development in many countries, but many positive aspects and their distribution are not recognized by the majority of population. This is the main reason for involving the Injustice Human Development Index (IHDI) into the analysis. This indicator brings a better view of human development distribution and shows a more realistic picture of human well-being. The components of the IHDI include lifetime index, education index and income index.

Table 3. IHDI in the Republic of Serbia and neighbouring countries for 2013

IHDI	Albania	Bosnia	Bulgaria	Hungary	Macedonia	Romania	Slovenia	Serbia	Croatia	Montenegro
IHDI value	0,620	0,653	0,692	0,757	0,633	0,702	0,824	0,663	0,721	0,733
Overall loss (%)	13,4	10,6	11,0	7,4	13,6	10,5	5,8	10,9	11,2	7,2
Difference from HDI rank	+11	+13	+5	+7	+7	+4	+9	+12	-2	5
Coefficient of human inequality	13,4	10,4	10,8	7,3	13,3	10,4	5,7	10,9	11,1	7,1
Inequality in life expectancy (%)	9,9	6,7	7,9	5,4	7,6	8,8	3,8	8,5	5,2	7,6
Inequality-adjusted life expectancy index	0,796	0,809	0,759	0,795	0,785	0,755	0,882	0,761	0,832	0,779
Inequality in education (%)	11,9	5,2	5,8	3,5	10,6	5,0	2,7	10,7	10,4	2,5
Inequality-adjusted education index	0,536	0,621	0,706	0,777	0,574	0,710	0,840	0,621	0,690	0,754
Inequality in income (%)	18,3	19,2	18,8	13,1	21,8	17,3	10,6	13,5	17,6	11,3
Inequality – adjusted income index	0,558	0,555	0,618	0,703	0,563	0,645	0,755	0,618	0,653	0,669

Source: UNDP, 2014

The IHDI showed slightly different results than the HDI, but that is a more realistic view of human development. Many people do not have the same access to education or to medical care and because of that the results are different. The HDI is lower with the effects of distribution and this is the reason for improving scores in Albania, Bosnia and Serbia. Inequality in education is huge in Albania and Serbia where a deficit of highly educational labor work exists. Inequality in income is widely present in Albania, Bosnia, Bulgaria and Macedonia, but not too much in Slovenia and Montenegro. Since the income distribution is not equal, there is a big gap between the rich and poor population.

If the GINI coefficient, which shows uniformity in income distribution, is included then the society gap is bigger because the GINI coefficient in this region is usually from 25 to 36. Most of the countries in this region are developing countries and their level of economic development is still low. Because of that, they have to pay full attention to human development. Their objectives in the next few years should be improved social structure and bigger investments in education and health protection so the quality of life can be raised, too.

Gross domestic product per capita (GDP per capita)

Every economic analysis cannot be done without the use of the Gross Domestic Product per capita (GDP *per capita*). When comparing value of production with population, it is possible to get a better view about the standard of living. The GDP *per capita* is used for comparative analysis of economic trends, but it can also be used for sustainable development analysis.

Table 4. GDP per capita in the Republic of Serbia and neighbouring countries for 2014

State	GDP *per capita*
Albania	4.609
Bosnia	4.597
Bulgaria	15.941
Hungary	22.190
Macedonia	4.482
Romania	8.635
Slovenia	24.417
Serbia	5.809
Croatia	20.904
Montenegro	7.112

Source: IMF, 2014

If the GDP *per capita* is included as an economic component of sustainable development, then countries like Slovenia, Croatia and Hungary have the best scores. These countries have implemented many economic reforms for improving economy structure, which helped them have better economic performances. The lowest GDP per capita have Albania, Bosnia and Macedonia and they are facing unpredictable future if they do not start with implementing appropriate economic reforms.

Social Sustainability Index (SSI)

The Social sustainability index (SSI) observes sustainable development from different aspects. Based on the Bruntland Commission definition, the SSI identifies the level of sustainability for countries. This indicator observes human, environmental and economic wellbeing. Human wellbeing includes basic needs, health, personal and social development. Environmental wellbeing includes natural resources, climate and energy. Finally, economic wellbeing includes transition and economy. Human and economic wellbeing have a close relationship. Economic wellbeing was included because it is integrated as a condition to achieve two other wellbeings. The SSI was first introduced in 2006 and is updated every two years.

Table 5. SSI in the Republic of Serbia and neighbouring countries for 2014

State	Human wellbeing	Environmental wellbeing	Economic wellbeing	SSI value
Albania	7,70	6,30	2,90	5,63
Bosnia	7,70	3,73	2,81	4,75
Bulgaria	8,14	4,33	5,33	5,93
Hungary	8,44	4,69	4,49	5,87
Macedonia	7,04	4,66	3,95	5,22
Romania	7,93	5,38	6,10	6,47
Slovenia	8,33	4,33	6,95	6,54
Serbia	7,98	5,07	2,66	5,24
Croatia	8,20	4,85	5,11	6,05
Montenegro	8,07	6,39	3,12	5,86

Source: Sustainable Society Foundation, 2014

The SSI value is the highest in Slovenia and Romania and the lowest in Macedonia and Serbia. If we look at the categories of wellbeing, a huge difference between some countries can be seen. Hungary and Slovenia have the highest scores for human wellbeing, thanks to excellent water and food supply and a good sanitation system. The quality of education in these countries is at the highest level in the region which influenced the final score in this category. Montenegro and Albania have the highest scores for environmental wellbeing. These countries have the highest scores in this area because they possess the most of the renewable water resources. Also, they have the highest rate of saving electricity. Most of the countries from table no.5 have very low biodiversity, huge electric power consumption and very high emissions of greenhouse gases. Because of that, environmental wellbeing is low in most of the countries, especially in Bosnia. As for economic wellbeing, Slovenia and Romania have the highest scores. These countries have made huge investments in organic production and also have a high GDP and low unemployment rate. Albania, Bosnia and Serbia have very low scores in this area, because they have a low GDP and high unemployment rates. Also, one of the problems is a growing public debt, which is a serious problem for these countries. Investments in organic production are very low and it is the same with the saving rates. The SSI values have shown that most of the countries from this region are at a medium level of social sustainability, except Bosnia which is at a very low level of social sustainability.

Global competitiveness index (GCI)

The Global competitiveness index (GCI) is one of the most important indicators for the creators of economic policy, because it can make comparison of competitiveness worldwide. The GCI was introduced by the World Economic Forum (WEF) and this indicator represents a good way for improving economic performances of many countries. Many

foreign investors carefully follow the GCI, so they can later make decision about possible investments. The GCI components are grouped into twelve pillars of competitiveness. These pillars are split into three groups. The first group is called *Basic requirements* and it includes: institutions, infrastructure, macroeconomic environment, health and primary education. The second group is called *Efficiency enhancers* and the components of this group are: higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness and market size. The third group is called *Innovation and sophistication indicators* and it includes: business sophistication and innovations.

As was told earlier, foreign investors follow this indicator because of potential investments. For investors it is important that a country has good traffic infrastructure, macroeconomic stability, highly educated labor force, effective and practical laws that will not obstruct business processes and that all markets work well without any problems. The investors' requests represent some kind of a test for the countries. This way, the countries can see what structural changes can be made for attracting more investments. This is a good opportunity for the countries to make the SWOT analysis and to implement different kinds of measures for improving competitiveness. The GCI offers a realistic view of progress in many areas and because of that foreign institutions and investors carefully follow this indicator.

Table 6. GCI in the Republic of Serbia and neighbouring countries for 2014

State	GCI		Basic requirements		Efficiency enhancers		Innovation and sophistication	
	Rank	Value	Rank	Value	Rank	Value	Rank	Value
Albania	97	3,84	97	4,14	95	3.72	114	3,17
Bosnia[*]	88	3,93	81	4,33	97	3,75	99	3,28
Bulgaria	54	4,37	59	4,71	52	4,31	106	3,27
Hungary	60	4,28	60	4,71	53	4,30	67	3,62
Macedonia	63	4,26	64	4,64	69	4,09	76	3,53
Romania	59	4,30	77	4,48	50	4,32	78	3,53
Slovenia	70	4,22	49	4,86	64	4,17	50	3,88
Serbia	94	3,90	101	4,10	80	3,90	121	3,06
Croatia	77	4,13	63	4,66	68	4,11	87	3,47
Montenegro	67	4,23	61	4,71	73	3,99	77	3,53

[*] Data for Bosnia are available only from WEF Report for 2013
Source: WEF, 2014

Table no.6 showed that Bulgaria and Romania have the highest GCI value and that Albania and Serbia have the lowest scores. Due to absence of the needed data for Bosnia in 2014, the data from 2013 were included. Basic requirements showed that Slovenia has the highest scores. Health, education and infrastructure have contributed to Slovenia final score in this area. Bulgaria and Romania have the highest rank at efficiency enhancers thanks to a higher efficiency of goods and labor markets. In the

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innovation and sophistication area, the highest score has Slovenia because of improved business processes and large investments in innovations. Serbia has the lowest scores in this area and that is a signal for developing and implementing emergency measures if Serbia wants to make a progress in this area and improve the total GCI.

Based on the GCI, the WEF organized countries development into three stages: 1. factor driven economies; 2. efficiency driven economies; 3. innovation driven economies. Stages are based upon two factors. The first one is the GDP *per capita* and the second one is natural resources fortune and their use, which is measured by the export of natural resources. Some countries like Croatia and Hungary are in transition phase, from efficient to innovation economy. Other countries like Albania, Bulgaria, Macedonia, Montenegro, Romania and Serbia are efficiency driven economies and only Slovenia from this region represents innovation economy. A deeper analysis can show what these countries have done for obtaining such rankings in the WEF methodology and what they should do to improve competitiveness and economic performances.

CORRELATION ANALYSIS OF SUSTAINABLE DEVELOPMENT INDICATORS

Sustainable development can be measured through economic, environmental and society components. Economic component can be followed through the GDP *per capita* and the GCI and social component through the HDI, IHDI and SSI. At the end, environmental component is followed through EPI. Correlation analysis can show relations between the indicators of sustainable development and it can give information about the strength and direction between the indicators. All data and correlation analysis were calculated by the SPSS 14 software package. Before measuring linear regression, the GDP *per capita* was set to be a dependent variable and all other indicators are independent variables. As was told earlier, the analysis includes the GCI data for 2013 in Bosnia, due to the absence of data for 2014.

Table no.7 showed that there is a positive and strong relation between indicators. If one indicator increases, then the other indicator will increase, too. This means that positive correlation between the indicators exists. For analyzing the strength of relations between the variables the Cohen scale was used (Cohen, 1988, p. 79-81). The strength of relations is mostly strong (0,606-0,992), with the exception of the relation between the EPI and SSI, which is at a medium level (0,437). The weakest relation is between the EPI and GCI (0,213). Individually, every of these indicators have a strong relation with the HDI and IHDI, and the analysis has shown that the strength of relation between the GDP *per capita* and these indicators is 0,803 and 0,832. Also, the strength of relation between the SSI

and HDI and IHDI is 0,763 and 0,713. If we analyze the strength of relation between the HDI and IHDI it is 0,992, which is obvious because both indicators have the same objective, but that objective is analysed from different aspects.

Table 7. Correlation coefficient for sustainable development indicators at Republic of Serbia and neighbouring countries for 2014

		GDP *per capita*	EPI	SSI	HDI	IDHI	GCI
GDP	Pearson coefficient	1					
per capita	Sig. (2-tailed)						
EPI	Pearson coefficient	0,633	1				
	Sig. (2-tailed)	0,049					
SSI	Pearson coefficient	0,655	0,437	1			
	Sig. (2-tailed)	0,040	0,206				
HDI	Pearson coefficient	0,803	0,697	0,763	1		
	Sig. (2-tailed)	0,005	0,025	0,010			
IHDI	Pearson coefficient	0,832	0,701	0,718	0,992	1	
	Sig. (2-tailed)	0,003	0,024	0,019	0,000		
GCI	Pearson coefficient	0,482	0,213	0,576	0,581	0,513	1
	Sig. (2-tailed)	0,158	0,554	0,082	0,078	0,110	

Source: Calculation made by authors

The determination coefficient can be calculated with the Pearson coefficient. Determination coefficient shows which part of the variable variance can be caused by other variable variances. The highest determination coefficient exists between the HDI and IHDI and it is 98,41 percents of common variance. This shows that the HDI has a very big impact on the IHDI. The lowest determination coefficient is between the GCI and EPI (4,54%). This only shows that the EPI does not have a big impact on the GCI and that their common variance is very low. With the help of linear regression, where the GDP *per capita* was set to be a dependent variable and all other indicators are independent, the determination coefficient is 82,8 %. This model explains 82,8% of the GDP *per capita* variance.

Table 8. Contribution of variables to the dependent variable, statistical significance and semipartial coefficient of independent variables

Independent variables	β - coefficient	Sig. (2-tailed)	Semipartial coefficient
EPI	0,352	0,213	0,213
SSI	0,543	0,198	0,299
HDI	-6,106	0,040	-0,449
IHDI	5,950	0,030	0,495
GCI	0,593	0,083	0,345

Source: Calculations made by the authors

Table no.8 showed detailed relations between independent variables and their impact on the dependent variable. Beta coefficient shows how the independent variable contributed to prediction of the dependent variable. With the negative connotation of the HDI, it had the biggest contribution to the prediction of the dependent variable where his beta coefficient is -6,106. Right after the HDI, the IHDI had the biggest contribution with beta coefficient of 5,950. The lowest beta coefficient had the EPI (0,352) and his contribution to prediction of dependent variable is very low. Statistical significance showed that only the IHDI (0,040) and HDI (0,030) have bigger significance to the analysis. All other indicators do not have a big statistical significance. Semipartial coefficient can show which part of the dependent variable total variance is explained by independent variables (Pallant, 2011, p.164). Adjusted R-Square showed that the biggest contribution to the total variance of the GDP *per capita* have the IHDI (24,5%). and HDI (20,16%). On the other side the EPI contribution is only 4,54%.

Table 9. Partial correlation of sustainable development indicators, where GDP per capita is controlled variable

		EPI	SSI	HDI	IHDI	GCI
EPI	Pearson coefficient	1.000				
	Sig. (2-tailed)					
SSI	Pearson coefficient	0,039	1.000			
	Sig. (2-tailed)	0,921				
HDI	Pearson coefficient	0,409	0,525	1.000		
	Sig. (2-tailed)	0,275	0,147			
IHDI	Pearson coefficient	0,406	0,413	0,981	1.000	
	Sig. (2-tailed)	0,278	0,270	0,000		
GCI	Pearson coefficient	-0,136	0,392	0,372	0,229	1.000
	Sig. (2-tailed)	0,727	0,296	0,324	0,553	

Source: Calculations made by the authors

Partial correlation is used for analyzing relation between at least two variables, where the impact of the third variable is statistically controlled (in this case the GDP *per capita*).When the GDP *per capita* impact is removed, the strength of relations between indicators is weaker. The strength of relation between the EPI and GCI, which was weak before (0,213) is now much weaker (-0,136). This means a shift of direction between the variables. When one indicator is increased it can cause decreasing of the other indicator. Contrary to that, a decrease of one indicator leads to increasing of the other indicator. In this case, the HDI and IHDI still have the strongest relation, although the Pearson coefficient had decreased from 0,992 to 0,981. Also, statistical significance between these two indicators is still significant.

The IHDI and HDI have the biggest impact on the GDP *per capita*. Just a little change in one of these indicators can cause changes to other indicators. Better education and health protection can contribute to a longer

lifetime, but they can also increase the GDP *per capita*. Social components such as the SSI can improve economic components. With a better care about environment and a higher level of protection, economic progress is possible. Environmental component has very weak impact on other components of sustainable development. Social and economic components have weak impact on environmental components, too. Environmental protection does not have larger impact on the GDP *per capita* in this region. All countries in this region are trying to achieve higher economic growth rates and because of that there is not enough space for full implementation of the sustainable development concept. In time, this will change when countries reach proper economic growth.

CONCLUSION

Developing countries are far from developed countries, if we compare their economic growth rates. Sustainable development is not among the priorities of developing countries. They only want to achieve many economic goals and to have competitive economies, at the moment. Good thing is that most of the developing countries have recognised the significance of the sustainable development concept, which can help them to start participating for many sustainable development projects under the UN organization. It will be a hard task for the developing countries to coordinate between economic growth and sustainable development, but this is something that they have to do if they want to be competitive on global markets. Some countries are participating in projects where renewable resources are used for everyday activities and first results were so far very positive.

The EU insists on environmental protection during the accession negotiations with candidate countries. This way the EU wants from potential candidate countries to create and implement sustainable development strategy and to show that they are starting to take a better care about environment. During the negotiations, bigger accent is on environmental and social components of sustainable development. Candidate countries can use the EU funding financing programmes and participate in many environmental projects. With a full membership in the EU, assets for environmental protection will become higher. The EU is among the first bigger integrations that have accepted sustainable development concept and that have shown how population from one part of the world can take a good care about the environment.

For better results of sustainable development implementation, there has to be coordination between economic, environmental and social components. Correlation analysis showed that one of major problems for the Republic of Serbia and neighbouring countries is the environmental component of sustainable development. The EPI has a weak correlation

with the GCI (0,213) and SSI (0,437). The relation between environmental component and other components is not strong enough, so implementing the sustainable development concept did not bring any success. Environmental components must be improved and that has to be a priority for the countries in this region. Economic and social components have a very strong correlation, if we follow correlation between the HDI and GDP *per capita* (0,803) or the IHDI and GDP *per capita* (0,832). The HDI and IHDI have the biggest contribution to the GDP *per capita*, which was shown by beta coefficient. Also, semipartial coefficient showed that the HDI and IHDI can predict the GDP *per capita* better than other indicators.

The Republic of Serbia is trying to follow developed countries with the implementation of the sustainable development concept. This process is very slow in Serbia due to many problems. Some of those problems are budget limits, low demographic structure, absence of the needed infrastructure for environmental protection and use of older and dirty technologies. People in Serbia need better education about sustainable development, which can raise their awareness for environmental problems. More people have to be included in solving sustainability problems and there must be more investments in cleaner technologies and waste management. All laws about environmental protection have to be implemented and improved by the time. Residents of Serbia must be fully aware of the processes that can cause terrible damage to the environment. Polluters have to face proper penalties for their actions. With better environmental care, Serbia can build a better reputation in the world. International institutions and investors can recognize that and they can start investing more in Serbia. With new investments there will be new jobs for the unemployed and economy will start going in a much better direction. It is important for Serbia to have an active role in the implementation of the sustainable development concept, because only that way all economic performances can be improved and the country will be competitive on global markets.

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КОМПАРАТИВНА АНАЛИЗА КОМПОНЕНТИ ОДРЖИВОГ РАЗВОЈА РЕПУБЛИКЕ СРБИЈЕ И СУСЕДНИХ ЗЕМАЉА

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Резиме

Концепт одрживог развоја постао је важан део социјално-економске политике највећег броја земаља света. Најразвијеније земље света су међу првима почеле да мењају свест о проблемима у природи и отпочеле су са увођењемразличитих стратегија које су за циљ имале очување и унапређење животне средине. Током последњих двадесет година постигнути су одређени напреци на пољу очувања животне средине. Инвестиције у чисте технологије повећавале су се из године у годину, донета је нова регулатива у области очувања животне средине, а едукација о важности очувања животне средине постала је важан део образовног система у многим земљама.

Када су у питању Република Србија и њени суседи, имплементација одрживог развоја се још увек налази на самом почетку. Највећи број земаља у окружењу спада у групу земаља у развоју и у покушају да се смањи привредни јаз за развијеним земљама, концепт одрживог развоја још увек нема довољно простора у политикама ових земаља. Због недостатка потребних средстава, Србија и њени суседи углавном се ослањају на фондове и програме ЕУ, а често се касни и са доношењем потребне регулативе. Ако се посматра еколошка компонента одрживог развоја, може се видети да су Мађарска, Словенија и Србија оствариле најбоље резултате. EPI индекс је показао да је утицај животне средине на здравље деце, али и приступ води и број обрадивих површина на високом нивоу. Проблем остају квалитет ваздуха и воде, али и чињеница да се повећао број биљних и животињских врста које су нестале у овим земљама. Када се посматра економска компонента, Бугарска, Мађарска, Румунија и Словенија налазе се међу лидерима у окружењу. Ове земље су дуги низ година спроводиле економске реформе, које су им омогућиле постизање веће стопе привредног раста и привлачење већег обима страних инвестиција. Већина осталих земаља у окружењу још увек је на почетку економских реформи и биће потребно још доста времена како би се унапредио пословни амбијент. Економска категорија одрживог развоја у великој мери утицала је и на друштвену компоненту. У земљама попут Мађарске, Словеније и Црне Горе повећан је животни век становништва, као и број година формалног образовања становништва. Побољшање друштвеног благостања омогућава већу бригу о животној средини и бољем спровођењу концепта одрживог развоја.

Ако се посматра однос између самих компоненти одрживог развоја, еколошка компонента има слабију корелацију са осталим компонентама. Истраживање је показало да EPI индекс има најјачу везу са IHDI (0,701) и HDI индексом (0,697), док са GCI индексом има најслабију везу (0,213). У окружењу HDI и IHDI индекс

имају најјачу везу да осталим варијаблама, што показује да промене у HDI и IHDI индексу узрокују промене јачег или слабијег интензитета у осталим варијаблама. Када је у питању појединачан допринос варијабли остварењу GDP per capita, мерено преко бета коефицијента, HDI и IHDI индекс највише доприносе његовом остварењу. Најмањи допринос оставрењу GDP per capita има EPI индекс (0,352) и то указује на одсуство јаке везе између еколошке и економске компоненте одрживог развоја. И у случају делимичне корелације, када се изолује утицај GDP per capita, EPI индекс и даље има слабу везу са осталим варијаблама. Србија и њени суседи морају се активније ангажовати на пољу одрживог развоја како би унапредили еколошке перформансе и смањили јаз за развијеним земљама. Употреба средстава из фондова ЕУ и учешће у програмима УН и ЕУ може помоћи у постизању бољих резултата, али је неопходно подићи свест становништва о еколошким проблемима како би концепт одрживог развоја добио на значају. Важно је да еколошка политика постане део економске политике земаља у окружењу и само усклађивањем привредног раста са политиком очувања животне средине могуће је сачувати природне ресурсе за будуће генерације и обезбедити им потребну егзистенцију.