

# The Possibilities of Sustainable Development Evaluation in the European Union Area

By Emília Huttmanová<sup>1</sup>

## Abstract

The concept of sustainable development is considered as a multidimensional. In general, we can conclude, that sustainable development brings together economic, environmental and social dimensions. Process of these different dimensions evaluation is very complicated, as well as results interpretation and creating of the conclusions formulation useful in the management of sustainability. The main aim of this paper is to present the possibilities of sustainable development evaluation in the conditions of the European Area countries.

*Keywords: Sustainable development, sustainability, management of sustainability, Human development index, EU countries*

## 1. Introduction

Sustainable development is now perceived as a general concept applicable in all spheres of economic life (Demo, Hronec, Tóthová, 2007). Sustainability is a multidimensional sphere of enforcement and formation of human activities (Huttmanová, 2015). Environmental, social and economic dimensions of the environment and sustainable development depends on human decisions (Adamišín, Vavrek; 2015); (Barrow, 2006); (Lačný, 2012); (Chovancová, 2015) and other. Quality of life was thus formed in space and time. These two dimensions (time and space) together with mutual human relationship with the environment and the surroundings are critical factors that shape and affect the quality of the environment and quality of life in it. More about spatial or regional specifics describes among others Jeníček (2010).

Attempts to human development, sustainable development and the quality of the environment are very closely interrelated (Rusko, Andrejovský, Bosák, Rovňák, 2010.); (Nováček, 2011); Moldan (2009)... Well-being and quality of life has been increased, among other things, by improving of environmental quality and quality ecosystems services providing services (also) for humans. The quality of life (also as a part of sustainable development) can be measured in different ways (Dušek, Pána, 2010); (Adamišín, Tej, 2012); (Maier, 2012). Quality of life is often quantified using the Human Development Index (HDI) (Adamcová, Němečková, 2009).

The main purpose of human development should be the expansion of human potential. These options can be endless, but they may change over time. People are the greatest wealth of the nation, and so the main aim of development should be to provide and ensure all opportunities for people, states M. ul Haq. He, in cooperation with his team, creates new indicator (index), which tries to measure the quality of the human factor (Adamcová – Němečková a kol. 2009).

<sup>1</sup>Assoc. Professor at the Department of Environmental Management, Faculty of Management, University of Prešov in Prešov (Slovak Republic)

## 2. Material and Methods

The aim of the paper is to evaluate the similarity of the European Union countries using the Human Development Index at the level of its individual components. According to HDI, there are three basic parameters for managing human development and quality of life: wealth, health and education. Wealth is measurable by gross domestic product, health is quantified by the life expectancy of the population, education indicated by number of years of education. The human development index consists of four components - indicators that represent the three dimensions of human development:

- health dimension,
- dimension of education,
- dimension of living standards

**Table 1** Human Development Index and its composition

DIMENSION	Long and healthy life	Knowledge / Education		Good standard life
INDICATOR	Life expectancy at birth	Adult literacy rate	Ger (gross enrollment ratio)	GDP per capita
INDEX	Life expectancy index (at birth)	Education index		Index GDP
<b>Human Development Index</b>				

*Note: GER - the gross share of children enrolled at different levels of the school regardless of their age compared to/ against the total number of children in age corresponding to given education level*

*Source: Human development Report 2007-2008, New York, UNDP, 2008, s. 355 In: Adamcová, Němečková a kol. Rozvojová ekonomika, 2009. s. 140*

At the beginning, the minimum and maximum values of all four indicators were deducted each year from their real lowest and highest values in the world. For example the minimum life expectancy was set at 42 years in 1990, because of the indicator in the countries, for example, Ethiopia, Afghanistan, Sierra Leone. The highest value of life expectancy was set in the same year at the 78-year level reached by Japan. Similarly, were derived the highest and lowest values of other variables. However, the changing of minimum and maximum values were hardly comparable in time, so the UNDP decided to establish the constant value that have been used since 1994. (Adamcová – Němečková a kol. 2009). Table 1 shows the maximum and minimum values of each indicator.

**Table 2** Minimum and maximum values of Human Development Index

INDICATOR	MINIMUM VALUE	MAXIMUM VALUE
Life expectancy (at birth)	25 years	85 years
Adult literacy rate	0 %	100 %
GER	0 %	100 %
GDP per capita (Purchasing power parity, USD)	100 USD	40 000 USD

*Note: The GER share may be in developing countries higher than 100%, because age of children who go to school because they age not responding to given (formal) level of education*

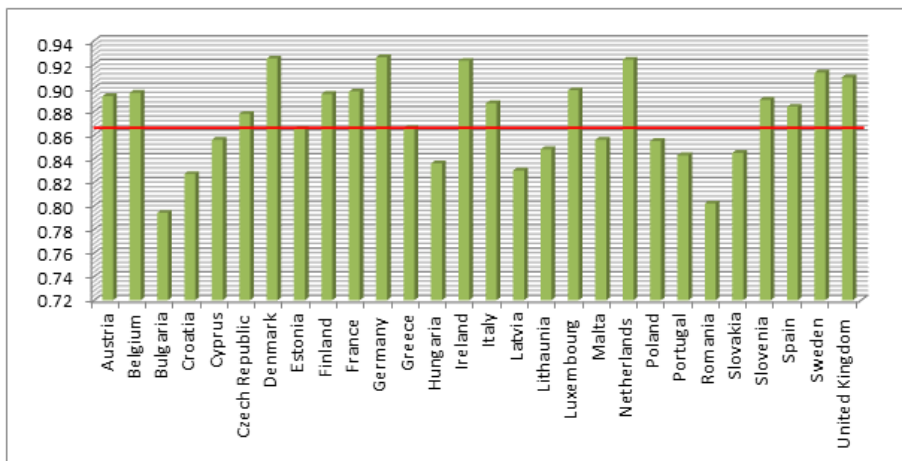
*Source: Human Development Report 2007-2008, New York, UNDP, 2008, s. 356. In: Adamcová, Němečková a kol. Rozvojová ekonomika, 2009. s. 14*

Countries are divided into 4 categories, based on the Human Development Index value:

- Countries with very high human development – value of index 1,00 – 0,80
- countries with high human development - value of index 0,79 – 0,70
- countries with a medium level of human development – value of index 0,69 – 0,55
- countries with low levels of human development - value of index 0,54 – 0,00.

### 3. Results and Discussion

The European Union's countries achieve the average of Human development index 0.87, shows graph 1. However, not all EU countries achieve a very high level of human development.



Graph 1 Achieved values of the Human Development Index in EU countries, 2015 (and index value at EU-28 average)

Source: data from Human Development Report, available on: <http://hdr.undp.org/en/content/human-development-report-2016> and own processing

The European Union countries, with the exception of Bulgaria, are included in the group of countries with very high level of human development. Germany, Denmark, Netherlands, Ireland and Sweden also have the highest values of HDI in the European Union, as well as in the world. The Slovak Republic has reached the value of the Human Development Index 0.85, which is slightly below the EU-28 average. The same value for an HDI (as has the Slovak Republic) was achieved by Lithuania.

We also realized assessment of the similarity of European Union countries using the human development index at the level of its individual components.

In this part we evaluate the degree of similarity of the European Union countries using the Human Development Index, at the level of its individual components, because it is not evaluated in standard units of measure but in the so-called "Dimensionless magnitude". But Human Development Index components (Life expectancy, Average years of school attendance, Expected years of school attendance and Gross National Income per capita (PPP in \$)) are expressed in measurable units.

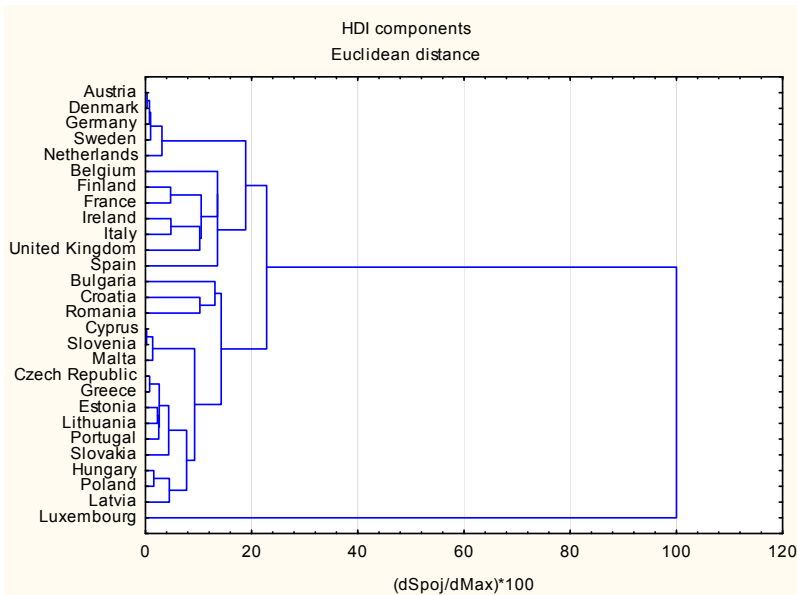


Figure 1 Dendrogram of Human Development Index at the level of its components in EU countries (2014)  
Source: own processing based on Human Development Report data

Dendrogram (Figure 1) shows the results of the cluster analysis based on the individual components of the Human development index). Based on the results of the cluster analysis, it can be conclude that there were created two relatively separate groups of countries:

1. cluster is created by countries: Austria, Denmark, Germany, Sweden, the Netherlands, Belgium, Finland, France, Ireland, Italy, the United Kingdom and Spain.
2. cluster is created by countries: Bulgaria, Croatia, Romania, Cyprus, Slovenia, Malta, Czech Republic, Greece, Estonia, Lithuania, Portugal, Slovakia, Hungary, Poland and Latvia.

There is Luxembourg an independent representative based on realized assessment, because it can not be uniquely assigned to any of the clusters (at the chosen level of similarity). A very high degree of similarity was demonstrated by Slovenia and Cyprus, as well as between Austria and Denmark. The Slovak Republic is similar in the field of quality of life to the Czech Republic, Greece, Estonia, Lithuania and Portugal. Realized cluster analysis shows, that in the field of quality of life are the European Union countries divided into two separate groups,

There In the area of quality of life, the countries of the European Union are divided into two relatively separate groups, while countries belonging to group (cluster) 1 perform better results in the quality of life evaluation.

#### 4. Conclusion

Human development index represents one of the important way (steps) in the effort of measure of the human factors progress and human development. Human

development could be sustainable, but we need better tools for its better quantification. The Human Development Index also has several shortcomings and weaknesses - the main problem is the fact that it does not take into account the environment. We agree that, human development cannot be considered as a long-term sustainable, if we omit the environmental dimension from the human development assessment. By adding the environmental dimension, this index was modified to the Human Sustainable Development Index - HSDI, or sometimes referred as Sustainable Human Development Index – S-HDI). But there is the most fundamental problem of the HSDI, that it is not properly evaluated - the other ranking was realized in 2010/2011.

## 5. Acknowledgement

This study has been created thanks to support under the Research and Development Operational Program, for the project: University Science Park TECHNICOM for Innovative Applications with the Support of Knowledge Technologies - II. Phase, project code: 313011D232, co-financed by the European Regional Development Fund.

The study was supported by project VEGA 1/0139/16 (Analysis of determinants and factors affecting the efficiency and competitiveness of entities working the soil in the Slovak Republic) and project KEGA 035PU-4/2016 (Microeconomics for managers - innovation of structure, content and the method of teaching the subject).

## References

- Adamcová, Lenka, Tereza Němečková a kol., 2009. *Rozvojová ekonomika*. Praha: Vysoká škola ekonomická v Praze. ISBN 978-80-245-1515-1.
- Adamišín, Peter a Juraj TEJ, 2012. The analysis of the economic efficiency of regions on the level of nuts III and on the proportion of municipal taxation. In: Polish journal of management studies. Vol. 5 (2012), s. 60-77. ISSN 2081-7452.
- Adamišín, Peter a Roman Vavrek, 2015. Analysis of the links between selected socio-economic indicators and waste management at the regional level in the Slovak republic. In: *5th Central European conference in regional science: conference proceedings*. Košice : Technical university of Košice. p. 1 – 9. ISBN 978-80-553-2015-1. Available to internet: <http://www3.ekf.tuke.sk/cers/files/zbornik2014/PDF/Adamisin.pdf>
- Barrow, C.J., 2006. *Environmental Management for Sustainable Development*. Routledge Taylor & Francis Group, London, New York. 454 p. ISBN 978-0-415-36534-5.
- Demo, Milan, Ondrej Hronec, Monika Tóthová et al., 2007. *Udržitelný rozvoj: život v medziach únosnej kapacity biosféry*. Nitra: Slovenská poľnohospodárska univerzita, ISBN 978-80-8069-826-3.
- Dušek, Jirí, Lubomír Pána et al. 2010. *Udržitelný rozvoj v evropských regionech*. České Budejovice : Vysoká škola evropských a regionálních studií, ISBN 978-80-86708-90-4.
- Chovancová, Jana. 2015. Environmental management systems – incentives and barriers of implementation in the Slovak enterprises. In: Ecology and environmental protection, environmental legislation, multilateral relations and funding opportunities : ecology, economics, education and legislation. Vol. 2 : conference proceedings. 15th international multidisciplinary scientific geoconferences SGEM 2015. Sofia : STEF92 Technology, 2015. S. 205-211. ISBN 978-619-7108-40-7.
- Huttmanová, Emília. 2015. *Analytický pohľad na manažment udržateľnosti rozvoja krajín európskej únie v kontexte globálnych zmien. Habilitačná práca*. Prešov : FM, 2015. 217 s.
- Jeníček, Vladimír a kol., 2010. *Vývážový rozvoj na globálnej a regionálnej úrovni*. Praha: Nakladatelství C. H. Beck, ISBN 978-80-7400-195-6.
- Lačný Martin, 2012. Environmentálna, sociálna a ekonomická oblasť spoločenskej zodpovednosti podnikov. In: *Folia oecologica 7. Prírodné vedy*. Roč. 54, č. 7 (2012), p. 55-65. ISSN 1338-080X

- Maier, Karel et al., 2012, Udržitelný rozvoj území. Praha: Grada Publishing, ISBN 978-80-247-4198-7.
- Moldan, Bedřich. 2009. Podmanená planéta. Praha: Univerzita Karlova v Praze, Nakladatelství Karolinum, ISBN 978-80-246-1580-6.
- Nováček, Pavel, 2011. *Udržitelný rozvoj*. Olomouc: Univerzita Palackého, ISBN 978-80-244-2795-9.
- Rusko, Miroslav, Pavol Andrejovský, Martin Bosák a Martin Rovňák, M. 2010. Economical aspects of environmental safety. In: *Vedecké práce Materiálovotechnologickej fakulty STU v Bratislave so sídlom v Trnave*. No. 29 (2010), s. 83-89. ISSN 1336-1589.