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**THEORETICAL JUSTIFICATION OF INDICATORS SYSTEM TO  
ESTIMATE THE REGIONAL STABILITY LEVEL CONSIDERING ITS  
DEVELOPMENT PECULIARITIES**

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*The article deals with theoretical analysis of the indicators system concept, observes in details such components of this system as society, nature, economy. The general indicators of social, ecological, and economic system development are considered. It has been found that indicators are the indexes system of ecological, economical, and social development and give the possibility to analyze and control the implementation of areas sustainable development statement. The system of indicators, which characterize the level of the region stability on the basis of domestic and foreign experience considering region peculiarities, has been improved. At that, the regional peculiarities of both the natural and resource potential and the economical activity impact on the natural and resource potential have been taken into account.*

**Keywords:** *sustainable development, indicator, index, indicators of sustainable development, indicators of social and economic development.*

**Problem statement.** Providing of a region sustainable development is possible only through overcoming the contradictions between economical growth, preservation of natural resources, and improvement of people's living standards. Regardless to gained experience, the indicators system requires further research and improvement for determination of the stability level in the regional ecological and economical system. Thus, formation and further improvement of ecological, economical, and social indicators system will allow to evaluate and to predict the

scenarios of regions approaching to sustainable development.

**Analysis of last researches and publications.** The scientific works of such native and foreign scientists as H. O. Bilyavskyj [1], Z. V. Herasymchuk [2], B. M. Danylyshyn [3], V. I. Danilov-Danylyan [4], S. I. Dorohuntsov [5], O. V. Kubatko [6], L. H. Melnyk [7], D. H. Medouz [8], V. V. Tarasova [9] and other scientists are devoted to the problems of the region and areas sustainable development assessment owing to indicators, indexes, and values.

**Statement of pending issues.** On the one hand, the problems to study regions sustainable development have been studied quite enough, but on the other hand, they require improvement on the basis of the region sustainable development peculiarities. For example, the southern region of Ukraine, which has the evolved water utilization system with not always positive influence on environment along with the traditional sectors of economy.

**The object of the article** is to improve the indicators system, which characterize the level of the region stability, based on domestic and foreign experience.

**The main material of the research.** The ecological and economical sustainable development in the region is evaluated through certain indexes and indicators. Today there is not any universal algorithm to form the indicators of result, effectiveness, and balancing of administrative and territorial units development, but there are recommendations, which help to form a row of indicators for the certain region considering its peculiarities.

The indicators of the regional sustainable development are the key numerical values of economical, ecological, and social state in region, which reflect the tendencies of its development and different factors influence on stability. The factors and components of the regional sustainable development require their qualitative and quantitative values-indicators. The indicator means the limits of the scope, within which the ecological and economical system can function stably and self-developed. In contrast to the indicator, which shows only the quantitative constancy, the indicator has the vector character, directed in time.

For the first time the task of indicators elaboration was set in 1987 by the World Commission of Environment and Development (Brundtland Commission). The necessity in elaboration of sustainable development indicators was marked at “Agenda 21”, adopted at United Nations Conference of Environment and Development in Rio de Janeiro in 1992. In chapter 40 of this document (“Information for decision-making”) it is noted: «...with the purpose to create reliable basis for the decision-making process at all levels and to assist to easing of self-regulated stability of complex ecological systems and development systems, it is necessary to elaborate the sustainable development indicators».

On the international level the project on 134 indicators of sustainable development has been elaborated, which are divided into major groups: the indicators of sustainable development social aspects, the indicators of sustainable development economical aspects, the indicators of sustainable development ecological aspects (including the characteristics of water, ground, atmosphere, other natural resources, and wastes) and the indicators of sustainable development institutional aspects (programming and planning of politics, scientific workings-out, international judicial instruments, information support, enhancement of the population major groups role). The suggested indicators in the project require special transformations, adjustment to certain conditions, and in some cases – extension for some countries.

Eventually the indicators and indexes of sustainable development are constantly being regulated, completed, improved, and determined depending on the aims and peculiarities of researched area.

As the native scientists note, the formation of sustainable development indicators should be started from determination of requirements to their formation, namely:

- sustainable development indicators are necessary to stimulate the working out of policy and respective decisions at all levels: a village, a town, a city, a region, a country, a continent, the world;

- indicators have to react to all important disturbances, which appear in the process of sustainable development. The special indicators are required, which take into account interworking systems and their environment;

- the amount of indicators must be maximum small, but at the same time they must be quite effective and reliable;

- indicators must be clear, exact, understandable, and practical. They must take into account the interests of all participants in the sustainable development process;

- indicators must help to evaluate the life activity, the stability of current events, connected to sustainable development. The problem consists in the fact that indicators depend on the situation, which always changes and is on the move. It is a dynamic process [10, p. 36–38]:

Generalizing the international organizations experience in the sphere of sustainable development indicators elaboration, it is possible to distinguish two principal methodical approaches:

1. Building of the indicators system, each of which reflects separate aspects of sustainable development. Within the range of the whole indicators system the following subsystems can be distinguished: ecological, economical, social, institutional, etc.

2. Creation of integral indicator, by means of which it is possible to judge about the stability level of social and economical development. Such indicator is based on

integration of three indexes groups: ecological and economical, ecological and social and economical, economical and ecological [6].

To measure the indexes of sustainable development economical component, apart from traditional indicators: GDP, manufacturing of products major kinds per capita, native scientist O. H. Osaulenko [11] suggests to use the indicators, which characterize the sectoral structure of the national economy. The economy development is determined by branching of the machine engineering sphere (there are 150-200 sub-branches in developed countries), in Ukraine this index is 160 sub-branches.

Most of scientists [1,7, 11, 12] consider that it is reasonably to study the sustainable development indicators in interconnection “man – environment – economic activity”. In this context the environment is considered as ecological space, which is described by the state of economy, society, and nature. Then ecological, social, and economical factors are to be considered as one integral part. The mentioned indicators are interconnected. For example, the ecological ones (quality of environment) influence the social ones (health condition, birth and mortality rate), the economical ones (level of performance, disease rate of workers), the social ones (improvement of demographic situation) influence the ecological ones in their turn (can cause more intensive usage of natural resources and increase the anthropogenic load on environment in whole) and the economical ones, and economical ones influence ecological and social ones in their turn. The economical systems indirectly depend on the ecological ones, for example the energy producing is performed for the account of mineral resources, and only the usage of energy alternative sources decreases the load on the environment.

Famous native scientists B.V. Burkinskyj, V.N. Stepanov, S.K. Harichkov, A.D. Krysilov propose to consider the sustainable development indicators taking into account the peculiarities of the Ukrainian society.

–social and economical indicators, which include different processes and demonstrations in economy, features and balance of manufacturing (consumption), levels of productivity, gross national product, its structure, the private property role and place;

–social and ecological indicators are characterized by health condition of the population, natural resources uniform consumption, availability of ecotechnologies;

–social and political indicators determine the structure of the society, foresees the availability of democratic institutes, the civil code;

–social and cultural indicators include the education level, the peculiarities of the national mentality, the maturity of service sector, the social institutes evolving;

–international indicators consist in building of relationships with the countries in the world (especially the scientists insist on building of relationships with the

countries of CIS)[13].

Having analyzed the works of L. H. Melnyk, L. B. Shostak, V. V. Tarasova, H. O. Bilyavskyj, O. H. Osaulenko [1,7,9,11,14], we found out that formation of the region sustainable development indicators system is based on the building of ecological, economical, social indicators and on their synergistic influence on the ecological and economical system state. At the same time the compulsory condition is the necessity to take into account the regional peculiarities of both the natural and resource potential and the impact of economic activity on the natural and resource potential. In the table 1 the groups of indicators and their descriptions are given, which can be used for estimation of the stability level in Kherson region.

**Table 1. Description of sustainable development indicators**

Groups of indicators	Description of indicators groups
Economic	<ul style="list-style-type: none"> <li>✓ GDP per capita;</li> <li>✓ Level of the average salary;</li> <li>✓ Production amount of the agricultural production;</li> <li>✓ Factors of market product ecological and economic level (quality, prime cost, production realization price, profit from implementation, production produce profitability</li> <li>✓ Capital investments into ecological and economic activity;</li> <li>✓ Factors of financial provision and payment-worthiness level;</li> <li>✓ Level of the workers' capacity for work</li> </ul>
Ecological	<ul style="list-style-type: none"> <li>✓ Factors, which describe atmosphere air state;</li> <li>✓ Factors to use fresh water by different branches;</li> <li>✓ Quality of water resources;</li> <li>✓ Factors, which describe the impact of water economy melioration complex on land resources (level of subsoil water, salinisation and alkalization of moving soil, level and areas of flood-prone territories etc);</li> <li>✓ Factors of soil water level</li> <li>✓ Level of meliorating lands pollution by heavy metals, by pesticides rests, by radionuclide;</li> <li>✓ Factors of the rational land resources use;</li> <li>✓ Factors of the soils fertility;</li> <li>✓ Factors, which characterize rationality to control ecosystems, to save biological variety;</li> <li>✓ Factors, which describe level to use ecologically secure technologies in economy branches, including agricultural and water sectors;</li> <li>✓ Amounts and directions of nature-protective costs;</li> <li>✓ Factors concerning the ecologically secure control of wastes, waste water, toxic substances;</li> <li>✓ Factors of rural areas development;</li> <li>✓ Level of agriculture sustainable development assistance;</li> <li>✓ Level of economic and producing complex branches ecologization;</li> <li>✓ Nature-protective territories and their state.</li> </ul>

Social	<ul style="list-style-type: none"> <li>✓ Density of population</li> <li>✓ Life duration;</li> <li>✓ Natural population growth;</li> <li>✓ Level of accommodation provision;</li> <li>✓ Level of professional illnesses;</li> <li>✓ Level of poverty;</li> <li>✓ Number of death;</li> <li>✓ Demographic situation;</li> <li>✓ Education level;</li> <li>✓ Professional training level;</li> <li>✓ Informedness and social upbringing;</li> <li>✓ Protection and improvement of people's health;</li> <li>✓ Level of labor efficiency;</li> <li>✓ Growth of labor efficiency;</li> <li>✓ Level of injuries;</li> <li>✓ Improvement of localities development;</li> <li>✓ Level of migration processes in rural localities;</li> <li>✓ Level of gender policy.</li> </ul>
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Indicators have to be interpreted and to unit economic, ecological and social aspects to satisfy modern generation's needs without needs limitation concerning future ones; to be available for their use at regional, state, global levels; to be clear for society. Being tools to make decisions and planning, indicators can conduct an important function, particularly, to inform society and to attract attention to some ecological dangers.

Melnik L.G. supposes [15, p. 730; 16, p. 431] that such interconnection of social, ecological and economic subsystems provides regional stability achievement. Therefore ecological factors play an important role, because, firstly, they influence each subsystem; secondly, they participate in human's physiological functions support or in society personal features formation.

In order to form ecological and economic policy of the sustainable development, oriented to the economic growth in region, and one can achieve social balance through four indicators groups. The suggested indicators groups of the sustainable development consider general theoretical approach, which comes to balanced uniting of economic, ecological and social aspects.

**Conclusions and perspectives of further researches.** Nowadays the list of sustainable development indicators has not been approved yet in Ukraine. There are no administration bodies, which have to calculate these indicators annually with purpose to give such tasks, which could be realized in economic and social and economic development plans. Great Britain can be example. It uses more than 30 indicators, which are annually approved, measured and recorded. Generally, such mechanisms have been founded in more than 40 countries within proper recommendations of UNO.

Mutual disharmonious imposition and connection of the observed indicators can

lead to appearing of ecological and economic losses and economic activity negative impact on social, ecological and economic system development, its components misbalance, which in its turn can lead to decrease of social and economic and ecological security in region.

Perspectives of further scientific researches have to be focused on legislative and normative base improvement concerning transfer to the sustainable development of territories and country, and on organizational-economic and ecological-economic mechanisms to control nature management within rural areas, regions, districts and country.

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## **ТЕОРЕТИЧНЕ ОБГРУНТУВАННЯ СИСТЕМИ ІНДИКАТОРІВ ДЛЯ ОЦІНКИ РІВНЯ СТАЛОСТІ РЕГІОНУ З УРАХУВАННЯМ ОСОБЛИВОСТЕЙ ЙОГО РОЗВИТКУ**

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*У статті наводиться теоретичний аналіз поняття системи індикаторів, детально вивчені компоненти даної системи, таких як: суспільство, природа, економіка. Розглянуто загальні індикатори розвитку соціо-еколого-економічної системи. Висвітлено, що індикатори є системою показників екологічного, економічного та соціального розвитку і дають можливість здійснювати аналіз та контроль за реалізацією положень сталого розвитку територій. Удосконалено систему індикаторів, які характеризують рівень сталості регіону виходячи з вітчизняного та зарубіжного досвіду з урахуванням особливостей регіону. При цьому враховані регіональні особливості як природно-ресурсний потенціал, так вплив господарської діяльності на природно-ресурсний потенціал.*

***Ключові слова:** сталий розвиток, індикатор, показник, індикатори сталого розвитку, індикатори соціально-економічного розвитку.*



**ТЕОРЕТИЧЕСКОЕ ОБОСНОВАНИЕ СИСТЕМЫ ИНДИКАТОРОВ  
ДЛЯ ОЦЕНКИ УРОВНЯ УСТОЙЧИВОСТИ РЕГИОНА С УЧЕТОМ  
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*В статье приводится теоретический анализ понятия системы индикаторов, детально изучены компоненты данной системы, таких как: общество, природа, экономика. Рассмотрены общие индикаторы развития социо-эколого-экономической системы. Отображено, что индикаторы являются системой показателей экологического, экономического и социального развития и дают возможность осуществлять анализ и контроль за реализацией положений устойчивого развития территорий. Усовершенствована система индикаторов, характеризующих уровень устойчивости региона исходя из отечественного и зарубежного опыта с учетом особенностей региона. При этом учтены региональные особенности как природно-ресурсный потенциал, так влияние хозяйственной деятельности на природно-ресурсный потенциал.*

***Ключевые слова:** устойчивое развитие, индикатор, показатель, индикаторы устойчивого развития, индикаторы социально-экономического развития.*