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A comparative analysis of selected synthetic indicators of sustainability

Anna Bluszcz^{a,*}

^a*Department of Management and Safety Engineering, Faculty of Mining and Geology, The Silesian University of Technology, 44-100 Gliwice, Poland*

Abstract

The problem of measuring the level of sustainable development is a current subject of numerous scientific studies. The need to monitor the level of sustainable development results from the strategy of the European Union, the aim of which is the pursuit of equal opportunities for all member countries. The literature review indicates numerous publications on methods and tools for measurement of the level of sustainable development based on quantitative methods, which enable the objectification of the conducted research and conclusions based on them. However, they require having reliable numerical information in all dimensions covered by the study. Multidimensionality of the sustainable development, which concerns the social sphere and the quality of life, the economic sphere and the environmental sphere entails numerous difficulties in the unambiguous, but at the same time its comprehensive measurement. In theory and practice there are many methods and tools concerning this issue, but so far each method has both advantages and disadvantages, therefore there is still no universal tool. Hence the scope of the article, which presents a review of selected synthetic measures used for assessing the level of sustainable development, with special consideration of the levels for Poland and the Czech Republic in the assessed areas of sustainable development. The research methodology can also be used in business practice for assessing the level of the sustainable development of corporations, industrial sectors or regions or cities.

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* Corresponding author. Tel.: +48322371906.
E-mail address: anna.bluszcz@polsl.pl

1. Introduction

The mankind constantly strives to increase the welfare of societies and to improve the quality of life, which results in increase of demand for raw materials and energy. With the end of the XVIII century the negative effects of the industrial revolution and the increasing pressure of the man on the Earth have been strongly highlighted. The human population is growing exponentially, while the number of available natural resources is limited. Hence the numerous initiatives and concepts of scientists, international organisations or global corporations aimed to minimise the human pressure on the natural environment taking into account aspects of the society development. The concept of the socio-economic development and environmental protection are interdependent, and in scientific publications they started functioning under the following names, e.g., ecological development (Sachs, 1979), development without destruction (Tolba, 1976) or environmentally-friendly development (David and Duckstein, 1976). In 1980 the International Union for Conservation of Nature – IUCN in cooperation with the World Wildlife Fund – WWF and the United Nations Development Programme – UNDP published a document entitled: “Global Strategy to Maintain Nature” (WCS, 1980). The report stressed the importance of social and environmental factors in the long-term socio-economic development. It has also become the base for the today most widely distributed notion in economics, respecting the natural environment – the concept of the so-called sustainable development. This notion, as the political and environmental model, was used for the first time in the Report of the World Commission on Environment and Development (WCED, 1987) entitled “Our Common Future”. The concept core is to preserve the regenerative capacity of the natural environment meeting the needs of the current generations, without limiting the possibilities of future generations to meet their needs. Starting from the above assumption, literature develops the diverse methodology of measurement of the consumption level of today generations and on the other hand, the regenerative possibilities of the natural environment. The problem of sustainable development has recently been gaining more and more importance in practice. Literature review shows number of ways in which the level of sustainable development can be measured and assessed in different approach and methodologies. The topic of monitoring and assessing sustainable development is frequently addressed in scientific publications, both on the national or regional scale (Bluszcz 2015, Giannias and Sfakianaki 2014; Hąbek 2014; Prochowicz and Sleszyński 2006), international scale (Stec et al. 2014; Hąbek and Wolniak 2013) as well as sector (Bluszcz and Kijewska 2015, Burchart-Korol et al., 2014; Weber 2008; Jenkins and Yakovleva 2006) – and company (Azapagic and Perdan 2000; Gajdzik 2012; Perrini and Tencati 2006; Hąbek and Wolniak 2015; Branco and Rodrigues 2007) -related scale. The article presented the selected synthetic measures, which enable the assessment of the sustainable development level, including among others: Sustainable Society Index (SSI), Environmental Performance Index (EPI), Ecological Footprint (EF) and Synthetic indicator of sustainable development (SISD). The comparative analysis was performed with special emphasis on Poland and the Czech Republic, which indicated the following similarities and differences in the studied areas.

2. Methodology and Data

Sustainable development as a complex and multidimensional problem needs developing some synthetic indicators that allow the assessment of the level of sustainable development. The method of aggregation of individual indices enabled measurement of the characteristics and phenomena that are expressed in various units or which have a qualitative character.

Measurement of the sustainable development level using the synthetic indicators has numerous advantages, which include, among others:

- the level of the synthetic indicators presented in a fairly long period enables keeping track of the basic changes occurring in the economy, the interpretation of the synthetic indicator and the inference on its basis are possible at the expert, political and general social level,
- recognition in the synthetic form, of the multidimensionality of the issue of sustainable development facilitates the comparative analysis in time and international space.

However, there are many opinions revealing the weaknesses of this approach, which among others include:

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