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ASSESSMENT OF THE SUSTAINABILITY OF RURAL DEVELOPMENT IN THE EUROPEAN UNION MEMBER STATES

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Abstract. The aim of the study was to determine the level of sustainability of rural development in the European Union Member States. The study included three dimensions of rural development, namely economic, environmental and social. Each dimension was determined using synthetic index elaborated on the basis of the primary variables, with the use of factor analysis. The study was conducted in all EU countries in the years 2000–2012. The obtained data shows that the highest degree of sustainability of rural development has occurred in Hungary, Bulgaria and Cyprus, and the lowest in Latvia, Romania and the United Kingdom.

Key words: sustainable development, rural areas, European Union countries

INTRODUCTION

Rural areas in the EU-28 make up 91% of its territory and 56% of the total population. These areas generate more than 15% of the total gross value added and employ 13% of the total working population. Their primary task is to provide food products for rural and urban society, as well as raw materials for industry. Rural development is a vitally important EU policy area, therefore, its strengthening is one of the EU top priorities.

In terms of indirect effects, any significant cut back in European farming activity would in turn generate losses in GDP and jobs in linked economic sectors – notably within the agri-food supply chain, which relies on the EU primary agricultural sector for

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high quality, competitive and reliable raw material inputs, as well as in non-food sectors. Rural activities, from tourism, transport, to local and public services would also be affected. Depopulation in rural areas would probably accelerate [Matthews 2012]. Being an integral part of the European economy and society, rural areas and their sustainability are particularly vulnerable, furthermore modern society faces specific challenges, even in relatively prosperous EU, taking into account the fact that rural areas play a huge role for the society, serving a number of socio-economic, environmental, cultural and spatial functions, being significant on local, regional, national and global levels.

The paradigm of sustainability was accepted as a guiding principle few decades ago by governments, businesses, NGOs and civil society. Recently sustainable development became a serious challenge, goal, global "trend" and of course, a continuous process aimed at reloading all the systems of our modern life. Sustainable rural development is vital to the economic, social and environmental viability of nations. It is especially essential for poverty eradication since global poverty is overwhelmingly rural. The other key challenges for both sustainable rural development and agriculture is to increase food production in a sustainable manner, ensuring and enhancing food security and improving livelihoods in rural areas [United Nations 2009a, Shalaby et al. 2011].

We got used to address these challenge calls for changes mainly in developed countries, first due to their financial and technical capacity to implement more sustainable policies and measures, yet the necessary level of political governance and especially an interest of average citizens is still insufficient. On the other hand, there is the lack of action in developing countries sometimes compounded by economic recession [Pearce et al. 1990, Rogers et al. 1997, Shalaby et al. 2011]. While there are common goals that are crucial to sustainable development, there is no single approach guaranteeing sustainable success in every country.

The European Union by its policy declares rural sustainability as a vitally important area, and its strengthening is one of its top priorities (European LEADER Association for Rural Development). Besides, there are many different support programs for agriculture and rural development, financed by the EU, but no final assessment of their efficiency in the long run has been completed. To what extent investing financial resources is resulted in improving sustainability of rural areas and life quality?

On the other hand, the theoretical aspect of the rural sustainability remains mutually contradictory, although a great deal of scientific papers is available in this topic during the last few decades, the authors still argue on the terms of "sustainability" and "sustainable development", making those definitions even more complicated, especially in non-native English literature sources[1] [Majewski 2008, Cherevko and Cherevko 2010, Stanny 2011].

However, there are many (over 100) definitions, indicators and indices of sustainable development, but still it is not completely clear where the optimal solution(s) are and how to keep the sustainability the point of sustainability is and how to accomplish and balance it (Table 1). What are the factors we should consider in order to estimate the overall level

[1] In Ukrainian literature a term "sustainable development" can be translated and applied by some authors as "sustainable growth" and "balanced development" with no or slight difference in meaning; in Polish – "zrównoważony rozwój" and "trwały rozwój".

Table 1. Some selected definitions and approaches to the sustainable development

Source	Definition / approach
Harwood [1990]	Sustainability lies in the dynamic nature of its fundamental components: ecological (spatial and temporal relations, diversity, stability, and resilience; economic (resource distribution and allocation); and social (equity, access, stewardship and institutions). Sustainable agriculture is a system that can evolve indefinitely toward greater human utility, greater efficiency of resource use and a balance with the environment which is which is favourable to humans and most other species.
Pearce et al. [1990]	Sustainable development involves devising a social and economic system, which ensures that these goals are sustained, i.e. that real incomes rise, that educational standards increase that the health of the nation improves, that the general quality of life is advanced.
World Bank [1991]	The challenge of development is to improve the quality of life (QOL). The improved QOL involves higher incomes, better education, higher standards of health and nutrition, less poverty, cleaner environment, more equality of opportunities, greater individual freedom, and a richer cultural life. It includes economic factors, such as capital, labor, natural resources, technology, established markets (labor, financial, goods).
World Bank [1991]	Sustainable agriculture, simply defined, is an approach to agriculture that focuses on producing food in a way that does not degrade the environment and contributes to the livelihood of communities. However, this simple statement conveys a complex concept: that agriculture must balance production, environmental, and community development goals.
Pearce and Warford [1993]	Sustainable development is concerned with the development of a society where the costs of development are not transferred to future generations, or at least an attempt is made to compensate for such costs.
Region of Hamilton--Wenetworth [1996]	Sustainable development is positive change, which does not undermine the environmental or social systems on which we depend. It requires a coordinated approach to planning and policy making that involves public participation. Its success depends on widespread understanding of the critical relationship between people and their environment and the will to make necessary changes.
Rogers et al. [1997]	There are three approaches to sustainable development: economic – maximizing income while maintaining a constant or increasing stock of capital; ecological – maintaining resilience and robustness of biological and physical systems; and social-cultural – maintaining stability of social and cultural systems.
Rogers et al. [1997]	Sustainability is the term chosen to bridge the gulf between development and environment. Originally, it came from forestry, fisheries, and groundwater, which dealt with quantities such as "maximum sustainable cut", "maximum sustainable yield", and "maximum sustainable pumping rate". The attempt now is to apply the concept of all aspects of development simultaneously. The problem is, we experience difficulties in defining sustainable development precisely or even defining it operationally.
Solow [1999]	If sustainability is anything more than a slogan or expression of emotion, it must amount to an injunction to preserve productive capacity for the indefinite future.
OECD [2000]	In general, sustainable agriculture is agricultural production that is economically viable and does not degrade the environment over the long run.
European Commission – Agriculture Directorate-General [2001]	According to Agenda 21, the concept of sustainability is multidimensional. It includes ecological, social and economic objectives. Between these different elements, there is interdependency. Research results indeed confirm that the relationships are strong, numerous and complex.
Daly [2007]	Sustainable development (by the definition from Bruntland Report) is development without growth – that is without throughput growth beyond the regenerative and adsorption capacities of the environment.
Majewski [2008]	In economic perspective, sustainable development assumes the possibility of achieving continuous economic growth, generating an income stream and means real increase of the society's living standards. In the socio-cultural dimension, it provides the opportunities for the society to meet the needs of individuals and to ensure equal opportunities for the development. While the implementation of the environmental requirements of sustainable development, serving to the nature protection, should increasingly be reflected in the welfare of producer and consumer, contributing to the increase in intergenerational social benefits.
Matthews [2012]	Sustainable development is often thought to have three components: environment, society, and economy. The well-being of these three areas is intertwined, not separate.

of development, its sustainability? Is there any integral indicator that must be applied in this case?

All the definitions of the sustainable development require that we see the world as a system – a system that connects space: and a system that connects time [International Institute for Sustainable Development 2015].

During the United Nations Conference on the Human Environment, held at Stockholm in June 1972 the World Commission on Environment and Development (WCED) was created. Reaffirming the Declaration of the United Nations and seeking to build upon it, *Rio Declaration on Environment and Development* was adopted in 1992 [*United Nations Environment Programme* 1992].

Although the concept of sustainable development has been defined many times, the most often cited is the following: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs" [United Nations 2009b].

In macroeconomic analysis, the simplest measure of the "sustainability" can be derived, taking into consideration the fact that in economic processes the natural resources are being changed into the capital goods. At the same time, it is not possible that the resources available to today's generation are not depleted. Therefore, if the sum of capital growth generated in a given period is less than zero, it means a lack of sustainability. The weak sustainability calls for minimum requirements, where the sum of capital growth is greater than zero. Strong sustainability requires protection of "crucial" (non-substitutable) capital components [Majewski 2008].

THE RESEARCH PURPOSE, SCOPE AND METHODS

The purpose of the study is to determine the sustainability level of rural development in the EU countries. The research included three pillars of sustainable rural development – its economic, environmental and social dimension of three-dimension space. We assume that sustainability degree of each dimension can be calculated as a distance between its particular points from the straight line – equilibrium (sustainability). The set of variables has been selected by the authors based on previous research [Siudek and Vashchyk 2014, Vashchyk and Siudek 2014, 2015]. While studying the economic development four primary variables have been considered, namely GDP per capita, cereal yield, livestock production index and agriculture value added per worker. The assessment of ecological development was based on six primary variables: the share of forest area in total land area, emissions of sulphur oxides (SOx) in agriculture, emissions of nitrogen oxides (NOx) in agriculture, electric power consumption per capita, the share of alternative and nuclear energy in total energy use and the share of area under organic farming in total agricultural land area. In turn, to assess social development five primary variables were applied, such as employment in agriculture, unemployment rate, at-risk-of-poverty rate, total social

expenditures and rural population[2]. The research itself consists of the theoretical and empirical parts. Theoretical part refers to the definitions of sustainability and functions of rural areas, whereas empirical part addresses to their development and sustainability level in all the EU Member States. Theoretical part of the study is based on the literature review (Table 1) and the empirical part – on a data obtained from the World Bank, OECD and European Commission statistics databases.

To determine the economic, environmental and social development of rural areas in the EU Member States the synthetic index (SI) has been built on the basis of above-mentioned secondary variables [Siudek and Vashchyk 2014, Vashchyk and Siudek 2014, 2015]. Factor analysis was applied to replace the original set of primary variables, describing the development of rural areas, by a new set of secondary variables, more convenient for practical application. Factor analysis was based on the study of interrelationships between variables in a multidimensional extend and to clarify the reasons for the general variability [Harman 1967, Bolch and Huang 1974, Morrison 1990, Jajuga 1993, Tadeusiewicz 1993, Dobosz 2001, Siudek 2006 i 2008].

The analysis fulfilled a linear transformation of the original n-variables x_i (i = 1, ..., n) to the new secondary t-variables U_k (k = 1, ..., t), which were uncorrelated, and their variance sum equals total variance of the original variables x_i. Variables U_k have been defined as main factors. The variance of each new factor explains certain variation value of the primary (original) variables and is represented by eigenvalue. Subsequently isolated main factors indicated less variability each next time. The decision concerning definition the stage of termination isolating factors depended mainly on state of random variation, which remained undefined by the new factors. All the factors were applied to determine the SI with no exclusions, having determined 100% of the total variation.

The value of the main factors and the SI has been calculated by the following equations:

$$U_k = a_{1k}x_1 + a_{2k}x_2 + a_{3k}x_3 + \ldots a_{nk}x_n \tag{1}$$

where: U_k – value of the main k-factor (k = 1, 2,… t);
a_{ik} – estimated significance of primary i-variable by the primary k-factor (i = 1, 2, …, n);
x_i – value of primary i-variable (i = 1, 2,…, n).

$$W_s = b_1U_1 + b_2U_2 + b_3U_3 + \ldots b_tU_t \tag{2}$$

where: W_s – synthetic index of economic, ecological or social development of rural areas in the EU countries (For economic, environmental and social development, separated SI have been estimated);
b_k – estimated significance of main k-factor, which reflects a certain percentage of variation (i = 1, 2, …, t);
U_k – value of main k-factor (k = 1, 2,…, t).

[2] Selection of variables for the research rests upon subject literature and the World Bank database (http://data.worldbank.org/indicator/EG.USE.COMM.CL.ZS).

Sustainability (balance) of rural development was determined by a simple equilibrium l: $Ax = By = Cz$, where $A = B = C = 1$, wherein $x, y, z \in R$ (x – economic dimension of rural development; y – environmental dimension of rural development; z – social dimension of rural development).

Rural development in the EU Member States was delineated by the points Pi (x_i, y_i, z_i) located in three-dimensional space (x_i – the economic dimension of the EU i-country; y_i – the environmental dimension of the EU i-country; z_i – the social dimension of the EU i-country).

The degree of sustainability of rural areas in the EU Member States has been calculated as a distance between points P_i from the straight line – equilibrium l. The shorter was the distance, the more balanced (sustainable) was the development of rural areas in the particular EU country and vice versa. Research covered the period of 2000–2012. All the results are presented in the respective tables and in previous research phases [Siudek and Vashchyk 2014, Vashchyk and Siudek 2014, 2015].

DISCUSSION AND RESULTS

Rural development in the EU Member States can be considered in three dimensions – economic, environmental and social. In economic contest, the EU's most developed countries in 2000–2012 were: Luxembourg, the Netherlands, Slovenia, France and Malta, and the least developed – Lithuania, Romania, Slovakia, Poland and the Czech Republic (Table 2). From the ecological point of view, Latvia, Finland, Austria, Sweden and Estonia have been carrying the palm, whereas the UK, Spain, France, Poland and Malta have been those with the worst parameters. On the whole, the highest level of social development in terms of applied indicators had been held by Luxembourg, Denmark, Belgium, Sweden and the Netherlands, and lowest – in Romania, Croatia, Poland, Lithuania and Greece. In 2000–2012 the highest sustainability level among the EU Member States was observed in Hungary, Bulgaria, Cyprus, Italy and Greece, whereas Latvia, the UK, Romania, Luxembourg and the Netherlands demonstrated the worst situation.

Among all the EU countries, the largest differences were observed between ecological and social development (16 countries, namely: Belgium, Croatia, Cyprus, Estonia, France, the Netherlands, Lithuania, Luxembourg, Latvia, Malta, Germany, Portugal, Romania, Slovakia, Slovenia and the United Kingdom), economic and social development (6 countries: Bulgaria, Czech Republic, Denmark, Greece, Poland and Hungary) and economic and environmental development (6 countries, that is Austria, Finland, Spain, Ireland, Sweden and Italy).

Having calculated the average rural development by the three dimensions and having estimated the deviation from an average, we may determine which dimensions has the greatest impact on rural instability in the EU Member States. The obtained data indicated that there was an imbalance of rural development in the EU by all the dimensions (Table 3).

Table 3. The dimensions and non-sustainability of rural development in the EU Member States,

Table 2. The degree of rural areas sustainability in the European Union Member States in 2000–2012

Country	Dimensions of development				Dimensions of development				Dimensions of development				Dimensions of development				Dimensions of development			
	Econ.	Ecol.	Social.	RDDFE	Econ.	Ecol.	Social.	RDDFE	Econ.	Ecol.	Social.	RDDFE	Econ.	Ecol.	Social.	RDDFE	Econ.	Ecol.	Social.	RDDFE
	2000	2000	2000	2000	2001	2001	2001	2001	2002	2002	2002	2002	2003	2003	2003	2003	2004	2004	2004	2004
Austria	–0.0266	1.5776	0.6540	1.1387	0.0623	1.6030	0.6895	1.0957	0.0784	1.6121	0.6819	1.0927	–0.0099	1.6750	0.6151	1.2046	0.0818	1.7504	0,7183	1,1909
Belgium	0.3950	–0.7313	1.8562	1.8347	0.3029	–0.7007	1.9500	1.8926	0.4321	–0.6375	1.9160	1.8135	0.3778	–0.6509	1.7308	1.6893	0.5048	–0.6423	1,8686	1,7777
Bulgaria	1.0272	–0.8993	–1.4330	1.8302	0.7340	–0.8832	–1.5643	1.6695	–0.3827	–0.7872	–1.3990	0.7236	–0.8759	–0.8078	–1.0899	0.2082	–0.6576	–0.7559	–1,0521	0,2904
Croatia	–1.3323	0.0157	–2.0849	1.5051	–1.0488	–0.0572	–2.1583	1.4865	–1.0393	–0.0685	–2.0849	1.4261	–0.9643	–0.0143	–2.2317	1.5733	–0.6609	–0.0150	–2,1583	1,5549
Cyprus	4.4610	–0.6887	–0.0547	3.9713	–0.2521	–0.6868	–0.0132	0.4830	–0.1119	–0.6817	0.0530	0.5452	–0.1406	–0.6820	0.0762	0.5523	–0.1585	–0.6708	0,0459	0,5221
Czech Republic	–0.5622	0.0146	0.3369	0.6442	–0.4470	0.0693	0.4013	0.6045	–0.5329	0.0910	0.4921	0.7305	–0.5978	0.0772	0.4473	0.7494	–0.4239	0.1121	0,4993	0,6556
Denmark	–0.0421	0.0367	2.0024	1.6381	0.0516	0.1321	1.9354	1.5063	0.1444	0.2117	2.1043	1.5735	0.2871	0.2462	2.0295	1.4397	0.4337	0.3087	2.1482	1.4536
Estonia	–1.2175	1.1826	–1.0950	1.9116	–1.0434	1.1937	–1.0368	1.8239	–0.5790	1.2334	–0.8578	1.6058	–0.6225	1.1895	–0.8162	1.5646	–0.6545	1.2097	–0.9129	1.6378
Finland	–0.1162	2.0087	0.9295	1.5026	–0.0208	1.9381	1.0073	1.3857	0.0896	2.0516	1.1256	1.3881	0.2193	1.9446	1.2124	1.2246	0.3122	2.0268	1.2635	1.2148
France	0.3048	–1.5526	0.5773	1.6392	0.3121	–1.4450	0.9326	1.7441	0.4654	–1.3812	1.0774	1.8101	0.4070	–1.3467	1.1208	1.7957	0.5517	–1.3419	1.0816	1.8018
Germany	–0.2593	–1.6022	1.0743	1.8926	–0.2322	–1.4904	1.0336	1.7847	–0.1985	–1.3813	1.0119	1.6923	–0.0962	–1.2960	1.0618	1.6673	0.1111	–1.2058	1.0503	1.6027
Greece	–0.6521	–1.0059	–1.9589	0.9559	–0.6066	–1.0209	–1.8169	0.8699	–0.5581	–0.8880	–1.7671	0.8838	–0.4224	–0.5692	–1.6752	0.9686	–0.3119	–0.5578	–1.5063	0.8919
Hungary	–0.1606	–0.7436	–0.3055	0.4293	–0.2180	–0.6760	–0.1622	0.3987	–0.1465	–0.6480	–0.0472	0.4555	–0.2387	–0.6122	–0.1504	0.3467	–0.2708	–0.4941	–0.0733	0.2977
Ireland	0.0085	–0.9708	–0.7729	0.7323	–0.0167	–0.9505	–0.6791	0.6793	–0.0594	–0.9286	–0.5286	0.6153	0.1239	–0.9133	–0.4412	0.7344	0.2004	–0.8910	–0.3492	0.7717
Italy	–0.0122	–1.1707	–0.3407	0.8444	0.0043	–1.0165	–0.3159	0.7383	0.0822	–0.9713	–0.2582	0.7603	0.0624	–0.9468	–0.2061	0.7392	0.2053	–0.9168	–0.0347	0.8356
Latvia	–1.0782	1.6774	–1.6409	2.5114	–1.0896	1.7366	–1.5551	2.5192	–1.1887	1.7465	–1.5760	2.5693	–1.0110	1.7628	–1.3422	2.4114	–0.8378	1.8194	–1.2224	2.3424
Lithuania	–1.2427	0.1921	–2.1344	1.6600	–1.4299	0.1807	–2.0151	1.6081	–1.3512	0.1675	–1.9002	1.5147	–1.1145	0.1641	–1.8778	1.4591	–0.7929	0.1964	–1.6164	1.2836
Luxembourg	1.1342	–0.3662	2.0778	1.7431	0.4347	–0.2856	2.1947	1.8045	0.7215	–0.2356	2.2561	1.7776	0.8248	–0.2300	2.2606	1.7680	1.1712	–0.2171	2.2906	1.7766
Malta	0.2364	–1.0932	1.0102	1.5045	0.7475	–1.1164	1.0438	1.6561	0.8406	–1.1170	1.1477	1.7374	0.8762	–1.1273	0.9696	1.6753	0.4603	–1.1022	1.0135	1.5517
Netherlands	0.3085	–0.9373	1.4029	1.6559	0.1463	–0.9101	1.4874	1.6993	0.1273	–0.8615	1.5821	1.7383	0.1938	–0.8606	1.5269	1.6920	0.4066	–0.8117	1.5079	1.6409
Poland	–0.9606	–1.5339	–2.2657	0.9251	–0.9774	–1.4619	–2.3776	1.0056	–0.8282	–1.3821	–2.4553	1.1699	–0.7400	–1.3668	–2.3526	1.1497	–0.7993	–1.3208	–2.3265	1.0978
Portugal	–0.5129	0.2492	–1.6232	1.3316	–0.5630	0.3232	–1.4762	1.2724	–0.4780	0.3247	–1.4656	1.2682	–0.5795	0.4482	–1.4547	1.3470	–0.4428	0.6333	–1.4374	1.4646
Romania	–1.0737	–0.4484	–3.9718	2.6586	–1.0797	–0.5587	–3.8835	2.5290	–0.8371	–0.5527	–3.6325	2.4070	–0.5427	–0.6227	–3.4669	2.3556	–0.6684	–0.4757	–3.3021	2.2332
Slovakia	–0.5680	–0.1157	–1.6360	1.1040	–0.7298	–0.1302	–1.5939	1.0406	–0.4081	–0.1287	–1.5238	1.0439	–0.3621	–0.1135	–1.4187	0.9801	–0.5108	–0.0611	–1.4013	0.9646
Slovenia	–0.2689	0.8679	–0.9433	1.2945	0.2774	0.8607	–0.8629	1.2398	0.3471	0.8336	–0.7638	1.1579	0.5425	0.8628	–0.6457	1.1240	0.5444	0.8708	–0.7496	1.2120
Spain	–0.3615	–2.2564	–0.5591	1.4732	–0.2696	–2.2669	–0.4078	1.5774	–0.0932	–2.2983	–0.3484	1.7058	0.0507	–2.1014	–0.2780	1.6395	0.0284	–2.1822	–0.3169	1.6818
Sweden	0.0632	1.5724	1.9959	1.4367	0.0179	1.5063	2.0142	1.4673	0.0927	1.5223	1.9419	1.3711	0.1887	1.6194	1.9815	1.3407	0.3698	1.5748	1.9411	1.1626
United Kingdom	0.0079	–2.3575	0.8440	2.3483	–0.1782	–2.2178	1.0538	2.3367	–0.0105	–2.0423	1.0417	2.2171	0.0367	–2.0449	0.9771	2.1871	0.1120	–1.9360	1.0935	2.1860

Table 2 cont.

Country	Dimensions of development				Dimensions of development				Dimensions of development				Dimensions of development				Dimensions of development			
	Econ.	Ecol.	Social.	RDDFE	Econ.	Ecol.	Social.	RDDFE	Econ.	Ecol.	Social.	RDDFE	Econ.	Ecol.	Social.	RDDFE	Econ.	Ecol.	Social.	RDDFE
	2005	2005	2005	2005	2006	2006	2006	2006	2007	2007	2007	2007	2008	2008	2008	2008	2009	2009	2009	2009
Austria	0.1845	1.8929	0.7284	1.2343	0.1599	1.9923	0.7680	1.3199	0.4070	2.1244	0.8682	1.2570	0.4192	2.2522	1.0024	1.3244	0.3916	2.4396	1.0330	1.4815
Belgium	0.3038	–0.6159	1.8303	1.7474	0.3773	–0.5279	1.8807	1.7206	0.4983	–0.4691	1.9218	1.7008	0.5564	–0.3939	2.0667	1.7549	0.5879	–0.2703	2.0620	1.6682
Bulgaria	–0.6322	–0.7479	–0.7355	0.0898	–0.5157	–0.7309	–0.8801	0.2591	–0.7782	–0.7504	–1.0147	0.2054	–0.6639	–0.5598	–0.8323	0.1945	–0.6763	–0.4343	–0.9580	0.3707
Croatia	–0.3388	–0.0401	–2.4867	1.8876	–0.2701	–0.0233	–1.7462	1.3176	–0.0093	–0.0770	–1.6587	1.3200	–0.0597	–0.0550	–1.5351	1.2066	–0.0078	–0.0178	–1.6836	1.3642
Cyprus	–0.2711	–0.6354	–0.0085	0.4452	–0.4932	–0.6215	0.2083	0.6317	–0.3591	–0.5625	0.2686	0.6127	0.7348	–0.5104	0.3121	0.8955	–0.2881	–0.4086	0.1911	0.4486
Czech Republic	–0.5183	0.1500	0.3673	0.6527	–0.5919	0.1735	0.4752	0.7779	–0.5562	0.2858	0.6316	0.8640	–0.4514	0.4109	0.8464	0.9341	–0.6124	0.6031	0.7027	1.0355
Denmark	0.4410	0.3206	2.1597	1.4550	0.4252	0.2797	2.2432	1.5472	0.6302	0.3949	2.3691	1.5250	0.6549	0.5226	2.4301	1.5064	0.5310	0.6557	2.2516	1.3568
Estonia	–0.6837	1.2207	–0.6072	1.5247	–0.4051	1.3626	–0.4690	1.4701	–0.3754	1.2706	–0.4517	1.3762	–0.3419	1.4290	–0.3912	1.4665	–0.1149	1.7678	–0.9847	1.9898
Finland	0.3528	2.0027	1.2638	1.1688	0.4255	1.9955	1.2737	1.1114	0.6563	1.9955	1.3273	0.9470	0.7122	2.1123	1.3725	0.9906	0.6449	2.1470	1.2945	1.0654
France	0.5352	–1.2772	1.1772	1.8001	0.4773	–1.2394	1.2341	1.7924	0.6182	–1.1634	1.3712	1.8408	0.7209	–0.9897	1.6176	1.8733	0.7403	–0.8947	1.4866	1.7225
Germany	0.0920	–1.1179	0.9717	1.4837	0.0940	–1.0611	0.9335	1.4163	0.4110	–0.8807	0.8658	1.2814	0.5960	–0.8192	0.9468	1.3222	0.6303	–0.6268	1.0096	1.2113
Greece	–0.2094	–0.4283	–1.3260	0.8368	–0.3077	–0.4364	–1.3031	0.7656	–0.3714	–0.4651	–1.1741	0.6207	–0.2456	–0.3517	–0.9892	0.5688	–0.3404	–0.2301	–1.1435	0.7051
Hungary	–0.5866	–0.3910	–0.2289	0.2533	–0.6613	–0.3623	–0.3758	0.2388	–0.6163	–0.3227	–0.0717	0.3855	–0.4581	–0.2391	0.0317	0.3470	–0.5634	–0.1109	–0.2358	0.3305
Ireland	0.2460	–0.8566	–0.2789	0.7800	0.3747	–0.8402	–0.0821	0.8678	0.4966	–0.8113	0.1352	0.9552	0.3682	–0.7810	0.2765	0.9032	0.1698	–0.7224	0.0439	0.6829
Italy	0.1900	–0.7539	0.0234	0.7125	0.1688	–0.6443	0.0583	0.6237	0.3293	–0.6078	0.1131	0.6939	0.5165	–0.5546	0.1977	0.7778	0.4182	–0.3184	0.1478	0.5270
Latvia	–0.6834	2.2303	–1.3398	2.6874	–0.4626	2.4058	–1.4283	2.8202	–0.1083	2.2346	–1.1162	2.4312	–0.0347	2.2873	–1.3801	2.6237	–0.0296	2.5776	–2.2115	3.3909
Lithuania	–0.5178	0.3392	–1.5644	1.3483	–0.5378	0.4859	–1.2028	1.2030	–0.3600	0.5354	–0.8767	1.0104	–0.4323	0.5944	–0.8455	1.0485	–0.3810	0.6974	–1.4795	1.5393
Luxembourg	1.2694	–0.1976	2.3229	1.7902	1.3864	–0.1934	2.3453	1.8129	1.5333	–0.0936	2.4738	1.8369	1.6927	–0.0684	2.6114	1.9259	1.6576	–0.0631	2.7036	1.9756
Malta	0.3815	–1.0895	1.1360	1.6006	0.4205	–1.0821	1.1547	1.6125	0.4448	–1.0750	1.1582	1.6131	0.4857	–1.0659	1.1916	1.6332	0.2812	–1.0533	1.2470	1.6335
Netherlands	0.5097	–0.7673	1.6665	1.7217	0.5996	–0.7600	1.9194	1.8947	0.8089	–0.7425	1.9656	1.9217	1.0216	–0.6782	2.0577	1.9535	1.1226	–0.6267	1.9941	1.8875
Poland	–0.6990	–1.2915	–2.5451	1.3330	–0.4915	–1.3452	–2.1215	1.1530	–0.4047	–1.2011	–1.6528	0.8937	–0.5341	–0.9747	–1.3676	0.5897	–0.5054	–0.7677	–1.4460	0.6864
Portugal	–0.3718	0.7012	–1.3500	1.4509	–0.4758	0.8768	–1.2712	1.5358	–0.3375	0.8164	–1.2123	1.4390	–0.0948	0.8043	–1.1239	1.3645	–0.1636	0.7571	–1.1541	1.3517
Romania	–0.6414	–0.5016	–3.3038	2.2331	–0.6580	–0.4930	–3.1845	2.1334	–0.5162	–0.3517	–3.5413	2.5398	–0.5768	–0.2617	–3.3087	2.3697	–0.5429	–0.0767	–3.3379	2.4943
Slovakia	–0.4898	0.1290	–1.2627	0.9861	–0.5219	0.2810	–0.9120	0.8602	–0.5402	0.3363	–0.6676	0.7729	–0.4868	0.4403	–0.5617	0.7893	–0.7834	0.5534	–0.8287	1.1104
Slovenia	0.4602	0.8795	–0.8971	1.3133	0.4930	0.9579	–0.8719	1.3450	0.7652	0.9873	–0.7832	1.3640	1.0659	1.0257	–0.7061	1.4307	0.8323	1.1751	–0.7240	1.4313
Spain	–0.0615	–2.1869	–0.1017	1.7192	–0.0268	–2.0648	–0.0441	1.6570	0.1239	–2.0287	0.0477	1.7273	0.2656	–1.3966	–0.0913	1.2375	0.0658	–1.1192	–0.4400	0.8409
Sweden	0.2652	1.6913	1.9929	1.3051	0.3287	1.8127	1.8649	1.2335	0.4134	2.1122	2.1189	1.3898	0.4819	2.2325	1.9717	1.3357	0.3018	2.5933	1.6585	1.6295
United Kingdom	0.1919	–1.8814	1.0515	2.1322	0.2619	–1.8646	1.0638	2.1401	0.3386	–1.7670	1.1034	2.1022	0.2838	–1.6058	0.9888	1.8973	0.1028	–1.4024	0.9222	1.6674

Table 2 cont.

Country	Dimensions of development				Dimensions of development				Dimensions of development				Dimensions of development			
	Econ.	Ecol.	Social.	RDDFE	Econ.	Ecol.	Social.	RDDFE	Econ.	Ecol.	Social.	RDDFE	Econ.	Ecol.	Social.	RDDFE
	2010	2010	2010	2010	2011	2011	2011	2011	2012	2012	2012	2012	2000–2012	2000–2012	2000–2012	2000–2012
Austria	0.4479	2.5879	1.0930	1.5525	0.7137	2.6277	1.1416	1.4207	0.6222	2.6417	1.0619	1.5019	0.2717	2.0598	0.8868	1.2847
Belgium	0.0971	–0.1993	2.1986	1.8488	0.1421	0.1082	2.1704	1.6701	0.1287	0.1537	2.3697	1.8196	0.3619	–0.4290	1.9793	1.7360
Bulgaria	–0.7319	–0.3109	–0.7449	0.3492	–0.7544	–0.4023	–1.1791	0.5501	–0.7442	–0.3767	–1.2437	0.6154	–0.4348	–0.6497	–0.9834	0.3910
Croatia	–0.1689	0.0231	–2.0681	1.6347	–0.0452	0.0946	–2.2332	1.8462	–0.0717	0.0946	–2.0999	1.7279	–0.4629	–0.0108	–1.7320	1.2620
Cyprus	–0.3543	–0.3867	0.2267	0.4881	–0.3578	–0.3748	0.2508	0.5040	–0.4151	–0.3748	0.0345	0.3518	0.1534	–0.5604	0.1590	0.5851
Czech Republic	–0.6805	0.7920	0.7186	1.1735	–0.6330	0.8922	0.6247	1.1518	–0.6860	0.9253	0.6266	1.2122	–0.5610	0.3536	0.5636	0.8457
Denmark	0.5797	0.7784	2.3878	1.4022	0.6243	0.8642	2.4193	1.3782	0.5393	1.0726	2.3787	1.3384	0.4077	0.4480	2.1665	1.4199
Estonia	–0.1036	1.8934	–0.5754	1.8534	0.1673	1.9778	–0.7994	1.9938	0.1813	2.0262	–0.5056	1.8516	–0.4456	1.4582	–0.5348	1.5921
Finland	0.6152	2.2547	1.4683	1.1596	0.7527	2.3784	1.4707	1.1521	0.6561	2.5470	1.6327	1.3373	0.4077	2.1079	1.2764	1.2023
France	0.7967	–0.7637	1.5890	1.6929	0.9893	–0.6923	1.7291	1.7548	0.9102	–0.6686	1.6736	1.6893	0.6022	–1.1351	1.3376	1.7957
Germany	0.6312	–0.5676	1.0467	1.1854	0.6723	–0.5534	1.0856	1.2055	0.6617	–0.5525	1.1895	1.2633	0.2395	–1.0119	1.0641	1.4783
Greece	–0.3378	–0.0724	–1.2058	0.8383	–0.3640	–0.2490	–1.4002	0.8967	–0.4490	–0.2159	–2.1328	1.4792	–0.3982	–0.4993	–1.3078	0.7050
Hungary	–0.7983	–0.0682	–0.2363	0.5407	–0.7189	–0.0602	–0.3621	0.4663	–0.7751	–0.0318	–0.3705	0.5263	–0.4779	–0.3662	–0.1705	0.2200
Ireland	0.3119	–0.6941	0.0993	0.7498	0.3752	–0.6604	0.0592	0.7506	0.2816	–0.6405	0.0219	0.6724	0.2216	–0.8201	–0.1058	0.7533
Italy	0.4254	–0.1851	0.2132	0.4383	0.3375	–0.1116	0.0854	0.3184	0.2968	–0.0292	0.0032	0.2540	0.2327	–0.6328	0.0428	0.6433
Latvia	–0.0054	2.5562	–1.7148	3.0400	0.1477	2.6521	–1.5725	3.0043	0.1356	2.6948	–1.3172	2.8726	–0.4805	2.1832	–1.2194	2.5310
Lithuania	–0.4336	0.9076	–1.3615	1.6133	–0.4364	0.8704	–1.5982	1.7466	–0.4376	0.8789	–1.4690	1.6643	–0.7283	0.4777	–1.3109	1.2901
Luxembourg	1.3142	–0.0764	2.8172	2.0466	1.3988	–0.0694	3.1825	2.3030	1.2563	–0.0713	2.8864	2.0951	1.2150	–0.1667	2.4545	1.8544
Malta	0.1709	–1.0812	1.2801	1.6707	0.0651	–0.7370	1.2756	1.4329	0.0209	–0.7285	1.4032	1.5293	0.4178	–1.0360	1.1976	1.6033
Netherlands	1.2531	–0.6422	2.2653	2.0873	1.3278	–0.6025	2.1888	2.0214	1.2771	–0.5873	2.2551	2.0422	0.7002	–0.7529	1.8425	1.8396
Poland	–0.4252	–0.7441	–1.4719	0.7587	–0.4042	–0.6023	–1.5464	0.8632	–0.4142	–0.5066	–1.5133	0.8622	–0.6295	–1.1153	–1.6937	0.7534
Portugal	–0.1358	0.8756	–1.1163	1.4085	–0.2087	0.9329	–0.9848	1.3642	–0.2481	0.9859	–1.2451	1.5805	–0.3548	0.6714	–1.0779	1.2432
Romania	–0.7325	0.0340	–3.2831	2.4560	–0.6741	–0.0276	–3.3030	2.4534	–0.7351	0.0151	–3.1888	2.3698	–0.7137	–0.3324	–3.0133	2.0510
Slovakia	–0.7347	0.7029	–0.8194	1.2099	–1.0231	0.6946	–1.0016	1.3938	–1.0411	0.6813	–1.1025	1.4321	–0.6308	0.2515	–0.9511	0.8808
Slovenia	1.0531	1.2175	–0.7831	1.5707	0.9509	1.2347	–0.9144	1.6511	0.9037	1.2801	–0.9385	1.6790	0.6128	1.0041	–0.6632	1.2331
Spain	0.0992	–1.0077	–0.4275	0.7830	0.2772	–0.9791	–0.6338	0.9179	0.1801	–0.9593	–1.0489	0.9690	0.0214	–1.7575	–0.2039	1.3698
Sweden	0.3581	2.7512	1.8357	1.7077	0.4774	2.7092	1.8416	1.5911	0.4435	2.7906	1.9308	1.6793	0.2925	2.0376	1.8701	1.3616
United Kingdom	0.2432	–1.3489	1.1022	1.7588	0.3601	–1.3123	1.0939	1.7441	0.3277	–1.3180	1.2558	1.8434	0.1598	–1.7768	1.1296	2.0927

Econ. – economic dimension; Ecol. – ecological dimension; Social. – social dimension; RDDFE – rural development deviation from equilibrium.

Source: Own calculations.

2000–2012

Country	Dimensions of development				The deviation from the average		
	Economic	Ecological	Social	Average	Economic	Ecological	Social
	2000–2012	2000–2012	2000–2012	2000–2012	2000–2012	2000–2012	2000–2012
Austria	0.2717	2.0598	0.8868	1.0727	–0.8010	0.9870	–0.1860
Belgium	0.3619	–0.4290	1.9793	0.6374	–0.2755	–1.0664	1.3419
Bulgaria	–0.4348	–0.6497	–0.9834	–0.6893	0.2545	0.0396	–0.2941
Croatia	–0.4629	–0.0108	–1.7320	–0.7352	0.2724	0.7244	–0.9968
Cyprus	0.1534	–0.5604	0.1590	–0.0827	0.2360	–0.4777	0.2417
Czech Republic	–0.5610	0.3536	0.5636	0.1187	–0.6798	0.2349	0.4448
Denmark	0.4077	0.4480	2.1665	1.0074	–0.5997	–0.5594	1.1591
Estonia	–0.4456	1.4582	–0.5348	0.1593	–0.6049	1.2990	–0.6941
Finland	0.4077	2.1079	1.2764	1.2640	–0.8563	0.8439	0.0124
France	0.6022	–1.1351	1.3376	0.2682	0.3340	–1.4033	1.0693
Germany	0.2395	–1.0119	1.0641	0.0972	0.1423	–1.1091	0.9669
Greece	–0.3982	–0.4993	–1.3078	–0.7351	0.3369	0.2358	–0.5727
Hungary	–0.4779	–0.3662	–0.1705	–0.3382	–0.1397	–0.0280	0.1677
Ireland	0.2216	–0.8201	–0.1058	–0.2347	0.4563	–0.5853	0.1290
Italy	0.2327	–0.6328	0.0428	–0.1191	0.3518	–0.5137	0.1620
Latvia	–0.4805	2.1832	–1.2194	0.1611	–0.6416	2.0221	–1.3805
Lithuania	–0.7283	0.4777	–1.3109	–0.5205	–0.2078	0.9982	–0.7904
Luxembourg	1.2150	–0.1667	2.4545	1.1676	0.0474	–1.3343	1.2869
Malta	0.4178	–1.0360	1.1976	0.1931	0.2247	–1.2292	1.0045
Netherlands	0.7002	–0.7529	1.8425	0.5966	0.1036	–1.3495	1.2459
Poland	–0.6295	–1.1153	–1.6937	–1.1462	0.5166	0.0309	–0.5475
Portugal	–0.3548	0.6714	–1.0779	–0.2538	–0.1010	0.9252	–0.8242
Romania	–0.7137	–0.3324	–3.0133	–1.3531	0.6394	1.0207	–1.6601
Slovakia	–0.6308	0.2515	–0.9511	–0.4434	–0.1873	0.6949	–0.5076
Slovenia	0.6128	1.0041	–0.6632	0.3179	0.2949	0.6862	–0.9811
Spain	0.0214	–1.7575	–0.2039	–0.6467	0.6681	–1.1108	0.4427
Sweden	0.2925	2.0376	1.8701	1.4000	–1.1076	0.6375	0.4700
United Kingdom	0.1598	–1.7768	1.1296	–0.1625	0.3223	–1.6144	1.2920

Source: Own calculations.

The economic dimension had the strongest impact on rural non-sustainability (by the applied variables) in the Czech Republic, Finland and Sweden (Table 3). In these countries, economic growth was the lowest among the three dimensions. The environmental aspect affected mostly rural imbalance in Austria, Estonia, Lithuania, Latvia, Portugal and Slovakia (the highest level out of the three dimensions) and also in Cyprus, France, Germany, Ireland, Italy, Luxembourg, Malta, Austria, Spain and in the UK (the lowest level by the three dimensions). Social "axis" caused the rural development distortion in Belgium, Denmark and Hungary (the highest index) as well as Bulgaria, Croatia, Greece, Poland, Romania and Slovakia (the lowest level).

CONCLUSIONS

There is no unified approach that would ensure maintaining of sustainability in a long run steady success in each country, whereas the sustainable development of rural areas implies achieving common goals. This non-uniformity must be considered in rural development policies and strategies for the EU Member States due to specific characteristics of their agriculture and rural areas.

According to the synthetic index and in terms of economic development the lowest indicators in 2000–2012 were typical for the Central and Eastern European countries (Lithuania, Romania, Slovakia, Poland and the Czech Republic), while the highest – in the Western and Southern Europe (Luxembourg, the Netherlands, France, Malta and Slovenia).

The worst ecological situation of rural areas (by the analyzed factors) was recorded in some of the "old" EU Member States (the United Kingdom, Spain and France) and the "new" ones (Malta and Poland). The highest ecological development was observed in the Scandinavian region (Finland and Sweden) and in one Baltic country (Latvia). In general, better outcomes in environmental situation in above mentioned states isn't necessarily explained by higher level of economic development and vice versa. This means that some countries succeeded in economy growth while increasing emissions, pollution or electric power consumption etc. Neither it means that some countries succeeded in economy growth while increasing emissions, pollution or electric power consumption etc.

The lowest social development level of rural areas was in the countries which had joined the EU after its last enlargements (Romania, Croatia, Poland and Lithuania) and the highest level – in the Benelux (Belgium, the Netherlands, Luxembourg) and the Scandinavian states (Denmark and Sweden). These outcomes confirmed disparities between these two "poles" of the EU-28 and demonstrated strong interdependence between the country's social development and its welfare.

Unexpectedly, the overall degree of rural sustainability was the lowest both in some of the "new" EU countries (Latvia and Romania), as well as in the "old" EU countries (the UK, Luxembourg, the Netherlands and France). The same diversity is true for the states with the highest sustainability level – in Hungary, Bulgaria, Cyprus and in Italy, Greece and Ireland.

Among all the EU countries, the ecological "vector" had the strongest impact on rural non-sustainability in the EU countries, whereas the economic component was not a key factor.

Generally, there is large diversification in economic, ecological and social development of rural areas among the EU Member States. The synthetic index of rural sustainable development and it's value can be considered as a measure of the relative likelihood of the country's ability to achieve favorable status. However, the high value of that index can't guarantee its ability to remain sustainable rural development in a long-term perspective.

The research has pointed out discrepancies among the different EU nations by all the three dimensions, mainly among the "old" and the "new" EU Member States. On the other hand, it has demonstrated their strong cohesion.

In fact, the sustainable (rural) development exists only in theory. In practice, this development deviates from equilibrium in some measure. In addition, the development of rural areas is a dynamic effect, because it is constantly changing over time.

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Streszczenie. Celem pracy jest określenie stopnia zrównoważenia rozwoju obszarów wiejskich w krajach Unii Europejskiej. Badania obejmowały trzy wymiary rozwoju obszarów wiejskich, tj. ekonomiczny, ekologiczny i społeczny. Każdy wymiar określany był za pomocą wskaźnika syntetycznego opracowanego na podstawie zmiennych pierwotnych, przy wykorzystaniu analizy czynnikowej. Badania przeprowadzono we wszystkich krajach UE w latach 2000–2012. Z uzyskanych danych wynika, że najwyższy stopień zrównoważenia rozwoju obszarów wiejskich wystąpił na Węgrzech, w Bułgarii i na Cyprze, a najniższy na Łotwie, w Rumunii i Wielkiej Brytanii.

Słowa kluczowe: zrównoważony rozwój, obszary wiejskie, kraje Unii Europejskiej

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