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Sustainable Development as a Challenge for a Society and an Economy

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Abstract: During the political process leading up to the Earth Summit in Rio de Janeiro in 1992 it was decided that the concept which will be used to coordinate spontaneous development processes will be the concept of sustainable development. Since that time, efforts are made to implement this concept through inclusion in the legal regulations and by modelling the development objectives of societies. This process should be accompanied by: 1) a reflection over a direction in which we should go and 2) a question whether actions, carried out in the spirit of sustainable development, really bring us closer to the realisation of this concept. The proposed paper will develop these last two questions focusing on how to get at least a partial response. A proposition of measuring a distance to a sustainable goal(s) for countries is presented.

Keywords: sustainable development, GDP, ISEW, HDI, Ecological Footprint

JEL codes: Q01, Q56, 044

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1. Introduction

Definition of sustainable development is not discussed in terms of its formulation but rather in terms of its interpretation. A career of this concept started exactly from the definition presented in so-called Brundtland report. Sustainable development was introduced to public debate as a development “which meets the needs of the present without compromising the ability of future generations to meet their own needs.” (Brundtland 1987). Introduced by the Brundtland report the idea of sustainable development was later acknowledged by the political decisions during the Earth Summit in Rio de Janeiro in 1992. This is a very simple idea with potentially very strong consequences to development policy of states and organisations. But unfortunately sustainable

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development is also very vague concept. That is why it is very reasonable to ask the following questions. Are we going in the right direction or not? And what is the right direction?

A lot of discussions, debates, papers, documents and efforts in the field of sustainability including the United Nations sustainable development goals could suggest that there is no need to answer the above questions. But even if the mentioned efforts try to apply a synthetic thinking and approach it is not obvious that current and long-term policies of particular countries really aimed at a sustainable goal. An example can illustrate that: sustainable means also keeping within the limitations of the Earth system - do really governments in the most developed countries promote by their policies the more sustainable lifestyles based on lesser consumption of resources or they just strictly follow in their economies already existing patterns of development that drive them away from this goal?

Let the goal of sustainable development be decomposed to better understanding and then it would be more clear what does it mean for particular economies. The concept of sustainability is very often translated through its three dimensions: economic, social and ecological. In other words, being sustainable means more or less standing on three legs. This applies on both macro (societal) and micro (organisational) level. Every entity, every organisation should realise a stream of goals which cannot be reduced to economic dimension only. They should try to reach their own sustainability while at the same time they should contribute to sustainable development of the whole society. In the paper the sustainability will be discussed mostly in its macro meaning.

If a consensus over what the sustainable goal is (“what is the right direction?”) could be reached then a next issue arise: are we closer nowadays to the sustainable goal or not. A proposition of how to measure this distance could be discussed and then implemented. In the paper one of such a possible measure is presented to further discussion.

2. How do we measure the success in sustainable development implementation

Trying to learn if our society follow the right direction in terms of reaching the sustainable future we have to refer to already mentioned three legs of sustainability and can operationalise the success by assuming that the society should reach its goals in all three dimensions of sustainability. It means that the society will operate sustainable economic system with fulfilled needs of people, will eliminate unsustainable social conditions of existence and will preserve goods and services of

ecosystems and their biodiversity for future generations. This is very idealistic picture but it can serve as a roadmap rather than as a postulate of an utopia.

2.1. Success in economic dimension

To assess the welfare of society traditionally we used to use a synthetic measure called: Gross Domestic Product (GDP) and its dynamics – the main macroeconomic indicator of System of National Accounts (SNA). It describes an increase in welfare and economic growth. When GDP decreases economists and politicians preach catastrophic comments, when it grows they fall into euphoria. But is it justified? Is it really like that that when GDP increases this is automatically connected with the rise of prosperity and increase in a quality of life?

The awareness is rising that the GDP not only can potentially measure wrong, but can be actually misleading. Measuring just the level of economic activity in the economy, GDP shows, after all, not only revenues that are achieved in the production of goods and services, that contribute to an improvement of the quality of life, but also the income of these industries, which affect or may affect negatively the quality of life. Is income growth in the industries degrading environment means that increases our quality of life? Is income growth of for example manufacturers of chemical fertilizers means that we have a healthier food, healthier soil, rivers, lakes, ...? What about the income growth of the tobacco, alcohol or car industry? What an increase in an income generated by the medical industry really means? This contributes to the growth of GDP with no doubt but is it really a progress or just a sign that we are becoming less healthy?

The increase in GDP can also be caused by a change of habits, for example switching from having meals at home to eating out in bars and restaurants. In some sense nothing has changed we still eat meals but the change is reflected by the GDP (income earned by members of the society working in bars and restaurants). And the issue of the quality of life can be also a point of discussion here.

Well, there is no intention of the author of the paper to repeat the whole discussion about the GDP failures that can be found in economic literature. The most important conclusion is that in search of a better measurement a variety of proposals appeared of other indicators that more realistically would assess the welfare of society (see for example Fiedor and Kociszewski 2010). One of such a proposal is a measure proposed by Professors Herman Daly and John Cobb (Daly

and Cobb, 1989). Index of Sustainable Economic Welfare (ISEW) is essentially an adjusted GDP. This modification consists of the following exemplary elements:

- 1) deducted expenses that aligns social and environmental costs of production,
- 2) included long-term costs of environmental degradation and depreciation of natural capital (the disappearance of resources);
- 3) a distribution of income reflected (in terms of a distribution of an additional amount of money rather in pockets of relatively poor people or in pockets of the rich);
- 4) calculated a value of households labour (to reflect also non-cash benefits for the economy)
- 5) costs of crime, underemployment, commuting and other (see for example: Lawn 2003: 108).

When you look at the trends and changes in GDP and ISEW in western economies in the last few decades the following observation is common: while the GDP reported is more or less continuously increasing, their ISEW indexes since the middle of the seventies show a slow downward trend (see for example: Daly and Cobb 1989; Cobb and Cobb 1994; Guenno and Tiezzi 1998, Lawn 2003).

Nevertheless GDP is still the 'easiest' and synthetic measure of the level of economic activities in national economies which contribute to a welfare of societies. Its modifications could serve as measures, at least partial, of social or environmental performance of societies depending on variables included in such modifications. The other thing is that specially policy makers misuse the GDP as a welfare indicator instead of presenting it and its dynamics just as a measure of the level of economic activities in particular economy. But for sure measuring the sustainable development only using GDP and its dynamics is far too narrow approach (see for example Chimiak and Fronia 2012: 25).

2.2. Success in social dimension

The social dimension of the sustainable development is obviously strongly interconnected with its economic dimension. To some extent economic measurements can be also good predictors of the social condition of the society. But being conscious about GDP failures we should strongly vote for more careful measurements of human conditions which in a better way reflect the nature of the situation of the society. There are a lot of propositions how to make the GDP a more excellent in that respect including the Index of Sustainable Economic Welfare mentioned above. But one proposition requires our attention as it is being used in practice nowadays. It is the Human

Development Index (HDI) which was created by the United Nations Development Programme in 1990 (Soubotina 2004: 137). It is combined as average of three indexes: the level of life (using GDP per capita in purchasing power parity terms), life expectancy at birth and level of education and access to knowledge (adult literacy and child education). This way the indicator is able to estimate in some sense social and economic sustainability. It measures “how far a country has gone in attaining the following goal: life expectancy of 85 years, adult literacy and enrollments of 100 percent, and real GDP per capita of \$40,000” (Soubotina 2004: 111). It was set by the United Nations that reaching the 80% (0.8) of the HDI means decent life conditions. Some actual numbers for chosen countries are presented in a table below (table 1).

Table 1. Human Development Index (HDI) value for 2014 – the first 10 and the last 10 countries.

	Country	HDI value
1	Norway	0.944
2	Australia	0.935
3	Switzerland	0.930
4	Denmark	0.923
5	Netherlands	0.922
6	Germany	0.916
6	Ireland	0.916
8	United States	0.915
9	Canada	0.913
10	New Zealand	0.913
...		
179	Mali	0.419
180	Mozambique	0.416
181	Sierra Leone	0.413
182	Guinea	0.411
183	Burkina Faso	0.402
184	Burundi	0.400
185	Chad	0.392
186	Eritrea	0.391
187	Central African Republic	0.350
188	Niger	0.348

Source: Human Development Report 2015: 208-211 (data can be obtained from: <http://hdr.undp.org/en>).

The main disadvantage of the aggregated indices is their simultaneous advantage as synthetic indicators: they are aggregated. We do not know why the change in their size happened, which of the elements of such a measurement worked in favor of its global changes. We do not know, for example, in case of HDI if the change „happens because of a change in GNP per capita or because of a change in adult literacy” until we decompose it to look at its components (Soubbotina 2004: 112).

2.3. Success in environmental dimension

As with the social dimension of sustainable development also in the ecological sphere we can find propositions to correct the GDP measurement in a way that it can reflect also ecological aspects of living. The Index of Sustainable Economic Welfare discussed earlier is a good example of that. But there are also other ideas how to better understand our impact on the environment. The impacts can be calculated in different ways and can concentrate on chosen aspects of certain processes, like for example CO₂ emissions (Carbon Footprint) or water usage (Water Footprint), or on the whole economy. But they can also try to synthesize many aspects like in the Ecological Footprint concept. The Ecological Footprint reflects the area of land and waters needed to produce the resources consumed by the society, and to absorb the stream of waste it produces. As we know the total surface of the Earth available it is easy to calculate even how many hectares of land are necessary to serve the certain lifestyle of individual. The total „bio-capacity of the earth is limited to 11.5 billion hectares of biologically productive space” (Woodward and Simms 2006: 3). Currently because of the size of the human population “this implies only 1.8 hectares (often referred to as global hectares (gha)) of ‘environmental space’ per person. Yet, the Ecological Footprint (also measured in gha) per person has already exceeded this limit and continues to increase” (*World Economic and Social Survey 2013*: 31; see also table 2 below). The moment that we exceeded this limit happened somewhere in the late seventies in XX century (table 3).

Table 2. Ecological Footprint and biocapacity in 2007.

	ECOLOGICAL FOOTPRINT (gha per capita)	BIOCAPACITY (gha per capita)
World	2,7	1,8
High Income Countries	6,1	3,1
Middle Income Countries	2,0	1,7
Low Income Countries	1,2	1,1

Source: *Ecological footprint and biocapacity, 2007, 2010* [12.07.2016].

The variable that mostly contribute to the rising of the Ecological Footprint is an emission of CO₂ (Carbon Footprint). That is why the climate change is the main ecological, and political at the same time, problem nowadays. The average bio-capacity per person is lower through time because of the population growth (from 3,7 global hectares per capita to 1,8 gha per capita) (see the table 3 below). At the same time one should conclude that the increase in CO₂ emission is related to increase in world population. Therefore, issues related to population growth should be also discussed as a key factor that contributes to sustainability which unfortunately does not happen in such intensity as in the case of climate change.

Table 3. Humanity's ecological footprint and biocapacity through time (global hectares per capita).

	1961	1965	1970	1975	1980	1985	1990	1995	2000	2005	2007
Global Population (billion)	3,1	3,3	3,7	4,1	4,4	4,8	5,3	5,7	6,1	6,5	6,7
Total Ecological Footprint	2,4	2,5	2,8	2,8	2,8	2,6	2,7	2,6	2,5	2,7	2,7
Total Biocapacity	3,7	3,5	3,1	2,9	2,6	2,4	2,3	2,1	2,0	1,8	1,8
Ecological Footprint to Biocapacity ratio	0,63	0,73	0,88	0,97	1,06	1,07	1,18	1,24	1,29	1,45	1,51

Source: *Ecological footprint and biocapacity, 2007, 2010* [12.07.2016]

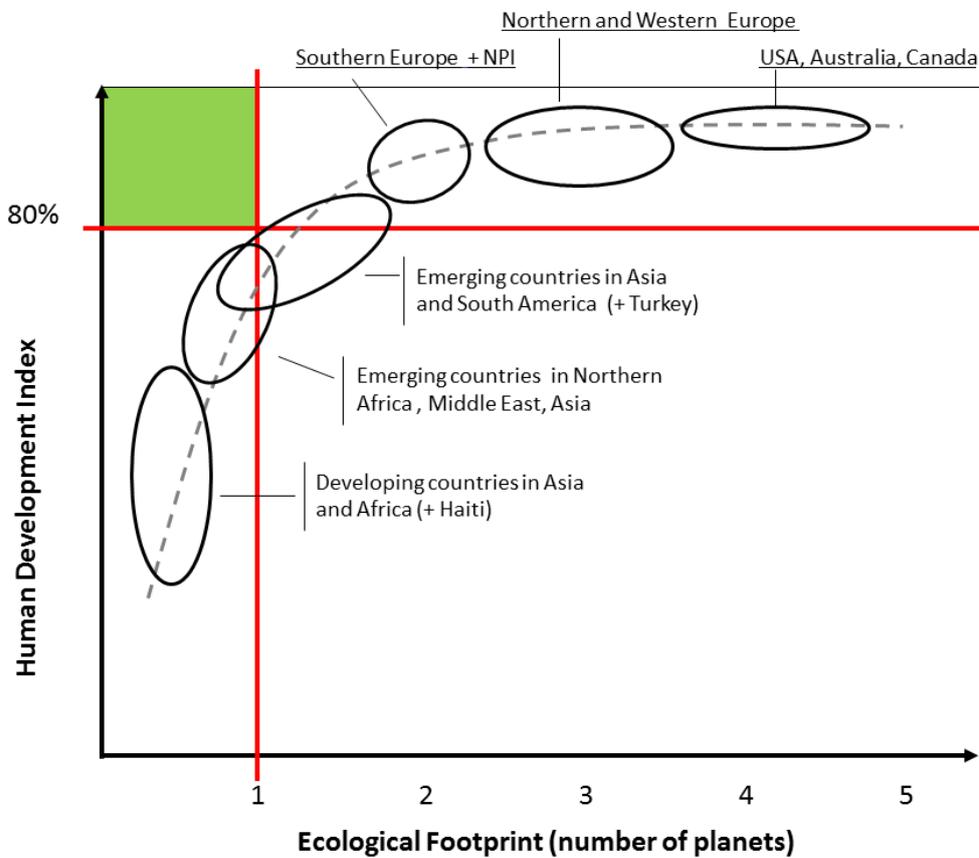
Distribution of differences in the Ecological Footprint between countries of varying wealth more or less coincides with the division on the continents. It also entails the differences in the size of the populations that live in certain conditions. This is mainly Europe and North America that contribute to exceeding of the global capacity of the environment of our world. The second observation is that most of the human population on Earth living below the standards typical to the richest countries

will seek to raise their material standard of living, simply because poverty itself is not sustainable. This will increase a negative impact on the environment, mainly - but it is not exclusively - by increasing CO2 emissions. We can suppose that our impact on our Planet will continue to grow in the next decades. Until we will reduce these impacts through the use of cleaner technologies that support our development processes and through changes in lifestyles too.

3. The matrix of desired (sustainable) future

To create a matrix of sustainable future we need to combine together all three dimensions of our activity i.e. all three dimensions of the sustainable development: economic, social and environmental one. This will create three dimensional space to analyse our position in the matrix. But if we assume that many social indicators/indexes cover also the economic dimension, as it is in the case of HDI, we can create only two dimensional space that would be much easier to analyse and present using only a sheet of paper. On one axis we can put a socio-economic index and on the second an environmental one (see Figure 1).

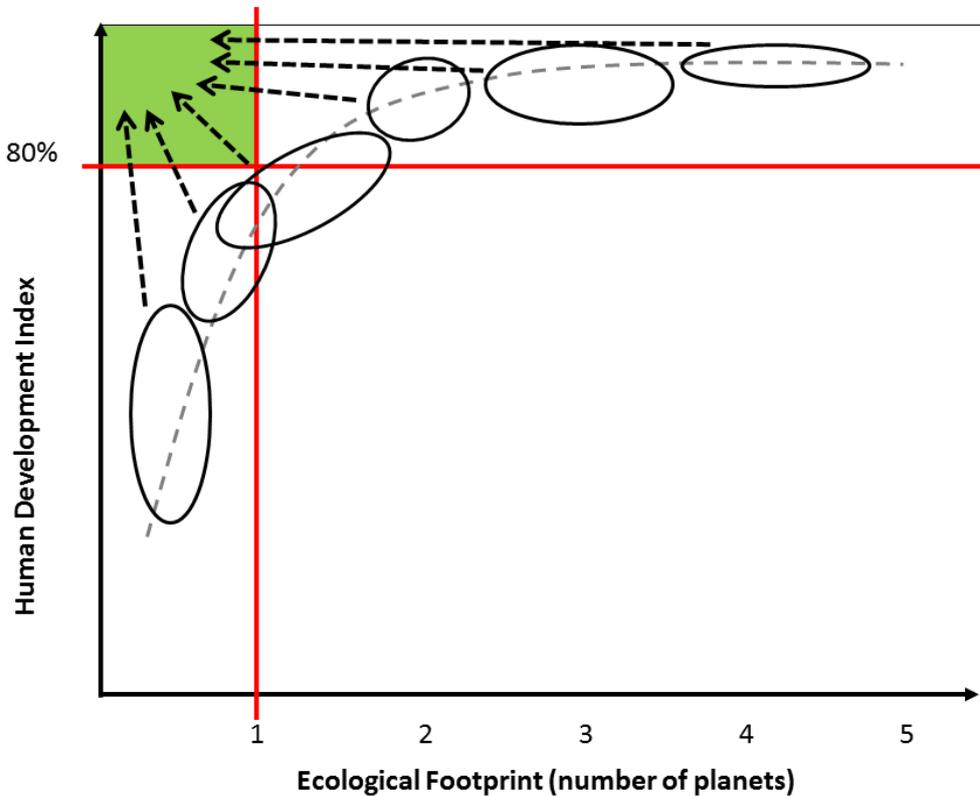
Figure 1. “Natural” path of growth missing sustainability.



Source: own elaboration based on Rosel  Chim 2007: 147 and Global Footprint Network webpage [12.07.2016].

This way we can observed “natural” path of growth: the path along which countries walked thanks to the development processes. This path is missing the green square which stands for sustainable goal of the society (high HDI over 80% and low impact on the environment within its “one planet” capacity). The exact direction of sustainable development paths are presented in Figure 2.

Figure 2. Sustainable development – changing a direction.



Source: own elaboration based on Rosel e Chim 2007: 147.

It is becoming obvious that while measuring the dynamics of development it should be checked whether the vector of development coincides with the “natural” path of development or is oriented toward sustainability. That requires quite different approach to measuring whether the particular society and its economy are reaching goals of sustainable development or not.

We can imagine the synthetic measurement of sustainable development of societies based on the above way of thinking. This would require to measure for example the changing length from the position of a particular country to a border of the green square on Figure 2. This is possible. However will rise a lot of questions and also methodological doubts. Many of the latter will be probably connected with the concept of social development behind the HDI methodology. The case of Cuba is one of such an example as Cuba was supposed to be one of not too many countries that possess the minimum criteria of sustainability. Cuba has managed to reach “a high HDI with a GDP per capita that is three times less than that of comparable countries.” (Cabello et al. 2012).

The other doubt can be connected with so-called 'natural' path of the growth in its initial section – all countries there seem to move closer to the green square but does it mean that they are more sustainable in all dimensions or these are just steps along the 'natural' path of growth when countries become richer (economic dimension only). Looking at Figures 1 and 2 one can suppose that such a synthetic measurement would be the most justified and useful when applied to the richest countries. The 'natural' path of the growth led them far away to right part of the Figure from the green square. These countries should turn back and move towards the sustainable goal without losing their high HDI level. This is probably the most important (and difficult at the same time) task for advanced economies. These countries should trace their position in the Figure to better understand actual effectiveness of their policy towards sustainability.

Having in mind the above description we should also remember all the time the statement of Neumayer (1999: 28) that “welfare and sustainability are entities much too complex that they could be dealt with by a single indicator”.

4. Conclusion

A policy of sustainable development requires a holistic approach. An attention should be paid to the various issues of the development of societies and their economies. These issues can be aggregated into the economic, social and environmental dimensions. A key is to make sure that a policy of sustainable development is really effective. This would require to observe a number of measures and indicators, and even though it will probably be difficult to reach a clear picture of the situation.

The paper shows how to get a possible synthetic picture of the implementation of sustainable development policy combining different measures from economic, social and ecological dimensions and finding the distance from the established sustainable goal(s). The main challenge of sustainable development is to realise a high level of HDI (over 0.8), however without exceeding an average ecological footprint of 1.8 global hectares per inhabitant (this is the current value per capita). We can observe this way if and how countries are moving towards that objective. Certainly having in mind all methodological problems that accompany such simplification. By measuring the mentioned distance (which is currently not measured) one can learn if a country is closer to the sustainable goal(s) or not.

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Rozwój zrównoważony jako wyzwanie dla społeczeństwa i gospodarki

Streszczenie

W politycznym procesie prowadzącym do Szczytu Ziemi w Rio de Janeiro w 1992 roku ustalono, że koncepcją, która będzie stosowana do koordynowania spontanicznych procesów rozwojowych będzie koncepcja rozwoju zrównoważonego. Od tego czasu czynione są wysiłki na rzecz realizacji tej koncepcji poprzez m.in. włączenie jej do ustawodawstwa oraz poprzez modelowanie za jej pomocą celów rozwojowych społeczeństw. Towarzyszyć temu powinny: 1) namysł nad tym dokąd/w jakim kierunku dokładnie powinniśmy zmierzać i 2) pytanie czy faktycznie prowadzone w duchu rozwoju zrównoważonego działania przybliżają nas do realizacji tej koncepcji. Artykuł rozwija te dwa ostatnie pytania skupiając się na uzyskaniu chociażby częściowych odpowiedzi. W artykule przedstawiono do dyskusji propozycję pomiaru dystansu jaki dzieli poszczególne kraje od celu(-ów) rozwoju zrównoważonego.

Słowa kluczowe: rozwój zrównoważony, PNB, ISEW, HDI, ślad ekologiczny.

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