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THE PERFORMANCE OF EUROPEAN UNION COUNTRIES IN DECOUPLING SOCIO-ECONOMIC PROGRESS FROM ENVIRONMENTAL IMPACTS

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Abstract

Over the last few decades, the European Union has intensified its commitments to decouple socio-economic progress from resource use and environmental impacts. This article examines the performance of countries in implementing selected aspects of these commitments in the period 1990–2016. To this end, it focuses on the relationships between progress in human development, in particular in raising people's incomes, and pressures on natural resources and ecosystem services, as incorporated in the concept of ecological footprint. The results show a certain measure of success in decoupling the two among the countries of the European Union, but the same cannot be said of the world's countries more generally.

Keywords: ecological footprint, human development, environment, incomes, sustainable development

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USPEŠNOST EVROPSKE UNIJE PRI LOČEVANJU SOCIALNO-EKONOMSKEGA NAPREDKA OD VPLIVOV NA OKOLJE

Izvleček

Evropska unija je v preteklih desetletjih stopnjevala svoje zaveze k ločevanju socialno-ekonomskega napredka od rabe virov oziroma vplivov na okolje, zato v članku preučujemo uspešnost držav pri udejanjanju izbranih vidikov teh zavez v obdobju 1990–2016. V ta namen so izpostavljena razmerja med napredkom na področju človekovega razvoja, zlasti še pri zviševanju dohodkov prebivalcev, ter pritiski na naravne vire in ekosistemske storitve, kot jih zajema koncept ekološkega odtisa. Rezultati kažejo določeno mero uspešnosti držav Evropske unije pri ločevanju obojega, medtem ko tega za države sveta na splošno ni možno potrditi.

Ključne besede: ekološki odtis, človekov razvoj, okolje, dohodki, trajnostni razvoj

1 INTRODUCTION

Efforts to improve the quality of human life are as old as human society itself, but the continuing increase in the socio-economic well-being of a steadily growing number of people has increasingly impacted the carrying capacity of the environment. The process has been accelerating greatly since the Industrial Revolution on. The awareness that economic development must take into account planetary limits has grown only in the last fifty years, particularly after the UN conference in Stockholm (1972), where discussions of the interactions between development and environmental aspects were still very limited in content, but extremely important, since they introduced environmental issues into international politics and initiated a discourse on sustainable development (Elliott, 2013). During this time, it was no longer possible to ignore the environmental problems that grew from having local to regional and global dimensions (such as air and water pollution, extinction of species, ozone depletion, global warming, deforestation, desertification, etc.). The landmark study *The Limits to Growth* (1972) was one of the first to point out the limited availability of natural resources as a key constraint on (endless) economic growth (Global environment outlook, 2002).

In the 1980s, the paradigm of sustainable development gradually took shape, and became firmly rooted in the international community through Agenda 21 (1992) at the 1992 UN Conference on Environment and Development in Rio de Janeiro. As a result, in the following years the commitment to sustainable development was also enshrined in high-level agreements in the European Union, first with the Maastricht Treaty in 1993. This introduced the concept of sustainable growth, which takes into account environmental considerations, as a contractual principle. Then in 1997 the Treaty of

Amsterdam was adopted, in which the requirement for sustainable development was moved to the central text of the Treaty and became the overarching goal of European policy (de Sadeleer, 2015; European Commission, 2020). Based on international and European obligations, in 2001 the European Council adopted a strategy for sustainable development that emphasizes, *inter alia*, the decoupling of environmental degradation and resource use from social and economic development (A sustainable Europe for a better world, 2001). Shortly after the adoption of the strategy, a wider debate was opened regarding its renewal, introducing greater efficiency and ambition in setting operational and individual objectives and measures, which led to the adoption of the Renewed EU Sustainable Development Strategy in 2006. In the subsequent years, the European Union also included the premises of sustainable development in the Europe 2020 umbrella strategy (2010) as well as in a number of sectoral policies, and individual member states also included them in their national development strategies. The process was given further impetus at the end of 2015, when world leaders at the special United Nations Sustainable Development Summit adopted the 2030 Agenda and its 17 Sustainable Development Goals, which are inextricably linked, as are their economic, social and environmental dimensions (Transforming our world ..., 2015). Highly significant from the point of view of decoupling economic growth and environmental impacts is the European Green Deal (2019), presented by the new European Commission at the end of 2019 as a new “growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use” (European green deal, 2019, p. 2). In the above-mentioned documents, the European Union also explicitly emphasizes its role as a global role model and leader and the need for global partnerships.

In this article, we examine selected aspects of the performance of European Union countries in decoupling socio-economic progress from resource use and environmental impacts, especially in comparison with other countries around the world. The starting point of the analysis was the income aspect of the concept of human development (i.e. gross national income – GNI) and the pressures on natural resources and ecosystem services as detected by the concept of ecological footprint. The period 1990–2016, for which there is sufficiently reliable data available for the indicators included and the countries studied, was selected for an analysis of the current state and trends. Previous research has mostly been based only on a comparison of the mentioned variables or the situation in particular years (e.g. Moran et al., 2008), monitoring of changes in indicators in selected geographical areas or countries (e.g. Bostan, Clipa, Clipa, 2017), or also addressing the calculation of alternative indices to build on existing ones (e.g. Vintar Mally, 2009; Long et al., 2020; Shi et al., 2020). Our research proceeds from the assumption that signs of the decoupling of socio-economic progress from environmental impacts can be detected in member states of the European Union, whereas this cannot be said for the countries of the world in general.

2 METHODS

Achieving socio-economic progress within existing environmental limits is a crucial requirement for sustainable development, but it is extremely difficult to monitor empirically. The UN has thus defined as many as 169 targets in the 17 fundamental areas of sustainable development mentioned above (Transforming our world ..., 2015), and monitors their achievement through as many as 231 indicators (United Nations, 2020). A large set of individual indicators can be effective in tracking changes in particular areas and identifying weak elements in the system that hinder the achievement of umbrella objectives, but at the same time a large set of calculations based on individual indicators and spatial units can be somewhat opaque and prevent a clear synthetic picture. For comparisons among countries, we thus prefer to use synthetic indicators that are internationally established and, despite their methodological shortcomings, offer a broader picture of the current state and trends in the world.

To this end, we have selected the ecological footprint per capita as a synthetic indicator to illustrate the environmental dimension of sustainable development, as it takes into account the consumption of resources for the inhabitants of a particular country, regardless of the country or region of origin of the resources. The ecological footprint (EF) as a synthetic measure of pressures on the environment and human impact on the biosphere is methodologically developed and calculated by the organization Global Footprint Network. EF calculations per capita take into account the amount of all biologically productive land and waters (i.e. cropland, forest land, grazing land and fishing grounds) needed to produce the resources that the inhabitants of each country use to support their way of life, as well as areas used for buildings and infrastructure and areas required for the absorption of the waste produced (Borucke et al., 2013; Global Footprint Network, 2019a). Despite some methodological limitations (see Galli et al., 2016), EF has become established in the international arena as a powerful communication tool (Wiedmann, Barrett, 2010; O'Neill et al., 2018), as it demonstrates extremely clearly the extent to which the metabolisms of economies interfere with the available biocapacity of countries and the planet (Galli et al., 2016). In addition to EF calculations (the consumption aspect), there are also biocapacity (BC) calculations of territory (the resource availability aspect) available for an individual country or region, and the difference between the two represents either an ecological deficit (i.e. EF surplus over BC) or ecological reserve (i.e. surplus of BC over EF) for a particular country or region. All these calculations use a standardized unit called the global hectare, which is a hectare with the average productivity of all biologically productive areas in the world (Borucke et al., 2013; Global Footprint Network, 2019a).

To analyse progress in decoupling of the socio-economic development of countries from their environmental impact, as a first step we chose the human development index (HDI) as a synthetic socio-economic indicator and in the second step, for more detailed analysis, the income aspect of the indicator, reflected in gross national

income (GNI) per capita. The concept of human development, together with the HDI, has been developed by the UN since the 1990s with the aim of monitoring progress in the field of human well-being, with health, education and standard of living as the three fundamental areas. Dimension indices are calculated for each of the areas covered, in which GNI per capita based on purchasing power standards was chosen for the area of access to resources for a decent life, life expectancy at birth for the area of a long and healthy life, and the expected number of years of schooling and mean years of schooling for access to education. Over the past thirty years the HDI has undergone some methodological improvements, and like all synthetic indicators, this index has also met with a number of criticisms (see Kovacevic, 2011). The HDI is aggregated from dimension indices, the values of which range from 0 to 1 due to the mode of normalization, with higher values indicating better socio-economic conditions in the country (Technical notes, 2018; Human development report, 2019). For a more detailed analysis of the relationship between environmental impacts and well-being, the study selected GNI per capita, which replaced gross domestic product per capita in HDI calculations after 2010, as differences between domestic production in countries and the incomes of their inhabitants are often large, and it is the income of the population that matters in terms of access to resources for a decent life (Kovacevic, 2011). This is also what affects the consumption of the population and thus the pressures on the environment as reflected in the ecological footprint.

An analysis of these synthetic indicators was carried out for the period 1990–2016 for the 28 European Union countries (hereinafter: EU-28 countries) that were members of this association in 2016, which was also the last year for which we had all the necessary data available for analysis at the time of the study. The United Kingdom is also considered among the twenty-eight countries, although it subsequently (2020) officially withdrew from the European Union. At the very beginning of the period under review, seven countries analysed were not yet independent, namely the Czech Republic and Slovakia (formerly Czechoslovakia, independent states since 1993), Estonia, Latvia and Lithuania (part of the former Soviet Union, independent states since 1990 and 1991), and Slovenia and Croatia (part of the former Yugoslavia, independent states since 1991), but most of the necessary statistics are also available for 1990. The only exception are the calculations of the ecological footprint, which was first calculated for these countries in 1992 and 1993, respectively, and then for all subsequent years.

The state and trends for the selected European countries in the period under study are also evaluated in the context of global developments, so most of the analyses were made simultaneously for the EU-28 countries and for all countries of the world for which data are available. To this end, the analysis took into account all 121 countries of the world for which all relevant data and calculations are available (i.e. for HDI, EF and GNI per capita) for both 1990 and 2016. However, since 54 countries which did not have all the necessary data for 1990 (but had them for 2016) were eliminated from the analysis on this basis, we decided to perform an additional analysis of the

situation for 2016 that could cover all 175 countries of the world having relevant data. Therefore, comparable results are presented in a meaningful way for all three analysed groups. The processing of the collected data included the creation of scatter plots, the calculation of growth indices and the Pearson correlation coefficient, and other statistical analyses that allowed us to determine the relationships between variables and their correlations, and in the final step to classify countries according to the ratio between GNI per capita and EF per capita for the period 1990–2016.

3 RESULTS AND DISCUSSION

The analysis of socio-economic progress using HDI calculations (Human development ..., 2018) shows that in the period 1990–2016 it increased in all countries of the world with available data, including the EU-28. Although various crises have lowered HDI values in individual countries around the world over short periods, this has not prevented a long-term increase in the index. In the quarter century under study, the global average HDI rose from 0.598 to 0.726, indicating a significant increase in the average well-being of the world's inhabitants, despite the fact that world population grew from 5.327 billion to 7.464 billion (World population prospects 2019, 2019). While the global average HDI in 2016 was 0.726, the HDI in the EU-28 was significantly higher, ranging from 0.807 (Romania) to 0.934 (Germany and Ireland). Thus, all EU-28 countries were above the threshold of very high human development (i.e. with values above 0.800) and recorded significantly higher values of the index compared to 1990, when it ranged from 0.670 (Croatia) to 0.829 (the Netherlands). During the period under study, the HDI rose most in the EU-28 in Ireland (from 0.763 to 0.934), which caught up with first-place Germany. In 2016, only Norway (0.951), Switzerland (0.943) and Australia (0.938) ranked higher. The smallest progress in raising the HDI was recorded in the Netherlands (from 0.829 to 0.928), which ranked fourth among EU-28 countries in 2016, overtaken by Germany, Ireland and Sweden over the last decade.

Table 1: Population, gross national income per capita, ecological footprint per capita and human development index for EU-28 countries in 1990 and 2016.

Country	Total population (thousands)		GNI per capita		EF per capita		HDI	
	1990	2016	1990	2016	1990	2016	1990	2016
Austria (AT)	7,724	8,747	31,587	44,443	5.35	6.03	0.795	0.906
Belgium (BE)	10,007	11,354	30,781	41,588	7.02	6.25	0.806	0.915
Bulgaria (BG)	8,841	7,152	8,518	17,759	4.71	3.45	0.694	0.810
Croatia (HR)	4,776	4,209	14,257	21,088	1.97*	3.94	0.670	0.828
Cyprus (CY)	767	1,170	23,680	30,955	4.36	3.75	0.732	0.867
Czech Republic (CZ)	10,341	10,619	20,151	29,400	5.59**	5.59	0.730	0.885
Denmark (DK)	5,141	5,711	32,969	47,209	8.82	6.80	0.799	0.928
Estonia (EE)	1,565	1,317	15,986	27,645	5.81*	7.06	0.733	0.868
Finland (FI)	4,996	5,498	28,133	40,066	7.20	6.26	0.784	0.918
France (FR)	56,667	64,668	29,661	38,702	5.59	4.45	0.779	0.899
Germany (DE)	79,054	82,194	31,793	45,203	6.90	4.84	0.801	0.934
Greece (EL)	10,226	10,615	21,080	24,284	4.74	4.27	0.753	0.868
Hungary (HU)	10,377	9,753	16,107	24,337	4.31	3.61	0.704	0.835
Ireland (IE)	3,511	4,696	19,791	50,475	6.34	5.12	0.763	0.934
Italy (IT)	57,048	60,663	30,729	34,733	5.18	4.44	0.769	0.878
Latvia (LV)	2,664	1,974	15,997	23,685	3.62*	6.36	0.704	0.844
Lithuania (LT)	3,696	2,890	15,951	26,884	3.83*	5.57	0.732	0.855
Luxembourg LU)	382	579	49,610	65,460	12.89	12.91	0.782	0.903
Malta (MT)	362	436	17,260	33,025	5.34	5.79	0.740	0.875
Netherlands (NL)	14,965	16,981	31,977	46,711	5.93	4.83	0.829	0.928
Poland (PL)	37,960	37,989	9,935	24,983	4.58	4.43	0.712	0.860
Portugal (PT)	9,895	10,326	20,109	26,521	4.19	4.10	0.711	0.845
Romania (RO)	23,489	19,796	11,411	21,060	4.45	3.09	0.701	0.807
Slovakia (SK)	5,288	5,442	14,668	28,546	2.58**	4.21	0.739	0.853
Slovenia (SI)	2,006	2,074	18,909	29,161	3.30*	5.13	0.767	0.894
Spain (ES)	39,203	46,634	23,594	33,307	4.55	4.04	0.754	0.889
Sweden (SE)	8,567	9,836	30,255	47,378	6.36	6.46	0.816	0.932
United Kingdom (UK)	57,134	66,298	26,684	38,680	5.84	4.37	0.775	0.920

Note: * data for 1992; ** data for 1993.

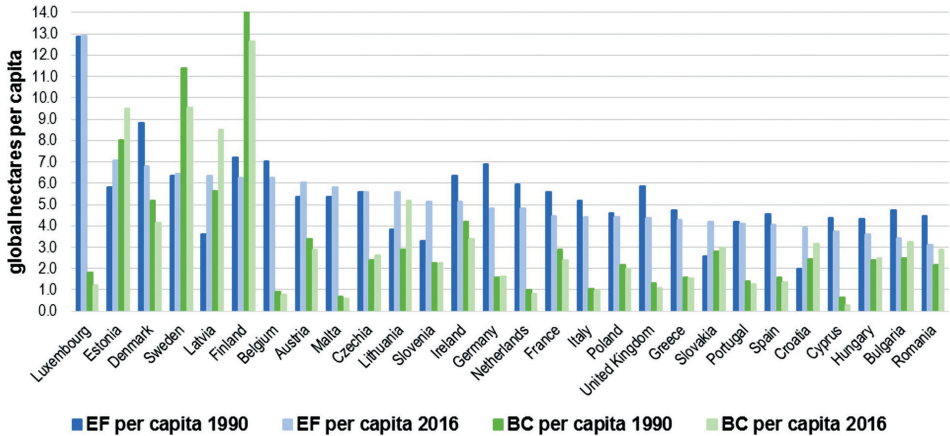
Sources: Human development ..., 2018; Global Footprint Network, 2019b; World population prospects 2019, 2019.

UN data (Human development ..., 2018) show that the average global GNI per capita also increased significantly between 1990 and 2016, from USD 8,959 to USD 15,017 per capita (i.e. a growth index of 168). Population growth is a key factor in raising the income of the population, as the growth of material well-being must outpace the growth of the

population in order for incomes per capita to increase at all. During the period under review, the global average population growth index (140) was significantly lower than income growth, especially in the EU-28, where the average population growth index was considerably lower (107). In seven EU-28 countries, there was even a decrease in population recorded by 2016 (Table 1), namely in Hungary (index 94.0), Croatia (88.1), Romania (84.3), Estonia (84.1), Bulgaria (80.9), Lithuania (78.2) and Latvia (74.1). Even compared to the average for the world, the rapid growth of the population in Luxembourg (index 152) and Cyprus (index 153) stood out. Between 1990 and 2016, the population of the EU-28 increased from a total of 477.7 million to 509.6 million. In all the European countries studied, GNI growth significantly outpaced population growth, so that GNI per capita also increased appreciably everywhere. The GNI per capita growth index ranged from 113 in Italy to 255 in Ireland in the period 1990–2016, and in 2016 the GNI per capita in the EU-28 ranged from USD 17,759 per capita in Bulgaria to USD 65,460 per capita in Luxembourg. Overall, higher growth rates were seen in the newer member states, which have joined the European Union since 2004.

Both in the EU-28 and in the world, there is a high correlation between GNI per capita and HDI, which is due partly to the fact that GNI per capita is included in the calculation of HDI as one of the dimension indices and certainly has a significant impact on its final value. Nevertheless, by way of illustration we note that the calculations for 2016, which are available for 175 countries of the world, show a high correlation between the two variables, with a Pearson correlation coefficient of 0.746 ($p < 0.01$). In the EU-28 group, this correlation was even higher ($r = 0.846$; $p < 0.01$), as a population with better access to resources for a decent life also achieves better results in other areas of human development as measured by the HDI.

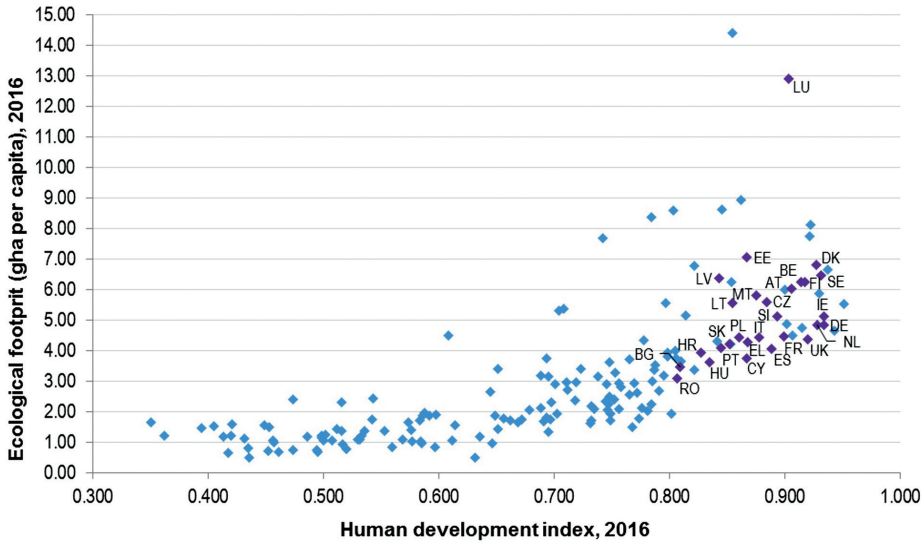
Figure 1: Ecological footprint per capita and biocapacity per capita in EU-28 countries in 1990 and 2016.



Data source: Global Footprint Network, 2019b.

Socio-economic progress in the world has clearly been achieved at the expense of increasing environmental pressures, as shown by the Global Footprint Network (2019a) data on the growth of total planetary EF from 14.190 billion gha in 1990 to 20.509 billion gha in 2016 (i.e. a growth index of 144). Due to rapid population growth, the growth in EF per capita was significantly lower, increasing from 2.66 gha to 2.75 gha per capita in the period 1990–2016 (i.e. a growth index of 103). Here it is important to note that over the same period the available BC per capita fell sharply, as its growth index in the period 1990–2016 was only 110 (i.e. an increase in global BC from 11.027 billion gha to 12.169 billion gha) and thus lagged significantly behind the population growth rate. Consequently, the average BC per capita in 2016 was only 1.63 gha (compared to 2.07 gha per capita in 1990). The result of this is an increase in the ecological deficit – excessive use of natural resources and overburdening of planetary sinks, which is reflected in pollution. In 2016, the highest EF per capita among the EU-28 countries was recorded in Luxembourg (12.9 gha), which was also the second highest value in the world, right after Qatar (14.4 gha). Luxembourg was followed in Europe mainly by northern European countries (Estonia, Denmark, Sweden, Latvia, Finland), and all EU-28 countries showed an above-average EF per capita relative to the world, with Romania having the lowest in this group with 3.09 gha per capita (Figure 1). According to calculations by the Global Footprint Network (2019a), the average EF in the EU-28 in 2016 was 4.6 gha per capita while the average BC was 2.1 gha per capita. Thus, the European Union as a whole recorded an ecological deficit of 2.5 gha per capita. All EU-28 countries, with the exception of Estonia, Finland, Latvia and Sweden, were in an ecological deficit throughout the period under study, while Slovakia and Croatia did not reach this position until 1994 and 1996, respectively. EU-28 countries which in 2016 had surplus BC over EF are also those with the highest BC per capita in Europe – Finland (12.6 gha), Sweden (9.6 gha), Estonia (9.5 gha) and Latvia (8.5 gha). Even with such high average per capita BC, however, they were not among the world’s highest: French Guiana (97.1 gha per capita) had the highest value, followed by Suriname, Guyana, Gabon, Bolivia, Canada, and Mongolia, while Finland was only eighth. As many as eleven EU-28 countries had a markedly below-average BC per capita in 2016, with Cyprus (0.27 gha per capita), Malta (0.60 gha), Belgium (0.79 gha), the Netherlands (0.82 gha) and Italy (0.94 gha) standing out.

Figure 2: Relationship between the human development index and the ecological footprint per capita in the countries of the world and the EU-28 countries in 2016.



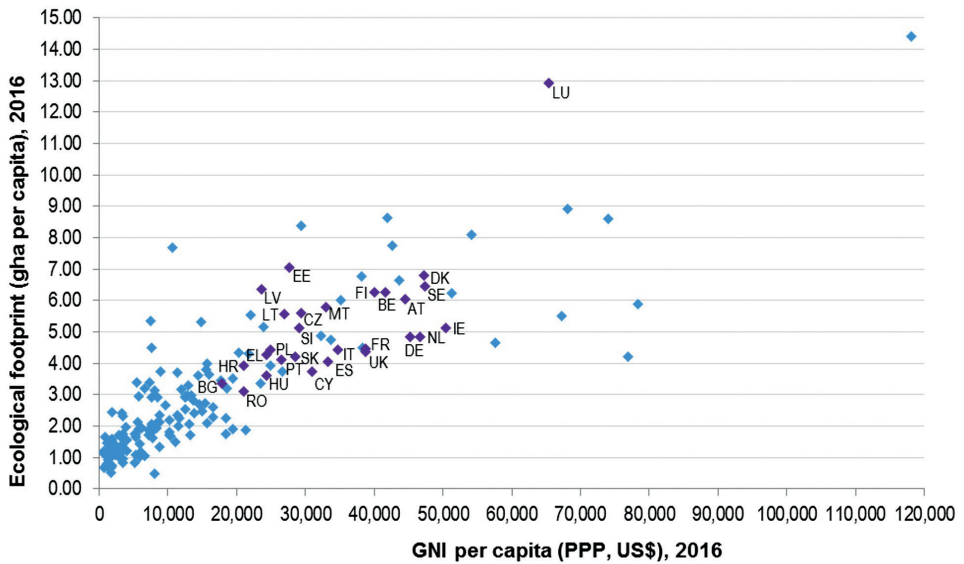
Note: EU-28 countries are denoted as listed in Table 1.

Data sources: Human development ..., 2018; Global Footprint Network, 2019b.

The relationship between progress in human development and pressures on the environment was studied using EF calculations per capita and HDI for 175 countries and separately for the EU-28 for 2016 (Figure 2). In the group of countries of the world, the Pearson correlation coefficient indicates a high correlation between the two variables, as it was 0.718 ($p < 0.01$), while in the EU-28 this correlation was much lower, but still significant ($r = 0.404$; $p < 0.05$). It is also interesting to compare the values of the Pearson correlation coefficient in the group of 121 countries of the world for which all data were available for 1990, which makes this comparison possible. In this group, the value of the Pearson correlation coefficient decreased from 0.746 in 1990 to 0.713 in 2016 ($p < 0.01$). We can also conclude that there is no significant difference between the calculations for 2016 that cover a larger sample (175 countries) and those that cover a smaller sample (121 countries). The analysis of the studied European countries also shows a higher correlation between the two variables in 1990. Data for 1990 are available only for the 21 then independent countries, later members of the EU-28, which show a moderate correlation of variables ($r = 0.532$; $p < 0.05$). If the EFs of the other seven countries (Czech Republic, Estonia, Croatia, Latvia, Lithuania, Slovakia and Slovenia) in 1992 and 1993 (i.e. the first following year with the available EF calculations) are taken into account, Pearson's correlation coefficient would be even

higher ($r = 0.594$; $p < 0.01$). Based on the above, we can conclude that the interdependence of EF and HDI, or progress in human development and the accompanying pressures on the environment, has decreased slightly in the last quarter of a century both in the EU-28 and in the studied group of countries of the world.

Figure 3: Relationship between the gross national income per capita and the ecological footprint per capita in the countries of the world and EU-28 countries in 2016.



Note: EU-28 countries are denoted as listed in Table 1.

Data sources: Human development ..., 2018; Global Footprint Network, 2019b.

In the next step, we were interested in more detail in the connection between the pressures on the environment or EF per capita and the income aspect of human development, as measured by the GNI per capita. This analysis was also conducted for all groups of countries: 175 countries of the world in 2016 (Figure 3), 121 countries of the world in 1990 and 2016, and the EU-28 countries in both years. The calculation of the Pearson correlation coefficient for 175 countries in 2016 shows a high correlation between GNI per capita and EF per capita ($r = 0.848$; $p < 0.01$) and a slightly lower correlation in the group of EU-28 countries ($r = 0.680$; $p < 0.01$). A comparative analysis in the group of 121 countries with all the necessary data for 1990 and 2016 shows that in the world the correlation between GNI per capita and EF per capita has generally increased, as in 1990 the Pearson correlation coefficient was 0.795 and in 2016 0.859 (in both cases $p < 0.01$). Likewise, in 2016 there was no significant difference between the results in the samples

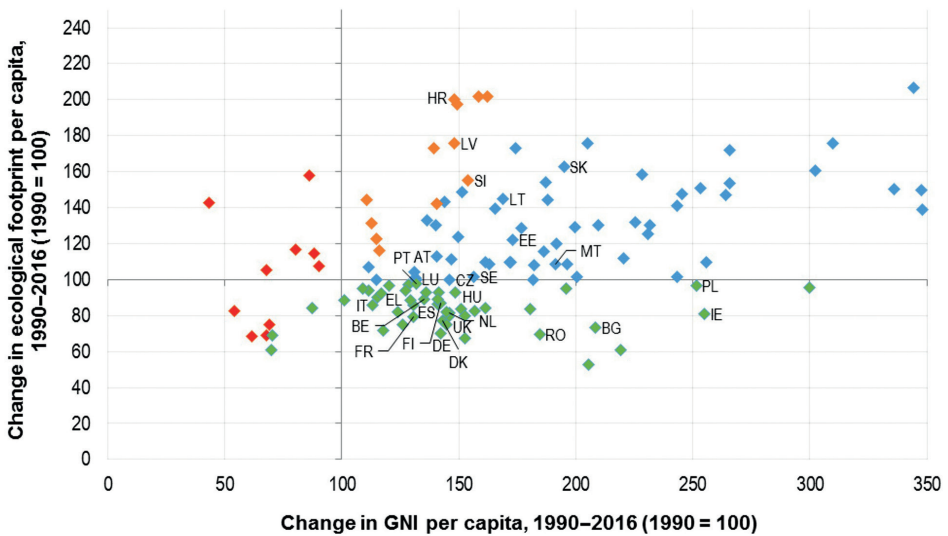
of 175 countries and 121 countries. In contrast to the global trend, the correlation between the two variables in the EU-28 has clearly declined over the last quarter of a century. Available data for 1990 for 21 independent European countries, later members of the EU-28, show a high correlation between GNI per capita and EF per capita ($r = 0.784$; $p < 0.01$). If we take into account the EF of the other seven countries (Czech Republic, Estonia, Croatia, Latvia, Lithuania, Slovakia and Slovenia) in 1992 and 1993 (i.e. the first following year in which the calculation of EF was available), the Pearson correlation coefficient was even slightly higher ($r = 0.795$; $p < 0.01$) and completely comparable to that in the group of 121 countries. It can be noted that in the last quarter of a century, the dependence of the ecological footprint on material well-being, as shown by the GNI per capita, has increased on average in the world, while in the European Union this correlation has decreased significantly.

We then analysed the trend with respect to the level of EF per capita and GNI per capita in the period 1990–2016, calculating growth indices for all 121 countries with relevant data, and we also added seven EU-28 countries that were lacking data on EF per capita in 1990 but were included in the analysis using the first subsequent year with available data on EF (i.e. 1992 or 1993). Thus, while for other countries the changes in the period 1990–2016 were taken into account, for these seven countries the calculations are not entirely comparable, as they refer to a two- or three-year shorter period. Nevertheless, these seven countries can still be at least roughly compared to others based on these data (Figure 4). While all the countries studied made progress in human development and increased their HDI values, the calculations mentioned show that in the vast majority of countries, average per capita incomes also increased significantly. In 2016, only thirteen countries (Brunei, Burundi, Central African Republic, DR Congo, Gabon, Haiti, Libya, Malawi, Sierra Leone, the United Arab Emirates, Venezuela, Yemen and Zimbabwe) recorded a lower GNI per capita than in 1990, the result of crises in some places and faster population growth in others. At the same time, EF per capita decreased in 50 countries and increased in the others. Based on the ratio between the GNI per capita and the EF per capita in the period 1990–2016, all the countries in the study were divided into two groups: countries in which the GNI per capita growth index was higher than the EF per capita growth index in the quarter century under study, and countries for which the reverse is true, i.e. the GNI per capita growth index was lower than the EF per capita growth index during the same period. In the next step, we focused on the most prominent subgroup within each group.

The first group (the orange and red points in Figure 4) comprised countries in which the growth of EF per capita was faster than the growth of GNI per capita, which is a distinctly unfavourable trend with respect to the environment and represents a divergence from the goals of sustainable development and the desired decoupling between the use of resources and economic production. A total of 24 countries were classified in this group, including three EU-28 countries: Slovenia, Latvia and Croatia. Croatia also had one of the largest deviations globally between the GNI per capita

growth index (148) and the EF per capita growth index (200), indicating a disproportionately rapid increase in environmental pressures with increasing material well-being of the population. On the other hand, this deviation was minimal in Slovenia (154 to 155). Within this group of countries, the most prominent countries (the red points in Figure 4) stand out due to their undesirable trends, since these experienced a decrease in GNI per capita, or in other words unfavourable economic and environmental trends simultaneously – Libya, Gabon, Malawi, Sierra Leone, Yemen, Haiti, Brunei, DR Congo, Central African Republic and United Arab Emirates. However, there were no European countries among these countries, as all of them recorded an increase in per capita income in the period under study.

Figure 4: Trends in gross national income per capita and ecological footprint per capita in countries of the world and in EU-28 countries in the period 1990–2016.



Note: For the purposes of readability, five countries with exceptionally high values of at least one of the variables are omitted from the chart (China – 939, 237; Myanmar – 686, 200; Saudi Arabia – 117, 293; Trinidad and Tobago – 260, 284; Vietnam – 405, 299). For Croatia, Estonia, Latvia, Lithuania and Slovenia, the change in the value of the ecological footprint per capita takes into account the period 1992–2016, and for the Czech Republic and Slovakia the period 1993–2016. EU-28 countries are denoted as listed in Table 1. Data sources: Human development ..., 2018; Global Footprint Network, 2019b.

The second group (the blue and green points in Figure 4) was made up of countries in which GNI per capita growth was faster than EF per capita growth during the period under study, indicating at least a relative break in the link between economic growth and environmental pressures (i.e. relative decoupling). The vast majority of all the analysed countries in the world (104 of 128, or 81%), including as many as 25 EU-28 countries, were included in this group. Of particular note is the subgroup of 46 countries (the green points in Figure 4) where in 2016 the EF per capita was lower than in 1990, which is the most economically and environmentally desirable of all possible combinations, as it indicates a decline in the use of environmental resources concomitant with economic growth (with the exception of Zimbabwe, Burundi and Venezuela, which recorded a decline in per capita income, but this was still lower than the decline in EF per capita). These trends were also observed in 17 EU-28 countries, with Ireland, Poland and Bulgaria standing out the most, achieving a GNI per capita growth index above 200 while managing to reduce the EF per capita, especially Ireland (by 19 index points) and Bulgaria (by 27 index points). Among the EU-28 countries that managed to reduce the EF per capita the most during the period under review are Romania (index 70), Germany (70), the United Kingdom (75), Denmark (77), France (80) and the Netherlands (81), and a decrease was also observable in the other eleven EU-28 countries in this subgroup. On the other hand, in 50 countries of the world and 8 EU-28 countries (the blue dots in Figure 4), the ecological footprint per capita increased between 1990 and 2016 as incomes grew. This was therefore also the case for Austria, the Czech Republic, Estonia, Lithuania, Luxembourg, Malta, Slovakia and Sweden.

We can conclude that, compared to 1990, only 46 of the world's countries, or 35% of all those analysed in 2016, demonstrated a higher level of socio-economic progress (represented by HDI and GNI per capita in the study) alongside lower consumption of natural resources and ecosystem services per capita. Among the EU-28 countries, this trend was shown by 17 countries, or 61% of the entire group. The results of our research are consistent with the findings of previous ones, which indicate a close relationship between income and environmental pressures (Vintar Mally, 2009; Aşici, 2013; Szigeti, Toth, Szabo, 2017; Kalimeris et al., 2020), and suggest that decoupling well-being from environmental pressures will not happen automatically, but rather requires concerted policy formulation and measures in order to be achieved (Oberle et al., 2019; Parrique et al., 2019). This is attested to, for example, by studies on the “ecological intensity of human well-being” (Jorgenson, Dietz, 2015), and above all by systematic reviews of the findings and evidence from empirical research conducted by Vadén et al. (2020), who, after analysing more than 170 articles, found that there is no evidence of economy-wide resource decoupling internationally and nationally, but only evidence of decoupling in particular areas. Parrique et al. (2019) came to a similar conclusion after reviewing more than 600 empirical articles, and the problem described is also recognized by decision-makers in the European Union, who focus in particular on the effectiveness of the European Green Deal.

4 CONCLUSIONS

The study presented here is intended to shed light on selected aspects of the relationship between socio-economic progress and well-being on the one hand and the use of resources and environmental impacts on the other, in order to provide a general assessment of how successfully there is a decoupling of the two in the European Union. The study of the period 1990–2016 focused on the country level and did not aim to look for the causes of the changes described in individual countries. This will certainly be an important task to be addressed by future research, especially in identifying examples of good practice. Since the analyses presented are based on a comparison of the situation in the countries in 1990 and in 2016, they do not detect changes over shorter periods of time. Similarly, trends for the countries analysed are calculated and evaluated in relation to the base year 1990, when countries were at different levels of economic and other kinds of development that even then were associated with varying levels of environmental impact. Certainly, the results of the analysis would be different if we chose years with a certain level of per capita income in the country as a starting point and followed the impact of countries on the environment over an equally long period of time. Such analyses would, in particular, provide better insights into the rate of increase or decrease in environmental pressures with the same increase in income.

The analysis of the current state and trends for the period after 1990 has confirmed our assumption that there are indications of decoupling socio-economic progress from environmental impacts in the member countries of the European Union. In both the EU-28 and the group of 121 countries of the world, the link between human development, as measured by HDI, and environmental pressures, as reflected in the EF per capita, weakened slightly between 1990 and 2016. On the other hand, over the last 25 years, the link between environmental pressures and incomes has only increased in the world, which is extremely unfavourable in terms of development and runs counter to efforts to detach economic growth from environmental impacts. In contrast, the correlation between incomes and environmental impacts weakened in the EU-28, where in three-fifths of the countries studied, incomes of the country and its population increased even as their ecological footprint decreased. However, this trend should not be cause for excessive satisfaction, as the ecological footprint of the average resident in all EU-28 countries is still higher than the available planetary biocapacity per capita. As a result, the European Union still faces many challenges in order to be able to achieve the goals of the European green deal and set an example for the world.

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USPEŠNOST EVROPSKE UNIJE PRI LOČEVANJU SOCIALNO-EKONOMSKEGA NAPREDKA OD VPLIVOV NA OKOLJE

Povzetek

V članku preučujemo izbrane vidike uspešnosti držav Evropske unije pri ločevanju socialno-ekonomskega napredka od rabe virov oziroma vplivov na okolje, zlasti še v primerjavi z drugimi državami po svetu. Za preučitev stanja in trendov je bilo izbrano obdobje 1990–2016, za izhodišče analize pa dohodkovni vidik koncepta človekovega razvoja (tj. bruto nacionalni dohodek) ter pritiski na naravne vire in ekosistemske storitve, kot jih zaznava koncept ekološkega odtisa. Raziskava je izhajala iz predpostavke, da je bilo v državah članicah Evropske unije v preučevanem obdobju možno zaznati znake ločevanja socialno-ekonomskega napredka od vplivov na okolje, medtem ko tega za države sveta na splošno ne moremo trditi.

Stanje in trendi za 28 evropskih držav, članic Evropske unije v letu 2016 (t. i. države EU-28), so v prispevku ovrednoteni tudi v kontekstu svetovnih dogajanj, zato je bila večina analiz izdelanih hkrati za države EU-28 in za vse države sveta z razpoložljivimi podatki. V ta namen je bilo v raziskavi upoštevanih vseh 121 držav sveta, za katere so na voljo vsi ustrezni podatki in izračuni (tj. za indeks človekovega razvoja, ekološki odtis in bruto nacionalni dohodek na prebivalca) tako za leto 1990 kot tudi za leto 2016. Ker pa je iz omenjene analize izpadlo kar 54 drugih držav, ki niso imele vseh potrebnih podatkov za leto 1990 (imele pa so jih za leto 2016), je bila izvedena še dodatna analiza stanja za leto 2016, ki je vključila 175 držav sveta z ustreznimi podatki. S statističnimi

analizami omenjenih podatkov smo ugotavljali spremembe v preučevanega četrta stoletja ter odnose med spremenljivkami in njihovo povezanost, v sklepnem koraku pa smo države razvrstili še v tipe glede na razmerje med gibanjem bruto nacionalnega dohodka na prebivalca in ekološkega odtisa na prebivalca v obdobju 1990–2016.

Analiza stanja in trendov za čas po letu 1990 potrjuje, da v državah članicah Evropske unije obstajajo znaki ločevanja socialno-ekonomskega napredka in vplivov na okolje. Prav vse preučevane države sveta so v navedenem obdobju v celoti napredovale na področju človekovega razvoja in uspele znatno zvišati indeks človekovega razvoja. Ob tem se je tako v državah EU-28 kot tudi v skupini 121 držav sveta med letoma 1990 in 2016 nekoliko zmanjšala povezanost med indeksom človekovega razvoja in pritiski na okolje, kot jih zaznava ekološki odtis na prebivalca. Po drugi strani pa se je v svetu v zadnjega četrta stoletja le še povečala povezanost pritiskov na okolje in dohodkov, kar je razvojno izjemno neugodno ter v nasprotju s prizadevanji za prekinitev povezave med gospodarsko rastjo in vplivi na okolje. Nasprotno se je povezanost dohodkov in vplivov na okolje zmanjšala v skupini držav EU-28, kjer so se v treh petinah držav dohodki države in prebivalcev povečali, njihov ekološki odtis pa se je hkrati zmanjšal. Povezanost obeh spremenljivk pa kljub temu še vedno ostaja razmeroma visoka.

V nadaljevanju smo vse preučevane države razdelili v dve skupini glede na razmerje med gibanjem bruto nacionalnega dohodka na prebivalca in ekološkega odtisa na prebivalca v obdobju 1990–2016. V prvo skupino se uvrščajo vse države, v katerih je bil indeks rasti ekološkega odtisa na prebivalca večji od indeksa rasti bruto nacionalnega dohodka, kar je okoljsko izrazito neugoden trend in pomeni odmikanje od ciljev trajnostnega razvoja oziroma od zelene prekinitev povezave med rabo virov in gospodarsko proizvodnjo. V tej skupini je 24 držav sveta, med njimi pa so tudi tri države EU-28: Slovenija, Latvija in Hrvaška. Znotraj tako opredeljene skupine je po neugodnosti trendov posebej izstopala podskupina desetih držav, ki so sočasno beležile tudi neugodne gospodarske trende oziroma upad dohodkov, a med njimi ni nobene evropske. V drugo skupino se uvrščajo vse države, v katerih je bila rast bruto nacionalnega dohodka na prebivalca hitrejša od rasti ekološkega odtisa na prebivalca, kar kaže na vsaj relativno prekinjanje povezave med gospodarsko rastjo in pritiski na okolje. V skupini je velika večina vseh analiziranih držav sveta (104 od 128 oziroma 81 %), od tega kar 25 držav EU-28. Posebej je izpostavljena podskupina 46 držav, v katerih je bil leta 2016 ekološki odtis na prebivalca manjši v primerjavi z letom 1990, kar je med vsemi možnimi kombinacijami najbolj gospodarsko in okoljsko zaželena, saj kaže na upadanje rabe virov okolja ob sočasni gospodarski rasti. Takšne trende je izkazovalo tudi 17 držav EU-28.

Opisano stanje in trendi v Evropski uniji vseeno niso razlog za pretirano zadovoljstvo, saj je ekološki odtis povprečnega prebivalca v vseh državah EU-28 višji od razpoložljive planetarne biokapacitete na prebivalca, večina držav pa ob tem izkazuje tudi ekološki deficit. Evropsko unijo posledično čakajo še mnogi izzivi, da bo zmoгла udejanjiti cilje Evropskega zelenega dogovora in drugih strateških dokumentov ter postati globalni zgled.