



## Management of the Sustainable Development of the Agrarian Sector of the Regions of Ukraine

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### ARTICLE INFO

Received August 17, 2018  
Revised from August 29, 2018  
Accepted November 05, 2018  
Available online December 15, 2018

#### **JEL classification:**

O13, Q11.

**DOI:** 10.14254/1800-5845/2018.14-4.12

#### **Keywords:**

sustainability,  
agrarian sector,  
management,  
government,  
development

### ABSTRACT

Nowadays there is no single generally accepted definition of "sustainability development of the agrarian branch (sector)", which is caused by underdevelopment and the controversy of sustainable development concepts, lack of information for the quantitative measurement of the sustainability degree. To develop a management model of the sustainable development of the agrarian sector in the region it is necessary to define the interpretation of the concept of "economic sustainability of the region" and "economic sustainability of the agrarian sector." The search for new directions and ways of agrarian activities development, which reduce its negative impact on the environment, defined the emergence of a new interpretation of agrarian production sustainability as production, based on the quality of food, quality of life and environmental safety, preservation of conditions for sustainable food ensuring of humanity in the long term. In this general ecological approach to the concept of "sustainability of agrarian sector development of the region" the following categories are distinguished: ecological, productive, economic and social. It is appropriate to supplement them in an intellectual and innovative component. The experience of Ukrainian regions shows that one of the most effective instruments of state regulation of the agrarian sector development of the region could be indicative planning, methodology, technology and organization of which should be built based on the market conditions. The development of indicative plan of agrarian sector development of the region should work together with the approved concept of regional development, based on which a strategic development plan is formed. It should be based on forecasting, which is rightly regarded as part of the indicative planning. It is necessary to rationally combine the actions of all subjects of management of agrarian relations, namely government regulation, market self-organization and management of agrarian sector on order to build an effective system of sustainability management of agrarian sector development of the region and to ensure its sustainable growth.

## INTRODUCTION

In conditions of increasing urbanization in many countries, including Ukraine, the problem of ensuring sustainable development of the agrarian sector becomes more actual. The most pressing issues of sustainable and integrated development stand out in agrarian regions of the country where this form of territorial organization of population and production prevails. Considering that the priority of the national policy of Ukraine is providing the population with a wide range of high quality food in sufficient quantity, the scientific problematic development of the agrarian sector is very important. Its solution is largely dependent on the state and conditions of functioning of agriculture, which has undergone a significant transformation, changes as a result of reforms, carried out during the 1990s. Despite this fact, the state is still in a difficult financial and economic situation.

The current stage of the national economic development is characterized by the intensification of the process of the transition to a social-market type of regional policy, focused on accelerating the pace and improving the quality of economic growth. Regional specialties of the farmer's production and strengthening social and economic importance of the agrarian sector serve to encourage the necessity of development and justification of methodological positions aimed at solving multifaceted and different issues of ensuring sustainable development of the agrarian sector at the level of regional structures.

Recognizing the scientific and practical value of the research carried out by Ukrainian and foreign researchers, it should be noted that several aspects of sustainable development of the agrarian sector requires further and more systematic study. In today's conditions, it is necessary to expand the format of the studying of this problem from the strategic view. It allows a comprehensive study of not only economic, but also social, scientific and technical, institutional, innovational, investment problems that arise in the food chain "product-intermediary-producer-consumer" of agrarian products. This explains the need for comprehensive research that will form the agrarian policy, adapted to the new economic situation of the Ukrainian agrarian policy in general as well as for individual regions. There are still some problems of ensuring the sustainability of functioning of the agrarian production industries of these regions that remain unresolved on the regional level.

## 1. LITERATURE REVIEW

The necessity of research is determined by the fact that in the global economy, beginning with the end of the twentieth century, the transformational processes have been expanding both in the systemic and in the structural-branch nature. In this regard, ensuring the sustainability of the development of economic systems gains a prime importance both in scientific research and in practical developments. Therefore, the issue of determining the sustainability of economic systems is relevant and crucial for current activity and for the future both for the economy as a whole, and for its industries, regions, individual enterprises, etc. Analyzing the concept of "sustainability" it is worth noting that for the first time the term "sustainable development" appeared in the *"World Strategy for the Protection of Nature"*, which was developed by the International Union for the Nature Conservation and published in 1980 (World Nature Conservation Strategy, 1980).

The concept of the sustainability of economic systems development is fundamental, because it is not possible to provide either economic growth or sustainable development of society without it. For further analysis expanded interpretations of the concept of "sustainability of development" made by scholars for the macro, meta- and micro-levels of economy are presented. V. Bugay (2008) offers the following interpretation: *"Sustainability of development is the ability of an enterprise to absorb external and internal destabilizing factors through the efficient use of its resources by improving economic potential"*. O. Vasilenko (2005) considers the sustainability of development from the point of view of the system's efficiency and believes that *"the sustainability of development is the ability of the system to maintain its operative condition to achieve the planned results"*

*when there are various changing impacts*". More complete is the definition of the category of sustainable development, which was proposed by V. Ivanov (2005): *"Sustainability is the ability of the economic system not to deviate from its state (statistical or dynamic) because of various internal and external destabilizing influences through effective formation and use of financial, production and organizational mechanisms"*.

Analyzing the concept of "sustainable development of the agrarian sector of the economy" it should be noted that there are different approaches to its definition. According to I. Suray (2003), the agrarian sector in the broad sense covers all enterprises of Ukraine regardless of the form of ownership and the organizational-legal form of management, which produce agrarian products and products of its primary processing, as well as related service enterprises and organizations (institutions) engaged in the development and implementation of state agrarian policy. Thus, N. Kulagina (2012) believes that *"the economic security of the agrarian sector as a system of economic interests is the discovering mechanisms for a compromise between ensuring the national interests of the country, food security and risks. These mechanisms result in the stable functioning of the agro-industrial complex"*.

From the standpoint of agrarian economic systems, the definition by O. Baltremus (2017) is: *"The economic sustainability of the agrarian sector is the ability of the agrarian sector to counteract external and internal influences, to maintain a stable equilibrium for a sufficient amount of time"*. M. Udovichenko (2012) considers the concept of sustainability from the point of achieving the state of equilibrium: *"...means the change of equilibrium states that guarantee the achievement of strategic and tactical goals at specific time intervals and ensure the compliance of parameters and results of the course of internal processes with the changing requirements of the internal environment"*.

A number of scientists, including O. Moroz (2008), tend to interpret the sustainability of the economy as its ability to counteract external negative influences and burdens. The list of factors that determine sustainability is quite diverse. In some sources, the procedure for determining the sustainability of the economic system is reduced to the calculation of certain financial indicators, that means calculating financial sustainability. In other words, methods that allow taking into account a large number of both quantitative and qualitative indicators influencing the sustainability of the system have been developed. There are approaches that differentiate external and internal sustainability factors. However, it would be more appropriate to divide these factors into those that can affect sustainability and those that provide it.

R. Popelnukhov (2009) notes that the sustainability of the economic system reflects its ability to effectively counteract adverse internal and external influences, adequately and quickly change its internal structure in accordance with changing conditions. The more stable the system is in adverse events, the more viable it is. T. Shovgenov (2007) reckons that the sustainability of the socio-economic system differs significantly from technical and physical sustainability, since the main characteristic of the socio-economic system is a certain equilibrium state and the ability to return to it in the case of harassing actions or preservation of a given course of development in the case of the impact of opposing forces, as well as the ability to effectively use and independently modify the resources of its development without increasing or minimizing the cost of basic, non-renewable resources.

The condition of economic security of the state can be studied from the standpoint of sustainability. Thus, S. Kozlovskiy, I. Khadzhyrov, I. Vlasenko and L. Marynychak (2017) consider that the economic sustainability of the system is the ability of the economic system after a certain perturbation (changes in the parameters of the economic system, its indicators) to quickly return to the state not worse than the previous one, to maintain its condition as long as desired, as well as to improve its state to the size of the perturbation in case of positive changes in the economic parameters of the system. Thus, the researchers of the problems of sustainable development of the economy tried to solve the problem rather from one side. Some of them proposed creation of an

effective system of material wealth's distribution of the country. Others tried to find an efficient economic sector that would allow sustainable development of society and its prosperity. Later researchers, using the method of a systematic approach, proposed the search for a single, general-important branch of the economy, which would ensure sustainable economic development of the country (Serban et al., 2017; Ruzic and Demonja, 2017).

Thus, it can be argued that the concept of sustainable economic development of the agrarian sector of Ukraine focuses on internal resources of the system, modernization of production, etc. It is especially important for most regional economic systems of Ukraine, the main components of which are agrarian and industrial segments of the real economy sector. The abovementioned analysis of the research problems helps to formulate the purpose of this work. The purposes of the article are to investigate the theory and nature of the concept of "*sustainability of the agrarian sector in the region*," to interpret the terms "*economic sustainability of the region*" and "*economic sustainability of agrarian sector in the region*," to improve the category of "*development sustainability of the agrarian sector in the region*", to single out its levels, to develop of its management model, to define the state's functions in ensuring the development sustainability of the agrarian sector, to form a functional model of management of the sustainability and to develop the agrarian sector of the region.

## 2. METHODOLOGY

A systematic approach to the interpretation of the concept of "*sustainability of the agrarian sector*" consists in analyzing and justifying the choice of the most effective ways to achieve the balanced production, economic, social and environmental goals that the agrarian sector is facing. In this regard, there is an objective need to determine the basic methodological principles of the study of the concept of "*sustainability of the agrarian sector*". All research principles can be grouped into three groups: general, specific and instrumental. Compliance with these principles will allow more skilful and purposeful formation of a management mechanism that would ensure the sustainable development of the agrarian sector (or agrarian economic system).

It should be emphasized that there are two main existing types of models for building a system for managing the sustainability of the development of the agrarian sector (Kozlovskiy et al., 2017), differing in principles of construction and functioning. According to the first type, the sustainability of the development of agrarian production is presented as an unregulated system, which operates only on the principles of self-organization and self-adjustment. Such a model operates on the principle of operation of a system with negative feedback, based on the mechanisms of market self-regulation of production processes.

In the other model, the principle of negative feedback is realized, using the regulatory influence on the sustainability of the agrarian sector. The difference between supply and demand for resources, services, products, etc. leads to an imbalance in the economic system and causes a need for the implementation of regulatory influences by the state and activating mechanisms of market self-regulation, which together eliminate this imbalance. It should be noted that the first model of the stability of the development of agrarian production has more theoretical and methodological significance, since it is practically not found in the classical form. Even in developed economies, the sustainability of the agrarian industry in the country and the region cannot be a self-regulating system. The state and regions retain a wide range of regulatory functions.

In order to ensure sustainability economic development of the agrarian sector of Ukraine it is expedient to use the following methods:

- Observation of the magnitude of the main macroeconomic indicators and their comparison with the threshold values for which the values of indicators are not lower than in the average world. An indicator approach that is used here allows you to analyze the state of the agrarian sector, taking into account its peculiarities.

- Comparison, that is, the calculation of the rates of economic growth by the main macroeconomic indicators and determining the dynamics of their changes.
- Expert evaluation, which enables to describe the qualitative characteristics of the investigated process.
- Scenario, which gives an opportunity to estimate the most probable course of development of events and possible consequences of the decisions taken on the basis of the expert's consideration of the smallest details of the current state of development of the phenomenon under study.
- Discriminant analysis, which involves establishing the essence of an unknown object based on the study of differences between several classes of objects in one or more parameters.

In the current conditions, achieving sustainable development of the agrarian sector can be carried out on its own reproductive basis. This is justified by the availability of significant natural resources, that are enough for production the required amount of all major types of food products, and by the large industrial potential of the agricultural sector, which was accumulated during many years of functioning. At the same time, the problem of ensuring the sustainable development of agrarian production in the regions is exacerbated by the influence of various internal and external factors, which necessitates its further research and development.

The research of the problem was conducted in three stages:

- at the first stage there was the theoretical analysis of existing methodological approaches in economic scientific literature and also theories and research methods in this field; the problem, the aim, and the research methods are identified.
- at the second stage the conceptual model of sustainable development of the agrarian sector was developed, this model is based on achievement of the main and basic targets in economic, social, ecological, institutional spheres of development of the agrarian sector whilst its rational interaction with the external environment by means of ensuring its ability to self-development, efficiency of functioning, flexibility, adaptability and safety.
- at the third stage the teoretical-experimental work was completed, the most important criteria for assessment of prospects evaluation of sustainable development of agrarian sector and their social, ecologic and economic levels were identified.

The following methodological steps were offered:

- to create a model of sustainable development of the agrarian sector of the regions of Ukraine.

To manage this task, it is necessary to identify the problems of the development of the agricultural sector of Ukraine, to analyze the economic state - the output (GDP) of the agrarian sector of Ukraine:

- to identify and to classify the problems of the development of the agricultural sector at the macroeconomic level;
- to conduct an analysis of the concepts of the category "sustainable development of the agricultural sector". To identify the key factors affecting the development of the agricultural sector;
- to modernize the existing concept of sustainable development of the agricultural sector in the direction of considering the factors of international influence;
- to structure the levels of ensuring the sustainability of the agrarian sector in the regions of Ukraine, considering the identified problem factors;
- based on these conceptual conclusions, to develop a structural model for ensuring sustainable development of the agricultural sector in the regions of Ukraine.

### 3. RESULTS

The sustainability of the agrarian sector plays a special role in ensuring the economic development. K. Marks wrote: "*Food production is the first condition of living of direct producers and all production in general*". Moreover, this process should be continuous and steadily growing, not only because people cannot stop consumption of products, but also because of the need to increase the volume and to improve the quality of produced products due to the growing demand and population. Solving this problem is very actual, as starvation is a constant world problem during the history of humanity.

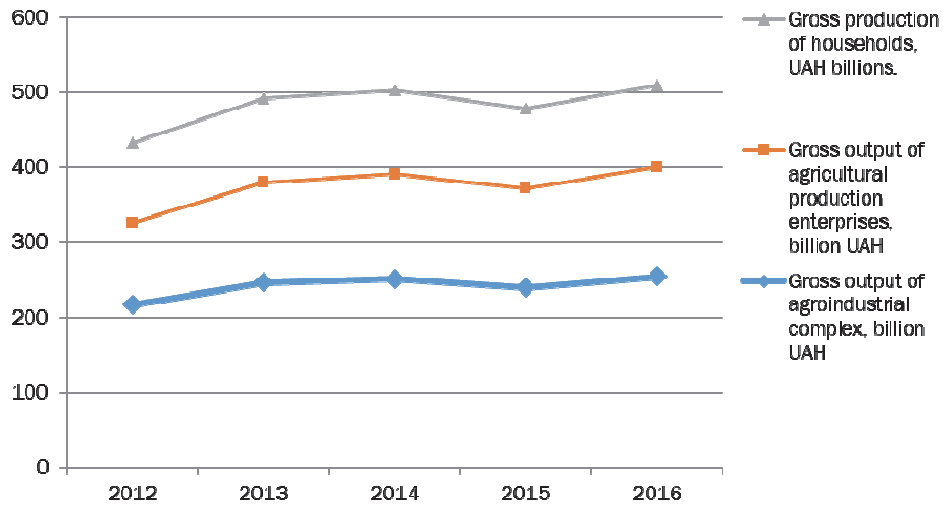
The analysis of macroeconomic indicators of Ukraine's economy shows that currently its agrarian sector is probably the only one that maintains the whole economy of the country. According to the IMF, in 2013 Ukraine's GDP per capita was US \$ 3862, which is lower than in Albania or Mongolia. Overall, it shows a critical state of the national economy, especially considering the events that took place at the beginning of 2014 and led to the outflow of investment capital from Ukraine, devaluation of national currency, reduction of real incomes and termination of production capacity because of supply contracts cancelling, increasing inflationary processes and so on. At the same time, in 2013 the domestic agro-industrial complex accounted for the largest share in total export performance: Ukraine exported agri-food products worth US \$ 17 billion., while import increased by almost 9% and amounted to US \$8.2 billion; 2/3 agro-food exports goods consisted of 5 types of products: corn - 13%, wheat - 11% rape seed - 7%, sunflower oil - 19% and sunflower meal - 5%.

According to the State Information and Analytical Center of External Commodity Markets Monitoring, priority direction for Ukraine in the structure of export and trade turnover in 2013 was the CIS countries, where about 36% of goods were exported, while 10% less products went to the EU. Among the leading importers of Ukrainian products were also countries of the Near and Far East, which imported 18% and 8% of goods respectively. The structure of imports to Ukraine was relatively similar: its largest share of products (37%) was imported from the CIS. The share of imports from the EU accounted for 35%, that was followed by the Far East and the Near East with 15% and 3% of the total correspondently.

The main indicator of the development of the agrarian economic system of the country is the indicator of gross agricultural production in Ukraine (Figure 1). In 2013, the change in the gross agricultural output in all categories of farms compared to 2012, which was calculated as the base one, was 29.5%. In 2014 compared with the base year of 2012 the difference accounted for 34.8%, while in 2015 – for 22.9%. At the same time, in 2016, compared with the base year of 2012, this indicator stood at 38%, which indicates that the Ukrainian agricultural sector is in a state of development and there is not enough data on the decline of the basic economic index of its activities (State Statistics Service of Ukraine, 2018). At the same time, the study of the pace of growth of the agrarian sector is considerably interesting, since its low growth rates may indicate the presence of the influence of certain negative factors, which in turn may jeopardize the economic security of the entire agrarian sector.

The negative side of this process is low added value of the exported goods. It is appropriate to note that in the years 1660-1685 in England at the time of King Charles II a law forbidding export of raw materials was passed. It happened because after processing them abroad they were then imported into the country at higher prices. Ukraine also has to diversify its export structure of agro-food products and to increase export of goods with high added value. As a result, the importance of the agrarian sector in the economy will grow. The domestic agrarian sector will become "a locomotive" for the modernization of state and the source that will stimulate the national economy through the multiplier effect of its various spheres (food industry, machinery, etc.). The problem of ensuring the sustainable development of the agrarian sector is not new, but its implementation directions under conditions of modern economic relations are significantly different (Figure 2).

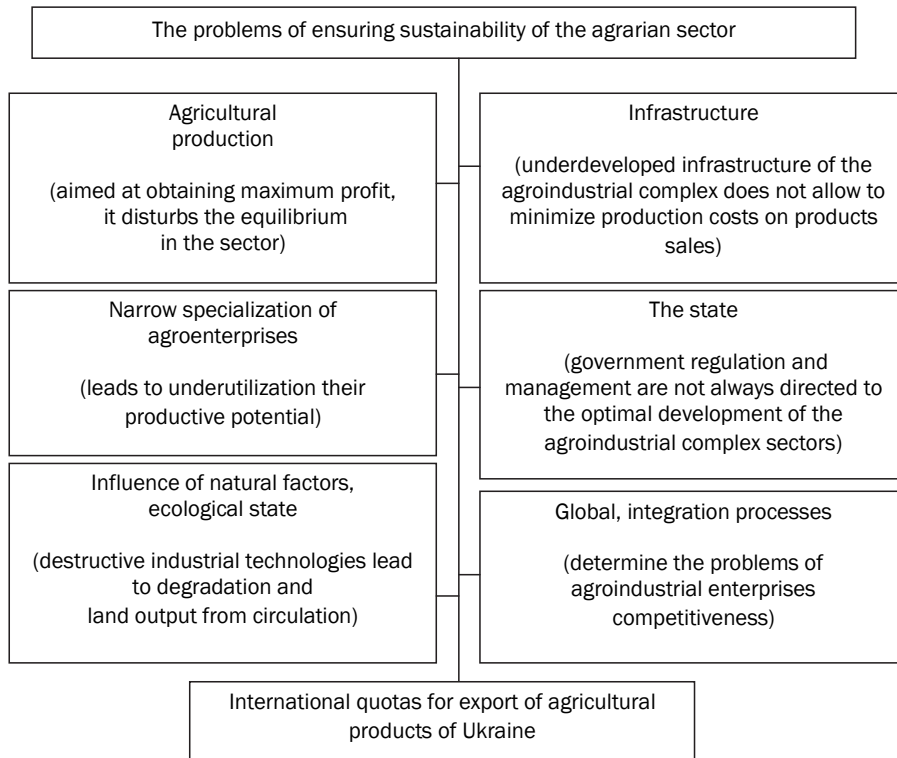
**Figure 1.** Volume of gross agricultural production (in comparable prices in 2012, billion UAH) in Ukraine



Source: compiled by the authors based on (State Statistics Service of Ukraine, 2018; Vdovenko et al., 2018)

Firstly, agriculture continues to be a major food producer and a major source of human activity. Any violation of its development leads to destabilization and imbalance of production and consumption. Structural changes in the sector under conditions of transformational economy is mainly focused on the production of the products, which provide the maximum profit. In the agrarian sector it is not always justified in terms of sustainability of production, ensuring food security in society and preserving soil fertility.

**Figure 2.** The problems of ensuring sustainability of the agrarian sector



Source: compiled by the authors based on (S. Kozlovskiy, V. Kozlovskiy, and Burlaka, 2014; Kolesnyk, Samborska, Talavyria and Nikolenko, 2018)

Secondly, market conditions determine the processes of narrow specialization of agrarian enterprises, which basically means production that gives the highest profit. However, changeable competition and world market conditions align prices and the profitability of producers, which eventually leads to underutilization of production potential of the agrarian sector, decline in production and sustainability, aggravation of social problems (Vol'vach et al., 2002). Thirdly, environmental factors significantly affect all processes in agriculture. Their partial regulation by melioration, chemicalization, mechanization, seed production organization on a scientific-substantiated level requires large investments, while agrarian producers and the state have an insufficient amount of investment capital, that causes instability in the main produce. Fourth, the developed infrastructure of agro-industrial complex and agrarian market is an important condition of the agrarian sector sustainability. With the transition to a market economy its formation and normal functioning are complicated, which increases the costs for promoting products to consumers, causes significant price variations, which also generates instability in agrarian development.

Fifth, the sustainability of agrarian production and interrelated sectors of the economy largely depends on the regulatory role of the state. However, its impact currently is insufficient. It disrupts the normal course of the reproduction process. Also, the damage caused by instability in the agrarian sector significantly exceeds the losses in other sectors. Sixth, there is a threat to sustainability of Ukraine's agrarian sector under conditions of world integration processes that is determined by the inability of most companies to produce products that meet international standards.

All of this enhances the attention of modern researchers (Aksaeva, 2002; Dolishnii, 1998) to the problem of production sustainability and agrarian development. At the same time, basic approaches to the disclosure of this concept and development measures that will ensure dynamic development are determined primarily by the need to overcome crisis state of agrarian production. A retrospective review of theoretical aspects of the agriculture sustainability problem shows that over many years it has been among the most urgent for the state. However, despite the significant number of scientific publications on improving the sustainability of production in general and agriculture in particular, it should be noted that the sustainability of the agrarian sector development is a new and still not enough disclosed category in terms of both the essence and research methodology.

Nowadays, there is no single generally accepted definition of "sustainability development of the agrarian branch (sector)", which is caused by underdevelopment and controversy of sustainable development concepts, lack of information for the quantitative measurement of the sustainability degree. Some authors believe that sustainability, of farming in particular, is the ability to withstand negative influences, mainly elemental forces of nature, to prevent or weaken decline in production (Zagaitov and Polovinkin, 1984). Others consider it as sustainability of average level of dynamic row (Yastremskii, 1961). The third group interpret it as sustainability of evolution, development of investigated phenomenon (Chetverikov, 1963). However, this concept is not limited to these definitions. Not only does sustainability of agrarian development provide an opportunity to overcome the adverse effects for agriculture, but it also gives the ability to use them with the greatest effect.

To develop a management model of the sustainable development of the agrarian sector in the region it is necessary to define the interpretation of the concept of "*economic sustainability of the region*" and "*economic sustainability of the agrarian sector*." Considering the research conducted by individual scholars (Kozlovskiy et al., 2017; Kaletnik, et al., 2012), it is accepted that:

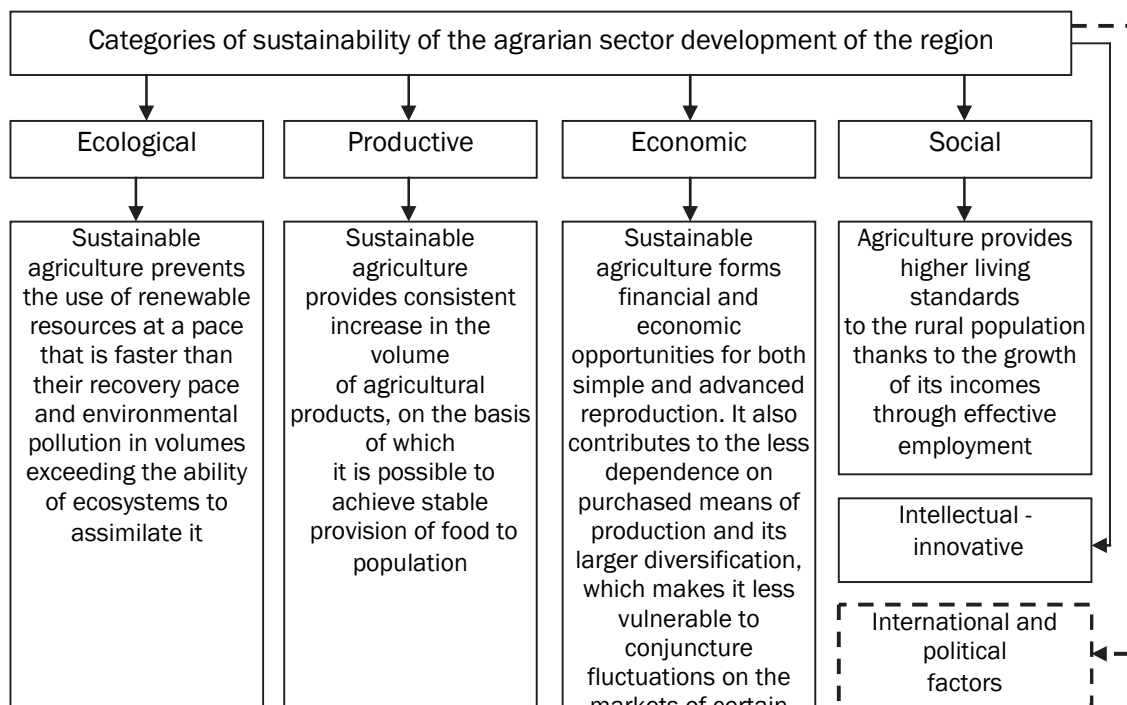
- the economic sustainability of the region is the ability of its economy after some disturbance (changes in external or internal factors of development) to quickly return to a state not worse than the previous, to maintain it for an arbitrarily long time, and to improve its subject to positive changes in the economy of the region;
- the economic sustainability of the agrarian sector is the ability to withstand external and internal influences and to save stable equilibrium for a sufficient time.



The transition to the sustainable development of the regional agrarian sector is quite a long process that requires solving complex economic tasks. With promotion towards the sustainable development this very idea will change and clarify, people's needs will be rationalized according to existing constraints, while the means for meeting those needs are improved. Therefore, implementation of the principles of sustainable development should be considered in stages. Moreover, only for a relatively early stage some programs and forecast documents can be developed. On the one hand, the region is a complex socio-economic system, internal environment of which consists of economic, social and ecological subsystems. On the other hand, it is a subsystem of a higher hierarchical level.

A variety of approaches to the definition of sustainability in the agrarian sector in the region is caused by the multifaceted problem, extreme complexity of the object and a set of tasks being solved by this sector as a whole and its components in particular. The search for new directions and ways of agrarian activities development, which would reduce its negative impact on the environment, defined the emergence of a new interpretation of agrarian production sustainability as production, based on the quality of food, quality of life and environmental safety, preservation of conditions for sustainable food provision of humanity in the long term. In this general ecological approach to the concept of "sustainability of agrarian sector development of the region" the following categories are distinguished: ecological, productive, economic and social. It is appropriate to supplement them in an intellectual and innovative component – Figure 3.

**Figure 3.** The concept of categories "sustainability of agrarian sector development of the region"



Source: compiled by the authors based on (Burlaka et al., 2014; Kolesnyk et al., 2018)

Currently there is no clear definition of "intellectual potential". Scientists consider "intellectual potential" as unity of creative and individual labor potentials of employees, which characterize their ability to the production of material goods using materialization of knowledge and their adequacy of management requirements.

Innovative potential is the totality of all kinds of informational, intellectual, technological, and scientific-production resources, including technical documentation, patents, licenses, business plans, and innovative programs and so on. Choice of one or another development strategy depends on the state of innovative potential. Innovative potential in this case can be considered as "degree of readiness" of the economic system to fulfill the goals of development. The system of sustainability of the agrarian sector of regions is the structural element of the economic system at the national level and the main link in the complex of measures to provide the population has food.

Considering agriculture (agrarian sector of economy) as unified economic, ecological and social system that has certain goals, structurally united features and functional relationships, in the modern period it is not only just the actual growth of agrarian production what is important, but also the increase of its economic efficiency, which provides sustainability in general. Thus, the increase in the volume of livestock production without radically enhancing its profitability (which is much lower than in crop production) can lead to aggravation of reproduction problems in the agrarian sector. At the same time, efficiency gain, which is not accompanied by an increase in production, threatens to strengthen the country's dependence on food imports and may cause growth of unemployment in rural areas and the expansion of poverty.

The approach to achieving social goals of sustainable development of the agrarian sector requires an explanation. In fact, the improvement in living conditions of agrarian workers extends beyond the agrarian sector and is largely connected with a complex development of rural areas (regions). Therefore, there is a clear interdependence of sustainability in the agrarian sector and the level of rural development. The close relationship of agriculture development with rural development as a social and territorial subsystem of society, where the sector dominates, is the most important component of the research methodology of agrarian sector sustainability problems. This approach was declared at the session of FAO in Rome in 1996. It was mentioned in the materials: *"The main task of the program of sustainable agriculture and development is a stable raising the level of food production and ensuring food security"*.

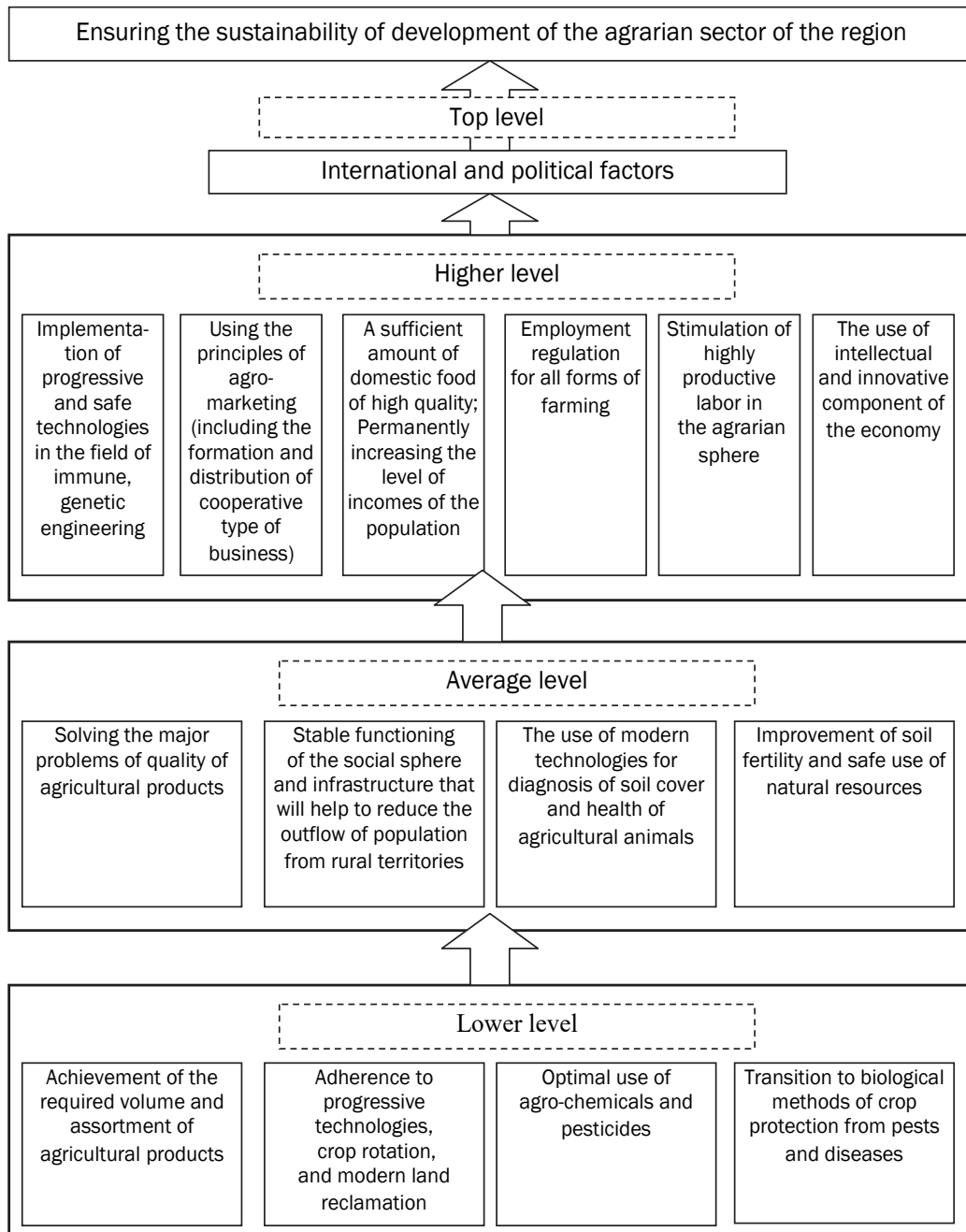
Thus, the essence of a systematic approach to the interpretation of sustainability of the agrarian sector development of the region is a balanced combination of productive, economic, social and ecological goals. Using a systematic approach and relying on identified essential features of the investigated category, it can be said that sustainability of development of the regional agrarian sector is a dynamic transition process of the system to a qualitatively new innovation level, aimed at ensuring economically grounded, ecologically safe, socially oriented expanded reproduction, as well as at increasing the level and improving the quality of life of rural population living under the influence of internal and external environment factors. The process of transition of agrarian sector to sustainable development involves the implementation at several levels – Figure 4.

The first one is the lower level. This is the level of development, which involves scientific compliance of crop rotation, the use of windbreaks and modern land melioration, optimally conditioned observance saving technologies in crop growing, forming productive herd, transition to biological methods of crop protection from pests, reducing the use of agrochemicals and pesticides. The second, average, one is the level of agriculture sustainability, which involves, along with above-mentioned characteristics, a number of additional measures that follow: improving soil fertility and natural resources of rural agrarian landscapes, the use of advanced diagnostic soil cover analysis and the health of farm animals, constant monitoring of pests and diseases of plants and animals.

On the third, higher level, attention should be given to the formation and organization of farms producing ecologically clean crop and livestock production, focused on implementing the most progressive, safe and non-waste technologies in the field of immune, genetic engineering and remote sensing of agrarian complex objects. Particular importance should be given to practical use of the agro-marketing principles and entrepreneurship. The following complex measures are also envisaged: mitigation and prevention of unemployment in rural areas, employment regulation in the context of all types of business entity, creating conditions for increasing incentives for highly productive labor in agriculture production, including through the extensive development of

different types of farms in non-agrarian production. Ultimately, this will facilitate sustainability of development in the agrarian sector in terms of improving the economic, social and labor sector in rural areas, increasing incomes and social protection of the rural population.

**Figure 4.** The levels of sustainability of the agrarian sector of the region



Source: developed by the authors based on (Burlaka et al., 2014)

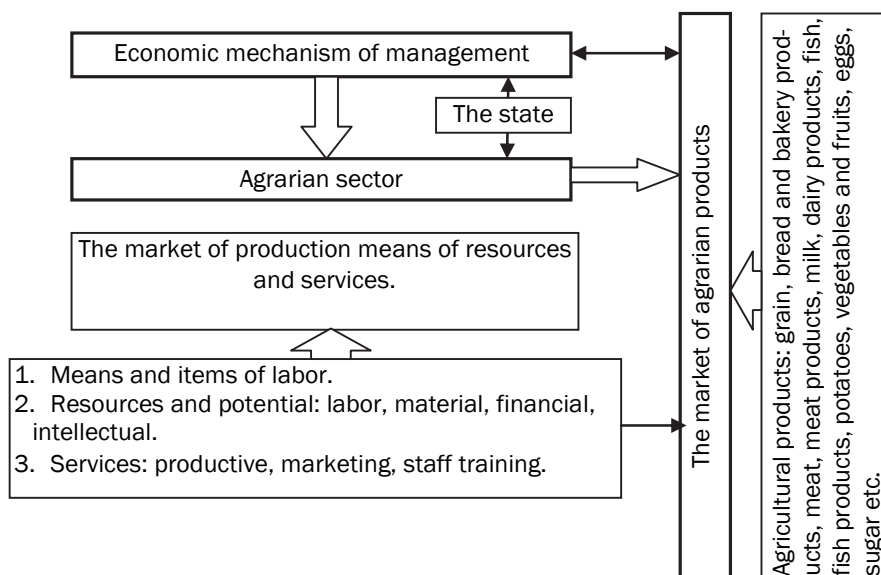
To ensure the sustainability of development of the agrarian sector a great importance must be given to the management of processes, which occur in its system forming elements. Indeed, any

existing organizational structure must comply with an adequate system of state management, because no country can exist without it. In Ukraine such a management body is the Ministry of Agrarian Policy and Food of Ukraine and its regional divisions.

For the implementation of management impacts on the agrarian sector of the region the application of a general cybernetic method is appropriate, proposed by the founder of cybernetics Norbert Wiener (Wiener, 2002). It has been successfully used in agriculture by A. Chudnovskiy (Chudnovskiy, 1965). Using this approach for management of sustainability of the agrarian sector development it is expedient at first to determine the following features: input and output information flows of agrarian economic system of the region; the principles of construction and functioning of the management model of sustainability of agrarian economic system development of the region; the objective function, types and tasks of management of sustainability of the agrarian economic system development of the region.

From this point of view the sustainability of the agrarian sector development of the region can be considered as a system formed by the following interrelated components: processes of production and recycling of agrarian products, the market of production means and services, the market of agrarian products and foodstuffs and the current economic mechanism of management – Figure 5. The relationship of these components forms a so-called sustainability management model of agrarian sector development of the region.

**Figure 5.** Sustainability management model of development on the agrarian sector



Source: developed by the authors

The transition to the sustainability management model of agrarian sector development of the region means, on the one hand, the existence of cash flows, consumer demand for agrarian products and foodstuffs. On the other hand, it creates an offer of economic entities of two main types of commodity groups: resources and services and means and items of labor. Resources and services are presented by a qualified labor force, productive and technical services (repair and maintenance of agrarian machinery, transportation, electricity, gas supply, etc.) staff training, scientific support, advertising and information services and so on.

The second commodity group includes: industrial buildings, agrarian machinery and equipment, vehicles, etc., and also fertilizers, combined feed, fuel, basic and auxiliary materials and so

on. The output of the model is, on the one hand, the aggregate supply of agrarian enterprises, storing and recycling enterprises, and also personal peasant households in the form of direct agrarian foodstuffs and commodity products of food industry. On the other, it is their demand for means of production and labor items, a variety of resources and services. The balance of aggregate demand and aggregate supply of business entities with an aggregate consumer demand for foodstuffs determines the equilibrium prices of the means of production, resources and services and also for certain kinds of food products.

Central place in the proposed sustainability management model of the agrarian sector development of the region take the market of agrarian products and foodstuffs, while the market of production means, resources and services has secondary importance. Indeed, the sale of means and items of work, material, labor, financial and other resources, provision of different services, only creates conditions for sustainability of the agrarian sector development, production growth and agrarian products sales.

It should be noted that the proposed model of sustainability of agrarian production development of the region has more theoretical and methodological than practical significance. Even in countries with developed economy sustainability of agrarian sector development of both the country in general and separate region cannot be a self-regulating system. State and regions retain quite a wide range of regulatory function:

- regulation of land operations and control of the structure of land use;
- stimulation of expedient concentration of agrarian production, its horizontal and vertical integration with related industries;
- regimentation of legal, organizational and economic conditions of rural producers activity;
- control of the ratio of market prices for means of production and agrarian products;
- control of the dynamics of production costs in agriculture, observance of established by the state standards of product quality;
- fixation of market prices for agrarian products, bringing their level to the level established by law or governmental resolutions;
- fines for failure to comply with the State established standards of product quality, quotas for its production and rules of land use;
- economic stimulation of new forms of organization of farming, social security and creating acceptable conditions for the life of the villagers;
- using quotas for products sales as an instrument of planning and regulation of government procurement of agrarian products;
- domestic and foreign economic protectionism in relation to rural producers;
- payment of subsidies for exports, what will cover losses of rural producers due to the lower world prices compared to the prices in the domestic market (without breaking the principles of the WTO);
- long- and medium-term planning of the development of agrarian production and agrarian science under the scheme "planning - budgeting".

According to the authors (Zinovchuk, 2001; Mazur et al., 2018), which suggest that government regulation of sustainability of the agrarian sector development must have a program-targeted character and include a set of legal, economic, organizational and administrative measures with necessary resources, an effective mechanism for implementing the goal and corresponding administrative apparatus that would provide direct and feedback relations of the State (regions) with producers and consumers of agrarian products. The State and regions should, on the one hand, guarantee agrarian producers such profitability that would be enough for expanded reproduction and not destroy at the same time the market mechanisms of self-regulation. On the other hand, they should implement measures for protecting the interests of consumers and the population in purchasing at affordable prices and requiring food products of the set quality.

## CONCLUSION

The experience of Ukrainian regions shows that one of the most effective instruments of state regulation of the agrarian sector development of the region could be indicative planning, methodology, technology and organization of which should be created considering the market conditions. Indicative planning system must meet the following requirements:

- be formed, using the existing powers of regional executive authorities;
- to contain information of interest to entrepreneurs and potential investors, considering the direction of social and economic development of the region, the benefits of the economic policy of regional authorities, the factors that determine the investment climate, etc.
- to have heredity and connection with the long-term strategy of socio-economic development.

The development of indicative plan of agrarian sector development of the region should be linked to the approved concept of regional development, based on which a strategic development plan is formed. It should be based on forecasting, which is rightly regarded as part of the indicative planning. For building an effective system of sustainability management of agrarian sector development of the region and ensuring its sustainable growth, it is necessary to rationally combine the actions of all subjects of management of agrarian relations, namely government regulation, market self-organization and management of agrarian sector.

The interaction of these three elements is implemented in the following way: the state regulates and stimulates the development of agrarian sector, contributes to the organization of branch management; market self-regulation forms the economic interests of the agrarian market subjects; branch management "complements" the state, indicates goals, direction and development prospects of the agrarian business.

To improve management of the agrarian sector development of the region, it is necessary to ensure a reasonable balance of economic interests between the state, market self-regulation and branch management, to introduce public control over the activities of state and local government. Studies conducted in Vinnitsa region, convincingly proved the importance of public control and civil initiatives for adoption of substantiated management decisions.

It should be emphasized that the importance of the agrarian sector for economic development requires a targeted effort, not only by the state but also by private business. An important instrument in this case could be the developing of forecasting scenarios of agrarian development in the long term, the use of which will allow agrarian producers better orientation in the agrarian market situation and an efficient implementation of modern achievements of science and practice in its activities, thus, contributing to the improvement of production, social and economic components of sustainability of the agrarian sector development.

## REFERENCES

- Aksaeva, A. (2002), "Conditions for the sustainable development of the agrarian sphere of the economy", *APC: Economy, Management*, Vol. 6, pp. 14-18 (in Russian).
- Bale, J., Lenteren, J., Bigler, F. (2008), „Biological control and sustainable food production“, *Philosophical Transactions of The Royal Society*, Vol. 363(1492), pp. 761-776. doi:10.1098/rstb.2007.2182.
- Belyaeva, G., Ermoshkina, E., Sukhinina, V., Starikova, L., Pecherskaya, E. (2016), "The conceptual model of sustainable development of the rural sector", *International Journal of Environmental & Science Education*, Vol. 11, pp. 6853-5865.
- Bugay, V. Z., Omelchenko, V. M. (2008), "Analysis and assessment of financial sustainability of the enterprise", *State and regions*, Vol. 1, pp. 34-39 (in Ukrainian).

- Chetverikov, N. S. (1963), *Statistical and Stochastic Studies*, Gosstatizdat, Moscow (in Russian).
- Chudnovskiy, A. F. (1965), *Cybernetics in Agriculture*, Kolos, Moscow (in Russian).
- Dolishnii, M. I., Kravcov, V. S. (1998), "Economic development and ecological safety: Ukraine's way" in *Problems of Sustainable Development*, Vol. 1, pp. 36-41 (in Ukrainian).
- Díaz -Zorita, M., Duarte, G., Grove, J. (2002), "A review of no-till systems and soil management for sustainable crop production in the subhumid and semiarid Pampas of Argentina", *Soil and Tillage Research*, Vol. 65, pp. 1-18.
- Gliessman, S. R. (2005), *Agroecology and agroecosystems*. In: Pretty J, editor. *The earthscan reader in sustainable agriculture*, Earthscan, London.
- Ivanov, V. L. (2005), *Management of economic stability of industrial enterprises (for example, enterprises of the machine-building complex*, Luhansk National University named after Vladimir Dal, Luhansk (in Ukrainian).
- Kesavan, P. C., Swaminathan, M. S. (2008), "Strategies and models for agricultural sustainability in developing Asian countries", *Philosophical Transactions of The Royal Society*, Vol. 363 (1492), pp. 877-891. doi:10.1098/rstb.2007.2189.
- Kolesnyk, T., Samborska, O., Talavyria, M., Nikolenko, L. (2018), "Ensuring the sustainable development of the Ukrainian agrarian sector in conditions of globalization", *Problems and Perspectives in Management*, Vol. 16, No. 3, pp. 245-258. doi:10.21511/ppm.16(3).2018.20.
- Kozlovskiy, S. V., Kozlovskiy, V. O., Burlaka, O. M. (2014), "Sustainability of the agrarian sector of the region as a factor of economic growth in Ukraine", *Economy of Ukraine*, Vol. 9, pp. 59-73 (in Ukrainian).
- Kozlovskiy, S., Grynyuk, R., Baltremus, O., Ivashchenko, A. (2017), "The methods of state regulation of sustainable development of agrarian sector in Ukraine", *Problems and Perspectives in Management*, Vol. 15, No. 2-2, pp. 332-343. doi:10.21511/ppm.15(2-2).2017.03.
- Kozlovskiy, S., Khadzhyrov, I., Vlasenko, I., Marynychak, L. (2017), "Managing the sustainability of economic system as the basis of investment development in Ukraine", *Investment Management and Financial Innovations*, Vol. 14, No. 4, pp. 50-59. doi:10.21511/imfi.14(4).2017.06.
- Kulagina, N. A. (2012), *Theory and methodology of economic security of the agro-industrial complex: the author's abstract*, Dis. for the academic degree of Ph. D., Moscow (in Russian).
- Lal, R., (2005), "Soil carbon sequestration for sustaining agricultural production and improving the environment with particular reference to Brazil", *Journal of Sustainable Agriculture*, Vol. 26, pp. 23-42.
- Marks, K. (1972), *Capital*, Politizdat, Moscow (in Russian).
- Moroz, O. V., Sventuh, A. O. (2008), *Economic identification of the stiffness and riskiness of the operation of economic systems*, Universum, Vinnytsia (in Ukrainian).
- Official site of the State Statistics Service of Ukraine, available at: <http://www.ukrstat.gov.ua/>
- Popelnuhov, R. V. (2009), "Theoretical and methodological principles of macroeconomic stability", *Economy and State*, Vol. 12, pp. 58-61 (in Ukrainian).
- Ruzic, P., Demonja, D. (2017), "Economic Impacts of Rural Tourism in Rural Areas of Istria (Croatia)", *Transformations in Business & Economics*, Vol. 16, No. 3 (42), pp. 31-41.
- Serban, A. C., Aceleanu, M. I., Saseanu, A. S. (2017), "Constraints of Transition to Ecological Agriculture in a Sustainable Development Society. Romanian Perspective", *Transformations in Business & Economics*, Vol. 16, No. 3 (42), pp. 56-73.
- Shovgenov, T. M. (2007), "The main aspects of the sustainability of socio-economic systems", *Regional economy and management: electronic scientific publication*, Vol. 3(11), available at: <http://region.mcnp.ru> (in Russian).
- Suray, I. (2003), "The concept of state administration of the agrarian sector of Ukraine's economy", *Digest of scientific papers NADU*, Vol. 2, pp. 269-270 (in Ukrainian).
- Udovishenko, M. O. (2012), "Economic stability of agrarian enterprises: factors, types, models of construction", *Digest of Poltava State Academy*, Vol. 2, pp. 185-189 (in Ukrainian).
- Vasilenko, A. V. (2005), *Management of sustainable development of enterprises*, Center for Educational Literature, Kiev (in Russian).

- Vdovenko, N., Baidala, V., Burlaka, N., Diuk, A. (2018), "Management mechanism of agrarian economic system: composition, functions and factors of development in Ukraine", *Problems and Perspectives in Management*, Vol. 16, No. 2, pp. 179-189. doi:10.21511/ppm.16(2).2018.16.
- Vol'vach, F. V., Dobrokhod, M. I. et al. (2002), *Sustainable Ecologically Safe Development in Ukraine*, MAUP, Kyiv (in Ukrainian).
- Wiener, N. (2002), *The Human Use of Human Beings: Cybernetics and Society*, Taideks, Moscow (in Russian).
- World Strategy of Nature Conservation*, available at: <http://data.iucn.org/dbtw-wpd/edocs/WCS-004.pdf>
- Yastremskii, B. S. (1961), *Some Questions of Mathematical Statistics*, Gosstatizdat, Moscow (in Russian).
- Zagaitov, I. B., Polovinkin, P. D. (1984), *Economic Problems of Enhancement of the Agrarian Production Stability*, Economy, Moscow (in Russian).
- Zinovchuk, V. V. (2001), *Organizational Foundations of an Agrarian Cooperative*, Logos, Kyiv (in Ukrainian).