APPROACHES ON MEASURING SUSTAINABLE DEVELOPMENT IN CONTEMPORARY WORLD – BEYOND CLASSICAL INDICATORS

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Abstract

Measurement of sustainable development in the contemporary world represents a topic of wide approach in the context of transformations which global economic environment has experienced over the last half-century. The necessity of identification of new indicators that provide a more faithful image of economic life has imposed the construction of new indicators for measuring. In this context, the central objective of the paper is to achieve a synthesis of some of these indicators, analysing their evolution in the context of existing economic realities but also highlighting further correlations, limitations and disputes to which they are subjected to lately.

Thus in this paper are presented and analyzed, considering the arguments above, a series of indicators such as the ecological footprint, biocapacity, happy planet index or other segnificant indicators. Another objective of the paper is also the identification of possible solutions for the application of these indicators in the foundation for sustainable economic policies in the context of global economic transformations.

Key words: *sustainable development, well-being, Ecological Footprint, Biocapacity, Happy Planet Index.*

JEL Classification: *E00, O1, H5.*

1. Introduction and context of the study

Sustainable economic growth is one of the main goals of the contemporary economy. Achieving sustainable economic growth, according to the exigencies of providing a superior valorisation of the resources available in a company involves an extensive process of mobilization and redistribution in contemporary societies. Ensuring sustainable economic growth is the main goal of policy makers in the modern states. Trying to achieve a resilient and competitive European economy, in terms of efficient allocation and use of available resources and socially inclusive require an integrative approach and the existence of a system of indicators that would enable monitoring the process. Such mostly quantitative measurement of objectives and economic performance is not grounded and of a qualitative assessment. Functionality and intelligence of a socioeconomic system cannot be assessed solely on quantitative data, which usually do not provide information about related phenomena, without defining and correlations.

In societies contemporary the classic indicator used by countries in measuring progress and economic performance is the Gross Domestic Product (GDP), which has already proven its limits and requires an extensive process of reconsideration, as outlined in the Commission's report Stiglitz-Sen-Fitoussi, where it says that "doubts on the ability of GDP to correctly measure well-being and even market activity exists for a long time".[1]

Issues raised by measuring the sustainable economic development were highlighted in numerous studies. Chancel et al., 2014 performed a review of six initiatives on GDP and beyond. Also, Stiglitz et al. (2009) highlights the need to replace and complement GDP with other indicators. Layard (2005) contributes to the identification of

[1] Stiglitz Joseph, Sen Amartya şi Fittousi Jean Paul, *Issues Paper, Commission on the Measurement of the Economic Perfomance and Social Progress*, 25.7.2008.

numerous ways of measuring the level of satisfaction with, including the happiness of the population and they should be used by decision makers in making public policy[2].

Over time, in literature [9-10] began to be raised and debated a number of limitations of GDP and consequently gaps generated by it. Thus, starting from the reality that GDP measures the total value of goods and services produced in a country, usually in a year [2] it can be seen as contemplated only economic outlook welfare a company [3], without study and other dimensions of well-being, it reducing the rule to a single monetary value of income per capita [1].

Although GDP captures the value of a country's economic performance and represents benchmark for macro-economic policies, it does not provide information about their well being, happiness and satisfaction of citizens or fence to emphasize the degree of sustainable development. An element taken into account in this regard and highlighted in the literature [6] is the fact that in measuring economic growth by GDP is overlooked as GDP accounts for revenues and costs without making any differentiation between processes that bring an increase in well-being and those that diminishes. Also using GDP as an indicator cannot achieve a differentiation between high-income levels and low-income levels, GDP per capita value reflecting the average income as is found in [5].

In the context outlined above limits for measuring well-being it requires more than measuring the growth of the company, it requires a comprehensive analysis on the welfare and progress of society, focusing on sustainable development in terms of social, economic and environmental. Thus, it needs to complement GDP with a set of indicators able to measure sustainable development, which includes welfare and economic prosperity, growth and environmental development. From this perspective, the central objective of this article is the presentation and analysis of possible indicators to measure and complementary aspects such as the: ecological footprint, European Benchmark Indicators (EBI), water footprint, Index of Sustainable Economic Welfare significant or other indicators.

2. Essential component of the economic welfare of contemporary society

Economic growth is perceived generally as a result of increased national income or gross domestic product as a result of increased production. But the company's growth can be seen beyond GDP growth, the result of increased well-being of each individual, which increases the welfare of the society. Thus, well-being can increase even if production decreases. [3]

Well-being is a broad concept that can be defined by using different terms such as quality-of-life, happiness, life satisfaction and welfare. It is a concept that includes many diverse elements but, in essence, focuses on fulfilling a decent living with a quality education, health care and the labor market.[5,12]

Being heavily dependent on various factors such as income, degree of culturalization and access to culture, the existence of jobs, the degree of development of the country, environment, and welfare is perceived differently by each individual, depending on the country or geographical area of part social categories according to which it belongs.

Welfare is an essential component of human development; it reflects the perception of each individual state to which they aspire optimal, resulting in a system needs correlated with economic and social environment to which he belongs [3,7]. Thus, the perception of well being includes indicators that reflect the views of each individual person on the welfare of citizens on the labor market, government Policies and judicial system. From the perspective of individual opinion on self-perceptions of self-relevant dimensions of human development indicators are considered as quality education, quality health care, standard of living and personal safety overall satisfaction with freedom of choice [7,14]. Thus, Table 1 shows the values recorded in 2014 on perceptions of individual well-being.

Table 1: Perceptions of individual well-being

Country	Education quality	Health care quality	Standard of living	Feeling safe	Freedom of choice	
	(% satisfied)	(% satisfied)	(% satisfied)	(% answering yes)	(% satisfied)	
					Female	Male
	2014	**2014**	**2014**	**2014**	**2014**	
Germany	66	85	90	80	88	91
United Kingdom	65	77	79	79	86	81
France	66	81	74	70	77	82
Finland	81	69	76	81	92	94
Spain	54	67	68	85	71	76
Italy	55	48	64	58	59	64

[2] Layard, Richard (2005). "Happiness: Lessons from a New Science", Penguim, London.

[3] Contribution to Beyond GDP „Virtual Indicator Expo",Environmentally Sustainable National Income (eSNI), asymmetric entries and other ways to improve information about economic growth. Summary prepared by (name; institution): Dr Roefie Hueting, Roelofsstraat 6, The Hague, the Netherlands, www.sni-hueting.info, July, 2012 (original: October 2007)

Estonia	52	51	46	65	73	73
Lithuania	54	52	34	47	46	43
Portugal	66	62	44	72	82	86
Hungary	53	56	48	47	48	46
Latvia	55	48	49	57	60	62
Romania	55	55	48	55	67	72
Bulgaria	42	38	37	54	53	53

Source: authors based on [24]

In the countries analysed in the table above, thosewith very high human development, according to HDI data, have a higher degree of individual welfare than countries with only high human development (Romania and Bulgaria).

In terms of education quality it can be seen that Finland is placed on the highest level, with 81% of population satistied by education level, followed by Germany, France, Portugal (66% satisfied) and the United Kindom (65% satisfied). In terms of health care quality and standard of living, Germany has the highest degree of satisfaction of needs of the population, with 85%, i.e. 90% degree of satisfaction.

Finland occupy first place in to maintain security of the population, with 81% of residents feeling safe, and in terms of freedom of choice, more than 90% of population, female (92%), as well as male (94%) are satisfied with the level of the society and the policies adopted in this respect.On the other hand, less-developed countries, such as Romania and Bulgaria, have a much lower level of welfare society compared with the desired level. Romania presents in 2015 only 55% degree of satisfaction of the needs of education quality, quality of health care and personal safety.

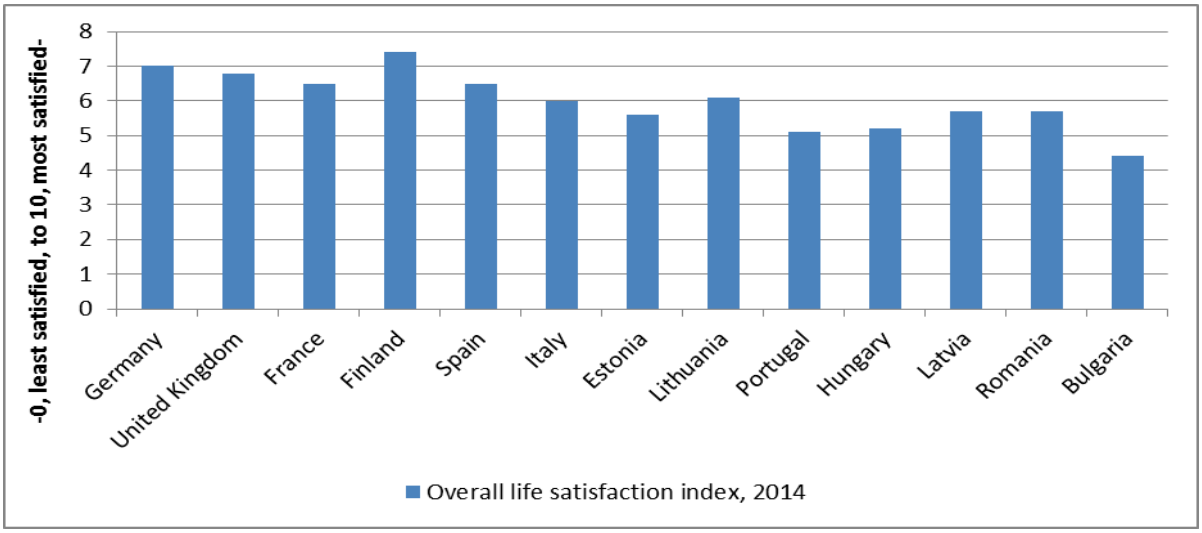

Fig. 1: Overall life satisfaction index in 2014
Source: author based on [24]

From Fig.1, it is noticed that the overall life satisfaction index in 2014, Finland records the highest degree of satisfaction of needs of the population, recording the value of 7.4 out of 10. It is followed by Germany with 7 out of 10 and the United Kindom 6.8 out of 10. In terms of countries that satisfy less the needs of citizens, Bulgaria receives 2.7 out of 10, and Romania and Latvia recorded a level of 3.5 out of 10.

Society's well-being depends not only on social factors, but also on environmental factors such as natural resources or pollution. In this sense, the Adjusted net saving (ANS) is the indicator which helps to measure the welfare of society taking into account environmental factors By definition, ANS measures the true rate of saving in an economy after taking into account investments in human capital, depletion of natural resources and damages caused by pollution.[4]

[4] Contribution to Beyond GDP, "Virtual Indicator Expo", http://www.beyond-gdp.eu, Name of the indicator/method: Adjusted Net Saving (ANS) as percentage of GNI, Summary prepared by: Environment Department, The World Bank, Updated: June 29, 2012

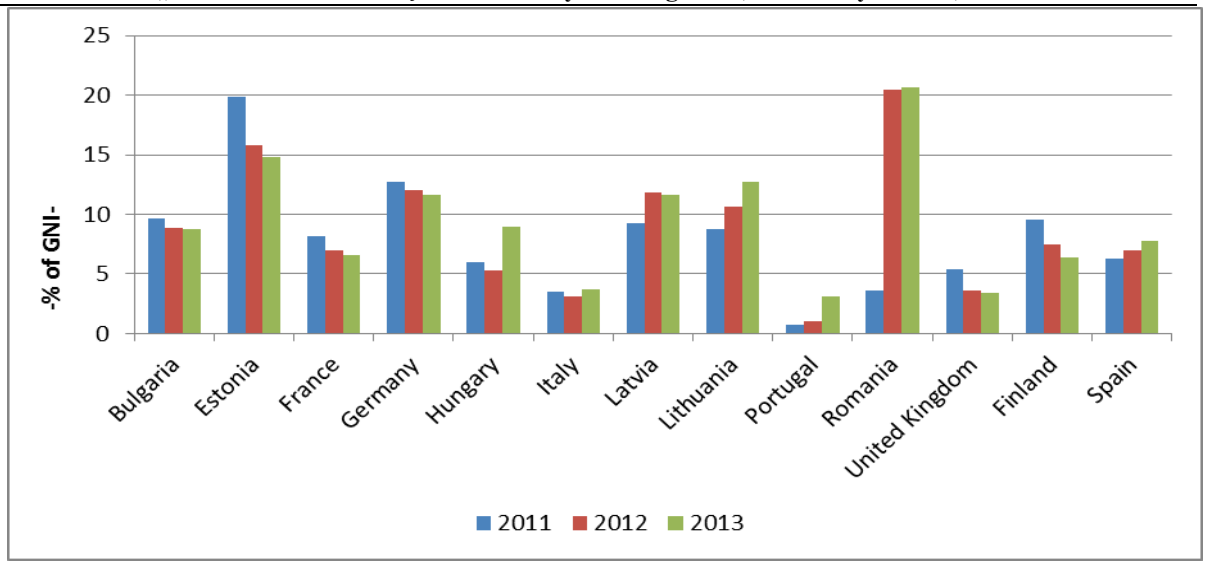

Fig. 2: Adjusted net savings, including particulate emission damage (% of GNI)
Source: authors based on [21]

From Fig. 2 it can be seen that countries less developed register growth of ANS in the period 2011-2013. Thus, significant growth is recorded in case of Latvia, from 5.8% of GNI (Gross National Income) in 2011, to 7.2% of GNI in 2013. Romania, however, registered the highest growth in this period, from 3.6% of GNI in 2011 to of 12.9% of GNI in 2013. According to ANS definition, these increases signify a growing welfare in society. On the other hand, developed countries register during period 2011-2013, decreases of ANS values.Even though Germany (7.2% of GNI in 2013), France (6.6% of GNI in 2013) and United Kingdom (3.4% of GNI in 2013) are some of the countries with the most developed economies, they register A decline to the level the ANS, which highlights the company's development which is not sustainable.

3. Alternative indicators in measuring sustainable economic growth

Another important indicator in measuring the welfare of society is the Human Development Index (HDI), being also considered an indicator that is intended to be able to replace GDP. HDI is a measurement that completes the concept of human development focusing on the important elements for citizens' well-being beyond income. According to [1,12], The Human Development Index is a composite indicator that measures the three key dimensions of human development. First, long and healthy life measured by life expectancy at birth, second, knowledge measured by mean years of schooling and by expected years of schooling and third a decent standard of living measured by Gross National Income per capita. Also, HDI has an upper limit of 1.0.

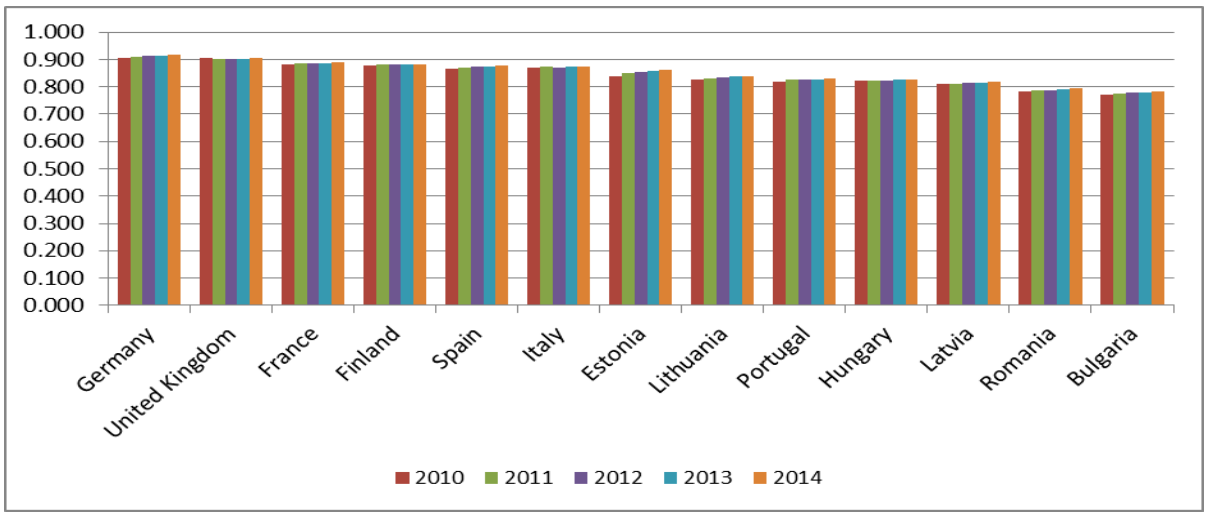

Fig. 3: Trends in the Human Development Index, 2000-2014
Source: author based on [24]

From Fig. 3, it can observed that the highest level of the HDI in 2014 is registered in Germany (0.916), followed by the United Kingdom (0907) and France (0.888), and countries with the greatest economic development in the European Union, which also registers a high level of well-being of the population. At the opposite pole lies Romania with 0793 and Bulgaria with 0782, countries with weaker development and economic power, with a rate of low well-being due to education welfare and health care quality (table 1).

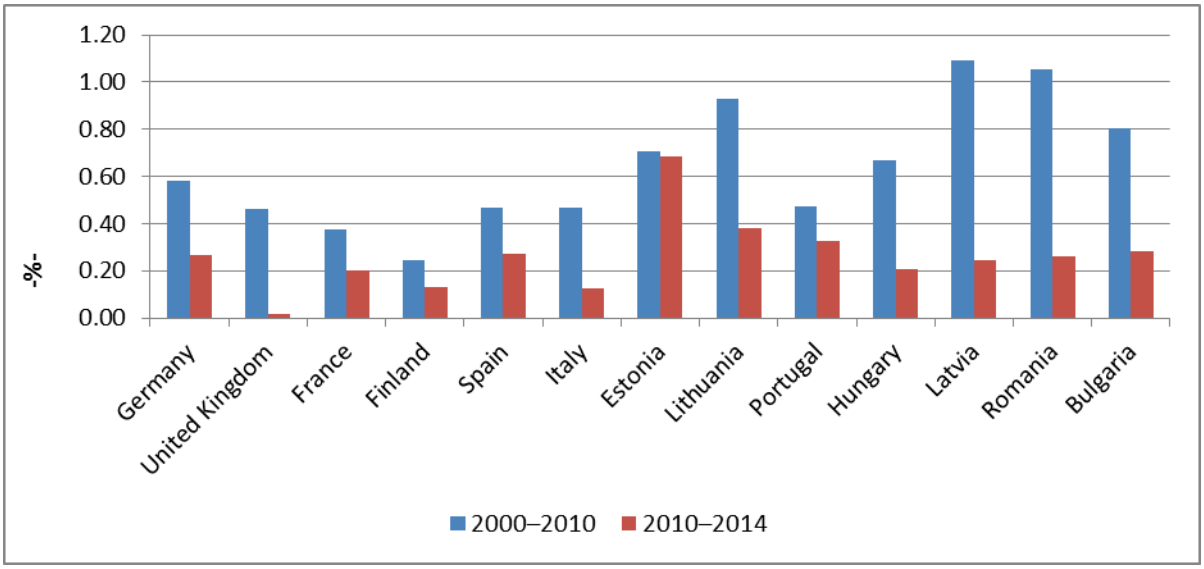

Fig. 4: Average annual HDI growth in 2000-2014
Source: author based on[24]

From Fig. 4 it is noticable that during 2000-2014 human development index value is growing. However, in the period 2000-2010 HDI growth is more pronounced than in during 2010-2014. In all the countries analysed, average annual HDI growth lowers, even if in 2014 were recorded growths of HDI. Estonia is the only country of the analyzed ones which maintains an approximately constant increasing of the HDI during 2000-2010 registering an annual growth of HDI of 0.71%, followed by an increase of 0.69% in the period 2010-2014. In human development, a very important aspect is represented by work. From an economic perspective, work helps people to achieve a level of economic security, and from the perspective of human development, work allows for a showdown of knowledge. Income from work allows people to have access to health and education of better quality, key factors in the calculation of the Human Development Index.

An evtremly important aspect in the analysis of the welfare of the individual, besides the individual perception of well-being (table 1) and perceptions of work and labour market is perceptions of government, more specifically the actions to preserve the environment,presented in table 2.

Table 2: Perceptions of government

Country	Trust in national government	Actions to preserve the environment	Confidence in judicial system
	(% answering yes)	(% satisfied)	(% answering yes)
	2014	**2014**	**2014**
Germany	60	71	67
United Kingdom	42	65	60
France	26	59	48
Finland	47	68	74
Spain	21	44	36
Italy	31	29	29
Estonia	41	61	54
Lithuania	34	49	30
Portugal	23	63	33
Hungary	31	41	46
Latvia	23	50	38
Romania	24	26	36
Bulgaria	14	22	19

Source: authors based on [24]

Note that, from the perspective of the government actions to preserve the environment, most citizens are happy in Germany with 71%, Finland 68% and United Kingdom by 65%. At the opposite pole lies a country like Bulgaria 22%, Romania 26% and Italy with 29%, in which less than 30% of the population is happy with the policies and actions taken by the State to protect the environment.

The environment has a very strong impact in human development, influencing all of its aspects. Thus, the environment is essential for socio-economic development in the ecological agriculture is very important, nature is therefore the one that provides the main components needed to develop, such as water, building materials, energy and fuels, textiles and productive soils[5].

Also, because the environment contains the main elements essential to life, it has a powerful effect on health and well-being and quality, a polluted environment thus lead to a decline of the welfare society. Thus, the ecosystem, a broad vision, is the main factor influencing economic growth and social development, creating market economies. In this sense we can talk about ecological footprint, biocapacity and happy planet index (HPI), indicators that directly influence the welfare of society.[10,23]

Ecological Footprint is an indicator that wants to use to replace GDP. This indicator is a measure of sustenability. The ecological footprint is an indicator that measures the surface area (in hectares) to produce the goods and services essential to humanity. Ecological footprint is an indicator that fails to accurately measure Environmental impact, but over the last 20 years, has been continuously improved and managed today to be the main indicator which can present a comprehensive picture on human development from the perspective of nature.[1,13,14]

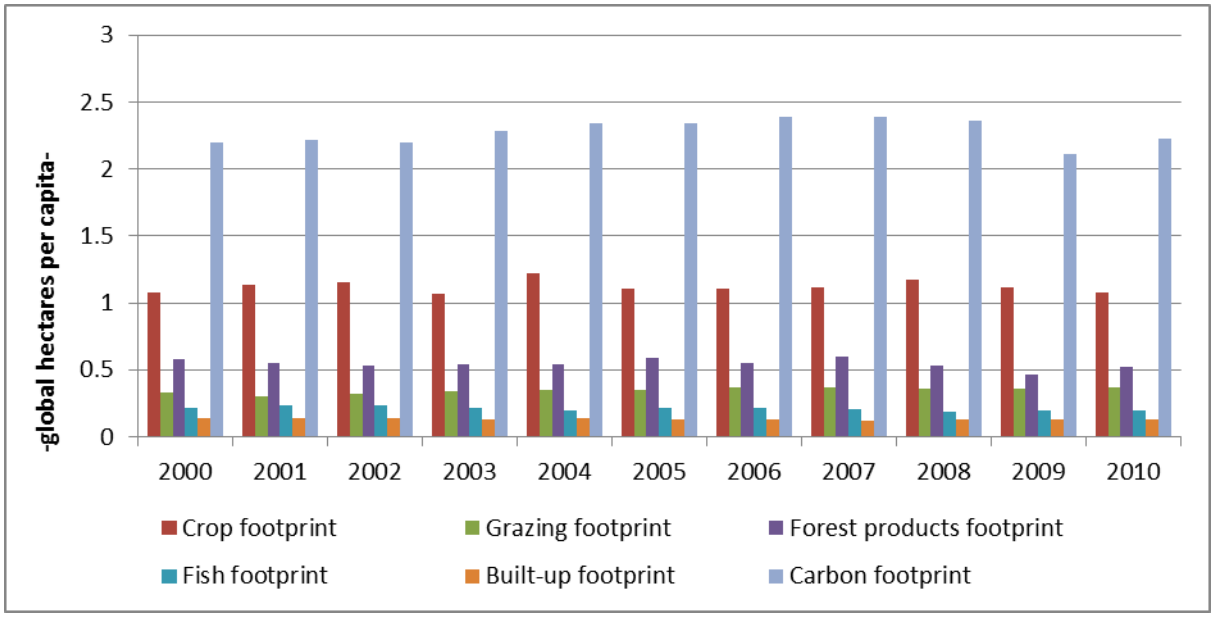

Fig. 5: Ecological footprint time series by land type
Source: authors based on [16]

In the 2000-2010 periods, seen from Fig. 5 as the ecological footprint develops differentiated by land type, there are many fluctuations over this period. The lowest levels of the ecological footprint is recorded, over the analyzed period, when built-up footprint which in 2010 recorded a value of 0.13 gha per capita, fighing footprint of 0.2 gha per capita and grazing footprint of 0.37 gha per capita. In contrast, with the highest values recorded observe crop footprint, whose value, although it has fluctuated over the period 2000-2010, in 2000 and 2010 recorded the same level of 1.08 gha per capita and carbon footprint.

The greatest impact on human development it has carbon footprint, which not only increased over the period 2000-2010 to 0.03 gha per capita, at 2.2 gha per capita in 2000 to 2.23 gha per capita in 2010, but and always been a component of the largest ecological footprint. The increase is due to continue its technological innovation, which in recent years has increasingly used more fossil fuels such as coal, oil and natural gas.

[5] Embedding the Environment in Sustainable Development Goals, UNEP Post-2015 Discussion Paper 1, Version 2, 19 July 2013, pp.21

In 2010, Earth's biocapacity was approximately 12 billion global hectares (gha) – which amounts to about 1.7 gha for every person on the planet. This biologically productive land must also support the 10 million or more wild species with which we share the planet.[6]

Society needs differ from country to country, therefore, biocapacity demand differ from country to country, for which biocapacity is distributed unevenly. According to Living Planet Report 2014, aproximatly 60 per cent of the world's total biocapacity is located in just 10 countries.[22]

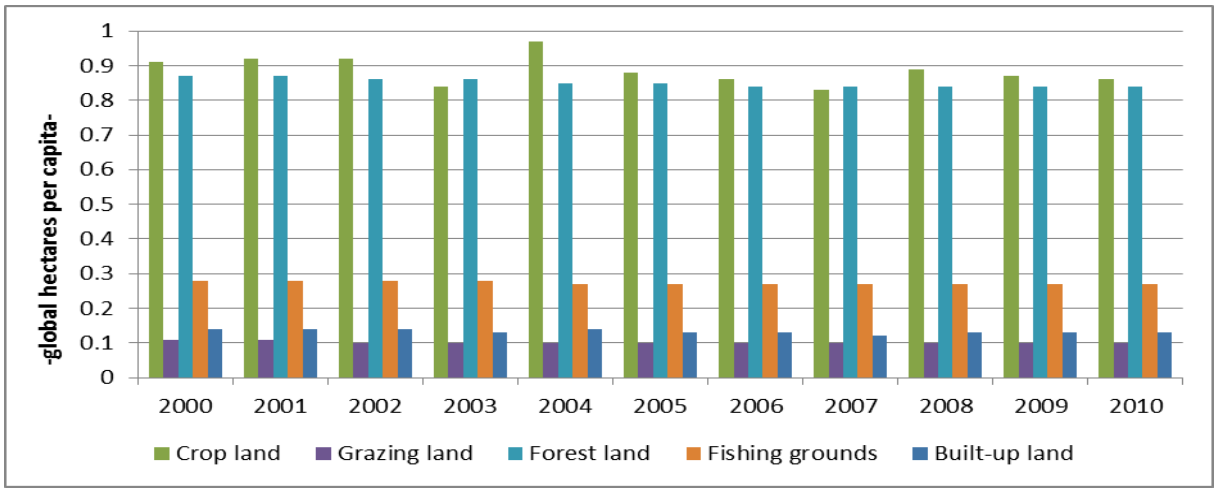

Fig. 6: Biocapacity time series by land type
Source: authors based on [25]

Referring to Fig. 6 reveals that during 2000-2010, the amount of biocapacity is decreasing in relation to any land type. The smallest amount of biocapacity is registered in the case of grazing land, where the value decreases even reaching in 2010 to 0.1 gha per capita, and built-up land, which also decreases the value, reaching in 2010 to 0.13 gha per capita. The highest values, in turn, are recorded in case of forest land that reaches in 2010 to 0.84 gha per capita, and crop land, which holds the largest share and reach in 2010 the per capita value of 0.86 gh.

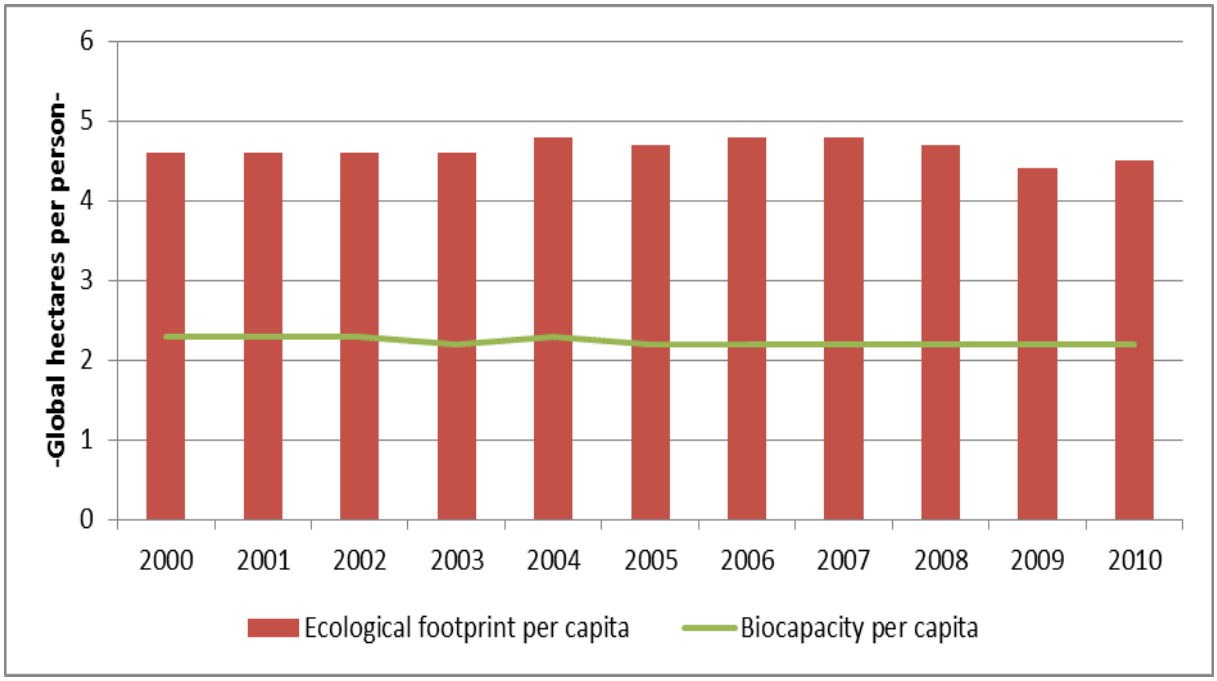

Fig. 7: Ecological footprint and biocapacity per capita, 2000-2010
Source: authors based on [25]

Over the years, the number of countries that have exceeded biocapacity level began to rise due to increasing population and rising standard of living of it. Thus, resources are becoming more and more limited, which can lead to

[6] Living Planet Report 2014, Species and spaces, people and places, p. 40

serious political implications, economic and social. In Fig. 7 that during the analysis period, 2000-2010, the ecological footprint is more than double the biocapacity. The biggest decrease the ecological footprint is recorded in 2009, when it reaches the 4.7 gha per capita in 2008 to 4.4 gha per capita, the biocapacity remains constant or 2.2 gha per capita, due to lower demand for fossil fuels, which generates a decrease in the carbon footprint.

According to Living Planet Report, currently, there is a discrepancy between the need for very high surface to produce the goods and existing surface, so humanity needing regenerative capacity of 1.5 Earthsea to achieve this need.[22]

It also notes [22] that rich countries tend to have a growth rate much higher ecological footprint than less developed countries with lower incomes. Even if countries with low income are the most vulnerable interdependence between natural elements: food, water and energy, affecting the entire humanity. So, human well-being is severely affected by the discrepancy between ecological footprint and biocapacity.

In measuring well-being is also used, and the Happy Planet Index (HPI). HPI is a measure of efficiency and a measure of Sustainable well-being. This indicator uses the sum of experienced well-being and life expectancy relative to ecological footprint, so current well-being and our impact on the planet, to calculate which are the countries with the best chance to produce and maintain long and happy Their inhabitants and their lives for future generations. According to the Happy Planet Index: 2012 Report, this year is still unhappy planet, with high and low-income to countries that, but have the same goal, to achieve a sustainable well-being.[23]

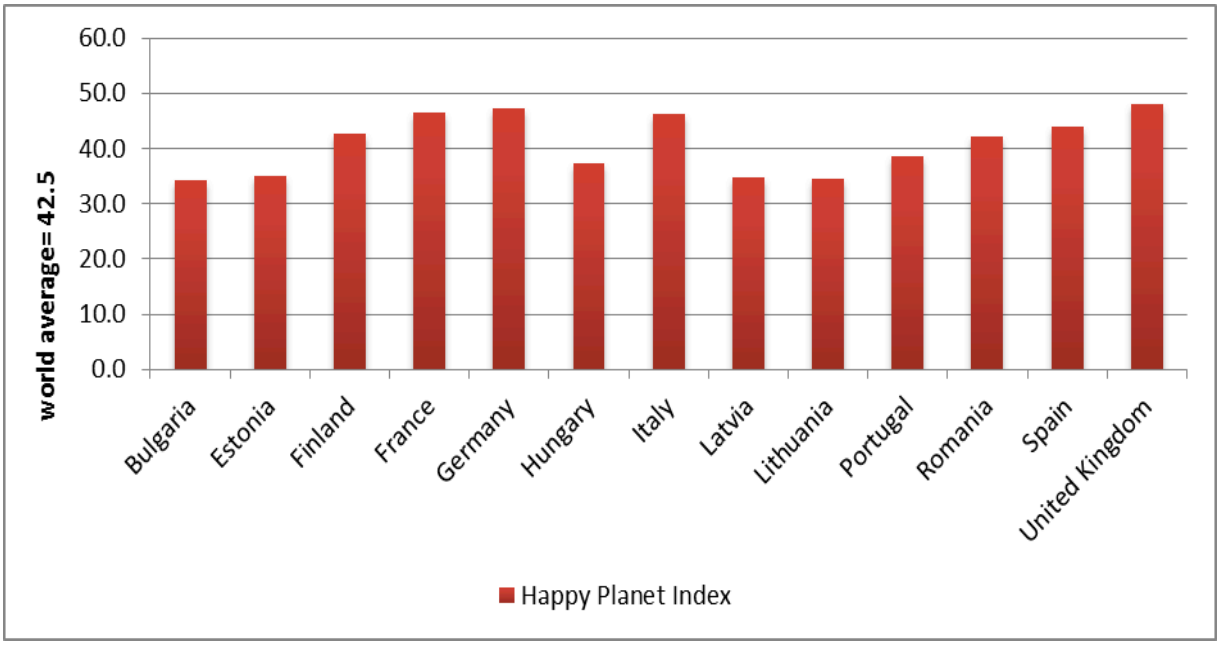

Fig. 8: Happy Planet Index, 2012
Source: author based on [23]

In Fig. 8 are highlighted some of the countries that belong to the EU. In 2012 Happy Planet Index value held a world average = 42.5. It notes that in Europe, rich countries exceed the world average. Thus, the United Kingdom recorded the highest value of the countries analyzed, 47.9, followed by Germany with 47.2 and France with 46.5, but none of the countries not included in the bright green, in which all three elements taken into account is good. All have one component poor.

On the other hand, less developed countries such as Hungary with 37.4, Latvia by 34.9 and Bulgaria with 34.4 falls into the red zone, all with two components poor, or "deep red" footprint. n contrast, Romania has all three components (life expectancy, well-being and Expected ecological footprint) middling, recording a value of 42.2, close to the world average.

CONCLUSIONS

Although GDP is the main indicator which express the current situation of economic development of a country, society welfare analysis can only be performed using this indicator. Thus, the analysis carried out above, it is observed that, for an individual to be satisfied, to reach a certain level of wealth, it takes into account social, environmental and economic. GDP provides an answer on how economic factors, is needed and indicators able to quantify the social and natural elements that influence society.Equally important in analyzing Sustainable well being and environmental factors are examined in this paper the ecological footprint, biocapacity and happy planet index. Following this analysis

finds that our planet is still not a happy one.Large discrepancy between ecological footprint and biocapacity highlights overall well-being decrease. In fact it is found that in rich countries economically, are not necessarily the happiest or have a high level of well-being. However, these indicators are still under development and improvement. For a more accurate analysis is needed on welfare and accurate data constantly renewed.

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