



THE FORMATION OF THE SYSTEM OF INDICATORS OF DEVELOPMENT OF THE COUNTRY'S REGIONS

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Abstract. According to the literature sources it has been already established that the sustainability of a system is ensured by the development of its three constituent parts - economic, social and environmental. For the analysis of the regional sustainable development of the country it is necessary to form a structural data system according to these three aspects. Nowadays the data provided by the statisticians ignore these aspects are not oriented towards the sustainable regional development. A scientific and practical problem arises - on basis of the present statistical data about the development of the country's regions to create a system of indexes enabling to analyse this development from the aspect of sustainability. There are much data characterizing the regional development therefore it is significant (important) to form a hierarchical system of indexes of regional development.

Keywords: regions, sustainable development, regional development, sustainability indicators.

JEL classification: Q 01.

1. Introduction

Sustainable development of socio-economic system is understood as the development of its three components - economic, social and environmental. Various methods for analysing the sustainable development have been discussed nowadays (Čiegis *et al.* 2010; Naruškevičius, Lazdinis 2010; Brauers, Ginevičius 2009; Kilijonienė *et al.* 2010; Kocmanova *et al.* 2012; Floridi *et al.* 2011; Rotmans 2006; Sprangenberg 2002; Parris, Kates 2003; Mori, Christodoulou 2012; Bell, Morse 2010; Dagiliūtė 2012). Analysis of these and other literary sources enables us to mark out its essential stages: first, quantitative evaluation of actual development of socio-economic system (SES); second, evaluation of sustainability of the system development. Both the first and second issues are subject for lots of research. Two approaches may be distinguished: quantitative evaluation of actual status of socio-economic system or its subsystem or based on one of them, or by several generalising indicators, or integrating several partial indicators into one index, which reflect individual aspects of SES or its subsystem.

The first approach is typical when the systems under consideration are characterized by very high complexity, for example, the development of a region of the country. To express the development of a region or of the whole country, three generalized indicators have been suggested: gross domestic product (GDP) per capita in the region, foreign direct investment (FDI) per capita in the region, and the unemployment rate in the region (Čiegis *et al.* 2010).

It is considered that the GDP per capita is a reliable indicator of success and wealth in the country, showing its economic development level; the fact that FDI allows favourable achievement of more rapid technological progress is an important source for the creation of main capital; the unemployment rate reflects the activity of the population.

Social development of both the country and its separate region is proposed to express by the following generalized indicators: the average useful area (m²) per capita; number of crimes per one hundred thousand inhabitants, and the costs of the GDP for social security and education (in %) (Čiegis *et al.* 2010).

It is offered to reflect the state of the environment of areas in question using the following three generalized indicators: forest land area compared with the area of the country (in %); pollutants emitted into the atmosphere per capita (in tons); contaminated and insufficiently treated wastewater discharged into the surface waters, (in thousand m³) (Čiegis *et al.* 2010).

In all three cases (economic, social and environmental development) the index reflecting the development is defined as follows:

$$I_{pj} = \sum_{i=1}^n \omega_{ij} R_{ij}, \quad (1)$$

where:

I_{pj} is the index reflecting the aspect (economic, social or environmental) of j-th regional development;

w_{ij} is the i-th weight ratio of j-th development aspect of the country (region) $i=1$;

R_{ij} – the index value of j-th development aspect.

Thus, if we assess the development state of the country (region) quantitatively, in essence we appeal to multi-criteria approach where the generalizing indicators reflecting essential aspect of the development are unified into one value.

Another approach to the quantitative evaluation of the country (region) development is also based on multi-criteria methods. The difference is that the generalizing indicators are detailed here, that is, their values are determined on basis of a considerable number of partial indicators. The object is to achieve in this way a most adequate reflection of characteristics of the analysed development aspect (economic, social or environmental) (Ginevičius 2009). In this case there arises a problem – how to combine correctly a great number of indicators into one generalized value.

In these both cases the adequateness of quantitative evaluation of socio-economic system or its subsystem mainly depends on the type of system of indicators being appealed to.

The object of this article is to form an indicators system for quantitative evaluation of regional development of the country, which could be used for the determination of the sustainability of this development.

To achieve stated object, the following goals have been set:

- to assess critically the existing methods for quantitative evaluation of the state in the country's regions;

- to analyze the existing official system of indicators reflecting regional development of the country;
- to form the system of indicators for quantitative evaluation of development of the country's regions which would be appropriate for application of multi-criteria methods and for the determination of development sustainability.

Research methods. Review of scientific literature, analysis of statistical data and the methods applied in the theory of multiple criteria have been used for the research.

2. Critical analysis of the methods for quantitative evaluation of the country (region) development

Striving to achieve the purpose of this article, that is to form the system of indicators for quantitative evaluation of country's (region) development, which could adequately reflect the current situation and which could make it possible to determine the sustainability of this development, a critical review of existing proposals should be considered.

As mentioned above, the first point of the method is that generalizing indicators reflecting a certain development aspect (economic, social, and environmental) are combined into one generalizing quantity. In connection with the following, these questions arise: first, whether these indicators adequately reflect the phenomenon in question; second, what is the relation between these indicators; and, third, what number of generalizing indicators is necessary.

Response to both the first and the third question will be given by the answer to the second question. In other words, it is necessary to determine whether there is a relation between these three indicators and of what nature this relation is. It can be seen in Figures 1 and 2.

1 and 2 Figures show that GDP and FDI, as well as GDP and unemployment rate are closely related to each other. In other words, the GDP inwardly integrates both the rapid technological progress of national region and positive impact of the main capital created thanks to the direct foreign investments on the economic development, i.e. essentially, FDI is a partial indicator of GDP.

Similarly, GDP inwardly integrates the situation on the labour market as well: the high rate says that the population activity was also high. Consequently, the unemployment rate is a partial indicator of GDP.

The structure of these indicators also refers to the prejudice of the use of generalizing indicators for the quantitative evaluation of the development.

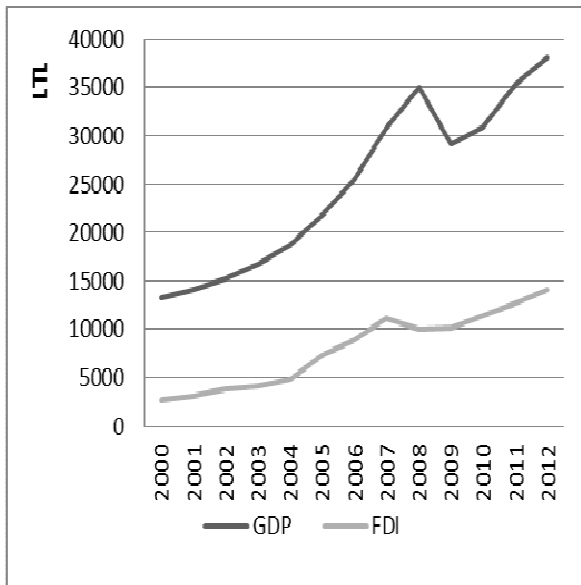


Fig. 1. FDI and GDP per capita (Source: Statistics Lithuania)

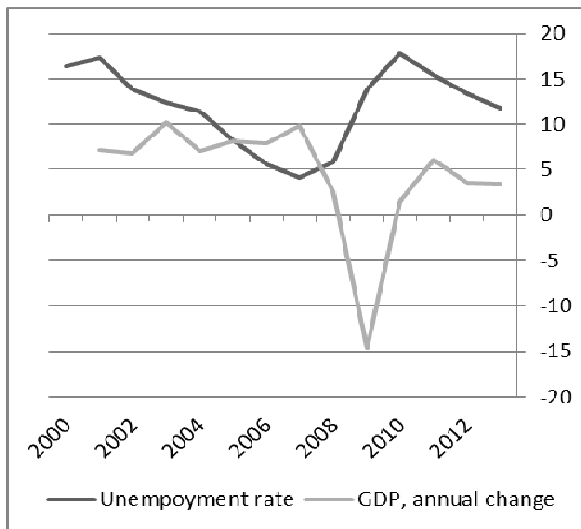


Fig. 2. Unemployment rate and change in GDP in 2000–2012 (Source: Statistics Lithuania)

The calculation of gross domestic product is based on the annual business structure, in other words, GDP is calculated according to each economic activity. In addition to activities directly related to the national regional economic development (industry, agriculture, forestry, fishery, construction, etc.), there are lots of activities that are directly related to social development - professional, scientific and technical, administrative and service activities, public administration, education, public health care, artistic, entertainment and leisure organization activities, etc. (Lietuvos apskritys 2012). This means if we take the GDP purely as the indicator generalizing the economic development, we get a perverted picture.

The same situation is with other economic development indicator - unemployment. The number of working people includes the residents who work

in the administration and service, public administration, social insurance, education, public health care, social work, art and other areas which are not purely economic activity sectors, and hence the unemployment rate may not accurately reflect the economic development in the country (region).

In conclusion we can state that with reference to the generalizing indicators, the level of the regional economic development of the country can only be determined if there are any other indicators unrelated to GDP. If such do not exist, it must be admitted that the economic development of the country (region) is reflected by only one generalizing indicator - gross domestic product per capita, which itself integrates all aspects of economic development indicators.

Exactly the same can be said about the quantitative evaluation of social and environmental development. In this case, the question of whether indicators included in the system adequately reflect the phenomenon under consideration comes to the fore.

The analysis of regional development indicators shows that, according to their intended purpose, some of them reflect the development of quantitative and the other – the qualitative side (Lietuvos apskritys 2012). For example, the first generalized indicator of social development is the usable area (m²) offered per capita on the average. Undoubtedly, this is one of the most representative indicators of social development. On the other hand, it reflects the quantitative side of the process.

Human well-being is closely related to qualitative conditions of his home, i.e. not only to the useful area, but also whether he has a separate accommodation. Therefore, alongside with the proposed one, there should be another indicator showing how many flats fall to, for example, 10 thousand inhabitants in the country (region).

Likewise, talking of the social situation in the country region, it is necessary to consider not only the number of crimes (the quantitative side of this phenomenon), but also the number of investigated crimes (qualitative side).

Similar reasoning is applied to the third indicator of social development. In addition to expenditure on social security and education, it is necessary to evaluate the quantitative base, i.e. the situation of the population in the country (region): their number per area unit, marriages, births, deaths, migration, etc.

Education, culture and social protection are also characterized by both quantitative and qualitative indicators of development. The part of GDP expenditure intended for this purpose does not fully reflect the actual state of their impact on social development.

As for the assessment of environmental state using one of the main quantitative development indicators, there should be the amount of taken and total water consumption.

Making general conclusion, it can be said that the use of generalized indicators for the quantitative evaluation of individual constituents of the national regional development (economic, social and environmental) cannot provide an adequate result. More detailed system of indicators is necessary, which, firstly, would allow covering all the sides of essential phenomenon under consideration, and secondly, allows the "purification" of indicators, which immediately reflects the specific constituent of development, and thirdly, on the basis of the weights of detailed indicators allows the assessment of actual situation of the development constituents more accurately.

3. Proposed system of indicators for the country's regional development

Issues related to the quantitative evaluation of economic - social development in the regions of Lithuania started to be studied more than ten years ago (Ginevičius, Mikelis 2002). They have quantitative multi-criteria evaluation of individual regional development aspects dominated, i.e. there is lack of integrated approach to the assessment in the context of sustainable development. The situation of scientific research today allows us to enter into other phase to resolve this problem.

If we refuse the application of generalized indicators to the quantitative evaluation of the country's regional development, we will have fundamental question raised: what principles should be followed to include generalized indicators reflecting the development in various aspects in their system.

In response to it we can appeal to the theory of systems. Socio-economic systems are divided into the real (material) and theoretical (abstract) ones. The first include the objects of inanimate nature and living systems (biological, social, economic, etc.). Theoretical (abstract) systems include hypotheses, theories, formalized models, etc. (Lydeka 1998; Ginevičius 2009). The system of the indicators reflecting the regional development in the country is precisely the theoretical (abstract) system or a formalized model that reflects the real (physical) system, i.e. the region of the country.

General theory of systems says that the main part of the system is its element, which is the smallest and is undivided in terms of analysis (Lydeka 1998; Simanauskas 1998; Motuzienė, Pyrantienė 2002).

Thus, if we want to reflect the development of country's region, we have to appeal to original and undivided, but not aggregated indicators. Walking this way, we face two problems. First, it is necessary to ensure the complexity of development reflection, i.e. the system of indicators has to be formed so that all aspects important to the development would be reflected. Second, since it may appear that there are quite a lot of such primary indicators and that would complicate or even make impossible the use of quantitative evaluation, it is necessary to find ways how to aggregate them and thus reduce the number of indicators assessed in unison.

The first problem can be dealt with choosing the information about the development of the country and its regions provided by the Lithuanian Department of Statistics (Lietuvos apskritys 2012; Statistical Yearbook of Lithuania 2012). These publications contain the data both within the section of the country and its regions in various aspects, already purified and well-established over the years

Table 1 shows the indicators describing the economic, social and environmental situation in the regions of Lithuania (Lietuvos apskritys 2012). On the grounds of the list of these indicators, it is necessary to develop such their system, which, firstly, would be structured under the principles of sustainable development, and secondly, it would be presented in such a way that it would be possible to assess the actual development of the region quantitatively with reference to this system.

There is an attempt in the literature to provide such a system of indicators (Ginevičius *et al.* 2004). When seen through today's position, such systems are not perfect due to several reasons. First, it has only the social and economic development distinguished, i.e. they are not fully structured in terms of sustainable development. Second, the system of indicators includes both initial, i.e. non-aggregated indicators, and generalizing indicators. On the other hand the goal of this research was not to form an adequate system of indicators, but to show how the system consisting of a number of indicators may be applied to the quantitative evaluation.

As can be seen in Table 1, the development of regions is characterized by many indicators. The point of multi-criteria assessment is that the indicators of the different importance reflecting the phenomenon under consideration have to be unified into one generalizing value. This importance is determined by experts. They can only assess a limited number of indicators with sufficient precision - 10-12 (Ginevičius 2009). Meanwhile, as we can see in Table 1, there are 45 indicators under

assessment. The only way to reduce the number of the indicators together is their classification, i.e. structuring of the system into subsystems (Ginevičius 2009). Thus a hierarchical system of indicators is obtained.

Table 1. Indicators of the development of the regions in Lithuania (source: compiled by authors)

Item No	Name of Indicator	Measure
1.	Unemployment rate in the areas of economic activities	In %
2.	Average wage in the areas of economic activities	LTL
3.	Number of economic entities in operation per 1000 population	unit
4.	Turnover per economic entity	million LTL
5.	Bankruptcy processes instituted and completed per 100 economic entities	unit
6.	Research and development activities per 100 economic entities	million LTL
7.	Construction work carried out	million LTL
8.	Number of goods vehicles (cars, trailers, trucks, etc.)	unit
9.	National freight transport by road	thousand tones
10.	Gross agricultural production per 1000 population	thousand LTL
11.	Animal products per 1000 population	t
12.	Number of population per 1 km ² of the country (region) area	unit
13.	Number of marriages per 1000 population	unit
14.	Number of divorces per 1000 population	unit
15.	Number of live birthss per 1 000 population	unit
16.	Number of deaths per 1 000 population	unit
17.	Number of physicians per 10 000 population	unit
18.	Number of old-age pension beneficiaries per 1000 working-age population	unit
19.	Migration	unit
20.	Amount of social benefit per capita	LTL
21.	Number of places at pre-school institutions per 100 children	unit
22.	Number of general schools per 1000 pupils	unit
23.	Number of vocational schools per 1000 pupils	unit
24.	Number of universities per 1000 students	unit

End of table 1

Item No	Name of Indicator	Measure
25.	Number of colleges per 1000 students	unit
26.	Number of library users per library	unit
27.	Number of cultural centres per 1000 population	unit
28.	Number of amateur art groups per 1000 population	unit
29.	Number of participants of amateur groups per amateur group	unit
30.	Support provided by legal persons per 1000 population	thousand LTL
31.	Individuals aged 16-74 who used a computer	In %
32.	The average useful floor area per capita	m ²
33.	Number of dwellings per 1000 population	unit
34.	Number of crimes per 1000 population	unit
35.	Share of criminal offences investigated	In %
36.	Average retail prices for food and non-food goods	LTL
37.	Turover of residential construction works per 1000 population	thousand LTL
38.	Turover of retail trade enterprises (VAT excluded) per capita	thousand LTL
39.	Turover of food and beverage service enterprises per 1000 population	thousand LTL
40.	Number of accomodation establishments per 100 km ²	unit
41.	Number of passenger vehicles per 1000 population	unit
42.	Water abstraction and consumption per 1000 population	thousand m ³
43.	Wastewater discharge per 1000 population	thousand m ³
44.	Air pollutant emissions from stacionary sources per 1000 population	t
45.	Forest areas compared to the area in the region	In %

There are two possible methods for the formation of the system: “from the top down” and “from the bottom to the top” (Ginevičius 2009). The first is meaningful when the essential aspects of the problem under consideration can be distinguished without difficulty. Second one is meaningful when the aspects of the phenomenon under consideration have not been highlighted, i.e. when we have the list of indicators characterizing different aspects of the phenomenon.

In our case under consideration, of course, the first way is purposeful, because it allows structuring the list of indicators available (Table 1) in the aspects of sustainable development - economic, social, environmental. Table 1 shows that the 11 indicators describe the economic, 30 - social, and 4 - environmental development. In this case, the system of indicators structured under the principles of sustainable development would look like this (Fig. 3):

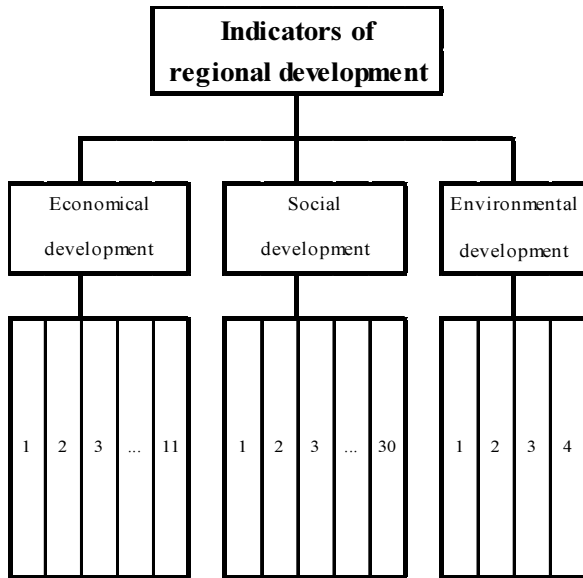


Fig. 3. System of regional development indicators structured under the principles of sustainable development (source: Ginevičius 2009)

Experience of multi-criteria evaluation says that experts can assess the system with sufficient accuracy that only consists of 10 - 12 indicators (Ginevičius *et al.* 2006; Ginevičius, Podvezko 2007; Aghdaie *et al.* 2013; Ginevičius *et al.* 2013; Ginevičius, Podvezko 2012; Brauers *et al.* 2010). Figure 3 shows that social development of the region is characterized by 30 indicators. In order to receive the number of indicators appropriate for the assessment, it is appropriate to form at least three of their subgroups and to include the indicators reflecting the same aspect (or more) in the 3rd subgroup.

Structuring of the system of indicators is a creative process, so it should not be done purely mechanically, i.e. only under the condition that the number of assessed values would not exceed 10-12. In this case, the indicators reflecting different aspects may find themselves in the first subgroup. We would have a situation where the experts analyzing the group of indicators meeting the condition of a number will be able to competently assess only part of them, so the assessment accuracy will suffer. Therefore, during the formation of subgroups, the priority should be given not to their number, but their nature and generality (Ginevičius 2009). In this case, all of the indica-

tors reflecting the regional development should be grouped into the following subgroups: population (8 indicators), health and social security (4 indicators), education, science and culture (10 indicators), housing and living conditions (8 indicators). Hierarchically structured system of indicators system of regional development would look as follows and shown in Fig. 4.

Hence the process for formation of country region development indicators would be as follows (Ginevičius 2009):

1. A list of indicators reflecting the development of the region shall be made.
2. All indicators shall be divided into three subgroups, reflecting the economic, social and environmental development.
3. If the number of indicators within a subgroup is large, additional hierarchical level shall be formed - a few lower-level subgroups shall be formed from related indicators.

The system of indicators of the country region development shown in figure 4 has been formed with reference to the principles of sustainable development and adapted to multi-criteria assessment.

4. Conclusions

In order to assess the sustainability of the country region development, it is necessary to form a system of indicators which would refer to the principles of sustainable development and would enable quantitative evaluation of current situation.

Quantitative evaluation of regional development is based on a multi-criteria approach, when the indicators universally reflecting the development are unified into one generalizing value. Multi-criteria evaluation of the country's regional development with reference to generalized indicators does not provide an adequate result because, on the one hand, it is difficult enough to accurately identify the weight of such complex indicators and, on the other hand, they are interrelated.

It is appropriate to use the declared system of non-aggregated indicators for quantitative evaluation of the regional development. This allows covering all essential sides of the phenomenon under consideration, immediately reflect specific constituents of the development and to determine the weights of indicators more precisely.

Proposed system of indicators for the regional development is a hierarchical system structured according to the principles of sustainable development and adapted to multi-criteria evaluation.

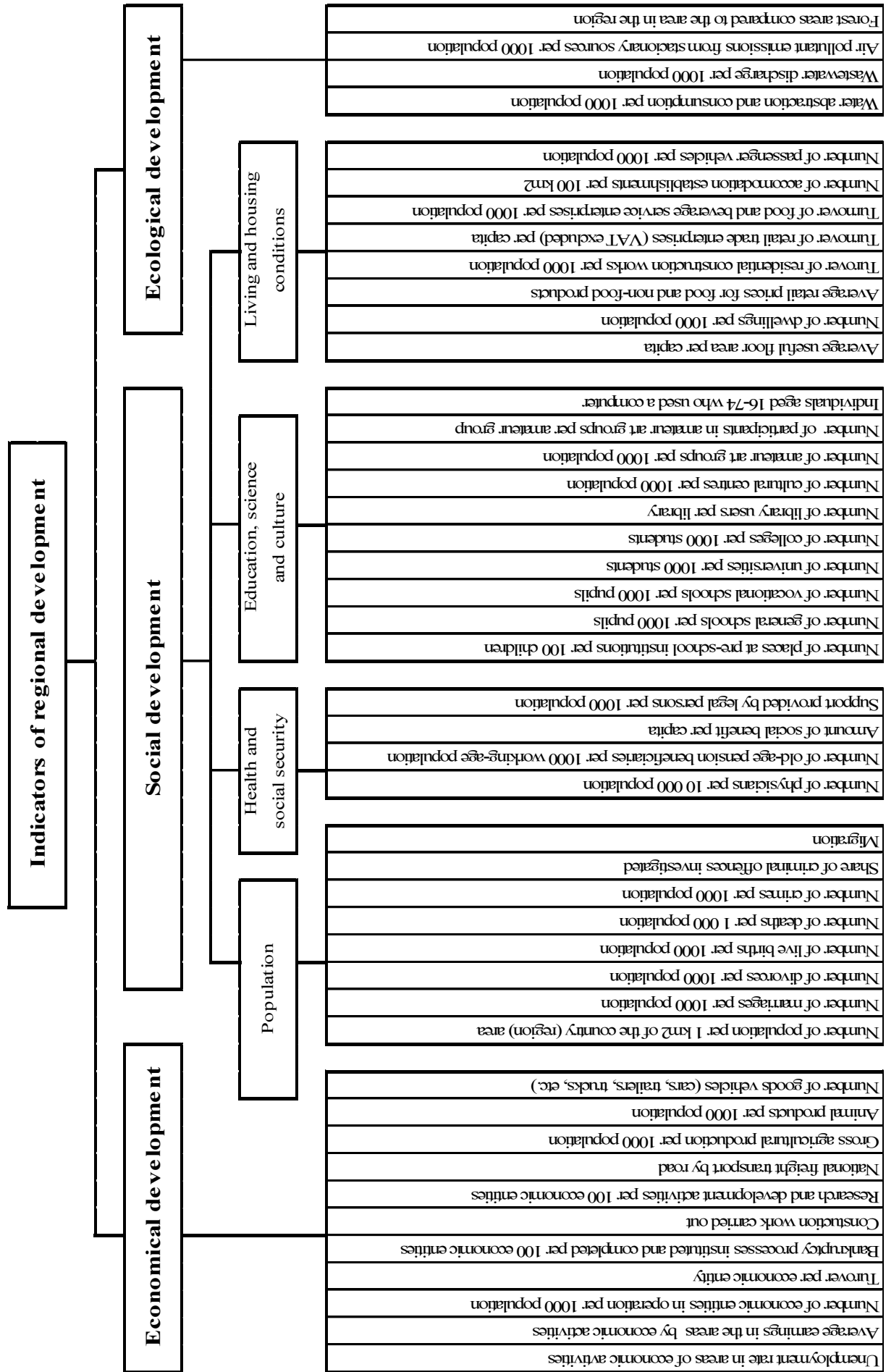


Fig. 4. Hierarchical system of indicators of regional development (source: compiled by authors)

References

- Aghdaie, M. H.; Zolfani, S. H.; Zavadskas, E. K. 2013. Market segment evaluation and selection based on application off fuzzy AHP and COPRAS-G methods, *Journal of Business Economics and Management* 14(1): 213–233.
<http://dx.doi.org/10.3846/16111699.2012.721392>
- Bell, D.; Morse, S. 2010. Sustainability indicators: Measuring the Immeasurable, *Local Environment* 6(3): 291–309.
<http://dx.doi.org/10.1080/13549830120073284>
- Brauers, W. K. M.; Ginevičius, R. 2009. Robustness in regional development studies. The case of Lithuania, *Journal of Business, Economics and Management* 10(2): 121–140.
<http://dx.doi.org/10.3846/1611-1699.2009.10.121-140>
- Brauers, W. K. M.; Ginevičius, R. 2010. The economy of the Belgian regions tested with Multimoora, *Journal of Business, Economics and Management* 11(2): 173–209.
<http://dx.doi.org/10.3846/jbem.2010.09>
- Brauers, W. K. M.; Ginevičius, R.; Podvezko, V. 2010. Regional development in Lithuania considering multiple objectives by the Moora method, *Technological and Economics Development of Economy* 16(4): 613–640.
<http://dx.doi.org/10.3846/tede.2010.38>
- Čiegis, R.; Ramanauskienė, J.; Šimanskienė, L. 2010. *Lietuvos regionų darnaus vystymosi vertinimas*. Klaipėda: Klaipėdos universiteto leidykla. 123 p. ISBN 978-9955-18-534-5.
- Dagilūtė, R. 2012. Sustainability of Lithuanian Regions: Application of Composite Index, *Regional Formation and Development Studies* 3(8): 65–73.
- Floridi, M.; Pagni, S.; Falorni, S.; Luzzati, T. 2011. An exercise in composite indicators construction: Assessing the sustainability of Italian regions, *Ecological Economics* 70(8): 1440–1447.
<http://dx.doi.org/10.1016/j.ecolecon.2011.03.003>
- Ginevičius, R. 2009. Socioekonominių sistemų būklės kiekybinio įvertinimo problematika, *Verslas: teorija ir praktika* 10(2): 69–83.
<http://dx.doi.org/10.3846/1648-0627.2009.10.69-83>
- Ginevičius, R.; Podvezko, V.; Mikelis, D. 2004. Quantitative evaluation of economics and social development of Lithuanian regions, *Ekonomika* 65: 67–81
- Ginevičius, R.; Podvezko, V. 2004. Quantitative assessment of regional development, *Environmental Research, Engineering and Management* 1(27): 10–14.
- Ginevičius, R.; Mikelis, D. 2002. Lietuvos regionų ekonominės ir socialinės plėtros investicijų efektyvumas, *Verslas: teorija ir praktika* 2(2): 89–95
- Ginevičius, R.; Podvezko, V.; Mikelis, D. 2006. Rating system of social-economic development of regions, *Polityka rozwoju państw Europy Środkowoschodniej. Aspekty makroekonomiczne i regionalne*. Włocławek: Lega, 212–224.
- Ginevičius, R.; Podvezko, V. 2007. Complex assessment of sustainable development of state regions with emphasis on ecological and dwelling conditions, *Ekologija* 33: 41–48.
- Ginevičius, R.; Podvezko, A. 2012. Features of Applying Decision-making Methods to Evaluation of Financial Stability of Commercial Banks, *Business: Theory and Practice* 13(4): 314–323.
<http://dx.doi.org/10.3846/btp.2012.33>
- Ginevičius, R.; Podvezko, V.; Ginevičius, A. 2013. Quantitative evaluation of enterprise marketing activities, *Journal of Business Economics and Management* 14(1): 200–212.
<http://dx.doi.org/10.3846/16111699.2012.731143>
- Kilijonienė, A.; Simanavičienė, Ž.; Simanavičius, A. 2010. The evaluation of Social and Economic Development of the Region, *Inžinerine Ekonomika - Engineering Economics* 21(1): 68–79.
- Kocmanova, A.; Karpišek, Z.; Klimkova, M. 2012. The Constuction of Environmental Indicators for Determination of Performance of Esg Indicators to Support Decision-Making of Investors, *Business: Theory and Practice* 13(4): 333–342.
<http://dx.doi.org/10.3846/btp.2012.35>
- Lietuvos apskritys 2012*. Lietuvos Statistikos departamentas. Vilnius. 236 p. ISSN 2029-5928
- Lydeka, Z. 1998. Ekonominė sistema ir jos kitimas: metodologinės problemos, *Ekonomika* 45: 71–84.
- Mori, K.; Christodoulou, A. 2012. Review of sustainability indices and indicators: Towards a new City Sustainability Index (CSI), *Environmental Impact Assessment review* 32(1): 94–106.
<http://dx.doi.org/10.1016/j.eiar.2011.06.001>
- Motuzienė, S.; Pyrantienė, D. 2002. *Dinaminių sistemų modeliavimas: metodiniai patarimai*. Kaunas: Lietuvos žemės ūkio universiteto leidybinis centras. 38 p.
- Naruševičius, V.; Lazdinis, I. 2010. *Darnaus vystymosi politika ir valdymas*. Vilnius. 236 p. ISBN 978-9955-19-289-3
- Parris, T. M.; Kates, R. W. 2003. Characterizing and measuring sustainable development, *Annual Review of Environment and Resources* 28(1): 559–586.
<http://dx.doi.org/10.1146/annurev.energy.28.050302.105551>
- Rotmans, J. 2006. Tools for Integrated sustainability assessment: a tow track approach, *The integrated Assessment Journal Bridging Sciences & Policy* 6(4): 35–57.
- Simanauskas, L. 1997. *Informacinių sistemų analizė*. Vilnius: Vilniaus universiteto leidykla. 140 p. ISBN 998-9162-765
- Spangenberg, J. H. 2002. Institutional sustainability indicators: An analysis of the institutions in Agenda 21 and a draft set of indicators for monitoring their effectivity, *Sustainable development* 10(2): 103–115.
<http://dx.doi.org/10.1002/sd.184>
- Statistical Yearbook of Lithuania 2013*. Statistics Lithuania. Vilnius. 672 p. ISSN 2029-3631
- Statistics Lithuania*. Available on Internet: <http://www.stat.gov.lt/>