









“Assessment of the socio-economic and environmental development of a region: A result-oriented approach”

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ARTICLE INFO


Borys Burkynskyi, Valerii Horiachuk, Oleksandr Laiko, Nataliya Shlafman and Olena Krivtsova (2021). Assessment of the socio-economic and environmental development of a region: A result-oriented approach. *Problems and Perspectives in Management*, 19(2), 40-56. doi:[10.21511/ppm.19\(2\).2021.04](https://doi.org/10.21511/ppm.19(2).2021.04)

DOI [http://dx.doi.org/10.21511/ppm.19\(2\).2021.04](http://dx.doi.org/10.21511/ppm.19(2).2021.04)

RELEASED ON Tuesday, 27 April 2021

RECEIVED ON Wednesday, 10 February 2021

ACCEPTED ON Wednesday, 21 April 2021

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JOURNAL "Problems and Perspectives in Management"

ISSN PRINT 1727-7051

ISSN ONLINE 1810-5467

PUBLISHER LLC “Consulting Publishing Company “Business Perspectives”

FOUNDER LLC “Consulting Publishing Company “Business Perspectives”


NUMBER OF REFERENCES
32


NUMBER OF FIGURES
12


NUMBER OF TABLES
0

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BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Received on: 10th of February, 2021

Accepted on: 21st of April, 2021

Published on: 27th of April, 2021

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Conflict of interest statement:

Author(s) reported no conflict of interest

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ASSESSMENT OF THE SOCIO- ECONOMIC AND ENVIRONMENTAL DEVELOPMENT OF A REGION: A RESULT-ORIENTED APPROACH

Abstract

Assessment of the socio-economic and environmental development of regions is one of the main tasks of regional policy, especially in the context of the decentralization reform in Ukraine. Biased and unsubstantiated assessment can disorient management bodies and significantly reduce efficiency and effectiveness of management, which leads to negative consequences. The paper aims to assess the development of Ukrainian regions based on the result-oriented approach. The analysis of available methodical approaches to the assessment has shown that they have significant conceptual flaws and do not provide a reasonable and transparent assessment. The proposed methodical approaches are as follows: the use of a model of sustainable development and assessments in the social, economic and environmental fields; transition from an integral indicator to a limited range of key indicators (results); use of additional indicators that complement the main ones; calculation of the rating of a region in the world; determination of the trend of changes in key indicators over the past 10 years; qualitative assessment of the regions' state based on thresholds. Based on the proposed approach, the socio-economic and environmental development of Odesa region is assessed.

Keywords

factor approach, result-oriented approach, integral indicator, key indicators, sustainable development

JEL Classification

O18, P25

INTRODUCTION

Ukraine's adoption of the Sustainable Development Goals for the period up to 2030 and the implementation of the decentralization reform determine the relevance of the socio-economic and environmental assessment of regional development. The state support for the regional development should be methodically based on the results of an objective assessment of regional development. An unjustified assessment can disorient management bodies and lead to subjectivism in making managerial decisions, significantly reduce the efficiency and effectiveness of management and, accordingly, lead to negative consequences.

A reasonable assessment of the socio-economic and environmental development of a region is a necessary condition for solving the problems of regional management in the current and future periods; analyzing the effectiveness of regional executive authorities and local self-government; conducting interregional comparisons; developing regional strategies and targeted regional programs; determining promising directions for using the region's potential and forming resource support; preserving and increasing the potential of a region; preventing negative processes with the possibility of transition of the

region into the category of depressed regions. Therefore, the availability of scientifically based methods and tools for assessing the socio-economic and environmental development of regions is of great importance both from a research and management point of view.

1. LITERATURE REVIEW AND THEORETICAL BASIS

The analysis of existing methods for assessing the regional development allows distinguishing two main approaches such as factor and result-oriented. According to the first approach, the assessment is carried out on the basis of factors that affect the socio-economic and ecological state of a region, for example, the volume of investment, the cost of fixed capital, the level of education and qualifications of the population, the state of the institutional environment, the availability of natural resources, geographical location, etc. According to the second approach, the level of development of a region is determined based on the results of its activities.

Results and factors of regional development are correlated as a function and its arguments:

$$[y_1, y_2, \dots, y_k] = f(x_1, x_2, \dots, x_n), \quad (1)$$

where y_1, y_2, \dots, y_k are the results of the region's activities; x_1, x_2, \dots, x_n are the factors affecting the results of the region's activities.

The factor approach is most widely used. Experts who use it believe that one or more socio-economic and environmental indicators cannot fully reflect the level of the regional development, as well as ensure their objective comparison. For a comprehensive assessment of the level of the regional development, they suggest using a significant number of indicators based on which the integral indicator is calculated.

Within the framework of the factor approach, regional development assessment is carried out according to the following algorithm (Goryachuk, 2011):

- development of the structural model of the regional development;
- identification of the main factors that determine the regional development level;

- determination of weighting factors;
- choosing the form of factors aggregation into integral indicator of the level of the regional development;
- calculation of the integral indicator of regional development;
- use of statistical methods for comparative analysis of the regional development and research of the dynamics of their development.

The structural model for assessing the regional development should present the main system-forming factors that affect its development. Since the model for assessing the regional development level is always formed by researchers, the definition of a set of factors, based on which the assessment is carried out, always has the elements of subjectivism and simplification. Accordingly, the evaluation results also contain a significant share of subjectivity.

As a part of the factor approach, Pripoten (2017) proposed a three-stage procedure for assessing the regional development based on a three-level hierarchical system of indicators. At the first stage, the selected factors are normalized using the threshold values of intervals. This allows the value of a specific factor of the analyzed region not to be tied to the other region values. The assessment result is not to place a region on the rating scale, as is usually done in many other studies, but to determine the place of the region on the threshold scale. The resulting values have an economic interpretation. At the second stage, two generalizing indicators are calculated, which characterize the social and economic aspects of the region's development, respectively. When calculating them, the significance (weight) of the initial factors is taken into account. At the third stage, an integral development indicator is calculated based on generalizing indicators of social and economic development of the region, while taking into account the significance (weight) of generalizing indicators. Difficulties in

the practical application of the proposed approach are due to the problems of determining thresholds, assessing the significance of initial factors and generalizing indicators. It should be particularly noted that the integral indicator of regional development does not have meaningful content.

Sergeev and Klimuk (2014) proposed their version of the three-stage regional development assessment procedure. As intermediate generalizing indicators, not two (social and economic) are used, but four (production, socio-demographic, financial and economic, environmental and energy). Each of them is characterized by a set of factors. The main methods for calculating weighting coefficients are the hierarchy analysis method, the point method, and the Fishburne method. Difficulties in the practical application of the proposed approach are associated with the problems of determining the significance of initial factors and generalizing indicators. Just as in the previous methodology, the integral indicator of regional development does not have a meaningful content.

Feraru and Orlova (2014) suggest using relevant per capita statistics to calculate baseline indicators, thereby ensuring comparability of the data. Summary indicators that characterize the level of development of a certain sphere of the socio-economic system are proposed to be defined as the arithmetic mean of normalized values of basic indicators. At the same time, it is assumed that all baseline indicators are interchangeable, and a decrease in the value of one of the normalized indicators is fully compensated in the integral assessment by a positive change in the normalized value of another baseline indicator. The model uses six intermediate generalizing indicators (natural resource development, personnel development, economic development, innovative development, infrastructure development, and social development). Determination of the integral indicator of socio-economic development of the region (I_{int}) is proposed to be carried out as follows:

$$I_{int} = \sqrt[6]{I_{nrd} \cdot I_{pd} \cdot I_{ed} \cdot I_{id} \cdot I_{infr} \cdot I_{sd}}, \quad (2)$$

where I_{nrd} – the level of natural resource development of a region, I_{pd} – the level of personnel development of a region, I_{ed} – the level of economic development of a region, I_{id} – the level of

innovative development of a region, I_{infr} – the level of infrastructure development of a region, and I_{sd} – the level of social development of a region.

According to Feraru and Orlova (2014), to achieve sustainable socio-economic development of a region, all values of summary indicators should be in the zone above the threshold and regulatory limits.

In Ukraine, attempts have been repeatedly made to introduce a system for assessing regional development at the state level. On April 15, 2003, the State Statistics Service of Ukraine adopted Order No. 114 “On approval of the methodology for calculating integral regional indices of economic development” (State Statistics Service of Ukraine, 2003). According to this Methodology, the assessment is carried out based on 28 basic indicators, which are divided into five blocks: macroeconomic efficiency; financial stability; innovation and scientific development; market transformations and entrepreneurship development; and investment attractiveness. Integration with the system of social development indicators and the corresponding construction of the integral index of socio-economic development occurs at the second stage of calculations.

Regarding the remark of Yaroshenko and Semygulina (2015) on the need to consider the growth rate of GRP, one should talk about assessing the trend over the past 5-10 years.

Resolution of the Cabinet of Ministers of Ukraine No. 113 dated February 4, 2004 approved the methodology for determining a comprehensive assessment of the results of socio-economic development of regions (Cabinet of Ministers of Ukraine, 2004). It uses 35 indicators of socio-economic development of regions, and the assessment itself is carried out in two stages. At the first stage, the rating is determined based on the results of relative deviations of regional development indicators from their best values among all regions, and at the second stage, the arithmetic mean of the sum of regional ratings for all indicators is determined. Based on the results of these calculations, the place of each region in the overall rating is determined.

On April 6, 2005, the Cabinet of Ministers of Ukraine adopted the Resolution No. 263 “*On the introduction of monitoring the results of the activities of the Cabinet of Ministers of Ukraine and the Council of Ministers of the Autonomous Republic of Crimea, regional, Kyiv and Sevastopol City State Administrations*” (Cabinet of Ministers of Ukraine, 2005). According to this Resolution, monitoring of the state of socio-economic development of the regions was carried out based on 48 indicators in seven areas: real sector; investment and foreign economic activity; financial sector; social sector; consumer market; crime; and small business development. The regions were not rated.

In 2005, the Law of Ukraine “*On stimulating the development of regions*” (ZU, 2005) was adopted, pursuant to Article 10 of which, on June 24, 2006, the Cabinet of Ministers of Ukraine adopted the Resolution No. 860 “*On approval of the procedure for monitoring the development indicators of regions, districts, cities of republican significance in the Autonomous Republic of Crimea and regional significance for recognizing territories as depressed*” (Cabinet of Ministers of Ukraine, 2006). This Resolution defined 10 indicators for recognizing territories as depressed. On March 2, 2010, the Cabinet of Ministers of Ukraine adopted the Resolution No.235, which approved a new procedure for monitoring socio-economic indicators of the development of regions, districts and cities of regional and republican significance in the Autonomous Republic of Crimea for recognizing territories as depressed (Cabinet of Ministers of Ukraine, 2010). Paragraph 3 of the Procedure defines that a region can be considered depressed if over the past five years the average indicator of the volume of gross regional product (before 2004 – the volume of gross value added) per person in actual prices is the lowest in all regions. In other words, only one region can be defined as a depressed region. It is clear that this approach is unfounded. In the European Union, about 25 percent of regions are considered depressed (regions where the level of gross regional product per capita is less than 75% of the community average). According to this Resolution: the list of territories is defined that granted the status of depressive; their borders are established; the period for which the territory is granted the status of depressed is determined; measures of state stimulation of the development

of the territory in order to overcome the depressed state and the forms and conditions of their application are defined; the ratio of state, regional and other financial resources that are directed to the implementation of the program for overcoming the state of territory depression; the term for introducing the draft program for overcoming the state of territory depression.

The Resolution of the Cabinet of Ministers of Ukraine “*On the introduction of a comprehensive assessment of the socio-economic development of the Autonomous Republic of Crimea, regions, Kyiv and Sevastopol*” No. 833 as of June 20, 2007 (Cabinet of Ministers of Ukraine, 2007) approved the Methodology for rating the socio-economic development of regions, which is an updated version of the Methodology approved by the Resolution of the Cabinet of Ministers of Ukraine No. 113 dated February 4, 2004 (Cabinet of Ministers of Ukraine, 2004). For a comprehensive assessment, 39 indicators of socio-economic development are used in five areas: real sector; investment and foreign economic activity; public finances and financial results of enterprises; social sector; and consumer market. In addition, the Methodology contains the “Index of physical volume of gross regional product” indicator and two other groups of indicators “Sphere of small business development” and “Sphere of ecology”, which are not included in the assessment and are informational in nature. Assessment is carried out in three stages. At the first stage, the assessment is based on calculating the relative deviations of indicators of each region from the maximum and minimum values of such indicators among all regions.

At the second stage, the average value of ratings for all indicators that characterize the particular type of activity is determined, and at the third stage, the integral rating assessment of regional development is determined as the arithmetic mean of ratings for all types of activities. The region with the lowest integral rating is considered the best.

The Resolution of the Cabinet of Ministers of Ukraine No. 650 as of June 9, 2011 (Cabinet of Ministers of Ukraine, 2011) approved the Procedure and Methodology for assessing the results of the activities of the Council of Ministers of the Autonomous Republic of Crimea, regional, Kyiv and

Sevastopol City State Administrations. The assessment methodology remained the same as the previous one (Resolution of the Cabinet of Ministers of Ukraine No. 833 dated June 20, 2007), but the number of indicators increased to 81, and the number of areas to 11 (economic development; investment and innovation; public finance; business support; consumer market; population and labor market; housing and communal services; education and health; protection of children's rights; crime rate; ecology). Two groups of indicators, "Business support" and "Ecology", are not used in the assessment and are only informational in nature.

The Resolution of the Cabinet of Ministers of Ukraine No. 856 as of October 21, 2015 (Cabinet of Ministers of Ukraine, 2015) approved the Procedure for monitoring and assessment of the effectiveness of the implementation of state regional policy and the Methodology for monitoring and evaluating the effectiveness of the implementation of state regional policy (hereinafter referred to as the Methodology).

According to the Methodology, the assessment of the socio-economic development of regions is carried out annually on the basis of 64 indicators in 12 areas. In 2018, the first place was taken by Kharkiv region, and after it, the second and third places were taken by Rivne and Vinnytsia regions, respectively; only the fourth place was taken by Dnipropetrovsk region. The last places were taken by Mykolaiv, Odesa and Chernihiv regions (excluding Donetsk and Luhansk regions) (Table 1) (Ministry of Regional Development, Construction, Housing and Communal Services of Ukraine, 2018).

The fifth and sixth places were taken by Chernivtsi and Ternopil regions, which traditionally, together with Zakarpattia region, occupy the last places in terms of GRP per capita. Poltava, Zakarpattia and Odesa regions, which have always been considered developed regions, ranked ninth, nineteenth and twenty-first, respectively (the penultimate one excluding Donetsk and Luhansk regions).

According to calculations using this Methodology, the rating of many regions changed dramatically (Ministry of Regional Development, Construction, Housing and Communal Services of Ukraine, 2016, 2017, 2018). Therefore, in 2015, Kyiv region took the 5th place, in 2016 it rose to the 2nd place, and then there was a sharp drop to the 13th place in 2017, and again a rise to the 7th place in 2018. A similar pattern occurs in the case of Ivano-Frankivsk, Ternopil and other regions. Ivano-Frankivsk region, in terms of falling and rise, fell from the 3rd to the 15th place, and Ternopil region also rose from 14th to 6th place in terms of falling and rise (Figure 1).

Since the regions as the socio-economic systems are inertial, such drastic changes in the assessment of their development level are difficult to explain. Therefore, questions regarding the validity of the Methodology arise.

The analysis of the Methodology shows that it has significant disadvantages.

Use of an integral indicator to assess socio-economic development. Firstly, the calculation of such an assessment is carried out by averaging different in-

Table 1. Assessment of the socio-economic development of Ukrainian regions in 2018

Source: Ministry of Regional Development, Construction, Housing and Communal Services of Ukraine (2018).

Region	Place	Region	Place
Kharkiv region	1	Volyn region	13
Rivne region	2	Kirovohrad region	14
Vinnytsia region	3	Ivano-Frankivsk region	15
Dnipropetrovsk region	4	Sumy region	16
Chernivtsi region	5	Kherson region	17
Ternopil region	6	Zakarpattia region	18
Kyiv region	7	Zaporizhzhia region	19
Cherkasy region	8	Mykolaiv region	20
Poltava region	9	Odesa region	21
Lviv region	10	Chernihiv region	22
Khmelnitskyi region	11	Donetsk region	23
Zhytomyr region	12	Luhansk region	24

Source: Ministry of Regional Development, Construction, Housing and Communal Services of Ukraine (2017, 2018).

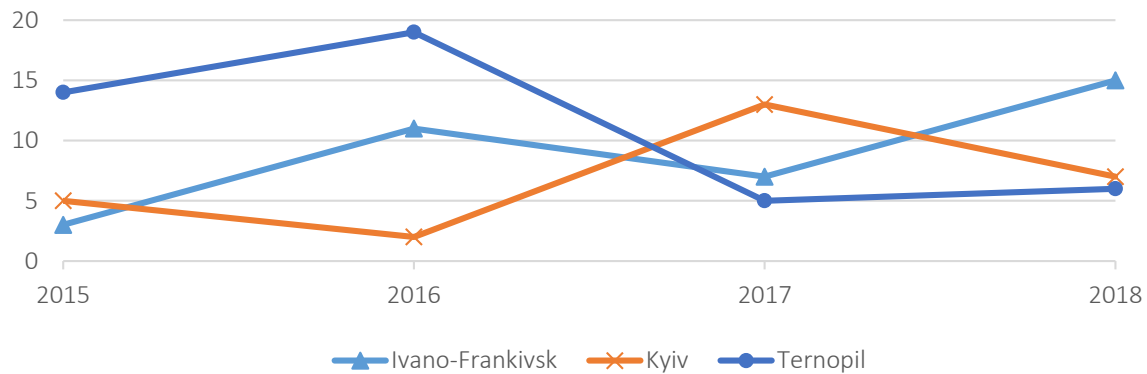


Figure 1. Ranking positions of Ivano-Frankivsk, Kyiv and Ternopil regions in the rating of socio-economic development of Ukrainian regions in 2015–2018

dicators that have different measurement units. The compilation of such indicators as the volume of industrial products sold per person, the total mortality rate per 1 thousand people of the available population, the real wage index for the previous year, the density of public roads, the share of children covered by extracurricular education, disposable income per person, the volume of emissions of pollutants from stationary sources, etc. does not make any sense and content. This is not even the average temperature in the hospital, because in the latter case we are talking about averaging only one “temperature” indicator in different patients.

Secondly, when calculating the integral estimate, there is a double and distorted accounting. For example, the Methodology uses gross regional product (*GRP*) and the volume of industrial output sold per person (*V_ind*) as indicators. The value of the latter indicator consists of gross value added and intermediate costs for its creation (raw materials and services). Therefore, when compiling these two indicators (*GRP* and *V_ind*), there is a double counting of Gross Value Added created in industry (*GVA_ind*), because it is already taken into account in the *GRP*:

$$GRP = GVA_{ind} + GVA_a + GVA_{transp} + GVA_{const} + \dots \quad (3)$$

$$V_{ind} = GVA_{ind} + Intermediate_costs (raw\ materials, services). \quad (4)$$

Adding the second component of the volume of industrial products sold, namely intermediate

costs (raw materials and services) to the *GRP* value, distorts the integral assessment of the regional development. Because the higher the intermediate costs, the greater the integral estimate. This is with the same regional product value. That is, with the inefficient use of resources, we have more importance of an integrated assessment of the regional development. The same applies to other types of activities (agriculture, transport, trade, construction, etc.).

The distortion of the integral assessment of the regional development also occurs when using indicators that affect the gross regional product, namely fixed assets, capital investment, foreign investment, etc. For example, the larger the volume of capital investment (with the same gross regional product), the larger the integral valuation. In other words, a region that uses capital investment less efficiently is more important for an integral assessment of the regional development.

Lack of a balanced regional development assessment model. The model should present the main system-forming factors that determine the development of a region, and they should be balanced. The current Methodology is based on 12 groups of indicators: economic and social cohesion, economic efficiency, investment and innovation development and foreign economic cooperation, financial self-sufficiency, development of small and medium-sized businesses; labor market efficiency, infrastructure development, renewable energy and energy efficiency, availability and quality of services in the field of education, availability and

quality of services in the field of health, social protection and safety, rational use of natural resources and environmental quality (Cabinet of Ministers of Ukraine, 2015). When considering these groups in the context of the concept of sustainable development, namely economic, social and ecologic spheres, one can see six groups of economic indicators, three groups of social indicators, one group of environmental indicators, one mixed group of economic and social indicators and another mixed group of economic and environmental indicators. That is, when calculating an integral indicator, the weight coefficient of economic indicators is 0.58, social indicators – 0.29, and environmental indicators – 0.13. Thus, the model for assessing the regional development in the context of sustainable development concept is not balanced.

A large number of indicators (64 indicators), no separation of key indicators. Proponents of using a large number of indicators believe that the use of GRP per capita as an integral indicator does not give a complete picture of a region's economic development and, therefore, it is necessary to use additional indicators that provide a more complete picture, for example, the output of basic economic activities, the volume of fixed assets, the volume of investment in fixed capital and foreign investment, the level of income, etc. Various researchers use dozens or even hundreds of indicators, on the basis of which the integral indicator is calculated. But as noted above, the use of a large number of indicators is associated with double accounting and distortion of an integral assessment. Besides, the use of a large number of indicators is associated with the problem of assessment of their impact, as well as with increasing difficulties in developing management decisions aimed at improving regional development.

The lack of comparison of key indicators of Ukraine's regional development with the same indicators in other countries. The lack of comparison of key indicators such as GRP per capita, life expectancy, education level and other indicators of the development of the regions of Ukraine with the same indicators in other countries significantly limits the idea of the level of the development of the regions of Ukraine.

The lack of assessment of trends of key regional development indicators. The assessment of changes

in these indicators over the past year alone does not provide an idea of the current trends in economic, social and environmental spheres of the region.

The lack of assessment of regional development indicators in the context of thresholds. Ranking (location determination) of regions by a certain indicator does not provide a qualitative assessment in terms of thresholds. For example, if we are talking about per capita income, it is advisable to compare it with the threshold value and highlight regions where it is exceeded and where it is not.

The lack of representativeness of certain groups of indicators. The group of indicators "Accessibility and quality of educational services" does not provide an idea of the availability of education. Since secondary education in Ukraine is free, we should talk about higher education. But among seven indicators in the "Accessibility and quality of educational services" group, six relate to preschool and secondary education, and only one to higher education.

The group of indicators "Financial self-sufficiency" does not provide an idea of the self-sufficiency of local communities, since the indicators of this group characterize only local budget revenues, but do not determine the volume of necessary expenditures for the execution of delegated powers.

The above-mentioned disadvantages are typical for most regional development assessment methods developed within the framework of the factor approach.

The result-oriented approach, unlike the factor approach, involves assessment of the level of development of a region based on the results of its activities, and not factors that affect the results. As part of a result-oriented approach, Pashnanov (2012) suggests assessing the development of regional socio-economic systems based on two indicators:

- gross regional product per person as an integral result of the regional economic subsystem, and
- life expectancy at birth as the final result of the social subsystem.

Pashnanov believes that any economic indicator that characterizes the development of the economic subsystem of a region, finally, is reflected in the GRP per person, and any social process (or phenomenon), as a result, affects life expectancy. For example, people who do sports have a much higher life expectancy than those who do not. Moreover, it is widely known that active mental activity, such as active scientific research, increases life expectancy. It is also believed that active occupation of culture and religion contributes to life extension. In the domestic and foreign economic literature, it is noted that the life expectancy of the population of the region depends on the level of the development of the region's economy and its growth rate.

Davydyants (2016) to assess the overall level of the development of regional socio-economic systems, suggested using GRP per capita and life expectancy at birth, which he defined as a "criterion of socio-economic efficiency" (Pashnanov, 2012). The use of such an indicator raises some doubts, since it does not have meaningful content. In addition, indicators such as GRP per capita and Life expectancy at birth are not interchangeable.

Ginevičius and co-authors justify the advantages of the results approach with the following arguments. GDP per capita is a reliable indicator of a country's success and well-being, reflecting the level of its economic development. Foreign direct investment contributes to faster technological development and is an important source of capital creation; the unemployment rate reflects people's participation. The analysis of their dynamics has shown that both foreign direct investment and employment levels are closely related to GDP. This means that GDP reflects both the rapid technological progress of a region and the positive impact on economic development through fixed capital growth with the help of direct foreign investment. Similarly, GDP reflects the situation on the labor market – a high level of GDP reflects a high level of population participation (Ginevičius et al., 2015, 2018).

The model for assessing the level of regional development of the British Institute of Competitiveness is based on a small amount of data – only six statistical indicators are used in the model. In addition, the authors of the model took into account

the hierarchy of factors, separating the "causes" and "results" of the region's activities. The level of regional development is considered as a cumulative result of the economic regional process, which has a group of "input" factors and a group of "output" indicators. The "input" parameters include factors that are a necessary prerequisite for regional development (Goryachuk, 2011):

- business density, which is an indicator of sustainable economic growth through generating new entrepreneurs and firms and is expressed by the number of business entities per capita;
- knowledge-based economy, which is represented by the share of enterprises in the branches of the "knowledge-based economy" in the regional economy; and
- economic activity, which is an indicator of the quality of human capital available in the region.

These factors affect the "output" of a region, which consists in productivity (GRP per capita). Finally, the interaction of these factors is realized in the characteristics of the "result": the average income of the population and the unemployment rate.

In the European Union, the following system of key indicators is used to compare regions and determine their level of development (Sepik, 2005):

- economy (GRP per capita, number of European patent applications per 1 million residents);
- labor market (unemployment rate, stagnant unemployment, employment rate of the population aged 15-64 years);
- demographics (population size, population density per square kilometer, percentage of the population under the age of 15, 15-64 and over 65 years);
- education (educational level of persons aged 25-59 years).

It should be noted that this model is based on the concept of a small number of key factors that determine the level of regional development.

Some researchers, as part of results-oriented approach, suggest that the assessment of the level of regional development should be based on the productivity of using regional resources and, first of all, labor and capital, which are generally measured by the volume of GRP per capita (Shehovtseva, 2001). In regions with higher GRP per capita, citizens tend to have a higher level of income and investors have a higher level of return on investment.

Sepik (2005) points out that GDP per capita is the traditional measure of living standards in the EU. It can be considered as an integral indicator of the level of development of a region in the economic sector. A developed region is characterized by high productivity, high employment and an economically active population:

$$\frac{GRP}{P} = \frac{GRP}{E} * \frac{E}{EAP} * \frac{EAP}{P} \quad (5)$$

where *GRP* – gross regional product, *P* – population, *EP* – employed population, and *EAP* – economically active population.

Sepik (2005) believes that, in addition to productivity per capita, the following indicators of the level of a region's development should be taken into account: the state of social sphere, health and environment.

According to the European Union Strategy "Europe 2020", three priorities of socio-economic growth of the community are defined (Horiachuk, 2018):

- smart growth: economic development based on knowledge and innovation;
- sustainable growth: creating an economy based on the appropriate use of resources, ecology and competition;
- comprehensive growth: promotion of employment, achievement of social and territorial harmony.

In accordance with the target priorities, Eurostat monitors and evaluates the state of regions in the European Union (unity policy) (Eurostat, n.d.).

At its core, the factor approach is mainly aimed at assessing the potential level of development of a region, and, to a lesser extent, at assessing the real level of the region's development. This is recognized by the authors of the widespread factor methodology of the World Economic Forum. The results-oriented approach is more reasonable and provides a more adequate assessment of regional development. Sepik (2005) emphasizes that the level of development of a region is determined by the results (income/standard of living), and not by the factors that affect them.

2. RESULTS

Based on the results of the analysis of methodological approaches to assessing the regional development, a choice was made in favor of results-oriented approach, and the following methodical bases are proposed:

- assessment of regional development based on the results of their activities, and not on the factors that affect these results;
- as an assessment model, it is proposed to use a well-known model of sustainable development and assess the development of a region in the economic, social and environmental fields. This assessment should be balanced. Given that today the main focus is on the economic and environmental spheres, it is necessary to increase attention to the social sphere, especially in the context of growing differentiation in society in terms of income, the ability to purchase their own housing, access to health care and education;
- refusal to use artificial integral indicators at all levels of assessment since they do not have meaningful content;
- refusal to use a large number of indicators and switch to the use of a limited range of key indicators that reflect the main results of economic, social and environmental development;
- use of additional indicators that complement key indicators and provide a more complete picture of regional development;

Table 2. Gross regional product per person

Source: Calculated by the authors on the basis of data from the State Statistics Service of Ukraine (2020).

Indicator	Value
Volume, UAH thousand	62.7*
Place in Ukraine	6
Place in the world	125
State of a region according to the EU criterion	Non-depressive

Note: * – 89% of the average GRP level per person in Ukraine.

- determination of the place of Ukrainian regions in the world by comparing their key development indicators with the same indicators in other countries;
- determination of trends in key indicators of the regional development during the last ten years, and, in some cases, during the entire period of the country's independence;
- qualitative assessment of regional development indicators in the context of thresholds and corresponding grouping of regions.

GRP per capita. The region ranks a fairly high sixth place in Ukraine, but only 125th in the world. According to the European Union criterion, the region is not depressed (a region with a GRP per capita above 75% of the average is considered depressed) (Table 2).

GRP trend. In 2008–2018, this indicator fluctuated significantly; in 2009 and 2015, it dropped to almost 92% from the 2008 level. Over the past three years, there has been a recovery in the index, which in 2018 almost reached the level of 2008 (99.4 %) (Figure 2).

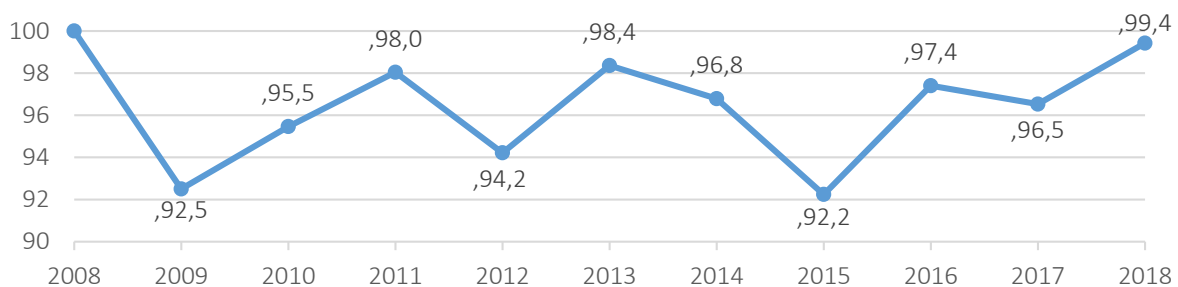
It is proposed to assess regional development in three areas: economic, social, and environmental. Assessment in each area is carried out on the basis of a two-level system of indicators. The upper level consists of key indicators that determine the main results of the development of a particular area, and the lower level consists of additional indicators that complement key indicators.

The GRP structure has significantly deteriorated, the share of the processing industry has decreased by almost 1.6 times, and agriculture has increased by more than 1.5 times. The largest share remained in transport – 18.4%, but it decreased (21.0% in 2008), the second and third places are occupied by trade and agriculture – 14.0% and 11.0%, respectively (Figure 3).

Based on the above-mentioned methodical foundations of the socio-economic and environmental evaluation of regional development, the development of Odesa region in the economic, social and environmental spheres in 2018 was assessed.

Capital investment. In 2008–2018, their level significantly decreased from 31.2% to 13.7% of GRP (a decrease of 2.3 times), the 15th place in Ukraine. In 2009 and 2015, they dropped to 15.2% and 10.0% of the GRP level, respectively. Over the past three years, the level of capital investment has grown and fluctuated around 14.2% (Figure 4).

Source: Calculated by the authors on the basis of data from the State Statistics Service of Ukraine (2020).

**Figure 2.** Index of physical volume of GRP in Odesa region in 2008–2018, percent (2008 = 100 %)

Source: Calculated by the authors on the basis of data from the State Statistics Service of Ukraine (2020).

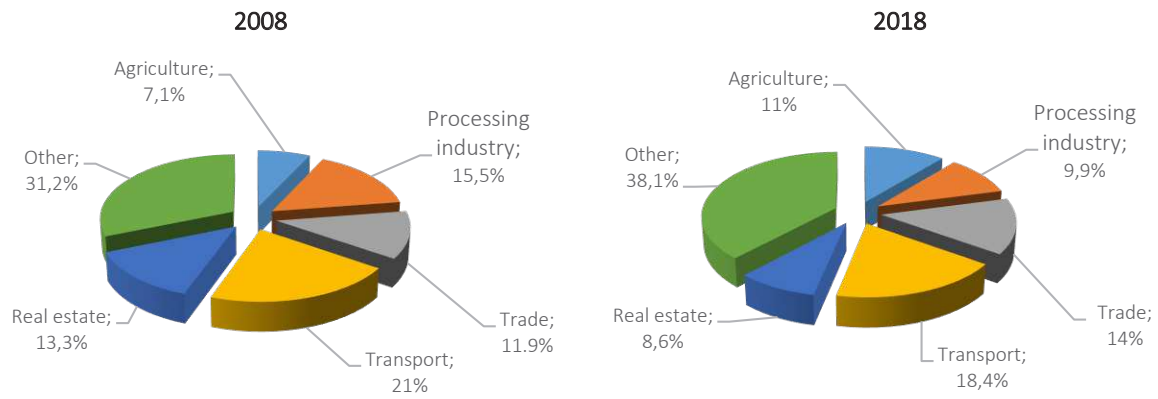


Figure 3. GRP structure in Odesa region in 2008 and 2018

Source: Calculated by the authors on the basis of data from the State Statistics Service of Ukraine (2020).

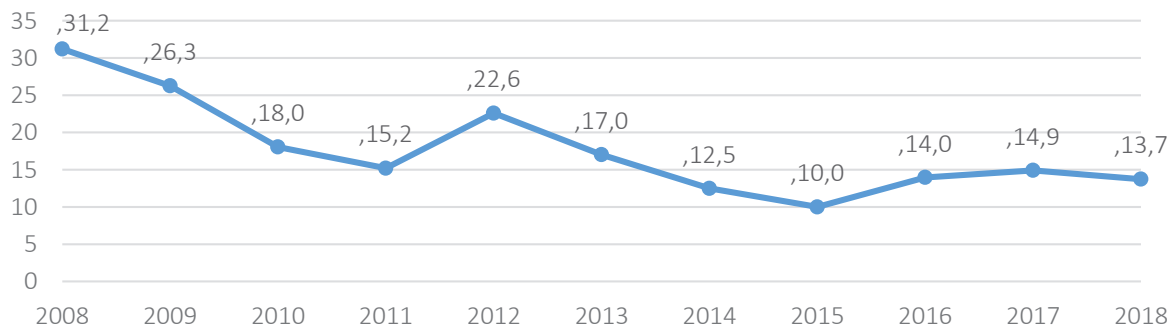


Figure 4. Capital investment in Odesa region in 2008–2018, interest rate to GRP

Source: Calculated by the authors on the basis of data from the State Statistics Service of Ukraine (2020).

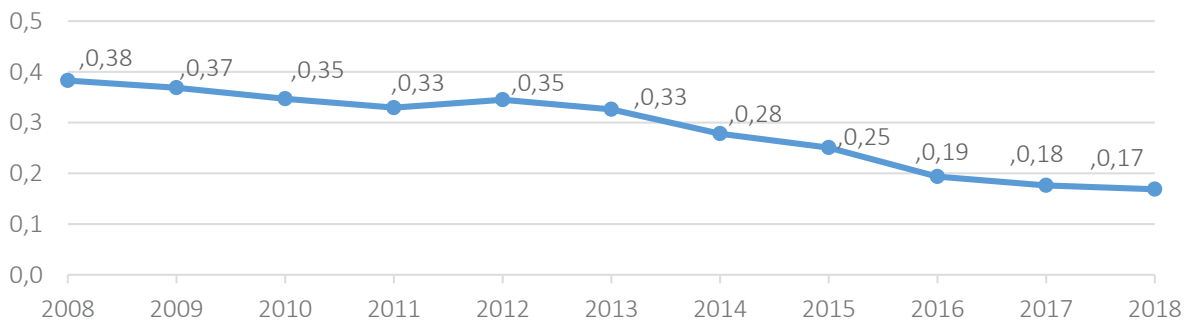


Figure 5. Internal current expenses for R&D in Odesa region in 2008–2018, percent to GRP

Internal current expenses for R&D. In 2008–2018, there was a steady downward trend of this indicator from 0.38% to 0.17% of GRP (a decrease of 2.3 times), the 8th place in Ukraine in 2018 (Figure 5). This is significantly less than in the EU, where the average cost of R&D is 1.7% of GDP.

Disposable income per person. The region occupies a fairly high sixth place in Ukraine (63.2 thousand UAH). After the 2009 financial crisis, the disposable income index per person grew and exceeded 150% in 2013. In 2014–2015, it dropped to almost 110%. In the future, it recovered, and in 2018 reached the level of 146.6% (Figure 6).

Source: Calculated by the authors on the basis of data from the State Statistics Service of Ukraine (2020).

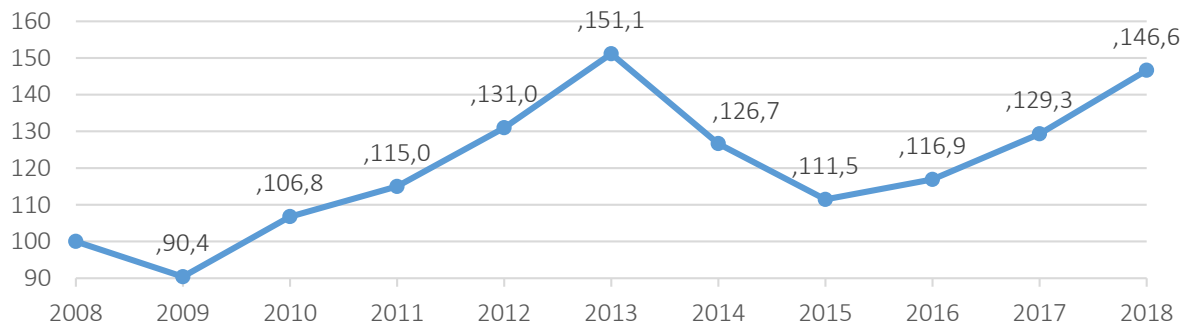


Figure 6. Disposable income index in Odesa region in 2008–2018, percent (2008 = 100 %)

Source: Calculated by the authors on the basis of data from the State Statistics Service of Ukraine (2020).

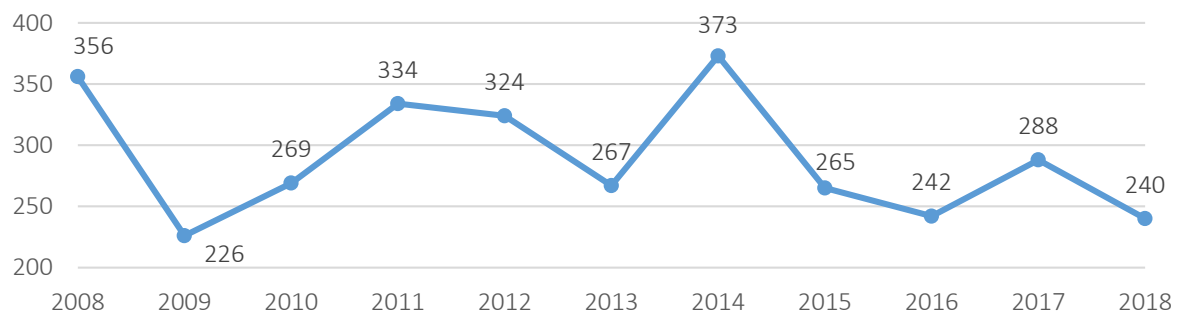


Figure 7. The area of residential buildings commissioned in Odesa region in 2008–2018, m² per 1 thousand people

Source: Calculated by the authors on the basis of data from the State Statistics Service of Ukraine (2020).

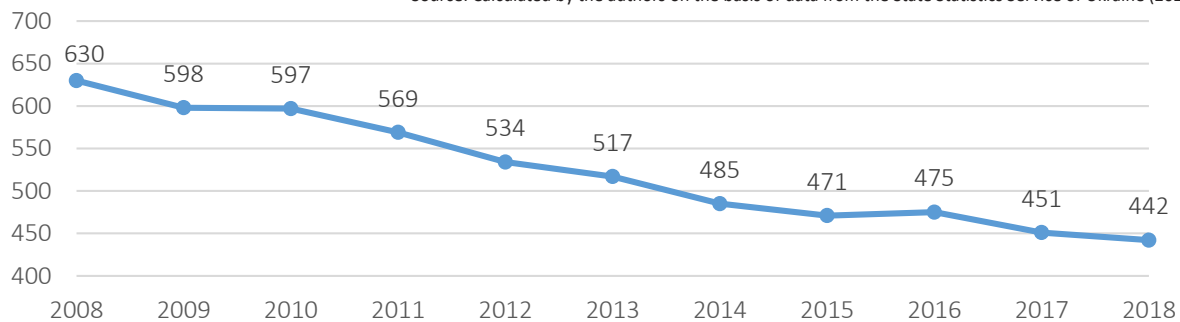


Figure 8. The number of students in higher education establishments in Odesa region in 2008–2018, people per 10 thousand population

Housing affordability. The region is among the top ten in Ukraine (10th place, 240 m² per 1 thousand people). The volume of housing construction in 2008–2018 fluctuated significantly, the general trend is falling, from 356 m² to 240 m² per 1 thousand people (Figure 7).

Medicine availability. In terms of “infant mortality” (7.6 per 1 thousand newborns) and “life expectancy” (71.0 years), the region ranks in the middle of the second ten in Ukraine – 15th and 16th plac-

es, respectively, and 62nd and 125th places in the world, respectively. The average life expectancy in 2013–2018 increased by more than six months and in 2018 was 71 years.

Education accessibility. The region ranks very high in terms of the “number of students in universities per 10 thousand population” – the third place in Ukraine (442 students). The number of students in 2008–2018 fell almost 1.5 times, from 630 to 442 students per 10 thousand population (Figure 8).

Source: Calculated by the authors on the basis of data from the State Statistics Service of Ukraine (2020).

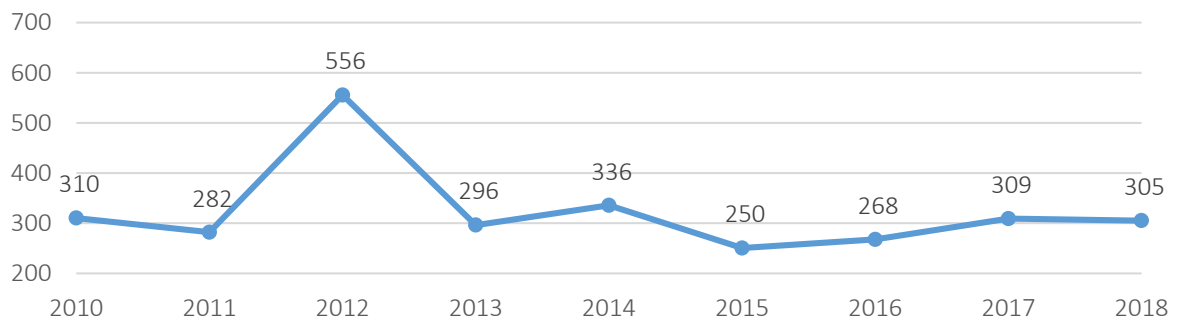


Figure 9. 4th class waste generation in Odesa region in 2010–2018, kg per 1 person

Source: Calculated by the authors on the basis of data from the State Statistics Service of Ukraine (2020).

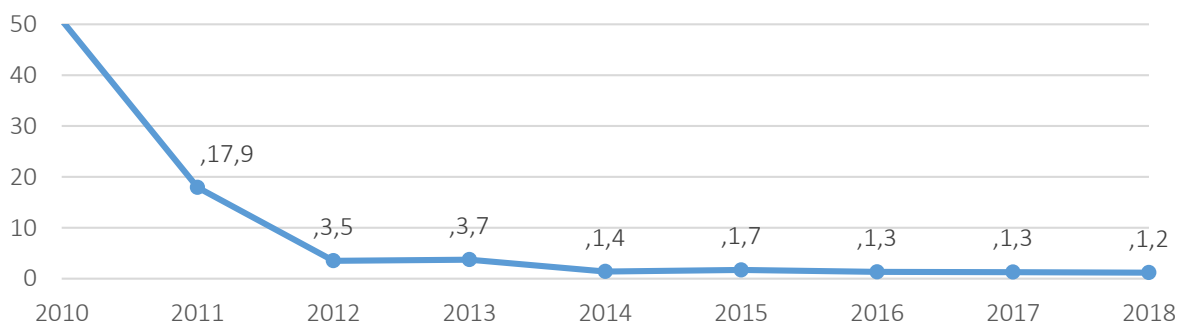


Figure 10. 4th class waste disposal in Odesa region in 2010–2018, percent

Source: Calculated by the authors on the basis of data from the State Statistics Service of Ukraine (2020).

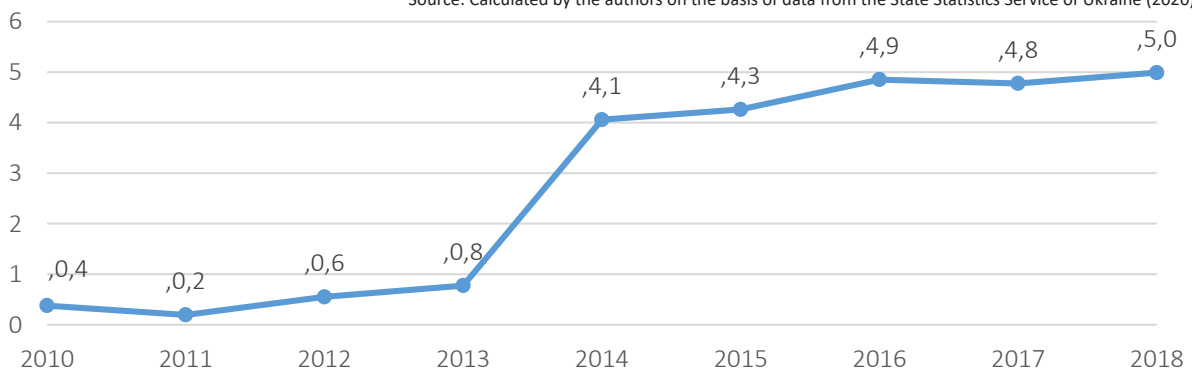


Figure 11. 4th class waste accumulation in Odesa region in 2010–2018, tons per person

4th class waste generation. The region ranks tenth in Ukraine (727 thousand tons), its share in Ukraine is 0.2%. But per person, the region ranks high – third place (305 kg). 4th class waste generation in Odesa region in 2010–2018 was stable and fluctuated at the level of 300 kg per 1 person per year, with the exception of 2012, when there was an increase to 556 kg (Figure 9).

4th class waste disposal. The region occupies one of the penultimate places in Ukraine – 23rd

place. The level of waste disposal in the region is very low, in 2014–2018 it was less than 2% (Figure 10).

4th class waste accumulation. The region ranks tenth in Ukraine (11.9 million tons), its share in Ukraine is 0.1%. 4th class waste accumulation is 5.0 tons per person, the sixth place in Ukraine. In 2010–2018, the accumulated volume of 4th class waste per 1 person increased from 0.4 tons to 5.0 tons (Figure 11).

Source: Calculated by the authors on the basis of data from the State Statistics Service of Ukraine (2020).

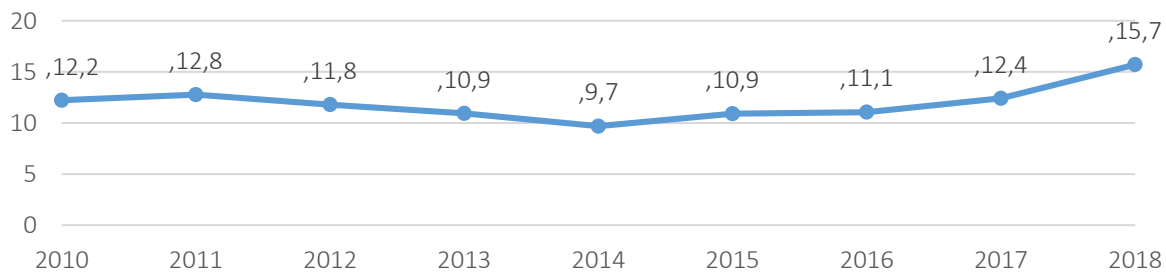


Figure 12. Air emissions from stationary sources of pollution in Odesa region in 2010–2018, kg per person

Emissions into the atmosphere from stationary sources of pollution. According to this indicator, Odesa region ranks thirteenth in Ukraine (37.4 thousand tons), its share in Ukraine is 1.5%. Emissions amount to 15.7 kg per person, the tenth place in Ukraine. In 2010–2018, the average level of atmospheric emissions was about 12 kg per person. In 2014–2018, there was an upward trend (Figure 12).

CONCLUSION

The analysis of existing methodological approaches to assessing the development of Ukraine's regions has shown that the most common is the factor approach; it has significant conceptual flaws, first of all, this is due to the use of an integral assessment, which is calculated by averaging different indicators that have different units of measurement. At the same time, there is a double and distorted accounting, and the assessment itself does not have a meaningful content.

It is shown that the results-oriented approach is more reasonable, according to which, unlike the factor approach, the level of development of a region is determined by the results (standard of living/income), and not by the factors that affect them. Within the framework of this approach, the methodological bases for socio-economic and environmental assessment of regional development are proposed. They are grounded on the use of a sustainable development model, which includes social, economic and environmental components. The scientific novelty consists in the following: transition to a limited range of key indicators that determine the results of the region's activities; use of additional indicators that complement key indicators; determining the place of regions in the world; assessing trends in key indicators of regional development in the last 10 years; qualitative assessment of regional development indicators in the context of threshold (critical) values. The proposed methodological foundations provide a reasonable and transparent assessment of the development of Ukraine's regions, which gives a comprehensive view of the state and trends in the development of a region and is intended for top managers of government bodies.

Calculations carried out to assess the development of Odesa region in the economic, social and environmental spheres showed that, according to most of the key indicators, it is in the top ten regions of Ukraine, the level of its development according to the concept of sustainable development is balanced and, according to the criterion of the European Union, the region is not depressed.

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ACKNOWLEDGMENTS

This publication was prepared within the framework of the scientific project “Organizational and economic mechanism of increasing productivity of entrepreneurial activity in Ukraine” at the expense of the budget program “Support of priority areas of scientific research development” (KPIK6541230).

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