ЗЕМЛЕУСТРІЙ, КАДАСТР І МОНІТОРИНГ ЗЕМЕЛЬ
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ЗМІСТ

УПРАВЛІННЯ ЗЕМЕЛЬНИМИ РЕСУРСАМИ ТА ЗЕМЛЕУСТРІЙ

ЕКОНОМІКА ТА ЕКОЛОГІЯ ЗЕМЛЕКОРИСТУВАННЯ

МОНІТОРИНГ ТА ОХОРОНА ЗЕМЕЛЬ

СТОРІНКА МОЛОДОГО ВЧЕНОГО

У НАУКОВИХ ЛАБОРАТОРІЯХ

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MANAGEMENT OF LAND RESOURCES AND LAND USING

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FINANCIAL SUSTAINABILITY OF UNITED TERRITORIAL COMMUNITIES AND LAND MANAGEMENT: STATE AND PROBLEMS

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Abstract. *It is grounded that in order to improve the financial condition of the created united territorial communities, land management measures should be implemented in order to establish their boundaries and land management of the territories, which, as land improvements, will increase the cost of land and, accordingly, revenues to the budget from the payment for land. To determine the legal and organizational principles of land management of the united territorial communities, proposals were made for amending the current legislation.*

Keywords: *land management, schemes of land management, territory of united territorial communities, land use, land management, land payment*

Formulation of the problem.

According to Article 2 "Principles of Voluntary Association of Territorial Communities", of the Law of Ukraine "On Voluntary Association of Territorial Communities" [1], one of the principles of voluntary association of territorial communities is the principle of economic efficiency. At the same time, the legislative and organizational directions of the implementation of this principle are not disclosed in the law.

According to Article 142 of the Constitution of Ukraine [2], the material and financial basis of local self-government is movable and immovable property, revenues of local budgets, other funds, ***land and other natural resources*** owned by territorial

1. Revenues of the united territorial communities in January – October 2017–2018 [3]

№	Budget revenues	2017		2018	
		mil. UAH	%	mil. UAH	%
1	Personal income tax	4100.8	40.6	9388.3	58.4
2	Excise tax	1259.7	12.5	1281.0	8.0
3	Land use payments	2279.5	22.6	2253.6	14.0
4	Single tax	2231.2	22.1	2803.9	17.4
5	Immovable property tax	227.8	2.2	349.5	2.2
Total		10099.0	100.0	16076.3	100.0

2. Estimation of the existing use of natural resource potential on the territory of the Desnianska united territorial community of Chernihiv region [4]

The name of the village councils that are part of the UTC	Resource potential as of 2016, ths. UAH						
	Mineral	Water	Land	Forest	Faunistic	Recreational	Total
Desnianska	0.00	0.0	0.0	23.6	1.4	3.1	28.1
Kosachivska	0.00	167.7	55413.7	51550.8	2246.7	46.3	109425.2
Mosivska	0.01	29.1	85067.0	12767.2	555.6	15.2	98434.1
Koropiivska	0.00	3.9	40109.6	1733.4	76.0	10.5	41933.4
Total	0.01	200.8	180590.3	66075.0	2879.6	75.1	249820.8
Specific weight of use of existing potential of NRP, in % to 1990	0.04	0.04	81.4	71.7	19.0	0.2	60.2
In % to existing NRP*	-	-	16.3	14.3	-	0.004	12.2

* Expert estimation of potential of natural resource potential of A. Tretyak

communities of villages, settlements, cities, urban areas, and as well as objects of their joint property, which are in the management of district and regional councils. Thus, the land and other natural resources located on the territory of the united territorial communities (UTC) are their material and financial basis. However, as shown in the Table 1, the revenues to the budget of the united territorial communities from the land payments are increasing, but their specific weight of the total income is reduced. This situation is explained by the uncertainty of the status and boundaries of the UTCs, the low efficiency of the use of land and other natural resources (*Table 2 shows, as an example, an assessment of the existing use of natural resource potential in the territory of the Desnianska united territorial community of Chernihiv region*) because of the absence of land management on their territories as an instrument for regulating land relations and land use rationalization.

Research results.

The process of community association lasts more than four years. However, by that time, there is no established (in the locality) territory of any one united territorial community and they are not included in the State Land Cadastre. The absence of community boundaries does not allow territorial communities to manage land resources within the jurisdiction of local self-government bodies. Consequently, these bodies remain isolated from resolving issues in the field of land relations.

According to the decision of the Cabinet of Ministers of Ukraine, 940,000 hectares of state-owned land outside of settlements was transferred to communal ownership during this year, representing only 4.8% of the total area of the united territorial communities. Of the total area of communal land, which is estimated now by experts of 5.2 million hectares, the State Land Cadastre has registered about 60 thousand ha or 0.1% of the entire territory of the country.

Legislative unregulated issues of establishing boundaries, developing schemes and projects for land management of a single land resource space of united territorial communities, village, settlement, city councils, land management projects for the formation of agricultural land masses that would allow the establishment of a landscape organization of the territory are at this stage one of the serious shortcomings of the introduction of the ubiquity of local self-government, the formation of a rational land use system, the creation of an ecologically balanced landscapes. However, only land management measures provided in the land management documentation permit the work on rational use and protection of land, the formation and organization of the territory of the object of land management, taking into account their purpose, restrictions on use and restrictions (encumbrances) on the rights of other persons (land easements), conservation and enhancement of soil fertility, etc. [5], namely, to make land improvements that increase the value of land and, accordingly, revenue to the budget of UTC.

Thus, according to our experimental researches in the Desnianska united territorial community [4], implementation of a complex of land tenure and legal measures to organize the use of existing natural resource potential, will increase average annual revenues of the budget of UTC to 2042.6 thousand UAH compared with 424.4 thousand UAH in 2015 (4.8 times more). If such an increase in the proceeds from the payment for land is expected within the territory of the UTC [3], it will amount to 10817.28 million UAH, and it's share of all revenue in 2018 would be 67.3% instead of 14.0%. Thus, land management is among the most important tools for increasing the financial sustainability of the united territorial communities.

According to Article 1 of the Law of Ukraine "On land valuation", land improvement is a change in the qualitative characteristics of the land due to the location of buildings, structures, engineering infrastructure objects, melioration systems, perennial plantations, forest and other vegetation, as well as due to economic activity or carrying out of certain type of work (change of relief, improvement of soils, etc.) [6]. Thus, the formation of a rational system of land use, the creation of ecologically balanced landscapes, the preparation of scientifically grounded proposals in the field of land relations, in particular regarding the redistribution of land, envi-

ronmentalization of land use, is impossible without the development of land management schemes and projects.

In accordance with Article 184 of the Land Code of Ukraine [7], land management provides for the drawing up of land management schemes, the development of feasibility studies on the use and protection of land in the respective administrative-territorial units. According to Article 45 of the Law of Ukraine "On Land Management" [5], the above schemes and justifications are drawn up in relation to the territory of the district, village, town, city. However, in accordance with Article 53 of the same Law for villages, settlements, cities, individual land management projects are being developed to streamline the territory of these settlements. Thus, in the legislative field, there are conflicts as to the nature of such a type of land-use documentation as "Land Management Schemes".

Land-use problems can not be covered by the scheme of planning of the united territorial communities, plans of territorial communities or other city-planning documentation. This is especially true of specific problems - creation of ecologically balanced landscapes, ecologization of land use, organization of territorial agricultural and non-agricultural enterprises and organizations.

Thus, in addition to the land management schemes of administrative districts, land management schemes of the territories of the united territorial communities of village, settlement, city councils should be developed.

In this regard, ***we are proposing amendments and additions to some legislative acts of Ukraine that are related to the necessity of land management of the united territorial communities.***

I. **Land Code of Ukraine**

The title of Chapter 29 of the Code should be worded as follows: Establishment and change of the boundaries of the administrative-territorial units, as well as territories of the united territorial communities, village, settlement and city councils.

To supplement the Code by ***Article 173[i] in the following wording***:

Article 173[i]. The boundaries of the united territorial communities, village, settlement, city councils

1. The boundaries of the united territorial communities, village, settlement, city councils are conditional closed lines on the surface of the land separating the territory of the united territorial communities, village, settlement, city councils from other territories.

2. The boundaries of the united territorial communities, village, settlement, city councils are established and changed by land management projects in relation to the establishment (change) of their boundaries.

Land management projects on changing the boundaries of the united territorial communities, village, settlement, city councils are developed taking into account the existing boundaries of village, town and city councils on the petitions of the respective communities.

3. Information about the established boundaries of the united territorial communities, village, settlement and city councils is entered into the State Land Cadastre and is determined in the extract from the State Land Cadastre, which is issued free of charge to the corresponding united territorial community, village, settlement, city council.

4. The decision to establish and change the boundaries of the united territorial communities, rural, settlement and city councils, shall be adopted by the

district council on the proposal of the respective united territorial communities, village, settlement and city councils.

5. The boundaries of the united territorial communities, village, settlement, city councils are established in accordance with the procedure and in accordance with the law.

3) In **Article 184** of the Code, the paragraph "c" should be worded as follows:

c) drawing up schemes of land management of oblasts, districts and territories of united territorial communities, village, settlement, city councils;

4). In **Article 186** of the Code:

in paragraph 1 of part one, the words "Land management schemes and feasibility studies for the use and protection of land of administrative-territorial units", replace with the words "Schemes of land management of oblasts and districts";

paragraph 2 of part one is to be worded as follows: "In the case of the development of a land management scheme for a territory of a united territorial community, village, settlement, city council, this scheme shall be approved by the respective village, settlement, city councils";

paragraph 3 of part one is to be worded as follows: The scheme of land management of the oblast, district is approved by the relevant oblast or rayon council, and land management schemes of the territories of the united territorial communities, village, settlement, city councils are approved by the corresponding united territorial community, village, settlement, city council;

paragraphs 3 and 4 of part one should be deleted.

II. **Law of Ukraine "On Land Management"**

In **Article 25** of the Law, paragraph "(c)" of the second part shall be worded as follows:

c) schemes of land management of oblasts, districts and territories of united territorial communities, village, settlement, city councils.

2) **Article 45** shall be amended to read as follows:

Article 45. Schemes of land management of oblasts and districts.

Schemes of land management of oblasts and districts are being developed with the purpose of determining the prospects for the use and protection of land for the preparation of substantiated proposals in the field of land relations, the organization of rational use and protection of land, redistribution of land, taking into account the needs of rural, forest and water management, development of villages, towns, territories of recreational, historical and cultural purposes, nature reserve fund and other nature protection purposes, etc.

Schemes of land management of oblasts and districts are developed by the decision of the regional, district council.

The scheme of land management of the oblast or rayon includes:

a) the task of drawing up a layout scheme;
b) an explanatory note;
c) the decision of the relevant local authority on the development of a land management scheme;
d) characterization of the natural conditions of the region, district;
e) information on the current state of use and protection of land within the region, district (including restrictions on land use);
f) cartograms of land categories in the context of land within the territory;
g) cartography of agro-industrial groups of soils and steepness of the slopes;
h) environmental and economic justification for the use and protection of land;

i) technical and economic indicators of the land management scheme;
j) materials for geodetic surveys and land-use planning;
k) information on the perspective state of use and protection of land within the region, district;
l) scheme of planned measures for rational use and protection of land;
m) materials for approval of the land management scheme.

3) To supplement the Law with **Article** 45^1 in the following wording:

Article 45^1 **Schemes of land management of territories of united territorial communities, village, settlement, city councils**

Land management schemes of territories of united territorial communities, village, settlement, city councils are developed with the purpose of determining the directions of use and protection of land and other natural resources depending on their suitability, value and potential, market redistribution of land taking into account the interests of the state, territorial communities, citizens and legal entities. Land management schemes of territories of united territorial communities, village, settlement, city councils are developed with the purpose of determining the directions of use and protection of land and other natural resources depending on their suitability, value and potential, market redistribution of land taking into account the interests of the state, territorial communities, citizens and legal entities.

Land management schemes of territories of united territorial communities, village, settlement, city councils are developed by the decision of the respective territorial community or council.

The scheme of land management of the territory of the united territorial community, village, settlement, city council provides:

- analysis of land use, evaluation of resource potential of land resources, ecological stability of land use, determination of the main ways of improving land redistribution, their rational use and protection;
- development of proposals for optimizing the composition and correlation of land, classification of land for suitability for agriculture, melioration and improvement, justification of land redistribution taking into account the value of other natural resources for further use in recreational and other purposes;
- formation of the ecological network at the local level and expansion (refinement) of the territories (lands) of nature conservation, nature reservation, recreational, historical and cultural purposes;
- identification of land with different usage regimes, as well as land that is restricted in use;
- clarification of the boundaries of settlements and the definition of land reserves to expand their boundaries;
- substantiation of the prospects for development and improvement of the territorial allocation of land use by agricultural enterprises and farms, taking into account the suitability of land and the value of other natural resources, non-agricultural enterprises of small and medium-sized businesses and their cooperation, engineering, industrial and social infrastructure objects;
- development of measures for erosion organization of the territory, protection of land from erosion, flooding, waterlogging, secondary salinization, pollution by production and consumption wastes, radioactive substances, improvement of natural landscapes, etc.;

- determination of the need for capital investments and material resources for implementation of the planned measures, development of proposals for financing and implementation of measures envisaged by the land management scheme;
- an assessment of the environmental impact of changes in the structure of land use and the environmental, economic and social effectiveness of the proposed measures.

The scheme of land management of the territory of the united territorial community, village, settlement, city council includes:

a) the task of drawing up the scheme;
b) an explanatory note;
c) the decision of the relevant local self-government on the development of a land management scheme;
d) characterization of the natural conditions of the territory of the united territorial community, village, settlement, city council;
e) information on the current state of use and protection of land within the territory of the united territorial community, village, settlement, city council (including restrictions on land use);
f) materials of geodetic surveys and land-use planning;
g) mapping the suitability of agricultural lands for the cultivation of crops and the value of natural resources;
h) land zoning plan by category, type (subtype) of land use;
i) the plan of territorial environmental and other restrictions on the use of land and other natural resources;
j) information on the perspective state of use and protection of land and other natural resources within the territory of the united territorial community, village, settlement, city council;
k) information on planned measures on rational use and protection of land and data on their volumes, terms of execution, cost and efficiency;
l) technical and economic indicators of the land management scheme;
m) materials for acceptance and approval of the scheme by the relevant united territorial communities, village, settlement, city councils.

III. **Law of Ukraine "On State Land Cadastre"**

Article 10 of the Law shall be worded as follows:

1. The objects of the State Land Cadastre are:

- land within the state border of Ukraine;
- land within the territory of administrative-territorial units;
- land within the territory of the united territorial communities, village, settlement, city councils;
- restrictions on the use of land;
- land plot.

Article 13 of the Law shall be worded as follows:

Article 13 Composition of information of the State Land Cadastre for land within the territories of administrative-territorial units, united territorial communities, village, settlement, city councils.

1. The State Land Cadastre includes the following information about land within the territory of the administrative-territorial units (the Autonomous Republic of Crimea, oblasts, cities of Kyiv and Sevastopol, districts, cities, towns, villages, urban areas) **and territories of united territorial communities, rural, township, city councils.**

a) the name of the administrative-territorial unit, the united territorial community, village, settlement, city council;

b) a description of the boundaries of the administrative-territorial unit, the territory of the united territorial community, village, settlement, city council;
c) the area of land within the territory of the administrative-territorial unit, the united territorial community, village, settlement, city council;
d) the full name of adjacent administrative-territorial units, united territorial communities, village, settlement, city councils;
e) information on the acts on the basis of which the boundaries of the administrative-territorial units, the united territorial community, village, settlement, city council are established and changed;
f) information on the category of land within the administrative-territorial unit, territory of the united territorial community, village, settlement, city council:
   - name, code (number), boundaries of the category of land;
   - description of boundaries;
   - area;
   - information about the documents on the basis of which the category of land is established;

g) information about the territory of the administrative-territorial unit:
   - name, code (number);
   - contours of the land;
   - area;
   - information about the documents on the basis of which the site is determined;
   - information about the qualitative characteristics of the land;

h) information on the economic and normative monetary valuation of land within the territory of the administrative-territorial unit, the united territorial community, village, settlement, city council;
i) information on bonus of the grounds of the administrative-territorial unit, territory of the united territorial community, village, settlement, city council.

2. The volume of information of the State Land Cadastre on qualitative characteristics of land in the territory of the administrative-territorial unit **and the united territorial community, village, settlement, city council** is determined by the Procedure of the State Land Cadastre.

3) Part one of **Article 18** should be worded as follows:

1. The documents of the State Land Cadastre, which are created during its administration, are:
   - index cadastral maps (plans) of Ukraine, Autonomous Republic of Crimea, regions, districts, villages, settlements, cities, territories of united territorial communities, village, settlement, city councils;
   - index cadastral maps (plans) of the cadastral zone, cadastral quarter;
   - cadastral maps (plans) of the Autonomous Republic of Crimea, regions, districts, villages, settlements, cities, territories of united territorial communities, village, settlement, city councils, other thematic maps (plans), the list of which is established by the Procedure for conducting the State Land Cadastre;
   - land books.

Conclusions.

In order to improve the financial condition of the formed united terri-

torial communities, land management measures should be implemented in order to formalize their boundaries and land management of territories, which, as land improvements, will increase the cost of land and, accordingly, revenues to the budget from payment for land. To determine the legal and organizational principles of land management of the united territorial communities, proposals were made for amending the current legislation.

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ФІНАНСОВА СТІЙКІСТЬ ОБ’ЄДНАНИХ ТЕРИТОРІАЛЬНИХ ГРОМАД ТА ЇХ ЗЕМЛЕУСТРІЙ: СТАН І ПРОБЛЕМИ

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Анотація. *Обґрунтовано, що для поліпшення фінансового стану створюваних об’єднаних територіальних громад необхідно здійснити землевпорядні заходи щодо встановлення їх меж та землевпорядкування територій, як земельні поліпшення дадуть змогу збільшити вартість земель і, відповідно, надходжень у бюджет від плати за землю. Для визначення правових і організаційних засад землевпорядкування об’єднаних територіальних громад розроблено пропозиції щодо внесення змін у чинне законодавство.*

Ключові слова: *землеустрій, схеми землеустрою, території об’єднаних територіальних громад, землекористування, землевпорядкування, плата за землю*

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ФИНАНСОВАЯ УСТОЙЧИВОСТЬ ОБЪЕДИНЕННЫХ ТЕРРИТОРИАЛЬНЫХ ОБЩИН И ЗЕМЛЕУСТРОЙСТВО: СОСТОЯНИЕ И ПРОБЛЕМЫ

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Аннотация. *Обосновано, что для улучшения финансового состояния создаваемых объединенных территориальных общин необходимо осуществить землеустроительные мероприятия по установлению их границ и землеустройства территорий, как земельные улучшения позволят увеличить стоимость земель и, соответственно, поступлений в бюджет от платы за землю. Для определения правовых и организационных основ землеустройства объединенных территориальных общин разработаны предложения по внесению изменений в действующее законодательство.*

Ключевые слова: *землеустройство, схемы землеустройства, территории объединенных территориальных общин, землепользования, землеустройства, плата за землю*

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PROBLEMS OF FORMATION AND ESTABLISHMENT OF THE UNITED TERRITORIAL COMMUNITIES BOUNDARIES: LAND-LEGAL ASPECTS

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Abstract. *As a result of the research, it was found that the lack of formed and established boundaries in newly formed territorial communities significantly affects the implementation of land management within their territory, the reliability of land registration and statistical reporting, the flow of funds to local budgets, the efficiency and rationality of the use of natural resources, which complicates the activities of local self-government bodies. It was clarified that the implementation of projects for the formation and establishment of boundaries of village and settlement councils was not carried out, that is, the formation of their boundaries took place only on paper without verification on the ground, and as a result, inaccurate areas and limits were obtained. These measures may be introduced in case of implementation of the proposed changes to the Land Code of Ukraine and the Law of Ukraine "On Land Management". The expected results are presented in the event of implementation of these measures.*
Keywords: *united territorial community, formation of boundaries, establishment of boundaries, bodies of local self-government*

Formulation of the problem.

In each of the 874 newly created communities on December 10, 2018, communities in Ukraine [4] have a common natural desire – to acquire the status of a capable and self-sufficient, for implementation of which the territorial community must effectively manage all assets located within its territory.

The united territorial communities (hereinafter – UTCs) are not recognized as subjects of the administrative-territorial structure in the Constitution of Ukraine, so the boundaries of these local self-government bodies can not be formed and established under the current legislation. With regard to the existing boundaries of the settlements that are part of the community, we note that they do not meet the legally established limits, becouse residential, and public construction in most cases went beyond the boundaries of settlements. In addition, the documentation

on the basis of which the boundaries of village councils that are part of the UTC are defined are the technical documentation for inventory made in 1991–1992 [6]. As a result, within four years the boundaries of any territorial community have not been established; they have not been included in the State Land Cadastre.

Clearly, the lack of existing and established boundaries of the newly formed territorial communities significantly complicates the local self-government, leading to numerous violations of land laws in the disposal of land and local budgets lack a significant amount of funds. On this basis, there are conflict situations, which complicates the rationalization of land use within the territories of the communities, which requires urgent resolution.

The purpose of the article **is** to reveal the essence of problem issues related to the formation and establishment of the boundaries of the united territorial communities and to propose ways of their solution.

Presentation of the main material.

At present in Ukraine there are several problems connected with the formation and establishment of boundaries of the united territorial communities because of unregulated legislative mechanism of their formation and establishment.

On the basis of the Law of Ukraine "On Voluntary Association of Territorial Communities", rural, town and city councils are united in united territorial communities [1]. At the same time, Article 133 of the Basic Law does not recognize these communities as part of the administrative-territorial structure of the state , since they include: the Autonomous Republic of Crimea, oblast, rayon, city, rayon in the city, village and settlement [3]. Current Constitution of Ukraine and the Law of Ukraine "On local government in Ukraine" defines the category of "territorial community", which refers to the primary subject of local self-government as a group of people, united by permanent residence within the village or city that are independent administrative-territorial units, or voluntary association of residents of several villages having a single administrative center. Residents of communities have a common interest – rayon and oblast councils. Thus, there is a conflict of interests: on the one hand – the presence of administrative-territorial entities, and on the other – local self-government bodies with its specific functions. With this in mind, territorial communities can plan the development of the territory only within certain limits, which according to the rules of the current legislation may be formed only for administrative territorial units.

On the basis of the Law of Ukraine "On Voluntary Association of Territorial Communities" an association of adjacent village, settlement and city councils in the united territorial communities (UTCs) is organized. The territory of the UTC should be inseparable, the boundaries of the united territorial community are determined by the outside boundaries of the councils, which formed the united territorial communities. This process leads to a significant increase in the area and population of local self-government entities by transferring their powers to one village, town or city council of a newly formed united territorial community [1].

Formation of the boundaries of village and settlement councils, which in the early 1990s were not administrative units, was intended to determine the boundaries in which local communities could, through appropriate village and settlement councils of people's deputies, implement local self-government. The appropriate formation of boundaries was

carried out on the basis of the instructions of the State Committee of Ukraine on Land Reform "On drafting the formation of territories and establishing boundaries of village, settlement councils of people's deputies".

The instruction formulates the purpose of forming the territories and establishing the boundaries of village and settlement councils of people's deputies as follows: "the projects of forming the territories and establishing the boundaries of village and settlement councils of people's deputies are formed in order to create territorial conditions for independent resolution by village, settlement councils of people's deputies and their bodies of all local life issues, based on the interests of the population living on these territories, the legislation of Ukraine and full economic independence" [2].

It was also very important to establish boundaries for all village and settlement councils of people's deputies within the administrative district (rayon) in order to check if they fit to each other. In the process of forming the boundaries of village and settlement councils, it included all land of all categories irrespective of their intended purpose.

Territory of the administrative district (rayon) were divided on the territory of village and settlement councils, as a rule, using the limits of land ownership of collective farms, state farms and their subdivisions, other agricultural enterprises, state forest enterprises and their subdivisions, the limits of land use of enterprises, and organizations and clearly defined nature objects, such as forests or water bodies [2].

The plans for forming the territories and establishing the boundaries of village councils were agreed by the village councils and approved by the district councils of people's deputies.

Work on the formation of territories and the establishment of boundaries of village and settlement councils of people's deputies was carried out in the following order:

- preparatory work;
- development of the scheme for the formation of the territories of village, town councils of people's deputies within the administrative district (rayon);
- development of projects for the formation of the territory and the establishment of the boundaries of each village, settlement council;
- projects approvement for forming the territory and establish boundaries of village, town councils;
- production of project documentation;
- project implementation in terrain [2].

The most important part of the formation and establishment of boundaries between different village and settlement councils is precisely the implementation of projects in terrain and control measurements, which should approve the fit each other in order to avoid mistakes. Unfortunately, the implementation of projects in terrain was not carried out, so the formation and establishment of boundaries between village and settlement councils was done only on paper without control measurements, and as a result, inaccurate areas and boundaries were received, and some land which was not considered to be the land of the collective agricultural enterprises (CAE) could not be the part of councils territory. As an example, we present data on the Palanska united territorial community of the Umansky rayon in Cherkaska oblast (Table).

In the research process we found significant differences between the size of the village councils and settlements that are part of the Palanska UTC according to different sources. The area received on the basis of the formation of village councils (23482.0498 hectares) differs from the

area calculated by summarizing the data of state static reporting (form № 6-zem), which is compiled for the village councils that entered the territory of the UTC, which is 23466.1 hectares. Consequently, the discrepancy between them is 15.9498 hectares, or 0.07%. In terms of statistical science, this error is negligible, but this discrepancy is inadmissible in land management practice. Differences in the area of agricultural land may be caused by changes in the process of land reform, lack of documentation for land plots, as well as the inaccurate and obsolete projects of the territories of the CAE. These differences are also caused by the uncertainty of the boundaries of the Palanska UTC and errors that arose in the process of boundaries forming of the village councils that became part of the Palanska UTC, since they were formed on the basis of cartographic materials of the projects of the economic management system of the CEA but were not implementation in terrain. Also, the lack of monitoring of land use within the village councils that are part of the UTC is the reason for this problem.

So, the formation and establishment of boundaries of newly formed united territorial communities becomes of particular importance, because it will ensure:

- authenticity of land registration and statistical reporting;
- implementation of land management within the territory of UTC;
- efficient and rational use of natural resources;
- increase of number of land taxation objects on the territory of UTC;
- regulation of land relations and administration of land use within community boundaries.

Accordingly, taking into account the need for the formation of territories and the establishment of boundaries in which united territorial communities could carry out local self-government, we propose the following measures:

1. To introduce the development of the Land Management Project to form and establish boundaries of the community.
2. To regulate at the legislative level that the ground for the establishment (change) of the boundaries of the set-

Comparison of the areas of village councils and villages of Palanska united territorial community [5]

Name of village council	Area of village council, ha			Area of village, ha		
	According to the formation of territories	According to statistical reporting	Difference	According to the formation of territories	According to statistical reporting	Difference
Palanska	4399.415	4395.000	4.415	501.990	520.528	-18.537
Berestivetska	2705.193	2702.600	2.593	339.684	337.150	2.534
Horodetska	3262.355	3256.900	5.455	570.742	555.194	15.548
Hromivska	3429.394	3425.100	4.294	426.375	438.800	-12.426
Kocherzhynska	3197.098	3195.600	1.498	495.903	486.500	9.403
Kochubiivska	2552.688	2546.400	6.288	582.914	586.200	-3.286
Maksymivska	1831.750	1836.400	-4.650	209.563	207.900	1.663
Tomashivska	2104.157	2108.100	-3.943	240.953	244.900	-3.947
Total	23482.050	23466.100	15.950	3368.124	3377.171	-9.048

tlement should be the plan of land and economic arrangement (spatial plan of the territory development), rather than the general plan of the settlement.
3. To simplify the procedure for establishing (changing) the boundaries of settlements in the community.
4. To develop a plan of boundaries of councils that are part of a territorial community.

The implementation of these measures is possible by introducing amendments to the Constitution of Ukraine regarding the acquisition of the status of an administrative-territorial unit by communities, which will allow the development of land management projects to establish (change) the boundaries of administrative-territorial units. In our opinion, there is another path that does not require changes to the Basic Law, which require a global approach and a rethinking of the system of state power and the system of its performance of its functions.

Section "Transitional Provisions" of the Land Code of Ukraine, should be supplemented with paragraph 22 in the following wording:

To establish that the boundaries of the land (territory) of the united territorial communities, formed in accordance with the Law of Ukraine "On voluntary association of territorial communities", before the introduction of amendments to the legislation on the administrative-territorial structure of Ukraine, are established (changed) in accordance with the procedure established by Chapter 29 of this Code and Article 45[1] of the Law of Ukraine "On Land Management".

To lay out the procedure for establishing (change) the boundaries of united territorial communities it is important to supplement the Land Code of Ukraine with Article 173[1], and the Law of Ukraine "On Land Management" with Article 45[1].

The title of Chapter 29 of the Land Code of Ukraine should be worded as follows:

Establishment and change of boundaries of administrative-territorial units, as well as territories of united territorial communities, village, settlement and city councils.

In Article 173[1], which should be added to the Land Code of Ukraine, the definition of the boundaries of the united territorial communities, village, settlement, city councils in the following edition should be defined – conditional closed lines on the surface of the land separating the territory of the united territorial communities, village, settlement, city councils from other territories. Also, in this article it is necessary to determine that the boundaries of the united territorial communities, village, settlement, city councils are established and changed by land management projects for the establishment (change) of their boundaries. At the same time, the change of boundaries can take place on a specific segment without the development of the project on the entire territory of the corresponding UTC, or council.

The title of Article 45[1], which is proposed to be added to the Law "On Land Management", should be worded as follows: "Land Management Schemes for territories of united territorial communities, village, settlement, city councils".

This article should stipulate that schemes for land management of territories of united territorial communities, village, settlement, city councils are developed by the decision of the respective territorial community or council. The purpose of developing these schemes is to determine the prospects for the use and protection of land, to prepare grounded proposals in the field of land relations, the organization of rational use and protection of land and other natural

resources, depending on their suitability, value and potential, market redistribution of land taking into account the interests of the state, territorial communities, their inhabitants and legal entities.

Also, this article should declare the composition, content and procedure for the development of land management schemes for territories of united territorial communities, village, settlement, city councils.

As a consequence, we expect the following results of the proposed changes to our Ukrainian legislation:

- territorial community becomes the basic unit of local self-government;
- the formation of borders between territories of the united territorial communities, village, settlement, city councils is carried out through the development of a land management project;
- prospects for the use and protection of land of united territorial communities, villages, settlement, city councils are carried out by developing appropriate schemes for land management;
- topologically fitted limits of communities form an integral territory of Ukraine;
- borders of settlements, as administrative-territorial units, limit the area of potential development in communities or councils;
- implementation of these changes is possible without changing the basic law and accordingly does not require a global rethinking of the administrative-territorial structure of the state, its system of power vertical and the implementation of its own functions.

Conclusions.

Our studies show that under the current land legislation and the Law of Ukraine "On a voluntary association of local communities" it is impossible to form and establish the boundaries of UTCs. Therefore, we are proposing amendments to the Land Code of Ukraine and the Law of Ukraine "On Land Management", which will allow territorial communities to carry out land management within their own territory and promote their economic, environmental and social development.

Boundaries uncertainty has a significant impact on the level of economic development of these communities. In this regard, we must legislative regulate (to amend the Land Code of Ukraine, the Law of Ukraine "On Land Management" without amending the Basic Law, which accordingly does not require a global rethinking of the administrative-territorial structure of the state, its system of power vertical and the implementation of its own functions) this process due to the development of the Land Management Project on the formation and establishment of boundaries between the united territorial communities, village, town and city councils. Territorial communities will be able to conduct land management within their own territory, which will facilitate their economic, environmental and social development.

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ПРОБЛЕМИ ФОРМУВАННЯ ТА ВСТАНОВЛЕННЯ МЕЖ ОБ'ЄДНАНИХ ТЕРИТОРІАЛЬНИХ ГРОМАД: ЗЕМЛЕВПОРЯДНО-ПРАВОВИЙ АСПЕКТ

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Анотація. *У результаті проведених досліджень з'ясовано, що відсутність сформованих і встановлених меж у новоутворених територіальних громадах значно впливає на здійснення землеустрою в межах їх території, достовірність обліку земель та статистичної звітності, на надходження коштів у місцеві бюджети, ефективність і раціональність використання природних ресурсів, що ускладнює діяльність органів місцевого самоврядування. З'ясовано також, що перенесення проектів формування та встановлення меж сільських і селищних рад у натуру не виконувалося, тобто формування їх меж відбувалося камеральними методами і, як наслідок, отримано неточні площі та межі. Зазначені заходи можливо запровадити за умови внесення запропонованих змін до Земельного кодексу України та Закону України «Про землеустрій». Наведено очікувані результати в разі запровадження зазначених заходів.*

Ключові слова: *об'єднана територіальна громада, формування меж, встановлення меж, органи місцевого самоврядування*

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ПРОБЛЕМЫ ФОРМИРОВАНИЯ И УСТАНОВЛЕНИЯ ГРАНИЦ ОБЪЕДИНЕННЫХ ТЕРРИТОРИАЛЬНЫХ ОБЩИН: ЗЕМЛЕУСТРОИТЕЛЬНО-ПРАВОВОЙ АСПЕКТ

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Аннотация. *В результате проведенных исследований установлено, что отсутствие сформированных и установленных границ новообразованных территориальных общин значительно влияет на осуществление землеустройства в пределах их территории, достоверность учета земель и статистической отчетности, на поступление средств в местные бюджеты, эффективность и рациональность использования природных ресурсов, затрудняет деятельность органов местного самоуправления. Выяснено, что перенос проектов формирования и установления границ сельских и поселковых советов в натуру не выполнялось, то есть формирование их границ происходило камеральными методами и, как следствие, получены неточные площади и границы. Указанные мероприятия возможно ввести при условии внесения предложенных изменений в Земельный кодекс Украины и Закон Украины «О землеустройстве». Приведены ожидаемые результаты в случае введения указанных мер.*

Ключевые слова: *объединенная территориальная община, формирование границ, установление границ, органы местного самоуправления*

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MODERN LAND MANAGEMENT AS A FUNDAMENTAL TOOL IN PROVIDING THE RATIONAL USE AND PROTECTION OF LAND RESOURCES

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Annotation. *The dynamics of the development of modern land management in the process of land reforming and the full implementation of land reform of the transformative processes as to restructuring of the land fund of Ukraine, as well as the creation of new land arrangements, which would provide for their development guided by the market principles were reasoned. As the result of the implementation of various activity types for land management in the field of land-reclamation management of the agricultural enterprises territory and establishment of an innovative form of ownership, other than a state, private, communal, thus launching a market-oriented land management was indeed necessary to significantly modify the true nature of the modern land management, in particular, to forego the sectoral one and to introduce the sharing principle for territorial reallocation of land: at the national, regional and local levels with further assignment the corresponding documentation on land management to each level. The mentioned land sharing was legally formalized in the provisions of the Law of Ukraine "On Land Management".*
The implementation of other activities regarding the denationalization of lands, transformation of the existing structures of land management, establishment of farms, demarcation of land shares, implementation provided the formalization of leasing relationship and other types of procedural and institutional as well as normative-technical nature were implemented based on the schemes and layouts for land management and other documentation, having formed the basis for the implementation of the state land politics. Thus, the modern land management deems to be one of the fundamental tools needed for the implementation of the state regulatory policies as to the use and protection of lands, and, above all, agricultural ones.
The role of modern land management in providing the ecologically safe and economically efficient use of land, particularly in the conditions of the development of degradation processes, and to a certain extent regulating social relations with respect to land ownership, use and disposal is considered. Its economic, environmental and social effectiveness is substantiated on a specific example.
Keywords: *land management, land resources, economic, ecological, social efficiency, degradation processes*

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Formulation of the problem.

Land has always been and will remain the greatest value of the state and every citizen. Ukraine stands out in the environment of other European countries, first of all, by its powerful land resource potential that provides the food security, which significantly influences its decision at the world level. But land is a limited natural resource. Therefore, the main task consists in the rational use and further protection of land resources.

In the implementation of the land reform, the considerable changes within the framework of land relations have taken place that contribute to the emergence of high-profile social, ecological and economic processes. These processes included state land management, which played a great role in the provision of reasonable use and protection of lands. Primarily, the recovery of evidence-based crops' rotation being infringed during transformational shifts as a cornerstone intervention regarding the degraded processes, the improvement of soil fertility and, in particular, of high-value chernozem types, which make up 33,3 % of the European countries and around 8% worldwide.

Further decentralization of power provides for the need to enhance the role of the state land management in the framework of a significant improvement of land relations at local level, where land resources are being negatively affected, resulting in destroying soil fertility, their industrial and even fitovirus pollution, that in the near future will lead both to the reduction in land productivity and massive environmental degradation.

Last research analysis. The consideration of scientific and methodological approaches and practical guidance regarding the essence and contribution of land management both in the framework of the implementation of land reform and in the current context are being discussed in the works of D. Dobriak, I. Dorosh, A. Martin, L. Novakovskyi, A. Tretiak, R. Tykhenko and others [1-9], where they analyze the need to improve land relations and, as being an integral part of them, land management issues in the current context concerning the formation of new land structure, development and impact of the degradation processes not only on the land resources and environment itself. Particularly high-profile are the approaches regarding the essence of modern land management that adversely affect the social and land relations.

Purpose of the article.

The publication aims to consider and justify the role of the state land management in policy-making concerning rationalization of the use and protection of lands in establishing market-led land relations, acquisition of a new essence of the modern land management, sophistication of the development of land management at local level, justification of their social, ecological and economic performance.

The main instrument of the state that provides the scientific basis for the environmentally safe and economically efficient use and protection of land is the state land management, which as an important component of land relations, is a realizing mechanism for the organization of land use as the main means of production in agriculture and forestry and to some extent regulates social relations concerning the possession, use and disposal of land.

In each period of the development of social relations, a concept is formed defining the purpose, tasks and ways of the social and economic development of productive forces. In this context, eco-

nomic relations determine the matter of land relations and serve as the basis for land management as a mechanism for their implementation [4.6]. This is scientifically and organizationally confirmed in the process of the implementation of a land reform. One of the important tasks of the land reform was the liquidation of the state monopoly on land ownership, and now the processes of land denationalization and transfer to the property of legal entities and individuals continue in accordance with the law. These processes are carried out based on land management projects. Lease relations concerning land use are also developing based on land management projects. It is important to emphasize that land management has significant legislation. Thus, in 2001 the Verkhovna Rada of Ukraine approved new Land Code of Ukraine [1], and in 2003 - the Law of Ukraine "On Land Management" [2]. These basic laws defined the fundamentals of activity in the field of land relations and land management with respect to the regulation of land problems that arise in the process of land use and protection as well as the power of local authorities, local self-government bodies, the duties of legal entities and individuals in ensuring the formation and development of ecologically safe and balanced land use.

Thus, Article 25 of the Law of Ukraine, "On Land Management" specifies the list of the main types of documentation for land management:

- the scheme of land management and feasibility studies for the use and protection of administratively territorial unit land;
- land management projects for the organization and establishment of boundaries of the territories of the nature reserve fund and other environmental protection purposes, health, recreational and historical-cultural, forestry and water protection zones, restrictions on the use of land and their regime forming objects;
- land management projects for re-zoning of land plots;
- land management projects providing the ecological and economic justification for crop rotation and landscaping;
- land management projects for the regulation of settlements;
- working projects of land management concerning the recultivation of disturbed land, landing of low-productive land, protection of land from erosion, flooding, pollution with industrial and other wastes, radionuclides and chemicals, improvement of agricultural land, increase of soil fertility (further working projects);
- technical documentation on land management regarding installation (restoration) of land plot boundaries in field;
- special thematic maps and atlases of land state and use [2];

The analysis of the mentioned list of documents can not be considered exhaustive because according to this article, other types of documentation on land management may be established by the Laws of Ukraine as well as other normative-legal documents. Particularly, the works related to land protection from degradation processes and the reproduction of soil fertility should be distinguished (Table 1).

It should be noted that the scientific bases and practical recommendations for contour-recultivation of sloping arable land have been developed and tested in practice in Ukraine. As a result, there are no alternatives for this organization. It is based on the technological and environmental parameters for the differentiation of the use intensity of sloping ar-

able land. This organization ensures the economic efficiency of land use and the effective protection measures against erosion processes. These methodological approaches have led to the need to revise the structure of land management as the main mechanism to implement their practical implementation in nature.

Thus, the Law of Ukraine, "On Land Management" approved a new status of land management in the system of state measures for regulating land relations, use and protection of land.

It should be emphasized that the division of land management at the national, regional and local levels referring relevant land management documentation to each level is introduced in the law instead of inter-economic and intraeconomic, cadastral and other types of land management.

Under present-day conditions, very important and necessary working projects of land management concerning the rehabilitation of anthropogenic disturbed land, conservation of degraded and low-productive land, land protection from water and wind erosion, flooding, swamping, secondary salinization, drying, landslides, compaction, acidification, pollution with industrial and other wastes, radionuclides, chemical and infectious substances including sunflower, corn and sugar beet viruses and increase of soil fertility are being developed.

This indicates that the state and local authorities do not practically deal with ecological problems of land use. The land attracts some interest only as an object of property and an economic resource but the issue of the ecological state of the territory and its sustainable

1. Types of documentation not defined by the Law of Ukraine "On Land management" that regulate activities for the protection of land from degradation processes and the reproduction of fertility of degraded and low-productive land*

A regulation that determines the need to develop documentation on land management	Name of documentation on land management (new)
Article 25 of the Law of Ukraine «On Land Protection» dated June 19, 2003, No. 962-IV	Project of land protection measures of land plots
Resolution of the Cabinet of Ministers of Ukraine dated January 31, 2001 No. 87 «On the procedure for land use within the boundaries of their possible flooding due to flash floods and deluges (paragraph 7 of the Procedure)	Land management project on the use of flood land with the agricultural purpose
Order of the State Committee of Ukraine of Ukraine dated October 17, 2002 No. 175, «On the Procedure for Land Conservation» (Registered in the Ministry of Justice of Ukraine on February 14, 2003, No. 117/7438 (paragraph 8 of the Procedure)	Land management project for land conservation
Order of the State Committee of Ukraine dated January 4, 2005, No. 1, "On Approval of the Procedure for issuance and cancellation of special permits for the removal and transfer of a fertile soil layer at land plots" (Registered in the Ministry of Justice of Ukraine on January 20, 2005, No. 522/22626 (paragraph 5 of the Position)	Working project of land management including removal, transfer, preservation and application of a fertile soil layer on low-productive land.

**A source:* formed by the authors

development, which is directly related to the planning of balanced land use, is a question of minor importance.

In Ukraine large-scale soil, geo-botanical and other land surveys are practically not carried out in order to obtain information on land quality as well as for the separation of lands affected by water and wind erosion, flooding, radiation, chemical pollution, viral [3.4] contamination and other degradation processes. As a result, the state does not possess sufficiently objective and extremely necessary information about the current state of land resources. Confirming the above-mentioned, it should be emphasized that in recent decades land management has gradually come to development of the most primitive types of land management documentation, which accompanies the procedure for parceling out and removal of land. First of all, the main reason for this is the insufficient attention of the state to the problems of sustainable development of territories and the limited budget funding of land management measures.

It is also due to the fact that unfortunately many heads of local authorities and state administrations are still not fully aware of the role and importance of land management in the questions of sustainable development of territories, balanced land use and creation of favorable conditions for population living, environmental protection, increase of investments in land resources. These problems become extremely urgent under conditions of decentralization of power. In view of the fact that Land Management represents engineering activity, the main task of documentation on land management is the formalization of design decisions adopted by trained specialists in land management.

The matter of project decisions in Land Management consists in the author's idea of the object of Land management (a plot of land, land use of an enterprise or an organization, a territorial zone, an administrative-territorial unit, etc.) with the definition of its spatial characteristics and a legal regime and the solution of social, economic, environmental, sanitary-hygienic, engineering and technical issues, which are included in the text and graphic parts of land management documentation.

An important condition for the adoption of a design decision is its compliance with current normative legal acts, standards and rules. The design decision is realized by transferring it in field and assigning special signs, the registration of corresponding rights to land plots and/or the restriction of these rights. The main sections of design decisions are spatial, functional, economic, financial and budgetary.

Spatial decisions must be recorded in the unified state geodetic coordinate system with their further introduction (after approval of land use) to the database of the State Land Cadastre. In fact, land management documentation is the main source of information for conducting the State Land Cadastre. The mutual consistency of the boundaries of land management objects must be provided by the unity of coordinate space in which they are fixed. Therefore, according to the Decree of the Cabinet of Ministers of Ukraine of 22 September 2004, No 1259, USC-2000 unified state geodetic coordinate system should be applied.

The functional section of the design decision includes the formation of a regulation or rules for use of a land management object, which includes generalization in a descriptive form of permitted and/or prohibited methods of land use within certain spatial units (plots, fields, zones, etc.). This section

should also include establishment of the purpose of a land plot, the schemes of alternating crops in a crop rotation, the content of the provision on the reserve protection zone, requirements for the rules of engineering object protection, and others. As a rule, this section of the design decision is further implemented through the formation and registration of appropriate restrictions on proprietary rights to land plots.

The economic section of the design decision includes calculations related to the justification of the components of the economic-legal and organizational mechanism of the regulation of land relations; compensation of losses to land owners and land users, compensation of losses of agricultural and forestry production; determination of the fee for establishment of the land easement, etc. The financial and estimated section of the project design is an integral part of such types of land use documentation as national and regional land use and protection programs.

The schemes of land management and feasibility studies for land use and protection of administratively territorial units. Its task is to substantiate the value of the complex of interrelated tasks and measures for land use and protection within a land management object, the volumes and sources of resource support for their implementation. These measures should be carried out due to budgetary funds and coordinated with the terms of execution, the composition of performers and the resources of provision. The financial and estimated section is one of the main components of the project design in work projects of land management, which substantiate the estimate of capital investments for the implementation of those or other land management measures, and it is a mandatory document for appropriate funding.

As an example, development of the land management project of LLC AGRO agricultural enterprise in Putivl district, Sumy region is described. During development of the land management project the materials of soil surveys carried out in 2014 by the Institute of Soil Conservation and the materials of sharing of collective property land developed by Cadastre land management company were used.

The relief and hydrography of arable land areas are rather complex and presented by several watersheds. The local watersheds are quite wide and strongly dissected by beams with slopes from 1 to 3 or more degrees. Erosion processes in this area take place on small areas of its study due to the fact that most of the erosive hazardous areas of arable land have been transformed into natural meadowlands.

The land used by LLC AGRO is located on the banks of the Beruushka and Vilshanka rivers. Land use of the company was formed from the property of citizens and provided to the partnership for ten years for commodity agricultural production.

The area of land use of the company is 1567.7 ha and located on 22 land plots.

Based on existing methodological recommendations, the eligibility of arable land for the cultivation of main crops was determined, notably the arable land was divided into 3 subclasses by suitability for the cultivation of food and industrial crops located in the region [7].

The first subclass (most suitable) is characterized by suitability for growing of main crops without any restrictions.

The second subclass *(medium suitability)* is characterized by medium supply with nutrients and in general relief and soil conditions correspond to the agro-ecological requirements for agricultural crops but there are factors that

reduce fertility *(a humus content, development of erosion processes and relief)*.

The third subclass *(limited land suitability)* is characterized by medium or low supply with nutrients and soil cover, relief and other conditions have some negative factors, the elimination of which is associated with additional costs for agro-technical, recultivation and other measures.

Based on the characteristics of soil quality and their economic assessment, the ecological and economic suitability of the arable land of LLC AGRO was substantiated for the cultivation of main regional crops (Table 2).

It is necessary to supplement the characteristic of the suitability of arable lands, which are classified as the III subclass, namely, the relief is complex with a slope of more than 3 degrees on this plot.

According to the bonus score and monetary valuation, by our approaches this plot of land can not be recommended for its removal from arable land and be subject to conservation. However, being used as a part of arable land, this plot can become potentially dangerous with regard to erosion.

Therefore, developing the project of territory organization, in this case the approach of the withdrawal of such erosive hazardous land plots in a hollow land plot is applied. The hollow land plot is used for 2-3 years under herbs, which will increase fertility, improve the structure of soil, and it will return to the proposed crop rotation.

Based on the ecological and economic assessment of the suitability of arable land, two variants of field crop rotation are recommended (Table 3).

Both variants give an opportunity to predict a hollow land plot, and in the second variant, it will be used for 3 years.

Taking into account this approach, one field in both variants of crop rotation is projected to be combined and composed of several sections including the hollow land plot, which will return to the crop rotation in 2-3 years.

2. Ecological and economic suitability of arable land of LLC AGRO for cultivating agricultural crops

Land plot number	Agro group code	Agro group name	Bonus score, cores	Monetary valuation, UAH/ha	Area, ha	Subclass of suitability
1	37в	Clear gray and gray podzolic weakly washed soils	20	12 600	4.01	III
2	40г	Dark gray, podzolic and weakly degraded light loamy soils	39	24 750	58.9	I
3	41г	Podzolic weakly degraded and dark gray strongly degraded light loamy chernozem	45	28 350	203.3	I
4	49г	Dark gray podzolic and degraded soils and podzolic and degraded, weakly washed light loamy chernozem	35	22 050	50.9	II
5	52г	Typical poorly humus chernozem and their complexes with light loamy solonized soils up to 30%	20	12 600	1047.8	II
6	55г	Typical chernozem and highly degraded weakly washed light loamy chernozem	39	24 570	202.8	II
Total			-	-	1567.7	-

3. Planned sown area, predicted yield and gross harvesting of crops according to recommended crop rotation variants*

Crop name	Sown area, ha	Predicted yield, t/ha	Gross amount, tons
I field grain-grass-wheat crop rotation			
Winter wheat	73.6	4.0	294.5
Sugar beet	73.6	38.0	2796.8
Buckwheat	73.6	1.0	73.6
Corn	73.6	7.0	515.2
Spring barley	73.6	2.0	147.2
Clover (hay)	73.6	2.5	184.0
Total crop rotation			4011.3
II field grain-grass-wheat crop rotation			
Winter wheat	91.8	4.0	367.2
Buckwheat	91.8	1.0	91.8
Corn	91.8	7.0	642.6
Oat	91.8	1.9	174.4
Lucerne (on two fields of crop rotation)	183.6	2.8	2570
Total crop rotation			1533.0

**A source:* formed by the authors

4. Economic efficiency of the land management project of LLC "AGRO"*

Crops	Value of output, UAH/t	Production costs, UAH/t	Profit, UAH/t	Profitability, %
Winter wheat	2350	1800	550	30.56
Corn	1750	1352	348	31.43
Spring barley	2100	1620	480	29.63
Oat	1650	1300	350	26.92
Buckwheat	3500	2200	1300	59.00

**A source:* formed by the authors

One of the main tasks that are solved in the land management project as shown on the example of LLC AGRO is the creation of organizational and territorial conditions that contribute to ecologically safe and economically efficient land use with the simultaneous intensification of production processes in agriculture including the rational organization of agricultural machinery use.

In this land management project indicators showing the economic efficiency of planned measures are conditional net income and the level of the profitability of crop industry (Table 4).

The ecological significance of the land management project is to ration land use by suitability ensuring their effective protection and preventing the emergence of degradation processes, and social sig-

nificance consists of the support of proper viable environment and improvement of working conditions.

Conclusions.

The reasoning specified above provide for the following conclusions and suggestions:

1. The implementation of land reforming as well as the corresponding activities have been carried out, predominantly, through land managing at national, regional and local levels. This was the rationale that underpinned the state policy-making within land management, converting the current land management in the basic state regulator for sophisticating and developing the market-led land relations as well as establishing the modern social relations, rationalization of agricultural land management and protection.

2. The newly formed land-use structures require, in the view of rationalization of their use and protection, the new guidance regarding the structures of the area planted, the scientifically sound rotation of crops and their social, ecological and economic evaluation.

3. Based on the results of the experimental designing, the methodological recommendations on the development of layouts designed by "AGRO" LLC. were implemented provided the formation of the crop patterns and shifts based on soil suitability and key staples and the justification and calculations of indicators of ecological, economic and social performance as well.

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СУЧАСНИЙ ЗЕМЛЕУСТРІЙ – ОСНОВОПОЛОЖНИЙ ІНСТРУМЕНТ У ЗАБЕЗПЕЧЕННІ РАЦІОНАЛЬНОГО ВИКОРИСТАННЯ ТА ОХОРОНИ ЗЕМЕЛЬНИХ РЕСУРСІВ

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Анотація. *Обґрунтовано динаміку формування сучасного землеустрою в процесі проведення земельної реформи та здійснення земельної реформи трансформаційних процесів щодо реструктуризації земельного фонду України і створення на цій основі нового ладу земельних відносин, який забезпечував би їх розвиток на ринкових засадах. У результаті виконання різних видів робіт із землеустрою щодо контурно-меліоративної організації території сільськогосподарських підприємств, реформування форм власності на землю і запровадження нових форм власності, крім державної, приватної, комунальної і створення на цій основі нових землекористувань ринкового типу, була реально зумовлена необхідність внести суттєві корективи в сутність сучасного землеустрою, а саме: відійти від галузевого і запропонувати територіальний принцип поділу землеустрою на загальнодержавний, регіональний та місцевий рівні з віднесенням до кожного з рівнів відповідної документації із землеустрою. Зазначений поділ землеустрою юридично було оформлено у Законі України «Про землеустрій».*

Виконання різних видів робіт із роздержавлення земель, трансформація існуючих структур землекористування, створення фермерських господарств, поділ земель на земельні частки (пай), запровадження з оформленням орендних відносин та інших видів організаційно-правового й нормативно-технічного характеру здійснювалося на основі схем і проектів землеустрою та інших видів документації та зумовило на цій основі формування державної земельної політики. Таким чином, сучасний землеустрій став одним із основоположних механізмів проведення державної регулятивної політики щодо використання й охорони земель, у першу чергу, земель сільськогосподарського призначення.

Розглянуто роль сучасного Землеустрою в забезпеченні екологічно безпечного та економічно ефективного використання земель, у тому числі в умовах розвитку деградаційних процесів і відповідною мірою регулюючого суспільні відносини щодо володіння, користування й розпоряджання землею. На конкретному прикладі обґрунтовано його економічну, екологічну й суспільну ефективність.

Ключові слова: *Землеустрій, земельні ресурси, економічна, екологічна, суспільна ефективність, деградаційні процеси, реформування, землекористування, загальнодержавний, регіональний рівень*

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СОВРЕМЕННОЕ ЗЕМЛЕУСТРОЙСТВО – ОСНОВОПОЛАГАЮЩИЙ ИНСТРУМЕНТ В ОБЕСПЕЧЕНИИ РАЦИОНАЛЬНОГО ИСПОЛЬЗОВАНИЯ И ОХРАНЫ ЗЕМЕЛЬНЫХ РЕСУРСОВ

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Аннотация. *Обоснована динамика формирования современного землеустройства в процессе проведения земельной реформы и осуществления земельной реформы трансформационных процессов относительно реструктуризации земельного фонда Украины и создание на этой основе нового строя земельных отношений, который обеспечил бы их развитие на рыночных принципах. В результате выполнения различных видов работ по землеустройству относитель-*

но контурно-мелиоративной организации территории сельскохозяйственных предприятий, реформирования форм собственности на землю и внедрения новых форм собственности, кроме государственной, частной, коммунальной и создание на этой основе новых землепользований рыночного типа, была реально обусловлена необходимость внести существенные коррективы в сущность современного землеустройства, а именно: отойти от отраслевого и предложить территориальный принцип разделения землеустройства на общегосударственный, региональный и местный уровни с отнесением к каждому из уровней соответствующей документации по землеустройству. Указанное разделение землеустройства юридически было оформлено в законе Украины «О землеустройстве».

Выполнение различных видов работ по разгосударствлению земель, трансформация существующих структур землепользования, создание фермерских хозяйств, разделение земель на земельные доли (паи), введение с оформлением арендных отношений и других видов организационно-правового и нормативно-технического характера осуществлялось на основе схем и проектов землеустройства и других видов документации и обусловило на этой основе формирование государственной земельной политики. Таким образом, современное землеустройство стало одним из основоположных механизмов проведения государственной регуляторной политики по использованию и охране земель, в первую очередь, земель сельскохозяйственного назначения.

Рассмотрена роль современного Землеустройства в обеспечении экологически безопасного и экономически эффективного использования земель, в том числе в условиях развития деградационных процессов и соответствующей мерой регулирующего общественные отношения по владению, пользованию и распоряжению землей. На конкретном примере обоснована его экономическая, экологическая и общественная эффективность.

Ключевые слова: *Землеустройство, земельные ресурсы, экономическая, экологическая, общественная эффективность, деградационные процессы, реформирование, землепользование, общегосударственный, региональный уровень*

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DIRECTIONS FOR IMPROVEMENT OF LAND USE ADMINISTRATION WITH CONSIDERATION OF ENVIRONMENTAL SAFETY REQUIREMENTS

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Abstract. *It is revealed that the general index of quality of state administration of land use in Ukraine is 15.5 points, which holds 76th place out of 186 states. It is revealed that its quality is determined by the coherence of the components of the administrative process: legal, regulatory, fiscal and information management. The essence of ecological and economic tools of land administration, which prompts landowners and land users to rational land use with financial, credit, fiscal, price, subsidy, control and other tools, is described in detail. It is determined that land protection activities should be financed from the state budget, from the profit of economic entities, from environmental, economic and insurance funds, provision of bank loans. In order to increase the responsibility of landowners and land users for compliance with ecological requirements in economic activity, introduction of land management regulations and economic sanctions is proposed. Areas of improvement of administration of land use taking into account the requirements of ecological safety are given.*

Keywords: *ecological and economic instruments, land use administration, economic stimulation, ecological safety*

Formulation of the problem.

Given the current ecological state of the land, the problem of it protection has become a security issue for the country. Therefore, ensuring the protection of lands and rational use of them requires an integrated and balanced approach at all levels – from local to state, taking into account the interests of individuals, communities and society as a whole. Priority in the settlement of this process belongs to the administration of land use, the success of which is assessed by the ability of management to administer land in an efficient, productive, and less costly way.

In this regard, the land administration system should guarantee the right to own land, support the taxation of land and real estate, provide monitoring of the land market, protect the land of state property, improve land use planning and its infrastructure, ensure the quality of land resources and environment management, to contribute to the completion of land reform.

The general index of quality of state administration of land use in Ukraine in 2017 is 15.5 points (76th among 186 countries). The leaders in this position are: Singapore – 29 points, Lithuania and the Netherlands – 28.5, Taiwan – 28.5, Rwanda – 28.0 points and Estonia on the sixth place [5, p. 220].

In this context, there is a need to expand the possibilities of administering land use to manage rights, limitations and responsibilities that can be solved through the management of business processes and administration systems that directly affect human activities in relation to land. This is determined by the implementation of relevant laws, institutions, processes and technologies, standards within which managers and administrators must operate the land.

The purpose of the paper is to investigate economic and environmental instruments that affect the quality of land administration and suggest directions for improving these instruments, taking into account environmental safety requirements.

Presenting main material.

The quality of the land use administration process is determined by the interconnectedness and coherence of the components of the management process – legal, regulatory, fiscal and information management, and the loss of one leads to a violation of the entire administration technology. The legal component is aimed at protecting the interests of business entities, subject to the fulfillment of their obligations in the possession, use and disposal of land in compliance with the ecological safety of land use. The fiscal component is aimed at obtaining economic benefits to economic entities from the use of land in compliance with the requirements of land protection activities. The importance of the regulatory component is to stimulate landowners and land users (introduction of preferential taxation, lending, insurance, limitation and subsidies) in order to increase land capitalization and sustainable (balanced) development. However, the key element in the system of land administration is the information and management component, since it accumulates all the others [13].

In scientific papers, there is an opinion that the effectiveness of land use administration depends on the effectiveness of two interrelated subsystems: 1) management – a key instrument for implementing land policy and land use management within the framework of building an integrated land use management system; 2) information (contains land-information systems, geospatial data infrastructure and electronic control system (e-government)) [5]. The effectiveness of the land administration system depends on the level of modernization of cadastral information as a tool for regulating land-property relations of the state.

According to A. Tretiak, O. Dorosh, the hierarchical land use management system consists of two subsystems, one of which is managerial (subject to state administration), the other is managed (involves private management). The task of the subject of control within these systems is to direct the development of the object in the expected direction through managerial influence [12, p. 37].

A. Tretiak believes that the administration of land use should be carried out in stages: 1) the definition of the components of environmental management of land use; 2) analysis of factors influencing the ecological safety of land use [11, p. 370].

Relations in the agrarian sector in economically developed countries are based on the stimulation of direct compliance with the rules and regulations of landowners and land users associated

with the use and protection of land. In the case of violation of norms and rules of land use, in a certain part their rights are terminated. For example, in the United States, such business entities are deprived of subsidies, loans, and the possibility of concluding public contracts. And for the abuse of the environment with emissions, discharges, dumping of pollutants, the use of harmful technologies in the cultivation of products fines are imposed: a) payment up to 25 thousand dollars. for each day of violation; b) criminal liability for up to two years. In the western part of Germany, for several decades, an annual soil survey, including analyses of nitrate content, is carried out. In case of exceeding the established norm, land owners and land users pay a substantial fine, and a ban on the sale of poor-quality products leads to bankruptcy.

The formation of the ecological and economic mechanism in Ukraine takes place on the basis of norms regulated at the legislative level. In particular, the Law of Ukraine "On Environmental Protection" defines: economic measures related to environmental protection and allocation of funds for their implementation; the size of payment taking into account the norms and limits for the special use of natural resources; payments for environmental pollution taking into account actual emissions and limits of dumping of waste production and pollutants; the amount of payment taking into account the limits for the deterioration of the quality of natural resources, which is the result of possession and use of them; distribution of payments for pollution of the environment and the use of natural resources; stimulation of rational nature use [9].

Requirements for landowners and land users are defined by the Law of Ukraine "On Land Conservation" (Article 35), which stipulates: not to violate the norms of land and environmental legislation; not to aggravate the qualitative state of lands and soils; do not use intensive soil tillage technologies; not to violate standards, norms and rules in the implementation of anti-erosion, agrotechnical, agrochemical, melioration and other measures; provide information on the use of pesticides and agrochemicals to relevant executive and local self-government bodies [8].

In view of the above, in Ukraine, the system of state administration of rational use and protection of land in the form of obligations to landowners and land users should be more efficiently implemented. Definition and guarantee of rights and restrictions on land use will allow determining the extent of liability in case of non-compliance and set the amount of incentives in case of their implementation.

In the field of agricultural land use, it is considered that economic levers, whose actions are aimed at land reproduction and ecological conservation, together constitute an economic mechanism for rational use and protection of land.

According to A. Martyn, the land-use system should contain economic regulators, which include: fiscal payments; transaction payments; formation of prices in the primary market of land; economic incentives for implementation of land protection measures; penalties for non-compliance with norms and rules when using land; provision of budget funds for implementation of land reform and land protection purposes [6, p. 24].

According to M. Khvesyk [10, p. 404], financial and economic regulators in the field of land relations include: land tax; rent for land; compensatory payments in case of land withdrawal; compensatory payments in case of land conservation; promotion (awards) for improving the quality of land; payments for reducing fertility of

soils; taxes on civil land turnover; normative price; market and mortgage price of land; tax privileges; investment credit stimulators; fines and financial sanctions.

Economists believe that the components of the economic mechanism in the field of nature use are: pricing; charge for nature use; economic responsibility for pollution, financing of environmental protection measures (provision of budget funds, establishment of environmental funds); environmental stimulation; environmental insurance [1; 2].

Land managers note that the economic methods of stimulation for the introduction of land conservation measures should include: 1) exemption from payment of land tax areas for conservation, engaged in the creation of field-protective forest bands and anti-erosion hydraulic engineering structures, land plots in the stage of agricultural development or improvement of their qualitative status, in the defined term of the project; 2) exemption from taxation of part of the profit used for land and nature conservation purposes; 3) provision of preferential loans and loans for the purchase of anti-erosion equipment intended for the cultivation of soil, the construction of anti-erosion hydrotechnical structures, the implementation of forest-melioration activities and the chemical soil reclamation [12, p. 183–184].

In view of the above, the ecological and economic mechanism of land use administration needs to be improved (Fig. 1).

After all, the use of traditional methods (permitting mechanisms in land use and direct administration in the framework of certain documentation) are not sufficiently effective because of the lack of both economic and environmental regulatory levers. The above are manifested because of: the inability to interest agricultural producers in land-based activities through the investment of their own money; lack of links with other economic indicators of economic activity; ineffective reaction to changing ecological and economic situation in the region and the state.

State regulation of ecological and economic measures in land use is a priority direction for efficient functioning of land administration. This requires the creation of a unified national geospatial data infrastructure, online access it, and the creation of electronic information services for the purpose of efficient planning and development of land use, investment attraction, etc. [4].

It is important that land-based activities are carried out at the expense of the state budget, from the profit of economic entities, from economic, environmental and insurance funds, and the provision of bank loans. And in order to increase the responsibility of landowners, land users and tenants of land plots it is important to introduce land management regulations and economic sanctions.

For the proper functioning of the land administration system, economic levers need to be improved, for which we propose: to develop mechanisms for returning funds to economic entities that use innovative technologies to ensure rational use, protection of lands and soils; to simplify the procedure for granting subsidies, subventions, grants, privileges for land owners and land users, using the funds from payment for land, reimbursement of losses of agricultural and forestry production coming to local budgets; optimize the payment of rent payments, the cost of land, land tax and rent; to improve the mechanism of economic stimulation (to supplement the list of land protection measures in relation to which it is expedient to stimulate landowners and land users.

An important ecological and economic tool for protecting land from negative natural and anthropogenic influences on

the one hand, and on the other – the system of compensation for damage caused is environmental insurance. This type of insurance will in the long run become an important element of national security, as it will contribute to the requirements of environmental safety. An important environmental tool in the land administration system is the environmental impact assessment. In this regard, environmental requirements and restrictions for investment-friendly areas should be established.

The formation of mechanisms and instruments for market turnover of land will facilitate the creation of conditions that stimulate the demand and supply of these land plots, and auctions for the sale of non-used agricultural land plots.

Responsibility for violation of land and environmental legislation should be strengthened through the introduction of market coercive measures through strict legal, tax, credit and administrative policies for: a) the use of land not for intended purpose; b) pollution of land and soils; c) waste disposal; d) excessive use and pollution within established limits (limits).

In this context, it is necessary to increase the effectiveness of state, self-government and public control over the use and protection of land. An agrochemical passport of a land plot may be an indispensable source of information for improving control over the use and protection of land and detecting violations.

O. Dorosh notes that "... the existing certification of land relates only to a certain set of agrochemical indices of the arable layer of soils, leaving out the attention of the processes and properties of soils that are inherent in deeper horizons of the soil profile, which are established and documented in the course of soil surveys. Namely, they, as a rule, directly influence the use of land, their protection, evaluation. In this form of agrochemical passport there are no quantitative indicators of the degree of erosion, gleiing, salinity, solodization, capacity of the profile and its individual horizons, which does not provide complete information for the objective solution of the problem of use and protection of land" [3, p. 23].

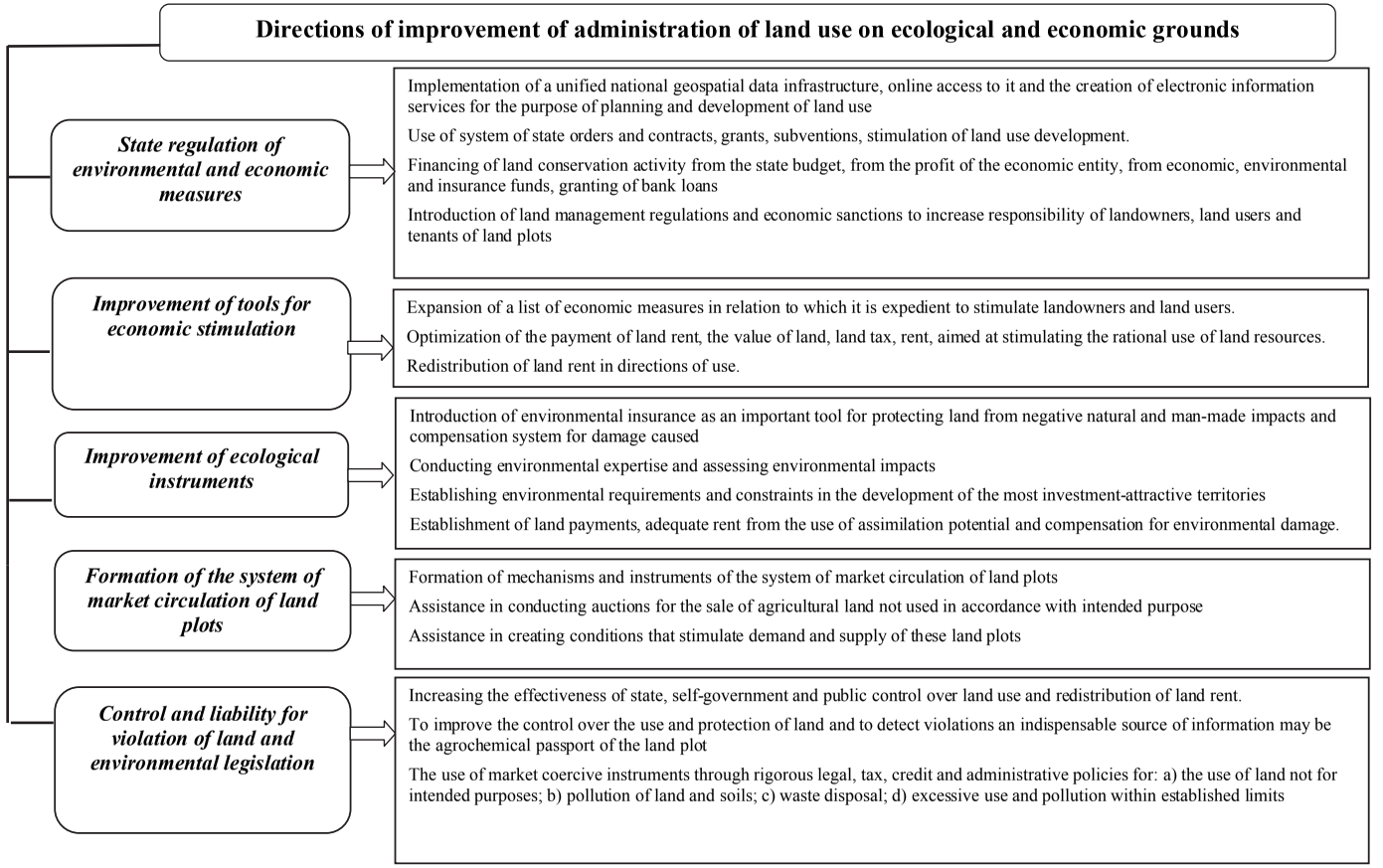
We believe that the content of this document should be supplemented with information on the suitability of the most appropriate use of agricultural lands, how it was used earlier, the ecological parameters of the site – the content of humus, chemical composition of the soil, measures aimed at improving the quality of land, expediency in land conservation and environmental protection measures. In the case of reducing the agro-chemical evaluation of land, sanctions are applied, and for its increase - economic incentives.

The development of agrochemical passports is a time-consuming and costly process, the realization of which is possible in the case of an agreement between the business entity and the developer of this document, which provides for payments extended in time with partial discounts. And for companies renting large land masses, the development of this document is possible on the basis of an agreement with the owners of land shares at the expense of payment of rent or part of it.

Conclusion.

Studies conducted show that the quality of land use administration is determined by the coherence of the legal, regulatory, fiscal and information management components, among which priority is given to the latter. It was clarified that financial, credit, fiscal, price, subsidy and control instruments induce landowners and land users to

Structural-logical scheme of improvement of the system of land administration on the ecological and economic basis



rational use of land. In this case, land-based activities should be financed by the state budget, from the profit of economic entities, from environmental, economic and insurance funds, and the provision of bank loans. The directions of improvement of the system of administration of land use, which should guarantee land ownership, support the taxation of land and real estate, provide monitoring of the land market, protect the land of state property, improve land use planning and its infrastructure, provide the quality of land management and the environment, to contribute to the improvement of the quality of land and soils and to facilitate the completion of land reform.

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Купріянчик І. П., Свиридова Л. А.
НАПРЯМИ ВДОСКОНАЛЕННЯ АДМІНІСТРУВАННЯ ЗЕМЛЕКОРИСТУВАННЯ З УРАХУВАННЯМ ВИМОГ ЕКОЛОГІЧНОЇ БЕЗПЕКИ
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Анотація. *З'ясовано, що загальний індекс якості державного адміністрування землекористування в Україні становить 15,5 бала, за яким їй належить 76-те місце зі 186 держав. Доведено, що його якість визначається взаємоузгодженістю складових управлінського процесу: правової, регуляторної, фіскальної та інформаційно-управлінської. Детально розкрито сутність екологічних та економічних інструментів земельного адміністрування, що спонукають землевласників і землекористувачів до раціонального використання земель за допомогою фінансово-кредитних, фіскальних, цінових, дотаційних, контрольних та інших інструментів.*

Визначено, що землеохоронна діяльність має фінансуватися з державного бюджету, з прибутку господарюючих суб'єктів, з екологічних, економічних і страхових фондів, банківських кредитів. З метою підвищення відповідальності землевласників і землекористувачів за дотримання екологічних вимог у господарській діяльності, запропоновано впровадження землевпорядних регламентів та економічних санкцій. Наведено напрями вдосконалення адміністрування землекористування з урахуванням вимог екологічної безпеки.

Ключові слова: *еколого-економічні інструменти, адміністрування землекористування, економічне стимулювання, екологічна безпека*

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Куприянчик И. П., Свиридова Л. А.
НАПРАВЛЕНИЯ СОВЕРШЕНСТВОВАНИЯ АДМИНИСТРИРОВАНИЯ ЗЕМЛЕПОЛЬЗОВАНИЯ С УЧЕТОМ ТРЕБОВАНИЙ ЭКОЛОГИЧЕСКОЙ БЕЗОПАСНОСТИ
https://doi.org/10.31548/zemleustriy2018.04.04

Аннотация. *Установлено, что общий индекс качества государственного администрирования землепользования в Украине составляет 15,5 балла, по которому ей принадлежит 76-е место из 186 стран. Доказано, что его качество определяет взаимосогласованность составляющих управленческого процесса: правовой, регуляторной, фискальной и информационно-управленческой. Подробно раскрыта сущность экологических и экономических инструментов земельного администрирования, побуждающих землевладельцев и землепользователей к рациональному использованию земель с помощью финансово-кредитных, фискальных, ценовых, дотационных, контрольных и других инструментов.*

Определено, что землеохранная деятельность должна финансироваться из государственного бюджета, из прибыли хозяйствующих субъектов, из экологических, экономических и страховых фондов, банковских кредитов. С целью повышения ответственности землевладельцев и землепользователей за соблюдение экологических требований в хозяйственной деятельности, предложено внедрение землеустроительных регламентов и экономических санкций. Приведены направления совершенствования администрирования землепользования с учетом требований экологической безопасности.

Ключевые слова: *эколого-экономические инструменты, администрирование землепользования, экономическое стимулирование, экологическая безопасность*

ECONOMY AND ECOLOGY OF LAND USE

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STRATEGY OF ECONOMIC EFFICIENCY ENHANCEMENT FOR LAND USE OF AVIATION TRANSPORT

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Abstract. *The issue of forming an effective land use system for aviation transport, which aims at obtaining a certain volume of material goods with minimum capital and energy costs, as well as achieving maximum productivity of natural resources use and environmental protection of the natural environment, was considered. Operation of the aviation industry is an extraordinary economic contribution to the level of productivity of other industries, which is a powerful fixative for their growth. Such influence, in turn, contributes to the increase of the productivity level of the world economy.*

It was substantiated that the economic evaluation of efficiency is a very important concept, which aims to determine the most optimal for the airline labor costs and capital, profit, compensation, use of labor, material and, above all, land resources as an indisputable territorial basis. One of the first issues that reveals the level of economic efficiency of land use of aviation is revenue (profit) as a result. The main economic indicators of the efficiency of land use of aviation transport port, calculated with the obligatory consideration of the area of the land plot and the specific period of time during which the given land was exploited: the potential of land use; land use intensity, land use efficiency and insurance risk assessment. The main ways to increase the level of economic performance of land use of aviation transport are to improve the structure of investments and the planning of infrastructure development in areas where the expansion of industrial and commercial facilities is possible. This investment strategy also aims to reduce the amount of residential development in areas near airports, as these objects are incompatible with each other.

Keywords: *aviation transport land use, economic efficiency indicator, improvement and development strategy*

Topicality.

The aviation industry has completely changed the way of travel and interaction with other types of production activity.

Modern society doesn't represent the world without aviation. So, thanks to series of democratic changes for the last 40 years, the cost of air transport services decreased by almost 60%, making it more accessible for more people on the planet. Also, over the years, airliners have become 70% energy efficient and 75% more quiet.

According to expert estimates in the field of air transport development, by 2030, the number of passengers using the services of air transport will reach 6 billion, and the number of domestic and international flights will increase by 50 million, which is almost three times more than in 2017.

Operation of the aviation industry is an extraordinary economic contribution to the level of productivity dynamics of other industries and a powerful fixative for their growth.

In turn, such influence contributes to the increase of the productivity level of the world economy.

Determining the types of land use with the airport activities, we must necessarity take into account economic factors that are inextricably linked with ecological moments. In most cases, decisions taken at the local level are somehow ignored, but it is a necessary factor of minimizing the negative impact of the airport on the environment and a factor of its protection against attacks on the part of incompatible types of land uses.

Considering the efficiency and eco-security of the main events and policies of land-use for the different countries, we can confidently confirm and we don't have a general strategy which can allow solving a number of existing problems.

Analysis of recent research and publications.

Issues of determining the economic efficiency of land use of aviation transport in the domestic scientific field are still little investigated. We should note some people among scientists who have made their scientific potential in the development and improvement of processes of ecologically safe and economically efficient of land use of aviation transport: S. Boichenko, O. Zaporozhets, Milan Janic, I. Novakovska.

The scientific contribution to improving the processes of ecologically safe, economically efficient of land use and the development of transport infrastructure is contained in the works of domestic scientists: D. Babmidry, I. Bystryakova, N. Bondarchuk, Y. Dorosha, K. Marintseva, A. Martina, L. Novakovskii, A. Miroshnichenko, A. Tretyak, M. Stetsyuk, A.Yurchenko and others.

The purpose of the research is the definition of the main indicators of economic efficiency of land use of aviation transport and strategic directions of their improvement.

Results of the research and their discussion.

According to expert estimates, the use of land for the purpose of accommodation and operation of aviation transport has always been very scarce, mainly for two reasons:

first, the question of using the territory for aviation needs is considered in the context of environmental indicators and by assessing the profitability;

secondly, in spite of the general international cooperation, the issue of land use

of the airport has always been considered at the local level, but for one country, we take into account regional and national development programs of airports.

The system of effective land use of aviation transport is aimed at obtaining a certain amount of material wealth, provided the minimum capital and energy costs, and achievement of the maximum productivity of natural resources using and environmental protection of the natural environment.

An economic assessment of efficiency is a very important concept, which aims to identify the most optimal for the airline labor costs and capital, profit, compensation for losses, use of labor, material and, above all, land resources as an indisputable territorial basis.

One of the first issues that reveals the level of economic efficiency of aviation land use is revenue (profit) as a result. In this case, it is necessary to determine specific economic indicators of land use of air transport (Figure).

Economic indicators (Figure) characterize the level of efficiency of land use with the mandatory consideration of the area of land and a specific period of time during which the land is exploited.

Potential of land use. The economic indicator is expressed by the maximum number of air traffic (in the generally accepted system of ICAO, this indicator is called – Air Traffic Management (ATMs), which are carried out in relation to 1 / A of the area of land occupied by the airport during the investigated period of time [3]:

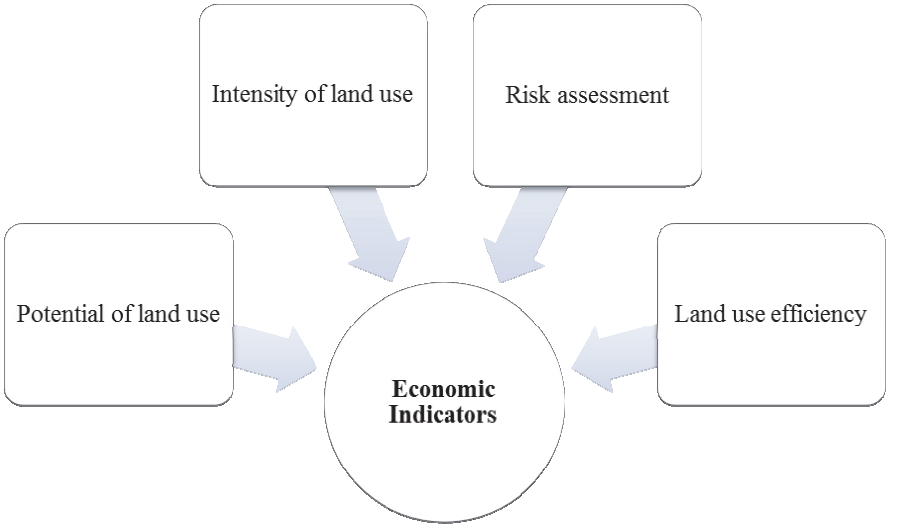
$$C_{LU} = C/A, \quad (1)$$

where C_{LU} – the potential of land use for a specific area of the land plot in accordance with the specific time;

C (T) – the maximum number of air transportation per year (ATMs / year), while it is advisable to consider that one aviation transportation is equivalent to landing or take-off;

A (T) – the area of the land plot which is occupied by the airport, respectively per year (ha or km^2).

Intensity of land use. The economic indicator should be expressed by



Economic indicators for determining the level of land use of aviation

the number of units of workload equivalent to one passenger and his luggage, or 100 kg of cargo, in relation to 1 / A land plot which is occupied by the airport for a specific period of time:

$$I_{LU} = W_{LU} / A, \quad (2)$$

where I_{LU} – intensity of land use;

W_{LU} (T) – the number of workload units placed at the airport for the year;

A (T) – the area of the land plot which is occupied by the airport, respectively per year (ha or km^2).

Land use efficiency. This economic indicator is expressed by the frequency of carried out transport (ATMs) on 1 / A land plot occupied by a specific airport during a specified period of time. Typically, the frequency is expressed by the time of arrival and departure of flights (ie, according to the schedule, with a delay of 15 minutes). In this case, the land area does not affect this value, and on the other means of management are usually used to balance the demand with the capacity of the airport, which, in turn, follows from the area of the occupied land and is calculated by the formula [7]:

$$Ef_{LU} = p_a * N_a + p_d * N_d / A, \quad (3)$$

where Ef_{LU} – the efficiency of land use (expressed in terms of: the number of flights / ha, km^2 / year);

p_a (T), p_d (T) – the proportion of flights on arrival (p_a) and departure (p_d) for a certain period of time respectively (T);

N_a (T), N_d (T) – total number of passengers arriving and departing for a certain period of time (T) (number of units);

A (T) – the area of the land plot which is occupied by the airport, respectively per year (ha or km^2).

Land use economics. Ultimately, it is important to define the meaning of the concept of land use economics for aviation in general. The concept is considered from the point of view of the level of profit, the use of labor, production resources and contribution to the general, local, regional, national, social and economic welfare that must be achieved in relation to the unit area of the land plot which is operated by an airport. According to the analysis of the above indicators, to evaluate the economic efficiency of land use in general should be by the following formula:

$$ECLU = PR (T) / A (T), \quad (4)$$

where EC_{LU} – economic efficiency of land use of aviation transport;

PR (T) – net profit which is received at operation of the airport for a specific period of time (T) (€ or $ US / year);

A (T) – the area of the land plot which is occupied by the airport, respectively per year (ha or km^2).

Ways of raising the economic indicators level of aviation transport land use. In order to increase the economic indicators level that were considered, it is expedient to apply measures to plan the improvement of the structure of investments [4].

The development of the airport can both stimulate and restrain its existence depending on the following factors:

- the presence or absence of infrastructure, which usually includes roads, a network of communal facilities (electricity, gas, water, sewage);
- the presence of such public facilities as schools, police departments, fire brigades.

Improvement of the structure of investments must be planned for infrastructure development in those areas, which are aimed at expanding industrial and commercial facilities. This investment strategy also aims to reduce the amount of residential development in areas near airports, as these objects are incompatible with each other.

It is also advisable to develop a capital investment plan for land-use types

that can interact with a certain level of noise and the maximum permissible level of pollution.

At the same time, measures to improve the structure of investments may be completely unnecessary for areas around the airport with well-developed infrastructure. Also, the provisions of the legislative framework, which do not regulate the conduct of certain measures, may become an obstacle. But still such a strategy is applied, and quite successfully, in Spain, Latvia, the USA, Poland and Korea.

Risk assessment. In any economic activity, it is advisable to consider the level of risks that should arise during production. In the case of aviation transport, it is necessary to calculate the risks of fatal aviation crashes, especially for such airport locations where is a tendency for a high concentration of different tupes of land uses near the runways. Therefore, the insurance risks from accidents to large-scale aviation companies as a result of the airliner crash can be calculated according to the following formula:

$$R_{FA} = r_{fac} * p_{fac/ap} * N * P / A_{c,} \quad (5)$$

where R_{FA} – estimation of risks of aviation transport land use;

r_{fac} – the speed of fatal crashes of an airliner for a certain period of time;

$p_{fac/ap}$ – the probability that a car crash will occur in the vicinity of the airport in a specific, defined period of time;

N – the number of flights for a specific, estimated period of time;

P – the number of inhabitants living within the limits of a potential accident, an airplane crash around the airport for a certain period of time and occupying a particular area of the land plot;

A_c – the area of the land plot which is occupied by the airport, respectively per year (ha or km^2).

Conclusions and perspectives.

Consequently, the economic side of the formation of effective land-use planning for aviation transport should operate and develop in order to achieve the following objectives [2]:

Estimation of the cost effectiveness in the allocation of a free land plot for the operation of aviation transport facilities or the calculation of the expediency of extending the territories of the exiting airport;

An assessment of the expediency of expansion the existing airport's territory, for example, for the construction of a new runway;

Measures for monitoring and comparing the results of land use at different airports, taking measures to avoid problems of incompatible adjacent infrastructure to the land use of a particular airport or vice versa;

Calculations of the future or current prospect of using land plots, which are occupied by airports.

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СТРАТЕГІЯ ПІДВИЩЕННЯ ЕКОНОМІЧНОЇ ЕФЕКТИВНОСТІ ЗЕМЛЕКОРИСТУВАННЯ АВІАЦІЙНОГО ТРАНСПОРТУ

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Анотація. *Розглянуто питання щодо формування системи ефективного землекористування авіаційного транспорту, яке має на меті отримання певного обсягу матеріальних благ за умови мінімальних капітальних та енергетичних затрат, а також досягнення максимальної продуктивності використання природних ресурсів і додержання екологічної безпеки природного навколишнього середовища.*

Функціонування авіаційної галузі є надзвичайним економічним внеском щодо рівня продуктивності інших видів промисловості та є потужним фіксатором їх зростання. Такий вплив, у свою чергу, сприяє підвищенню рівня продуктивності світової економіки.

Обґрунтовано, що економічна оцінка ефективності є дуже важливим поняттям, пов'язаним із визначенням найбільш оптимальних для авіапідприємства витрат праці й капіталу, отриманням прибутку, відшкодуванням збитків, використанням трудових, матеріальних, і, в першу чергу, земельних ресурсів, як безперечного територіального базису.

Одним із перших питань, які виявляють рівень економічної ефективності землекористування авіаційного транспорту, є дохід (прибуток) як кінцевий результат.

Подано основні економічні показники ефективності землекористування авіаційного транспорту, які розраховуються з обов'язковим урахуванням площі земельної ділянки та конкретного періоду часу, впродовж якого дана земельна ділянка експлуатується: потенціал землекористування; інтенсивність землекористування, ефективність землекористування та оцінка страхових ризиків.

Основні способи щодо підвищення рівня економічних показників землекористування авіаційного транспорту мають на меті вдосконалення структури капіталовкладень та планування розвитку інфраструктури в тих районах, на території яких можливе розширення промислових та комерційних об'єктів. Така стратегія капіталовкладень також сприятиме зменшенню кількості житлової забудови в районах поблизу аеропортів, оскільки ці об'єкти несумісні один із одним.

Ключові слова: *землекористування авіаційного транспорту, показники економічної ефективності, стратегія вдосконалення та розвитку*

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СТРАТЕГИЯ ПОВЫШЕНИЯ ЭКОНОМИЧЕСКОЙ ЭФФЕКТИВНОСТИ ЗЕМЛЕПОЛЬЗОВАНИЯ АВИАЦИОННОГО ТРАНСПОРТА

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Аннотация. *Рассмотрены вопросы формирования системы эффективного землепользования авиационного транспорта, имеющего целью получение определенного объема материальных благ при минимальных капитальных и энергетических затратах,*

а также достижение максимальной производительности использования природных ресурсов и соблюдения экологической безопасности окружающей природной среды.

Функционирование авиационной отрасли является чрезвычайным экономическим вкладом по уровню производительности других видов промышленности и является мощным фиксатором их роста. Такое влияние, в свою очередь, способствует повышению уровня производительности мировой экономики.

Обосновано, что экономическая оценка эффективности является очень важным понятием, связанным с определением наиболее оптимальных для авиапредприятия затрат труда и капитала, получением прибыли, возмещением убытков, использованием трудовых, материальных, и, в первую очередь, земельных ресурсов, как беспрекословного территориального базиса. Одним из первых вопросов, которые выявляют уровень экономической эффективности землепользования авиационного транспорта, является доход (прибыль) как конечный результат.

Представлены основные экономические показатели эффективности землепользования авиационного трасnпорта, которые рассчитываются с обязательным учетом площади земельного участка и конкретного периода времени, в течение которого данный земельный участок эксплуатируется: потенциал землепользования; интенсивность землепользования, эффективность землепользования и оценка страховых рисков.

Основные способы по повышению уровня экономических показателей землепользования авиационного транспорта имеют целью усовершенствование структуры капиталовложений и планирования развития инфраструктуры в тех районах, на территориии которых возможно расширение промышленных и коммерческих объектов. Такая стратегия капиталовложений будет также способствовать уменьшению количества жилой застройки в районах вблизи аэропортов, поскольку эти объекты несовместимы друг с другом.

Ключевые слова: *землепользование авиационного транспорта, показатели экономической эффективности, стратегия усовершенствования и развития*

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TOWARDS ORGANIC PRODUCTION DEVELOPMENT IN UKRAINE

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Abstract. *The article analyzes the development of organic production in Ukraine. It has been established that organic production in our country has recently expanded considerably due to the need to provide natural food products to the population, as well as the reproduction of natural fertility of soils and biodiversity of the environment with the implementation of a careful attitude towards nature, producer and consumer.*

The results of the Kyiv population survey, the attitude of people to organic products and goods, their impact on human health and on the state of the environment, as well as the formation of the value of such products, have been analyzed. The factors influencing the formation of value and the development of the market of organic products in Ukraine are substantiated, in particular, the main ones are considerable expenses in production and processing, as well as the passage of the corresponding certification. Adoption of the Law of Ukraine "On Basic Principles and Requirements for Organic Production, Circulation and Marking of Organic Products" is important for harmonization of national legislation with European regulation in the field of organic production and circulation of products. It establishes the general principles of legal regulation in the field of organic production, circulation and labeling of organic products, which should give an additional impetus to the sustainable development of organic production in Ukraine.

Keywords: *organic production development, consumers of organic products, organic land, organic, labeling and circulation of organic products*

Introduction.

The development of the organic market in Ukraine - from production to organic products - is an overview of the organic products market and Ukraine's place as a reliable producer and supplier. The main segment of the global organic produce market is the production of environmentally friendly food products.

On July 10, 2018, the Verkhovna Rada of Ukraine adopted the Law of Ukraine No. 2496-VIII «On Basic Principles and Requirements for Organic

Production, Turning and Marking of Organic Products», which established the general principles of legal regulation in the field of organic production, circulation and labeling of organic products that should give an additional impetus to the sustainable development of organic production in Ukraine, increase the competitiveness of domestic organic products and expand the geography of its sales on international markets, to determine the mechanism state supervision over the activities of entities of the organic market and establish their responsibility for possible violation of the legislation in this area, introduce a transparent system of registration of certification bodies, market operators and organic seeds, etc. [2, p. 2-3].

The responsibility for the misuse of all terms related to organic products when marking products is clearly stated, in particular, such a violation entails imposing a fine on legal entities in the amount of eight minimum wages, for individual entrepreneurs - at the rate of five minimum wages boards The penalties provided for by the document, in our opinion, are relatively low, but still they will allow to deal with such a shameful phenomenon as «pseudo-organic». Such positions should facilitate the work of domestic bona fide certified organic producers and will allow to effectively control the organic sector of executive bodies, the public and consumers.

Analysis of recent researches and publications.

Studies of organic production in Ukraine are engaged in domestic scientists, in particular: G. Antoniuk, V. Artysh, A. Vdovichenko, V. Vovk, K. Gladchenko, L. Marmul, E. Milovanov, N. Novak, O. Tomashevska, O. Shevchenko etc.

Modern conditions of development of organic production require more profound and detailed study of the issue, and also issues certification for organic businesses and products, especially the cost of certification services; specialisation of organic production and substantiation of new directions for small producers.

The purpose of the study is to assess the development of organic production in Ukraine and analyze the Law of Ukraine «On main principles and requirements to organic production, rotation and labelling of organic products» from 10.07.2018 (which will come into force in 2019) and to establish the possibilities of doing this type of work in Ukraine and prospects for improving environmental condition.

Results.

After analyzing the results of our surveys of residents of Kiev regarding the consumption of organic products, the majority said that use organic products of own production (grown personally on a country land or have close relatives in the garden), because to buy if too expensive. If you are buying and, in most cases, the baby food, and average spend UAH 1500 per month, which is 15 times less than in Europe. So, comparing with the average per capita in European countries (poles (minimal) 4000, germans 12 000) also, there is evidence that the Polish producers of organic products raise concerns about the lack of use of organic products their fellow citizens and the lack of more support for organic producer from the state [1, p. 2; 8, p. 34]. Also, the poll confirm the fact that our citizens become more environmentally literate and prefer to worry about the organic habitat and on occasion choose organic products, the production of which in no way harms the environment.

The peculiarity of organic food products is the following: high taste, nutritious quality, in particular, contain no harmful impurities and various compounds, allergenic components, genetically modified organisms, synthetic flavors and preservatives in the processed form. The survey also noted that the consumption of organic products leads to a significant improvement in health and in general health of people, and especially this was noted by a group of people suffering from allergic diseases and diseases of the gastrointestinal tract. There is also a study of scientists about the positive effects of organic products consumption, in particular, the promotion of active mental and physical activity, as well as the extension of life expectancy. It is especially important to use organic products for children and young people, since it is at this age that the foundations of health are laid and all the systems of the human body are formed, and most importantly - habits of healthy eating are acquired.

Over the past three years, the area under organic crops in our country has increased by almost 48.0%, the main factors are the expansion of markets for organic products in the state, increased availability of agrarian market of the European Union and other countries for domestic organic producers, improvement of law-making their activities. However, the issue of certification of organic enterprises and organic products in the whole, and in particular the cost of certification services, remains to be solved at an adequate level; specialization in organic production and substantiation of new directions for small and small commodity producers (at the level of personal farms or small home farms) [5, p. 1].

At present, many Ukrainian agricultural enterprises are certified in accordance with European, American and other international organic regulations, and after the adoption of the Law of Ukraine «On Basic Principles and Requirements for Organic Production, Turnover and Marking of Organic Products», during the formation of budget support programs in the field of agriculture, it is possible to will also argue about the financial incentive for organic production - just after clear identifiers are received, what exactly is the body of the original product.

In the countries of the European Union, regulatory acts regulating the production of organic products appeared much earlier, in particular: Council of the European Union Decree № 834 / 2007 of 28 June 2007 on organic production and labeling of organic products and Regulation of the European Commission No. 889/2008 of September 5, 2008 «Detailed rules on organic production, labeling and control for the implementation of the Regulation of the Council of the European Union No. 834/2007 concerning organic production and labeling of organic products», as amended [6, p. 2].

Our law repeats somewhat, imposes European regulations, but in more detailed analysis it is possible to see not only explicit legal defects, but also serious differences in relation to the problem, the environment and, actually, to ourselves.

Last year, the market for organic products exceeded the expected results with a significant share of domestic production certified according to the standards of the European Union [5, p. 1].

According to the Federation of Organic Movement of Ukraine, it is known that Ukrainian organic producers have established a new record for the export of organic soybeans, namely, over the first seven months of this year, more than 12 thousand tons of legume crops

were exported, which is 24% more than in comparison with last year. Also, from these sources, it is known that currently more than 400 names of organic products are produced in Ukraine - it is mainly: bakery, dairy and meat products [7, p. 1].

An analysis of the development of the organic products market in Ukraine has been made and it has been proved that it could develop at a faster pace, if not such a major constraining factor is the high cost of organic products (roughly an order of magnitude comparing to the cost of products grown in a sacramental way). It is established that in European countries the standard mark-up on organic products is 20-30%, here we have 50-300% and higher than inorganic analogs of food products and household goods. The reasons for such a markup are: high cost of certification of the organic producer, biological means for organic production (biological fungicides and insecticides, etc.) [1, p. 1; 4, p. 27].

Such a significant difference can be explained by the following factors of influence:

- direct high costs of the production process, especially in livestock production;
- the processing process is much more expensive, as well as the storage of organic products;
- small volumes of production and transportation distances with special terms of suitability of such products;
- considerably higher labor costs in the production of organic products, as well as taking into account the costs of its certification [3, p. 62].

Discussion.

Analyzing the state of the organic sector in Ukraine and the world, the emphasis should be placed on the special role of soybeans, whose organic cultivation has a positive impact on the quality of the soil and the improvement of soil fertility. In addition, there is a steady trend in the growth of demand for organic soybean and its products for processing, and Ukraine has a unique chance for a long time to be a European leader in its production and supply.

However, special attention should be paid not only to the improvement of technological approaches in organic growing of legumes, but also to ensure maximum transparency, traceability of origin and movement, transformation of all organic products, which is one of the key requirements of the present.

We believe that the future of agrarian development in our country can and can be based on the principles of organic production, taking into account and care for the environment, consumer and producer of organic products.

We also believe that increasing the supply and demand for organic products in our country, as sought by Poles and implemented in Denmark, can be through appropriate funding by the Government of the country to support the production of environmentally friendly food products (for example, in Poland, there is state support for farmers producing organic products, as well as various projects (for example, the project of the European Union «Support for cooperation between Polish agricultural organizations and the European Union», especially with regard to providing producers with various communications).

To introduce and promote the use of organic products in school, preschool and higher education institutions, as well as in state institutions, hospitals, etc., and such actions could quickly and effectively increase the demand for organic products.

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ДО ПИТАННЯ РОЗВИТКУ ОРГАНІЧНОГО ВИРОБНИЦТВА В УКРАЇНІ

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Анотація. *Проаналізовано розвиток органічного виробництва в Україні. Встановлено, що органічне виробництво у нашій країні останнім часом значно розширюється через потребу забезпечення натуральними продуктами харчування населення, а також відтворення природної родючості ґрунтів і біорізноманіття навколишнього природного середовища з метою дбайливого ставлення до природи виробника та споживача.*

Проаналізовано, за результатами опитування населення м. Києва, ставлення людей до органічної продукції та товарів, їх вплив на здоров'я людини й на стан навколишнього природного середовища, а також формування вартості такої продукції. Обґрунтовано чинники, що впливають на формування вартості та на розвиток ринку органічних продуктів в Україні, зокрема, головними з них є значні затрати під час виробництва та переробки, а також проходження відповідної сертифікації.

Ухвалення Закону України «Про основні принципи та вимоги до органічного виробництва, обігу та маркування органічної продукції» є важливим для гармонізації національного законодавства з європейським регулюванням у сфері органічного виробництва та обігу продукції. Він встановлює загальні засади правового регулювання у сфері органічного виробництва, обігу та маркування органічної продукції, який має надати додатковий поштовх сталому розвитку органічного виробництва в Україні.

Ключові слова: *розвиток органічного виробництва, споживачі органічної продукції, площі органічних земель, органіка, маркування та обіг органічної продукції*

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О. В. Кустовская, Я. А. Смолий

К ВОПРОСУ РАЗВИТИЯ ОРГАНИЧЕСКОГО ПРОИЗВОДСТВА В УКРАИНЕ

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Аннотация. *Проанализировано развитие органического производства в Украине. Установлено, что органическое производство в нашей стране в последнее время значительно расширяется из-за необходимости обеспечения натуральными продуктами питания населения, а также воспроизводства естественного плодородия почв и биоразнообразия окружающей природной среды с целью бережного отношения к природе производителя и потребителя.*

Проанализировано, по результатам опроса населения г. Киева, отношение людей к органической продукции и товарам, их влияние на здоровье человека и состояние окружающей природной среды, а также формирование стоимости такой продукции. Обоснованы факторы, влияющие на формирование стоимости и на развитие рынка органических продуктов в Украине, в частности, главными из них являются значительные затраты при производстве и переработке, а также прохождение соответствующей сертификации.

Принятие Закона Украины «Об основных принципах и требованиях к органическому производству, обращению и маркировке органической продукции» является важным для гармонизации национального законодательства с европейским регулированием в сфере органического производства и обращения продукции. Им установлены общие принципы правового регулирования в сфере органического производства, обращения и маркировки органической продукции, который должен предоставить дополнительный толчок устойчивому развитию органического производства в Украине.

Ключевые слова: *развитие органического производства, потребители органической продукции, площади органических земель, органика, маркировка и оборот органической продукции*

MONITORING AND PROTECTION OF LAND

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LAND RESOURCES OF THE ZVENIGOROD DISTRICT OF CHERKASY REGION: ASSESSMENT OF THE STATE AND OPTIMIZATION

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Abstract. *The article presents a comparative analysis of the optimal environmental parameters and the current structure of lands in the Zvenigorod district of Cherkasy region. The purpose of the study is to assess the current state of land use in the Zvenigorod district of Cherkasy region and to identify problems and justify ways of solving it. An analysis of the current state of land use in the district indicates a high level of technological load on land resources, which results in low ecological stability of land use in general. An assessment of ecological stability of the territorial structure land of the district and sustainability of lands to anthropogenic load is provided. Only 10% of the area of the district's land can be attributed to medium-stable territories relatively low level of anthropogenic loading and least landslide of agricultural lands - the Territories of the Morin, Popivska and Khlipnivska village councils.*

In the result of carrying out researcheskey directions in the optimization of territorial land use in the Zvenigorod district are grounded: improvement of the structure of crops and crop rotation by increasing the proportion of perennial grasses, leguminous crops; reduction of the area of arable lands due to their withdrawal from arable land and transfer to hayfields and pasture lands (increasing the area of ecologically stabilizing lands); preservation of degraded, unproductive and technogenically polluted land and to rehabilitate affected lands.

Keywords: *land use; agrilandscape; ecological stability of a territory; anthropogenic load*

Relevance.

State land policy in Ukraine envisages the activity of state authorities in the field of land relations aimed at the rational use and protection of land, ensures food security of the country and creates environmentally safe conditions for the conduct of economic activity and citizens residence. The quality of the state

land policy is determined taking into account the criteria (requirements) of good state management of land resources contained in the recommendations of the Food and Agriculture Organization of the United Nations (FAO) [1].

The level of intensity of land use is an extremely important indicator in agricultural production. However, the effectiveness of management on the ground is determined by the size of gross output and yield, and the rationality of nature is characterized by the structure of the use of territory and the quality of the ecological potential of land. Therefore, the main objective of land evaluation is to identify areas with unsatisfactory ecological status and to develop proposals for optimizing land use.

Analysis of recent research and publications.

Significant contribution to the development of the solution to the problem of optimization of agricultural land use was made by such scientists as D. S. Dobriak, O. P. Kanash, I. R. Karplyuk, V. M. Krivov, A. M. Tretiak [2,3,4]. In their works the directions of optimization of stabilizing and destabilizing lands are grounded by bringing to the optimal sizes of areas of hayfields, pastures, forests, protected areas, creation of an effective mechanism for managing the land resources. However, despite existing scientific studies, the issue of environmentally safe use of land requires a more detailed study.

The purpose of the study is to assess the current state of land use in the Zvenigorod district of Cherkasy region and to identify problems and justify ways of solving it.

Presenting main material.

From the total area of Cherkasy region (2 091.6 thousand hectares), the total area of Zvenigorod district is 100996.9 hectares: agricultural land is 74181.37 he, including agricultural lands 72608.48 he, of which arable land is 62618.08 he, fallows – 601.22 he, perennial plantations – 2033.48 he, hayfields and pastures – 4348.16 he (fig. 1 and fig. 2).

The use of agricultural land is determined by the principles that are in the pursuit of agricultural commodity producers to increase production volumes due to the increase in the share of arable land. That is, with more arable land there is a decrease in ecological-

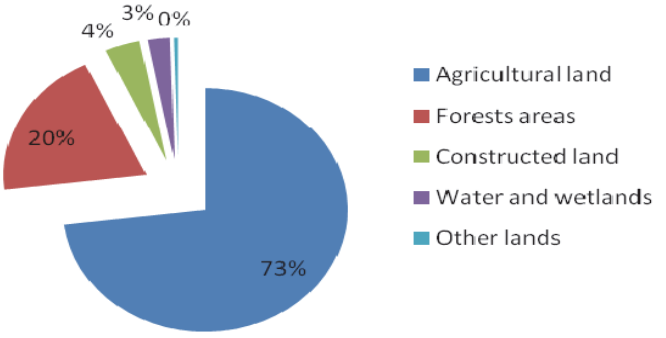

Fig. 1. Distribution of lands of Zvenigorod district of Cherkasy region by main types of lands, 2018*

* According to the The State Service of Ukraine for Geodesy, Cartography and Cadastre, 2018

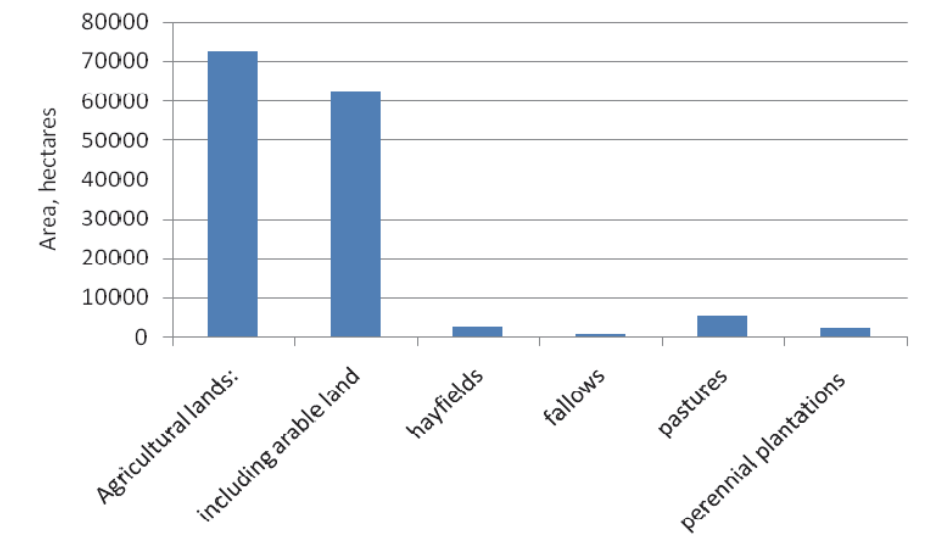

Fig. 2. Structure of agricultural lands of Zvenigorod district of Cherkasy region*

* According to the State Geocodist of Ukraine, 2018.

ly stabilizing lands (forests, hayfields, pastures, shrubs, etc.), the increase of which worsens the ecological situation in the studied area.

Modern use of land resources in the Cherkasy region, and in particular in Zvenigorod district, does not meet the requirements of rational nature management. So, as in Ukraine, significant violations of the ecologically permissible ratio of arable land, natural forage lands, forest plantations, which negatively affects the stability of biocenosis, are noted in the area.

The main fertility losses of soils are related to the high degree of land cultivation and the increase of erosion processes; violation of the structure of crop rotation; an increase in the deficit of the balance of nutrients and organic matter, and therefore the depletion of their reserves in the soil; weakening of the microbiological activity of the soil; the presence of acid soils; an increase in the density of the soil and a drop in its water-retaining capacity; the slow introduction of modern soil protection technology of cultivation [2].

The average weighted index of humus content in the soils of Zvenigorod rayon according to the last (X round) agrochemical survey is 2.8%, and in the district the average ecological-agrochemical bonite of arable land is 55.7 points [8].

To characterize the qualitative state of the lands of the Zvenigorod district and to determine the level of their suitability, a number of indicators were determined which reflect the ecological state of land holdings (by A. Tretiak's methodology) [4]. As a result of our research, it was found that the overall coefficient of ecological stability of Zvenigorod district is 0.37.

This characterizes the area as environmentally stable unstable. The average indicator of ecological stability in Ukraine is 0.41. The results of calculation of the coefficient of ecological stability of the territory of Zvenigorod district of Cherkasy region are graphically shown in Fig. 3.

According to the degree of ecological balance of territories and the level of anthropogenic load, the analysis and ranking of administrative-territorial units of the district have been carried out. According to the characteristics of the ecological state, the administrative-territorial units of Zvenigorod district are divided into 3 groups.

The first group included environmentally instable territories with a higher level of anthropogenic loading, which make up 60% of the district's area (17 administrative units). The second group includes environmentally unstable territories, which make up 28% of the district's area (8 administrative-territorial units). Only 10% of the area of the district's land can be attributed to medium-stable territories – the Territories of the Morin, Popivska and Khlipnivska village councils.

The coefficient of anthropogenic loading characterizes the magnitude of the impact of human economic activity on land resources. The level of anthropogenic impact, which affects the state of ecosystems, shows that the moderate anthropogenic load corresponds to areas where the value of this indicator is within the range of 3,1–3,5. The coefficient of anthropogenic loading in the region is 3.57 (Table). The average indicator for Ukraine is 3.42 [5], which indicates an increased level of anthropogenic load on the territory. In particular, only the territory of three administrative-territorial units of the Morin, Popivska and Khlipnivska village councils has an average level of anthropogenic pressure. This is due to the fact that in these areas the largest share is occupied by forestland and areas under water and covered with wetlands.

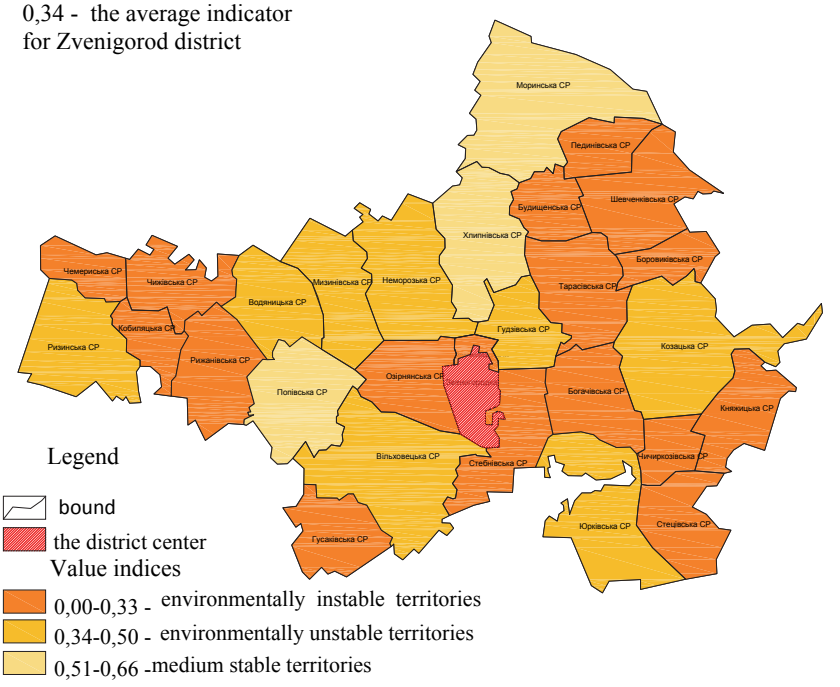

Fig. 3. Mapping scheme of Zvenigorod district on the coefficient of ecological stability

Indicators of the ecological state of land resources Zvenigorod district of Cherkasy region*

№	The name of the village council	Total area, ha	Area agricultural land, ha	The area of arable land, ha	Coefficient		Plowing total territory	area's wooded
					ecological stability	anthropogenic loading		
1	Bogachev	3813,90	3158,65	2494,00	0,33	3,60	65,4	10,8
2	Borovikivska	1701,80	1546,20	1368,12	0,21	3,88	80,4	4,0
3	Budyshchenskaya	1715,00	1392,80	1169,12	0,32	3,63	68,2	14,0
4	Vilkhovets	7312,30	5210,30	4644,84	0,37	3,50	63,5	22,5
5	Vodnyatskaya	3302,10	2692,60	1927,47	0,36	3,56	58,4	12,7
6	Hudziv	2217,90	1583,70	1045,60	0,44	3,41	47,1	23,5
7	Gusakiv	3036,40	2455,50	2192,57	0,30	3,64	72,2	14,3
8	Knyazhitsky	3265,40	2703,90	2574,93	0,25	3,75	78,9	11,1
9	Kobylyatsky	2161,20	1999,50	1538,90	0,24	3,84	71,2	3,1
10	Cossack	6615,90	4078,00	3655,90	0,46	3,28	55,3	33,6
11	m. Zvenigorodka	2466,96	1551,20	1306,99	0,23	3,98	53,0	9,5
12	Myzynivska	3193,70	2465,77	1603,07	0,43	3,38	50,2	16,9
13	Morinsky	7451,40	4112,86	3214,77	0,55	3,09	43,1	40,6
14	Nemorozka	5148,30	2837,66	2303,41	0,50	3,17	44,7	31,6
15	Ozernyansky	2864,70	2514,90	2229,99	0,24	3,80	77,8	6,1
16	Pedinovsky	2310,40	1935,23	1630,62	0,30	3,65	70,6	11,5
17	Popov	7451,40	4112,86	3214,77	0,55	3,09	43,1	40,6
18	Ryzhaniv	5148,30	2837,66	2303,41	0,50	3,17	44,7	31,6
19	Rizin	4456,80	2838,28	2479,88	0,47	3,25	55,6	33,4
20	Stebnovsky	3575,34	2860,08	2571,79	0,27	3,71	71,9	9,5
21	Stetsiv	3636,10	3190,90	2980,60	0,21	3,83	82,0	4,8
22	Tarasiv	3969,80	3544,26	2954,84	0,27	3,73	74,4	6,7
23	Chlipniv	4573,50	2181,65	1826,30	0,59	2,99	39,9	47,3
24	Chemeri	1677,00	1429,40	1208,90	0,29	3,67	72,1	10,2
25	Chizhiv	2624,00	2355,68	1938,56	0,25	3,81	73,9	5,6
26	Chichirkuzovsky	1998,50	1644,27	1440,58	0,29	3,66	72,1	8,5
27	Shevchenko	4325,10	3775,72	3331,27	0,24	3,81	77,0	6,7
28	Yurkiv	4020,10	2836,12	2537,56	0,37	3,48	63,1	19,1
	Total	106033,3	75845,65	63688,73				
	Average in the area				0,34	3,57	0,67	0,17

*Calculated by the A. Tretiak's methodology

In 2018, in the Zvenigorodsky District, 30 agribusiness entities are operating on the basis of collective agricultural enterprises, including: 10 Agricultural limited liability companies, private enterprise – 3, agricultural production cooperatives – 2, limited liability company – 9, large peasant farms – 5, private agricultural enterprises – 1, in the use of which is located and processed 72609 hectares agricultural lands, including arable land 62618g (95 and 98% of the total area of the land). There are also 114 economically active farms operating in the use of which there are 4357 hectares of arable land [6].

For commercial use, more than 71 percent of the territory is involved. Extremely high level of cultivation of the territory and is more than 60 percent (in developed countries of Europe - does not exceed 35 percent [7]). As we see the greatest degree of tilled land area observed such as village councils Stetsivskiy (82%), Borovykivskiy (80%), Kniazhytskyi (79%), Ozirnyanskiy (78%), Shevchenkivskiy (77%). Such a correlation is not ecologically optimal, due to increased agricultural development and cultivations of lands significantly reduced ecological stability of landscapes (Table 1).

The actual forest area of the district is only 14 percent, which is not enough to ensure ecological balance (the average indicator of European countries - 25-30 percent [7]. As we see, the smallest forested area (up to 10%) is observed on the territory of such village councils as Borovikivska (4%), Kobylyatskaya (3.1%), Ozernyanska (6.1%), Stebnovskaya (9.5%), Stetsivska (4.8%), Tarasivska (6.7%), Chizhivska (5.6%), Chichirkuzovskaia (8.5%), Shevchenkivska (6.7%).

Agricultural land is a priority in the implementation of measures for the protection of land resources, since they are the main means of production and can not be replaced by another means.

Conclusions and perspectives.

Consequently, the analysis of the use of land resources in Zvenigorod district shows continuous process of deterioration of ecological state. Only 10% of the area of the district's land can be attributed to medium-stable territories relatively low level of anthropogenic loading and least landslide of agricultural lands - the Territories of the Morin, Popivska and Khlipnivska village councils.

Therefore, there is a need for decisions on rational use and protection of land namely in changing the structure of the land fund and increasing the area of ecologically stabilizing lands.

The land tenure structure of the Zvenigorod district of Cherkasy region should be optimized in the following areas: improvement of the structure of crops and crop rotation by increasing the proportion of perennial grasses, leguminous crops; reduction of the area of arable lands due to their withdrawal from arable land and transfer to hayfields and pasture lands (increasing the area of ecologically stabilizing lands); preservation of degraded, unproductive and technogenically polluted land and to rehabilitate affected lands.

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ЗЕМЕЛЬНІ РЕСУРСИ ЗВЕНИГОРОДСЬКОГО РАЙОНУ ЧЕРКАСЬКОЇ ОБЛАСТІ: СУЧАСНИЙ СТАН ТА ОПТИМІЗАЦІЯ ЇХ ВИКОРИСТАННЯ

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Анотація. *Подано порівняльний аналіз оптимальних екологічних параметрів і сучасної структури земель території Звенигородського району Черкаської області.*

Метою даної праці є дослідження та оцінка сучасного стану використання земельних ресурсів Звенигородського району Черкаської області та виявлення проблем і обґрунтування шляхів їх вирішення. Матеріалами дослідження є дані державного земельного кадастру, побудовані на методичних прийомах наукової абстракції, синтезу та аналізу окремих елементів.

Аналіз сучасного стану використання земель в районі свідчить про високий рівень технологічного навантаження на земельні ресурси, який зумовлює низьку екологічну стабільність землекористування в цілому. Лише 10 % площі земель району можна віднести до середньостабільних територій із середніми рівнем антропогенного навантаження та найнижчим ступенем розораності – це території Моринської, Попівської та Хлипнівської сільських рад.

У результаті проведених досліджень обґрунтовано основні напрями оптимізації територіальної структури землекористування Звенигородського району: удосконалення структури посівних площ і сівозмін шляхом збільшення питомої ваги багаторічних трав, зернобобових культур; скорочення площі орних угідь за рахунок виведення їх із ріллі й переведення в сінокісно-пасовищні угіддя (збільшення площі екологостабілізуючих угідь); провести консервацію деградованих, малопродуктивних і техногенно забруднених земель та рекультивацію порушених земель.

Ключові слова: *землекористування; розораність; екологічна стабільність території; антропогенне навантаження*

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Бавровская Н., Шлихта Т.

ЗЕМЕЛЬНЫЕ РЕСУРСЫ ЗВЕНИГОРОДСКОГО РАЙОНА ЧЕРКАССКОЙ ОБЛАСТИ: СОВРЕМЕННОЕ СОСТОЯНИЕ И ОПТИМИЗАЦИЯ ИХ ИСПОЛЬЗОВАНИЯ

https://doi.org/10.31548/zemleustriy2018.04.07

Аннотация. *Представлен сравнительный анализ оптимальных экологических параметров и современной структуры земель территории Звенигородского района Черкасской области.*

Целью данной работы является исследование и оценка современного использования состояния земельных ресурсов Звенигородского района Черкасской области и выявление проблем и обоснованных путей их решения. Материалами исследования являются данные государственного земельного кадастра, построенные на методических приемах научной абстракции, синтеза и анализа отдельных элементов.

Анализ современного состояния использования земель в районе свидетельствует о высоком уровне технологической нагрузки на земельные ресурсы, который обусловливает низкую экологическую стабильность землепользования в целом.

В результате проведенных исследований обоснованы основные направления оптимизации территориальной структуры землепользования Звенигородского района: необходимо усовершенствование структуры посевных площадей и севооборотов путем увеличения удельного веса многолетних трав, зернобобовых культур; сокращение площади пахотных угодий за счет вывода их из пашни и перевода в сенокосно-пастбищные угодья (увеличение площади экологостабилизирующих угодий); проведение консервации деградированных, малопродуктивных, техногенно-загрязненных земель и рекультивации нарушенных земель.

Ключевые слова: *землепользование, распашка, экологическая стабильность территории, антропогенная нагрузка*

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MAPPING BEE FORAGE TREES

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Abstract. *The possibilities of using the remote sensing data for bee forage mapping in the forest have been shown in the research. Finding the areas of nectar and pollen plants could help effective development of beekeeping.*
In the article was shown the analysis of different periods of remote sensing data acquisition for the most suitable mapping bee forage trees.
The NDVI was calculated during the growing season from late April to the beginning of October. That index were fluctuating during the period of the research. The peak of the development of green mass period was defined for NDVI as the most suitable for the study and selection of different types of trees.
As a result of the research, it was established that the determining location of bee forage trees based on remote sensing data provides the best result in combination of several NDVI images.
Keywords: *remote sensing data, bee forage, mapping*

Introduction.

Remote sensing is an approach to get operative spatial data and keeping the data up to date. Today remote sensing is commonly used in different spheres in solving problems in nature and human activities. Many researches using remote sensing for identifying plants were performed.

Finding the areas of nectar and pollen plants could help effective development of beekeeping. Beekeepers need to find enough areas of bee forage. The basis of bee forage may be honey forest plants, because, as a rule, forest plants do not change place of localization every year.

This paper uses remote sensing data for bee forage mapping in the forest.

Analysis of recent researches and publications.

The development problems of scientific and organizational principles of beekeeping in Ukraine from the earliest time to the present has been covered by scientists M. M. Vitvitsky, O. H. Andriyashev, V. A. Nestervodsky, G. L. Bodnarchuk.

The research [1] covered usage ng of remote sensing data for forest park landscape classification in urban and suburban forests. However, the identification of the areas of nectary and pollen forest resources according to remote sensing data was not highlighted.

The identification of agricultural resources based on vegetation indexes of the remote sensing data has covered in different researches [2–5].

The article [6] considers elements of applying some methods of multispectral images classification for bee forage determining based on field crops.

The study [7] highlights the inventory of honey plants in arid zones. Ground-based inventory works were supported by GIS-applications.

However, an optimal period for identification and bee forage trees mapping based on the remote sensing data was not defined in the Ukrainian forest-steppe zone.

Objectives of the article: the analysis of different periods of remote sensing data acquisition for the most suitable mapping bee forage trees.

Materials and methods.

The study was conducted on the territory of Boryspil district of Kyiv region.

To achieve the objective of the study, the following methods were used: thematic processing of remote sensing data; statistical and cartographic methods.

The paper used modules of image processing of the Idrisi Selva software. The information base of the research is the ground-based survey of place and multispectral images Landsat 8.

Results.

The remote sensing data is an operative source for obtaining geoinformation data and the main source for keeping information up-to-date.

To achieve the research objective the tasks which were structured in the model were performed. The functional model of the application of remote sensing data and data collection in the nature for selection the optimal location of apiaries was illustrated in Fig. 1.

The key components of this model are: problem statement and determination of the territory, collection of data in the nature, visual image interpretation, selection of reference areas, selection of remote sensing data, thematic processing of remote sensing data and the creation of a thematic map of perennial honey trees.

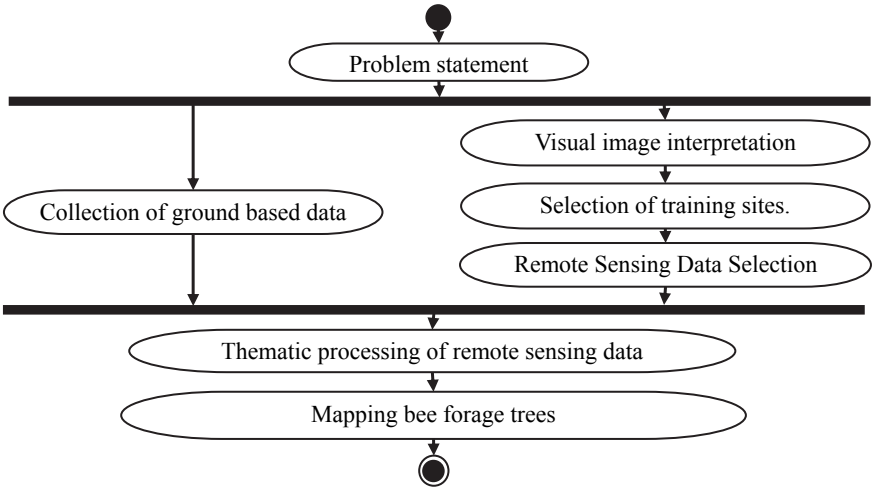

Fig. 1. The functional model of the implementation of actions to solve the problem

Problem statement. The rational development of beekeeping depends entirely on the availability of bee forage resources, their productivity and quantitative composition.

Many honey plants grow in the forest. However, not every forestland is rich in honey vegetation. Honey-bearing forest plants include acacia, apple, pear, cherry, poplar, birch, elm, linden, heather, blackberry, blueberries, raspberries etc [9].

Honey plants can be found in all tiers in the forest. However, based on remote sensing data, only plants that grow in the upper tier could identified. In this way, large forests can be explored in search of nectar or pollen. In this work, the following forest crops were selected for research: birch, alder, acacia, aspen, willow, linden, pine, spruce, oak, ash, maple.

Collection of ground based data. The ground-based survey used Garmin device to define the location of trees.

Visual image interpretation. Vegetation could be determined by visual image interpretation based on separate spectral channels or color compositions. However, this method did not provide the exact result of the location of nectar and pollen plants.

Selection of training sites. The selection of reference areas is carried out in the ground based was used to create training sites. In the research of terrain, objects are interpreted directly by comparing of their image to image in nature. The research of the images in laboratories was based on a variety of cartographic and reference materials. Using the combination of these two methods, more precise and standardized templates were obtained – exemplary interpreted images of forest areas with a known breed of trees [8].

Remote sensing data selection. Since the objective of the research is to define the territories for the location of nomadic and stationary apiaries, the objects of spatial differentiation are arrays of trees that are not less than 0,1 hectares, which can be covered by multispectral images of Landsat 8 with a spatial resolution of 30 meters.

Clouds were covering target territory on the more than half of Landsat 8 images during vegetation periods in 2017 and 2018. During the growing season in 2016, Landsat 8 took images on the following dates: 24.04, 10.05, 26.05, 11.06 (cloudiness), 27.06, 13.07, 29.07, 14.08 (clouds), 30.08 (few clouds), 15.09, 1.10.

Thematic processing of remote sensing data. Vegetation indices are widely used for the evaluation and mapping of the vegetation state. Vegetation indices were calculated based on measured spectral brightness of different plant types [2].

NDVI is a simple quantitative indicator of the amount of photosynthetic active biomass, which is calculated by two of the most stable parts of the spectral reflection curve of plants. In the red region of the spectrum (0.6–0.7 microns), the maximum absorption of solar radiation by chlorophyll plants lies and the infrared region (0.7–1.0 microns) is the region of maximum reflection of the cellular structures of the leaf [8].

The NDVI was calculated during the growing season from late April to the beginning of October. Figure 2 shows NDVI graphs for each type of studding plants.

The values of NDVI were fluctuating during the period of the research. The most of the studied plants are broad-leaved vegetations, so the peak of the development of green mass in them increases at the end of May and lasts until mid-July. The same period was defined for NDVI as the most suitable for the study and selection of different types of trees.

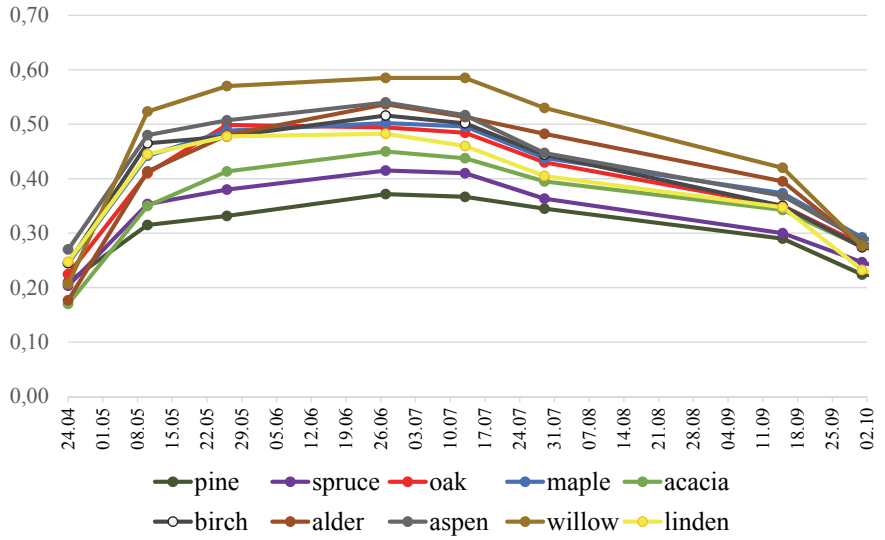

Fig. 2. NDVI graphs

Thematic processing of remote sensing data included algorithms of supervised classification. Training sites were selected of reference areas carried out in the terrain. They included etalons of honey and background plants such as pine and spruce.

From the set of algorithms of the supervised classification for the identification and mapping of the beekeeping feed base, we considered the possibility of using "hard classifiers": methods of Minimum Distance to Means, Linear discriminant analysis (Table).

The classification of satellite images was carried out separately on certain days and combination of days.

The Method of Minimum Distance to Means. On May 10, background plants – pine and spruce – were well-recognized. Linden trees were recognized erroneously. On May 26, the results were slightly better, because the green biomass of the studied plants had increased. Alder, oak, nut and ash have been recognized partly on correct places. On July 13, there was the peak of green biomass and the most diverse NDVI in the studied plants. Therefore, we saw no bad results, but instead of pine the classifier partially recognized spruce. On July 29, the classification result was similar to July, 13. Using the Method of Minimum Distance to Means of supervised classification based on combining NDVI images provided the best result.

The Method of Linear discriminant analysis. This method provided the best results, even in the middle of May, when the plants are starting to grow up green biomass. All plants were recognized. Of course, the best results of supervised classification was shown on July image, when there is the largest green mass. In the combined image the classifier of plants had bigger recognition accuracy.

Mapping bee forage trees. Identification and mapping of the bee forage trees based on remote sensing data was performed. Thematic maps of tree types were created. They had scale 1:100000 and can be used as the base to the planning of the localization of roaming apiaries.

Classification results
10.05
26.05
13.07
29.07
NDVI
Linear discriminant analysis
Minimum Distance to Means
pine
spruce
oak
maple
acacia
birch
alder
aspen
willow
linden

Conclusions.

This research describes the vegetation period of trees as a source of forage base for beekeeping. Determining location of bee forage trees based on remote sensing data provides the best result in combination of several NDVI images such as NDVI of the third ten-day period of May (26.05), NDVI of the third ten-day period of June (27.06) and NDVI of the second ten-day period of July (13.07).

This research had analyzed methods of supervised classification. The method of linear discriminant analysis had given the best result of bee forage trees localization.

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КАРТОГРАФУВАННЯ МЕДОНОСНИХ ДЕРЕВ

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Анотація. *Показано можливості використання даних дистанційного зондування для картографування кормової бази бджільництва у лісі. Пошук районів нектаро- та пилконосних рослин може допомогти ефективному розвитку бджільництва.*

Проаналізовано різні періоди даних дистанційного зондування задля визначення найбільш оптимального для картографування кормової бази бджільництва у лісі.

NDVI було розраховано впродовж вегетаційного періоду з кінця квітня до початку жовтня. Цей індекс коливався протягом періоду дослідження. Період піку розвитку зеленої маси було визначено для NDVI як найбільш прийнятний для вивчення та відбору різних типів дерев.

У результаті дослідження було встановлено, що картографування кормової бази бджільництва багаторічних дерев на основі даних дистанційного зондування забезпечує найкращий результат при поєднанні кількох зображень NDVI.

Ключові слова: *дані дистанційного зондування, кормова база бджільництва, картографування*

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КАРТОГРАФИРОВАНИЕ МЕДОНОСНЫХ ДЕРЕВЬЕВ

https://doi.org/10.31548/zemleustriy2018.04.08

Аннотация. *Показаны возможности использования данных дистанционного зондирования для картографирования кормовой базы пчеловодства в лесу. Поиск областей нектарных и пыльценосных растений может помочь в эффективном развитии пчеловодства.*

Проанализированы различные периоды сбора данных дистанционного зондирования наиболее подходящих для картографирования деревьев кормовой базы пчеловодства.

NDVI был рассчитан в течение вегетационного периода с конца апреля до начала октября. Этот индекс колебался в течение периода исследования. Период наибольшего развития зеленой массы был определен для NDVI как наиболее подходящий для изучения и отбора различных типов деревьев.

В результате исследования было установлено, что определение местоположения деревьев кормовой базы пчеловодства на основе данных дистанционного зондирования обеспечивает наилучший результат в сочетании нескольких изображений NDVI.

Ключевые слова: *данные дистанционного зондирования, пчеловодство, картографирование*

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THE USE OF UNMANNED AERIAL VEHICLES (UAV) FOR LAND MANAGEMENT

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Abstract. *The article is devoted to a comparative analysis of the use of unmanned aerial vehicles for solving problems of land management. Scientific work highlights the prospects for the use of unmanned aerial systems in the implementation of local monitoring and the need to take into account the possibility of using unmanned aerial systems of various types in making management decisions to ensure their maximum efficiency in the shortest possible time. Given problem is not sufficiently substantiated in the Ukrainian law and this can lead to the complication of the use of unmanned aerial vehicles, due to bureaucratic and corruption schemes as well as the negative impact on objects of special use regime.*

Keywords: *unmanned aerial vehicles, a temporary order of use of the airspace of Ukraine, Earth remote sensing, land management*

The relevance of the article.

Efficiency in obtaining reliable information is an important component in making timely and effective management decisions to ensure an adequate response in critical situations and support the sustainable development of the economy. The use of modern means of scientific and technological progress allows us to achieve the desired results with minimal time and human labor.

Effective use of land resources is impossible without taking into account the specific properties of the land, directly or indirectly reflected in the structure of the qualitative and quantitative composition of land resources, which are in constant change.

The above suggests that the effective use of land resources largely depends on the effectiveness of monitoring land resources as a source of information about the current status of natural resources and dynamic changes in their structure.

Taking into account ease of use, efficiency, and reliability in collecting the necessary information about objects using unmanned aerial vehicles, the characteristics of the structures and the prospects for using them, as well as describing the possibility of their place in the coordinates of the legal field, requires detailed study and analysis.

Analysis of recent research and publications.

Actual information on the introduction of certain unmanned aerial systems is provided on official electronic resources of manufacturing companies and companies distributing UAV such as DJI, Smart Drones, People's Drone, etc.

At the same time, considering the UAV in the context of land management, it is impossible not to single out the role of scientists like Dorosh Y.M. and Butenko E.V. in the study of problems of monitoring land resources; Martyn A.G. and Tretyak A.M. in matters of legislative framework for the effectiveness of management decisions; Kokhan S.S. and Vostokov A.V. whose works are devoted to the specifics of geoinformatics and remote sensing of the Earth.

The aim of the article is to compare the characteristics of the currently existing models of unmanned aerial vehicles and the legal regulation of their use and also determine the use of the achievements of scientific and technological progress for the needs of the management of sustainable development of territories in the legal field.

Basic material.

The rapid development of scientific and technological progress, financial, economic and legal relations in society leads to constant rapid changes in the location of urban infrastructure, the structure and configuration of agricultural landscapes, agricultural and forestry lands, natural resources consumption areas. The efficiency and accuracy of managerial decision make directly depend on the information sensitivity to changes in the spatial location of objects which are sources or places of concentration of material goods, cultural, spiritual and aesthetic values.

That's why the task is to timely meet the needs of various consumer groups with current information about the objects of the surroundings that can be expressed as a set of geospatial and attribute data about the objects of the potential query of users of geographic information systems.

For a long time, the solution of the set goals is achieved by land monitoring systems, remote sensing of the Earth and means of aerial photo-geodetic survey. The data collection process required careful preparation, time and cost and it was possible only in large areas.

The Antonov AN-30 aircraft served as a carrier of aerophoto mais equipment during medium and smaller scale surveys with an upper limit of flight altitude of 8 km and an average speed of 440 km/h.

For aerial surveys on a medium scale, the Ilyushin IL-14 FK was used, the flight altitude of which reaches 6 km and the average cruising speed is 300 km/h.

The Antonov An-2 was designed for photographing on a large scale. Its altitude is 5 km, the average speed is 180 km/h. The Kamov Ka-26 helicopter was used for photographing small areas of the land surface on the same scale. Its height reached 3 km and the average speed was 140 km/h.

Nowadays, obtaining high-quality aerial photographs has become possible because of the use of UAV which greatly simplified the process of aerial photography and made it possible to take photos even of insignificant areas or individual objects.

The use of unmanned aerial systems allows:

- Solve topographic and geodetic engineering tasks;
- Build 3D terrain models;

Comparison of multicopter and aircraft platforms

Comparison options	Multicopter	Aircraft
Maneuverability	Higher	Lower
Price	Cheaper	More expensive
Portability	Compact, conveniently fold	Larger, often need additional launch catapults
Ease of use	Simpler	More difficult
Stability	Lower	Higher
Load capacity	Lower	Higher
The need for space for takeoff / landing	Absent	Obligatory
Large Area Monitoring	On average 50 ha	On average 6000 ha

- Perform remote diagnostics of engineering structures;
- Use a thermal imaging survey.

Flying on a given route, it is possible to get accurate and reliable photos and videos about the features of the relief, the state of the situation and the natural resources of the area which requires research.

In accordance with the objectives of aerial photography, there are 2 types of unmanned aerial systems which are used: copter and aircraft type. From the table, it can be concluded that it is advisable to use the multicopter for photographing individual point objects or areas of up to 20 ha, and aircraft-type drones for photographing and shooting linear objects and territories with known areas of more than 20 ha.

Among the copter-type UAVs, recently DJI Phantom 4 Pro (Pic. 1) is in great demand. It guarantees 30 minutes of flight, covering up to 50 ha with images; it can reach a maximum speed of up to 72 km/h, with a signal range of up to 7000 m and maximum wind speed up to 10 m/s. Phantom 4 Pro is equipped with a 20 MP, 1" sensor camera with a mechanical shutter, dual navigation system, high-precision guidance system.

Pic. 1. DJI Phantom 4 Pro

In order to introduce the use of modern trends with the use of UAVs in the arsenal of future leaders of state institutions, the National University of Life and Environmental Sciences of Ukraine has been using drones in the educational process from 2018.

An example of an orthophotomap created by students on the basis of Phantom 4 Pro materials is shown in Picture 3. It demonstrates the ability to produce quickly high-quality and high-resolution images for land management needs.

The prominent representative of the aircraft type of UAV can serve People's Drone PD-1 (Pic. 2), that during a flight of 600 minutes it is capable of covering 6,000 ha with a maximum wind speed of up to 10 m/s and can carry up to 8 kg of payload. The launch can be carried out using a catapult or chassis.

Pic. 2. PD-1

The launch of UAVs on the territory of Ukraine is regulated by the "Temporary Order of Using the Airspace of Ukraine", approved by the State Aviation Service of Ukraine (01.06.2018). This Order directly defines the conditions under which the use of drones is permitted.

Based on the procedure, a UAV, that together with a camera or special equipment weighs more than two kilograms, should be submitted an application for the use of airspace. And if necessary, also get permission from the Air Force of the Armed Forces of Ukraine, the State Border Service of Ukraine, the bodies of the United JCMS of Ukraine, the air traffic control and air traffic control authorities, etc.

It is allowed to fly only within the line of sight, but not farther than 500 meters from the external pilot. The maximum height is not more than 50 meters above the level of the land (water) surface.

It is also prohibited to fly over:

1. roads of state importance along the central streets of cities, urban-type settlements and villages;
2. state and regional railways;
3. and along power lines, product pipelines, except for the cases when the flights are carried out in agreement with the owner of the object;
4. industrial zones, power stations, railway stations, seaports, storages of fuel, oil, gas, other hazardous substances and liquids, etc., except for

Pic. 3. Orthophotomap of the training ground of NUBiP (Boyarka, Kyiv region, Ukraine)

the cases when flights are performed in coordination with the owner of the object;
5. the places (areas) of accidents and catastrophes (except those that involved in the aftermath of their consequences and search and rescue operations);
6. the penitentiary institutions and pre-trial detention centers, except for the cases when flights are carried out in the interests of the administrations of these institutions and detention centers;
7. other important state and potentially dangerous objects, except for the cases of flights under the permission of the authorities;
8. objects that are defined by the Ministry of Defense of Ukraine, the Ministry of Internal Affairs of Ukraine, the State Border Service of Ukraine, the Security Service of Ukraine, the National Police of Ukraine, the NGU, the State Guard Department, other military formations and law enforcement agencies established in accordance with the laws Ukraine and in respect of which the protection is carried out, except for the cases of flights with the permission of the above bodies.

For violation of airspace a fine is from 1020 to 8500 hryvnia.

Conclusion.

The development of unmanned aircraft offers a wide range of opportunities for specialists in the field of GIS, remote sensing and land management, provides an opportunity to conduct local monitoring of natural resources with high frequency and minimal cost. But with the development of scientific and technological progress, there is an urgent need to assess the achievements of science in the legal context and the perfect legislative regulation of processes related to the use of UAVs. It is necessary to create a legal framework that would ensure the unhindered implementation of monitoring and other activities related to the use of unmanned aerial vehicles without jeopardizing the security of the state, preserving state secrets and preventing threats to the life and health of citizens.

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ЗАСТОСУВАННЯ БЕЗПІЛОТНИХ ЛІТАЛЬНИХ СИСТЕМ ПІД ЧАС ВИРІШЕННЯ ЗАДАЧ ЗЕМЛЕУСТРОЮ

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Анотація. *Стаття присвячена порівняльному аналізу використання безпілотних літальних апаратів для вирішення задач землеустрою. Наукова праця висвітлює перспективи застосування безпілотних літальних систем під час здійснення локального моніторингу і необхідності врахування можливості використання безпілотних літальних систем різних типів у прийнятті управлінських рішень, для забезпечення їх максимальної ефективності в найкоротші терміни.*

Окреслено проблему недостатньо обґрунтованого законодавчого базису, що може призвести до ускладнення використання безпілотних літальних апаратів через бюрократичні й корупційні схеми та негативний вплив на об'єкти особливого режиму використання.

Ключові слова: *безпілотні літальні апарати, Тимчасовий порядок використання повітряного простору України, землеустрій, дистанційне зондування Землі, управління земельними ресурсами*

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ПРИМЕНЕНИЕ БЕСПИЛОТНЫХ ЛЕТАТЕЛЬНЫХ СИСТЕМ ПРИ РЕШЕНИИ ЗАДАЧ ЗЕМЛЕУСТРОЙСТВА

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Аннотация. *Статья посвящена сравнительному анализу использования беспилотных летательных аппаратов для решения задач землеустройства. Научная работа освещает перспективы применения беспилотных летательных систем при осуществлении локального мониторинга и необходимости учета возможности использования беспилотных летательных систем различных типов в подготовке управленческих решений, для обеспечения их максимальной эффективности в кратчайшие сроки. Затронуты проблемы недостаточно обоснованного законодательного базиса, что может привести к усложнению использования беспилотных летательных аппаратов из-за бюрократических и коррупционных схем и негативного воздействия на объекты особого режима использования.*

Ключевые слова: *беспилотные летательные аппараты, Временный порядок использования воздушного пространства Украины, землеустройство, дистанционное зондирование Земли, управление земельными ресурсами*

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SDI IN MODERN CARTOGRAPHY FOR INFORMATION ON LAND RESOURCES

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Abstract. *Land is the foundation of all human social production activities and is a precious natural resource and property. Land is a non-renewable resource with a limited area. With the development of human society, the demand for land is also growing. In order to make better use of land resources, scientifically plan land use, protect land resources, obtain maximum economic benefits, and achieve sustainable social and economic development, access to land information is very important. Cartography, which originated from the production activities of human society, has a close relationship with the land. With the development of modern information technology, more and more new technologies have emerged, which has promoted the development and change of cartography, network information technology and database technology. This development has also promoted the emergence and development of spatial data infrastructures (SDI). These changes make the acquisition of land information easier, and the types and quantities of information acquired are more diversified and huge.*

Keywords: *cartography, Spatial Data Infrastructures (SDI), geodata, land resources*

Importance (topicality) of research follows from dynamics of SDI development in many countries of the world, thus trends to changing traditional approaches to land mapping are obvious. The demand for production activities originating from human society has developed with the progress of human society and is closely related to land use. In the fourth century BC, there were maps [2] depicted on rocky walls. These original maps are just a few simple line combinations, just a rough picture. Information and data are at the heart of cartography, and the primary method of accessing information is to use a variety of measurement tools. From

the 1950s, the application of electronic information technology, the emergence of computer-aided drafting technology, the emergence of cartography. Great changes have taken place, and digital mapping methods and theories are constantly enriched. Since the 1970s, the application of information network technology and database technology, the establishment of map database, and cartography have entered the digital age (Ning, J.S., 2008). Geoinformation mapping in modern world widely uses data from open sources and SDI-related information. Concerning development of NSDI in Ukraine, including launch of pilot project, current information on land resources in access from SDI services is of high importance.

Overview of recent publications.

The development of information technology and network technology has greatly enriched people's lives and changed society. In order to promote the rapid development of the information society, in February 1993, US President Bill Clinton proposed the implementation of the National Information Infrastructure (NII), establishing a high-speed information network covering the entire United States, providing information services to all US citizens, while reduce the administrative costs of the government. In order to accurately query, describe and express geo-referenced information in high-speed information networks, it is necessary to establish a spatial data framework covering the whole country. Therefore, in 1994.04.13, President Clinton signed the establishment of "National Spatial Data Infrastructure" (NSDI) Presidential Decree No. 12906. In this command, SDI is defined as: "the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data." In addition to the United States, many countries and organizations around the world have also recognized the potential and value of establishing SDI in social, economic, and ecological aspects, and have begun to actively carry out research and construction of spatial data infrastructure. SDI is an information support platform that helps practitioners in different industries create and share spatial resources and data (Rajabifard et al., 2009).

The Danish SDI is based on INSPIRE principles: 1) Data should be only collected once; 2) Data should be maintained where this can be done most effectively; 3) Data should be combinable, regardless of their source; 4) It should be easy to get an overview of the available data and internet services; 5) There should be clear conditions which assure that data can be utilized by many users in many contexts. (Yomralioglu, T., Mclaughlin, J., 2017.)

The prototype of the Map of Open SDI in Europe was presented during a workshop at the INSPIRE 2017 conference. The main objectives of this workshop were to introduce the Map of Open SDI as a tool for measuring and assessing the openness of spatial data infrastructures, to discuss the relevance and applicability of the Map, and to collect input from SDI experts and practitioners on how the tool could be further improved. (Vancauwenberghe, G., Valekait, K., van Loenen, B., & Welle Donker, F., 2018).

Thus, SDI is used widely by land administrators and surveyors as a well-organized and systematized set of data on land, that correspond standards and protocols, avoiding duplicating and excessive metadata.

Aim of the paper – to define main directions of SDI use in land resources

mapping, to analyze approaches to land information organization in such infrastructures.

Materials and methods.

Comparative analysis of SDI initiatives on national and trans-national levels were examined in the study, such countries as the US, Denmark, Sweden, etc., although the most attention was payed to INSPIRE project of the EU, as well as pilot project of Ukrainian NSDI.

Results and discussion.

Although different countries and regions have proposed different SDI definitions and organizational structures according to their actual conditions and needs, in general, the basic structure of SDI is the same, they are:

1. Basic Geographic Information Database
2. Information Network System
3. Policy regulations and standards
4. Administrative organization structure system
5. Technical support system
6. Human resources and personnel training.

The basic geographic information database is the core of SDI. The information network system helps information collection, storage and transmission. Policy regulations and standards define unified standards and principles and provide legal support for SDI.

The administrative organization structure determines the composition of the relevant departments that implement SDI, and clarifies the tasks and responsibilities of each department. The technical support system provides technical assistance during the construction of SDI, and implements some ideas and achievements through technical means.

Human resources and talent development are very important. SDI has applied many new technologies, including many new concepts. Training talents who can understand and apply these concepts and technologies will affect the speed and development of SDI.

The navigation logic should enable novice, 'low-end' users to easily find their way around. The interface should enable novice low-end users to easily create and edit metadata records. This includes consideration of operational and navigational design, graphical and visual design, help information and assistance, the process of entering, editing and retrieving metadata records, and finally technical issues such as response and navigation speed (Rajabifard, A. Kalantari, M. & Binns, A., 2009).

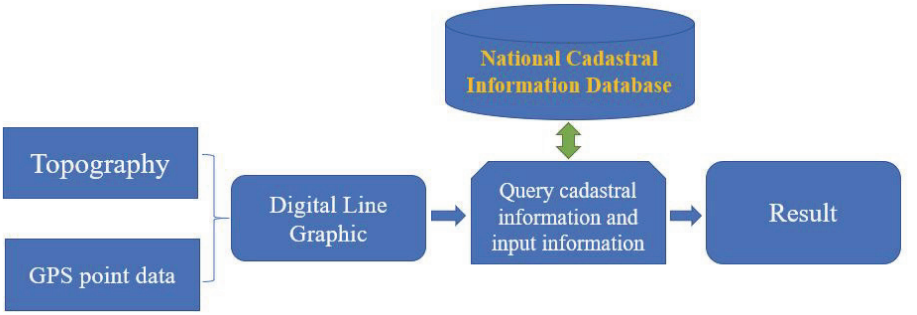

Fig. 1. Working with cadastral information systems

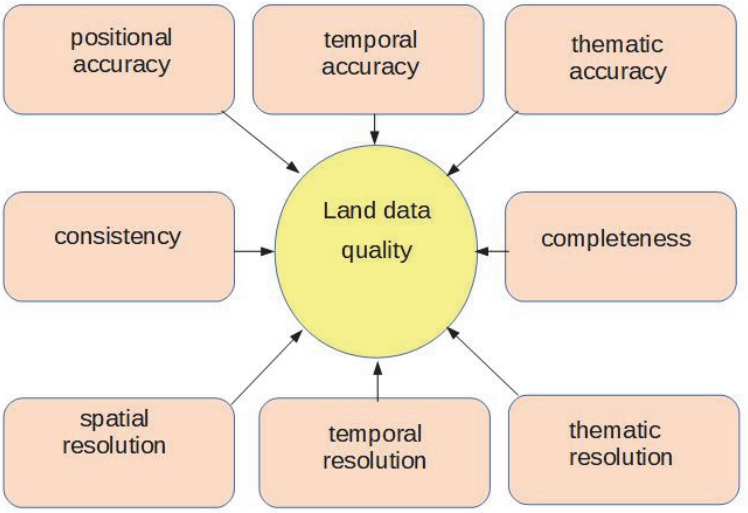

Fig. 2. Land information data and service requirements

Although Ukraine adopted the draft law "On National Spatial Data Infrastructure" by January 23, 2018, in practice, the experience of how to build and apply SDI is still very rare. We need an example to demonstrate how to apply SDI-related systems and mechanisms.

The Ukrainian public cadastre system is an important part of the Ukrainian spatial information infrastructure. Through this system, users with different authorities can obtain different land cadastre information, including land location, area, cadastre number, property ownership, and rights holder information. In addition to finding information, authorized users can upload the collected data to the cadastral system and improve the land information of the cadastral system.

As shown on Fig. 2, according to H. Veregin (1999), the following geodata quality parameters which may be addressed to land geodata quality, are assessed: spatial accuracy (or 'positional accuracy'); temporal accuracy; thematic accuracy; spatial resolution; temporal resolution; thematic resolution; consistency; completeness.

As H. Veregin (1999) mentions, standards provide models for data documentation but not a mechanism whereby users of disparate GIS packages can implement these models for database documentation. A related problem is that standards treat data quality as essentially static.

Generally, SDI standards over the world include requirements to data and metadata quality, quality of services and standardized protocols. One of examples of such approach to standardization in data on land resources is implementation of XML descriptors to land cadastral data in Ukraine.

Thus, such kinds of standards as SDTS or FGDC, may have applicability to SDI and modern geodata on land resources, and main benefit of their use is their flexibility.

Using remote sensing, the electronic total station and RTK technologies, geospatial information of the land is collected, and the attribute information of the target land is input according to the data. After the collected data is processed, it

is drawn into a digital map, uploaded to the cadastral system, and in the cadastre system, the associated information is searched for comprehensive analysis, and the result is finally obtained.

Conclusions.

Land resources mapping is an important task to retrieve actual and precise information on land resources properties and land use. With the development of information revolution, more and more new technologies have emerged, which has promoted the development and change of cartography, network information technology and database technology. This development has also promoted the emergence and development of SDI. These changes make the acquisition of land information easier, and the types and quantities of information acquired are more diversified and huge. Scientific planning, management, and decision-making are of great significance for realizing the sustainable development of land resources. Faced with huge data and social needs, the concept of "National Spatial Data Infrastructure" was proposed and implemented. Although different countries and organizations have proposed different SDI definitions and structures according to their own situations and developments, the basic structure of SDI is the same. The construction and application of SDI integrates the geospatial information and socio-economic attribute information of the land, providing a new and more powerful support for the protection of land resources. With the further improvement of SDI construction, more information and applications will be generated in a friendly, easy-to-use interface.

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Жень Л., Богданець В. А.

ІНФОРМАЦІЯ ПРО ЗЕМЕЛЬНІ РЕСУРСИ В ІНФРАСТРУКТУРІ ГЕОПРОСТОРОВИХ ДАНИХ

https://doi.org/10.31548/zemleustriy2018.04.10

Анотація. *З розвитком сучасних інформаційних технологій виникало дедалі більше нових технологій на стику картогра-*

фії, комп'ютерних технологій, мережевих інформаційних технологій та технологій баз даних. Цей розвиток сприяв виникненню й розвитку інфраструктур геопросторових даних (ІГД). ІГД полегшують отримання інформації про земельні ресурси, а види та кількість отриманої інформації є більш диверсифікованими та мають вищі якісні параметри. Зіткнувшись із "великими даними" (big data) і соціальними потребами, було запропоновано та впроваджено концепцію "Національної інфраструктури просторових даних".

Незважаючи на те, що різні країни та організації запропонували різні визначення й структури ІГД відповідно до власних ситуацій та подій, типова структура ІГД однакова. Побудова ІГД та їх застосування для цілей, пов'язаних із управлінням земельними ресурсами, об'єднують геопросторову інформацію та соціально-економічну атрибутивну інформацію про землю, забезпечуючи нову і більш потужну підтримку для адміністрування земельних ресурсів. Завдяки подальшому вдосконаленню конструкції ІГД, дедалі більше сервісів та додатків із новим, великомасштабним рівнем наповнення інформації буде створено в дружньому, простому і доступному для користувача інтерфейсі.

Ключові слова: *картографія, інфраструктури геопросторових даних, геодані, земельні ресурси*

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Жень Л., Богданец В. А.

ІНФОРМАЦИЯ О ЗЕМЕЛЬНЫХ РЕСУРСАХ В ИНФРАСТРУКТУРЕ ГЕОПРОСТРАНСТВЕННЫХ ДАННЫХ

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Аннотация. *С развитием современных информационных технологий возникало все больше новых технологий на стыке картографии, компьютерных технологий, сетевых информационных технологий и технологий баз данных. Это развитие способствовало возникновению и развитию инфраструктур геопространственных данных (ИГД). ИГД облегчают получение информации о земельных ресурсах, а виды и количество полученной информации более диверсифицированы и имеют более высокие качественные параметры. Столкнувшись с "большими данными" (big data) и социальными потребностями, была предложена и внедрена концепция "Национальной инфраструктуры пространственных данных".*

Несмотря на то, что разные страны и организации предложили разные определения и структуры ИГД в соответствии с собственными ситуациями и событиями, типовая структура ИГД одна и та же. Построение ИГД и их применение для целей, связанных с управлением земельными ресурсами, объединяют геопространственную информацию и социально-экономическую атрибутивную информацию о земле, обеспечивая новую и более мощную поддержку для администрирования земельных ресурсов. Благодаря дальнейшему усовершенствованию конструкции ИГД, все больше сервисов и дополнений с новым, крупномасштабным уровнем наполнения информации будет создано в дружественном, простом и доступном для пользователя интерфейсе.

Ключевые слова: *картография, инфраструктуры геопространственных данных, геоданные, земельные ресурсы*

https://doi.org/10.31548/zemleustriy2018.04.11

PROSPECTS FOR AGRICULTURAL DEVELOPMENT IN RURAL TERRITORIES. PROJECT OF THE WORLD BANK "PROMOTING BUSINESS DEVELOPMENT IN AGRICULTURAL HOLDING" (EBA)

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Abstract. *(EBA) is an initiative of the World Bank Group, which defines and controls policy rules which affect agricultural and agribusiness markets. The project presents globally comparable nature of data that can inform the government about decision-making processes and encourage it to conduct policy dialogues with stakeholders to create a facilitate environment for local, regional and international business in agriculture. The project "Promoting business development in agricultural holding 2017" aims to assist creation of more favorable conditions for agricultural business. By providing the key information about regulatory documents whic hare compared at the global level, the project builds a data base that can be used to start a dialogue about policy and reforms development. These challenges can stimulate activities of a private sector and lead to create more efficient and effective chains of values in agriculture economy.*
Keywords: *GDP, agribusiness, strategy, globalization, urbanization*

The relevance of the article.

For Ukraine, as for an export-oriented country with almost unlimited agricultural potential, development forecast of the world agricultural market looks promising. It is expected that global volumes of trade in agricultural products will steadily increase against a background of increased incomes, urbanization, changes in food habits and biofuel production development. It is related for both raw materials and finished products and high added value. However, the reform of the agricultural sector of Ukraine is necessary in order to take advantages of huge predicted opportunities as far as Ukrainian agriculture and food industry of Ukraine have not reach both possible and desirable levels of competitiveness.

The purpose of the work is to study the strategic directions of agribusiness development in rural areas of the country in conditions of globalization.

Analysis of recent research and publications.

Theoretical substantiations of the domestic agrarian business development have been reflected in researches of D. Belarus, N. Volchenko, T. Zinchuk, who point out strategies of the agrarian business development in Ukraine. S. Kvasha, Y. Kozak, R. Kolosova determine a place and significance of domestic agrarian business within international economy. At the same time, globalization processes in Ukraine are in intensive development and accordingly require a deep research. It can be explained due to a specific role of agribusiness, its strategic importance for the domestic economy, as well as a need for adaptation of state regulation instruments, tools of ensuring the production of competitive products and sustainable development.

Research methodology.

To achieve the stated goal, modern methods of research were used. In particular we can highlight that a theoretical synthesis of scientific concepts, strategies and plans for the development of agriculture and rural areas was carried out on the basis of the system-analytical method.

The following methods were used to solve individual problems: statistical analysis – to study the dynamics, structure and efficiency of the existing strategy for agricultural and rural development; problem-oriented – for scientific substantiation of strategic directions of solving problems concerning the ineffectiveness of agribusiness in rural areas; SWOT analysis – to identify weak and strong points of external and internal factors which affect the effectiveness of agribusiness, to research their strategy; comparative – to compare the effectiveness of agribusiness in different regions and countries.

Main part. Exceptional natural resources and favorable geographic location provide an excellent basis for building a powerful agricultural sector in Ukraine. One third of the world's most fertile black earth resources, together with favorable temperature regime and precipitation, provide an excellent basis for the development of crop, livestock and biomass production for bioenergy. The country is also lucky to have access to the Black Sea, ports of which do not freeze all year round, and navigable rivers. All this simplifies Ukraine's access to key markets in the Middle East, North Africa and the EU.

Over the past ten years, due to its soils and agro-climatic conditions, Ukraine has substantially increased its agricultural production and grain exports becoming one of the world's leading producers and exporters. In 2014, Ukraine became the third largest corn and barley exporter in the world (17.6 million tons) and (4.2 million tons) respectively, as well as the sixth largest exporter of wheat (10.5 million tons). Ukraine also ranked first in the world in terms of exports of sunflower oil. Over the past ten years, total grain and oilseeds production of Ukraine has increased by 56 percent and reached a record high of 79 million tons in 2014. During this period, exports of grain, seeds of oilseeds and products of their processing increased by 250 per cent and reached 35 million tons in 2014. Such an increase in production was due to the expansion of sown areas, as well as increased productivity of production. However, the agricultural sector of Ukraine continues to dominate the cultivation of cereals and industrial crops,

which requires large areas of land for effective production, while little progress has been made in the development of agricultural processing and high value-added food production.

The urgency of the rural economy is significantly different in different countries. On the basis of the World Report on Development of 2008 and the consolidation of data on the Particular Economy in GDP and the share of active population employed in agriculture, EBA classifies countries in three categories: agrarian, with transition economy and urbanization.

Urbanized countries are on average on the brink of best practices in regulatory regulation across all EBA topics. They are followed by countries with economies in transition. Agrarian countries retain the potential to improve the quality of the regulatory framework and reduce operating costs. However, on average, agricultural countries showed better or similar figures for financial services, water resources, transport and markets compared to countries with economies in transition [1].

Kenya, Malawi and Mozambique have developed legislation that regulates water use permits. Burkina Faso, Côte d'Ivoire and Ethiopia are among the top 10 countries in terms of the effectiveness of obtaining a license for transboundary traffic.

The quality of regulation in countries is associated with economic growth and development. Countries with high incomes have higher indicators in the field of agrarian regulation. Such conclusion is observed on all subjects.

However, there are exceptions: a number of countries have higher EBA rates than their predictable rate if calculations are based on these countries income level. For example, this is a case of Vietnam for fertilizers, agricultural machinery and transport; Kenya from seed, finance, water and ICT; Kyrgyz Republic on finance, markets and agri-

Country ranking for each EBA topic*

Countries	Seed production	Fertilizers	Agricultural machinery	Financial Services	Markets	Transport	Water Resources	ICT
Armenia	28	53	30	52	23	56	5	31
Bangladesh	54	35	49	23	21	45	56	37
Burkina Faso	57	56	32	41	37	12	47	59
Denmark	3	3	8	37	6	3	24	6
Spain	2	5	6	3	2	1	1	1
Cameroon	58	48	37	51	41	31	44	52
Netherlands	1	7	7	17	1	9	20	1
Poland	5	2	1	21	7	24	13	1
Romania	6	28	3	11	12	2	7	1
Ukraine	33	32	15	26	26	42	29	43
Ethiopia	39	59	25	27	51	21	34	62

**Source:* fragment of project rating EBA [5].

cultural machinery. On the other hand, in spite of the rather strong regulatory requirements for the issuance of operating licenses in the field of ICT and plant protection, there is no legislation for fertilizer registration and certification of tractor conformity in Chile. Regarding the regions, the OECD countries with high incomes have on average the most favorable legislative environment for doing business in agriculture [1].

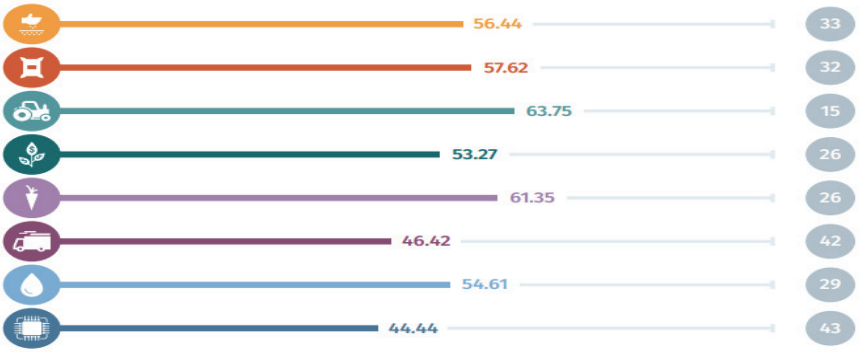
All of these countries have laws that encourage quality control, trade promotion as well as implementation of the agricultural market.

The "Promoting business development in agricultural holding 2017" project presents 8 topics in 62 countries around the world, and also provides initial data collected on topics such as livestock farming, agricultural land, gender and environmental sustainability. In 2017, the project team will disseminate data and results, improve and aggregate indicators, expand the scope and coverage of countries, and hold discussions with various stakeholders on the most effective follow-up. The main trends identified concern improvements in the process of obtaining an appropriate feedback on the development of indicators, the choice of the countries under study and the criteria used to expand coverage in the future, as well as the identification of countries where subnational analysis is appropriate, as well as the development of a relevant methodology. Future reports will allow the team to track the progress of countries in each topic by monitoring legislative reforms that affect the indicators surveyed. It is also expected to expand the coverage of countries and, ultimately, bring them to a total of 80–100 countries [1].

It should be mentioned that within the framework of the EVA project, Ukraine was not mentioned in the description and evaluation of the following topics:

- Transport;
- Water resources;
- ICT;
- Gender
- Environmental sustainability.

In spite of this, Ukraine was assessed for all 8 rating criteria on an average level ranging from 44 to 64 points per 100-point scale. The most developed



Ukraine's assessment on 8 topics within the framework of the project "Promoting business development in agricultural holding"*

**Source:* fragment of project rating EBA [5].

aspects, according to the World Bank, were Agricultural Machinery – 63.75 and Markets – 61.35. At the same time, the topics most in need of further development are Information and Communication Technologies (ICTs) – 44.44 and Transport – 46.42.

The institutional environment in Ukraine provides significant tax breaks to agriculture but neglects the need for infrastructure development and other related services, and also imposes significant operating costs on producers due to excessive regulation. Nowadays the agrarian policy of Ukraine lacks a well-defined strategy for the development of agriculture and rural areas: policy formulation continues to be unsystematic and opportunistic, focusing more on sub-sectoral strategies than creating equal conditions for producers and creating a coherent and long-term strategic vision that would has led state intervention in line with market-based economic principles.

The following information summarizes the most important strengths and weaknesses of the agro-food sector of Ukraine and rural areas based on the sector's assessment:

Strengths.

Production potential: favorable agroclimatic conditions and one third of the world's stock of fertile chernozems.

Geographical location: location between major east and west markets, access to North Africa and Asia.

Modern agricultural sector: the use of advanced technology by large agricultural holdings (zero ground treatment, global positioning system, remote sensing).

Export orientation: one of the global exporters of agricultural products (mainly grains and sunflower oil); established export infrastructure and partners.

Infrastructure: developed system of railways and roads, network of navigable rivers; access to non-freezing ports with high capacity for large-tonnage vessels throughout a year.

Some favorable conditions for livestock and food industry development: for the development of both industries advantageous availability of grain of domestic production and cheap labor [2].

Weaknesses (which can be eliminated through the reform of agrarian policy):

Inability of some farmers to adapt: very small farms and perhaps larger enterprises may lack information and will not be able to adapt to the requirements of the Association Agreement between Ukraine and the EU, in particular regarding hygiene, sanitation and phytosanitary.

Deterioration of agricultural and infrastructure: lack of investment in agrarian infrastructure (equipment, storage, etc.), maintenance and development.

Loss of export opportunities: new export markets are busy with more flexible and productive competitors.

Deterioration of the environment: the negative impact of the intensification of agricultural production on the environment (reduction of nutrient content in soils, erosion, wear of melioration systems) and climate.

Harsh situation of rural areas: the aging of the rural population; depopulation of the countryside; lack of skilled labor for agriculture; lack of development of nonagricultural business activity.

Resistance to change: counteracting changes from stakeholders that are beneficial to maintaining the current situation and who are keenly interested in delaying and sabotaging many reforms (outside of the direct impact of agricultural policy).

Price dynamics: global prices for agricultural raw materials are expected to decline compared to recent high levels.

Political instability: the continuation of aggression in the East and the annexation of the Autonomous Republic of Crimea.

Economic conditions: the deterioration of the economic situation and unfavorable exchange rate dynamics leads to budget constraints and a lack of liquidity.

Energy prices: high energy prices lead to higher prices for production and transportation.

Deterioration of logistics and infrastructure: in particular, the deterioration of roads and the wear and tear of railroads; insufficient level of investment in modernization [2].

Conclusion.

The purpose of the State Strategy and Action Plan for the Development of Agriculture and Rural Areas is to develop an integrated, comprehensive, impartial and realistic strategy and general principles for reforming the agrarian sector. Taking into account the global importance of agricultural production in the world, as well as the dynamics of agricultural development in Ukraine and the possibilities for reforming the agro-food sector, Ukraine is one of the most attractive countries for running agrarian business. Both for foreign investors and for domestic small, medium and large commodity producers.

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ПЕРСПЕКТИВИ РОЗВИТКУ АГРОБІЗНЕСУ НА СІЛЬСЬКИХ ТЕРИТОРІЯХ. ПРОЕКТ СВІТОВОГО БАНКУ «СПРИЯННЯ РОЗВИТКУ БІЗНЕСУ В СІЛЬСЬКОМУ ГОСПОДАРСТВІ» (ЕВА)

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Анотація. *(ЕВА) є ініціативою Групи Світового Банку і визначає та контролює правила політики, що впливають на ринки сільського господарства та агробізнесу. Проект представляє глобально-порівнянний характер даних, які можуть інформувати уряд щодо прийняття рішень та заохочувати політичний діалог із залученням зацікавлених сторін задля створення середовища, що сприяє місцевому, регіональному та міжнародному бізнесу в сільському господарстві.*

Проект «Сприяння розвитку бізнесу в сільському господарстві 2017» ставить собі за мету сприяти створенню сприятливіших умов для агробізнесу. Надаючи ключові дані про нормативно-правові документи, зіставлені на глобальному рівні, проект на-

рощує інформаційну базу, яка може бути використана для проведення діалогу з питань розробки політики та реформ. Такі зусилля можуть стимулювати діяльність приватного сектора і привести до створення більш ефективних і дієвих ланцюжків цінностей у сільському господарстві.

Ключові слова: *ВВП, агробізнес, стратегія, глобалізація, урбанізація*

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Аврамчук Б. О., Лошакова Ю. А.

ПЕРСПЕКТИВЫ РАЗВИТИЯ АГРОБИЗНЕСА НА СЕЛЬСКИХ ТЕРРИТОРИЯХ. ПРОЕКТ МИРОВОГО БАНКА «СОДЕЙСТВИЯ РАЗВИТИЮ БИЗНЕСА В СЕЛЬСКОМ ХОЗЯЙСТВЕ» (ЕВА)

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Аннотация. *(ЕВА) является инициативой Группы Всемирного Банка и определяет и контролирует правила политики, влияющие на рынки сельского хозяйства и агробизнеса. Проект представляет глобально сопоставимый характер данных, которые могут информировать правительство о принятии решений и поощрять политический диалог с привлечением заинтересованных сторон с целью создания среды, способствующей местному, региональному и международному бизнесу в сельском хозяйстве.*

Проект «Содействие развитию бизнеса в сельском хозяйстве 2017» ставит своей целью содействие созданию благоприятных условий для агробизнеса. Предоставляя ключевые данные о нормативно-правовых документах, сопоставленные на глобальном уровне, проект наращивает информационную базу, которая может быть использована для проведения диалога по разработке вопросов политики и реформ. Такие усилия могут стимулировать деятельность частного сектора и привести к созданию более эффективных и действенных цепочек ценностей в сельском хозяйстве.

Ключевые слова: *ВВП, агробизнес, стратегия, глобализация, урбанизация*

IN SCIENTIFIC LABORATORIES

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EFFICIENCY OF AGRICULTURAL ENTERPRISES OF THE ZHYTOMYR REGION ON THE EXISTING LAND-RESOURCE POTENTIAL

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Abstract. *Ukraine belongs to agricultural states and has high percent of plowed land. The same tendency is typical for Zhytomyr region, on territory of which more than 350 thousand hectares of highly fertile soils are allocated. However, high land plowing and the favorable raw material base do not always indicate the high economic development of agriculture of the administrative-territorial formation. The task of our research was to analyze the development of crop and livestock production, their share in the structure of agricultural products, as well as the level of population provision by these products in Zhytomyr region.*

The establishment of the efficiency of the land resources use in the studied region was carried out by statistical analysis.

Crop production in Zhytomyr region is represented mainly by the following crops: cereals and legumes, potatoes, vegetable crops, sugar beet, fruit and berry crops. The livestock sector has a dairy-meat direction. Among the agricultural products in the field crop production, the largest share belongs to potatoes and other vegetable crops (24,2%), and in the field of animal husbandry – to milk production (14,7%). The indices of crop and livestock production in households are somewhat higher (116.9 and 101,0%) than in agricultural enterprises (100,6% and 97,1%). The use of land resources by farms in Zhytomyr region is quite effective. This is evidenced by the agricultural product index, which is 105,2% compared to the previous year and the average indicator for Ukraine in 2017 (97,3%).

Keywords: *land resources, efficiency, index of agricultural products, economy, rating, crop production, livestock production*

Relevance of research.

Land is an indispensable natural resource, which is the object of human and environmental social and economic ties, as well as a basis for the production of agricultural products. Priority of agricultural lands is determined by the Constitution of Ukraine [p. 87, 5].

Complete satisfaction of the population's needs in food products, light industry sectors in agricultural raw materials requires increased production of agricultural products on the basis of rational and efficient use of land. The practice of managing in market conditions shows that the result and efficiency of agricultural enterprises activities of various scales and forms of ownership primarily depends on the effective use of land [p. 263, 3].

As a result of the irrational use of land resources, there is a disturbance in the balance between available land resources and economic efficiency of land use. The consequence of such an imbalance is the incomplete provision of the population by agricultural products in spite of presence of highly fertile soils [p. 127, 1; p. 89, 118, 5].

Analysis of recent research and publications.

Ukraine belongs to agricultural states and has rather high plowing of agricultural land. However, this indicator is heterogeneous both in Ukraine and in Zhytomyr region, and directly depends on the administrative-territorial unit provision by land resources. It is known that Zhytomyr region is characterized by the presence of highly fertile soils (gray forest, dark gray podzolized soils and podzolized chernozems, typical chernozems, meadow and chernozem-meadow soils, etc.), the total area of which is over 350 thousand hectares. However, high land plowing does not always indicate the high economic development of agriculture [p. 128, 1].

The efficiency of land use in agriculture is evidenced by the following indicators: the index of basic agricultural products, crop and livestock production per person. These issues require separate study and detalization in accordance with different forms of management on the territory of Zhytomyr region.

The aim of the study. The advantageous physical-geographical and economic-geographical position of Zhytomyr region contributes to the compact population settling and economic development of the territory. An effective combination of favorable soil and climatic conditions with the presence of a mineral-raw material base contributes to the development of multi-sectoral agriculture [p. 87, 5].

The analysis of crop and livestock branches development in the region, their share in the structure of agricultural products, as well as the level of population provision of the region and justifies the efficiency of management in the territory of Zhytomyr region for the available land and resource potential. Determining the level of region's development by indicators of agricultural production indicates the economic efficiency of the use land resources of the region as households and agricultural enterprises.

Materials and methods of research.

The Statistical Yearbooks of Zhytomyr Region and Ukraine published by State Statistics Service served as material for conducting researches. To process the results in order to further their generalization, the analysis was used as one of the theoretical methods of research.

Research results and their discussion.

Zhytomyr region is located in the northwest part of Ukraine, the territory of which is 2982,7 thousand hectares. The total area of agricultural land is 1510,3 thousand hectares or 50.6%. Among the agricultural lands, the largest area belongs to arable lands – 1111,2 thousand hectares [p. 74, 2].

On the territory of the region there are 1103,0 agro-industrial formations. According to research results, indices of agricultural products produced by households and agricultural enterprises of Zhytomyr region are different in dynamics over the years. Thus, in 2013, the gross crop production by agricultural enterprises amounted to 115,4% compared to the previous year, by households – 99,8%. In 2017, the farms provided Zhytomyr region by crop production on 116,9%, large agricultural enterprises – on 100,6%. In general, there has been a certain trend towards changes in crop production indices over the last five years. Although the efficiency of farms production in the region in total remained almost the same during years of research, however, in 2015 there was a significant decline of gross crop production both by agricultural enterprises (80,7%) and households (96,1%) (table 1).

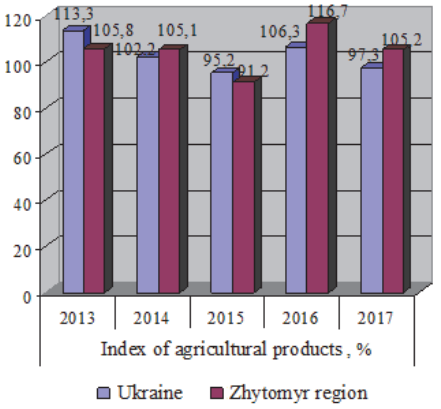
As for livestock production indexes, they remained stable from 2013 to 2017. Also, there was no significant difference between the productivity of livestock producers in the private sector (97,2–102,3%) and agricultural enterprises (96,9–107,6%).

Land fund of Zhytomyr region in 2017 was 2982,7 thousand hectares. Agricultural lands occupied 1510,1 thousand hectares, including 1112,0 thousand hectares of arable lands. The area of Zhytomyr region agricultural enterprises, that are producers of crop and livestock products, covers 533,3 thousand hectares. Despite the fact that the plow of land is not the same from region to

1. Indices of agricultural products produced by farms of Zhytomyr region (2013-2017)*

	2013	2014	2015	2016	2017
Agricultural products					
Farms in total	105,8	105,1	91,2	116,7	105,2
Including					
agricultural enterprises	113,4	110,3	82,8	127,1	100,2
households	100,5	101,0	98,5	109,1	109,4
Crop products					
Farms in total	108,4	109,2	86,8	123,9	107,3
Including					
agricultural enterprises	115,4	112,3	80,7	130,2	100,6
households	99,8	105,0	96,1	116,0	116,9
Livestock products					
Farms in total	101,2	97,1	100,8	103,1	100,3
Including					
agricultural enterprises	101,1	96,9	99,6	107,6	97,1
households	101,3	97,2	101,0	102,3	101,0

* percentage to the previous year [p. 74, 6].



Index of agricultural products of Zhytomyr region in comparison with the average indicator in Ukraine, % to the previous year (2013–2107) [p. 73, 7].

region due to the prevailing soils on the territory of administrative-territorial units, in general, this indicator in Zhytomyr region is quite high and constitutes 50,6%. Totally, the specialization of agricultural enterprises is directed on production economically attractive export-oriented crops (soybeans, corn for grain, sunflower, rape, winter grain crops), as well as meat, milk, eggs, etc.

Regarding the structure of agricultural production in Zhytomyr region, the share of plant growing in the last five years has increased significantly, from 65,9% in 2013 to 70,6% in 2017. Over the same period the livestock production decreased by 4,7%. The share of the main groups of crops in the total crop production was also irregular in terms of years. Thus, in 2013, grain and leguminous crops were 26,9%, technical – 12,3%, potatoes and other vegetables – 21,7%, feedstuffs – 2,8%, fruit and berries – 2,4% (table 2).

In 2017, the share of grain and legumes in the structure of crop production decreased to 21,1%, technical and vegetable crops, including potatoes, increased to 20,4% and 24,2% respectively. The production of fruit and berry crops decreased to 1,7%. The weight of such a crop as potatoes in the structure of crop production increased gradually over the last five years (table 2).

As for livestock products, Zhytomyr region firstly specializes in milk production.

2. The structure of agricultural products of Zhytomyr region, % (2013–2017)*

	2013	2014	2015	2016	2017
Agricultural products	100,0	100,0	100,0	100,0	100,0
Crop products	65,9	68,4	65,1	69,2	70,6
Cereals and legumes	26,9	23,2	19,2	23,9	21,1
Technical cultures	12,3	18,3	18,3	17,9	20,4
Potatoes, vegetables and melons	21,7	20,8	22,4	22,3	24,2
Fruit and berry crops	2,4	2,2	2,6	2,0	1,7
Fodder crops	2,8	3,8	2,4	2,5	2,8
Other products	0,2	0,1	0,2	0,6	0,4
Livestock products	34,1	31,6	34,9	30,8	29,4
Livestock breeding	10,3	8,9	10,3	9,7	9,0
Milk	17,9	16,8	18,2	15,2	14,7
Eggs	3,1	3,2	3,4	3,3	3,2
Other products	2,8	2,7	3,0	2,6	2,5

* [p. 74, 6].

3. Production of agricultural products per person on the territory of Zhytomyr region, kg (2013–2017)*

	2013	2014	2015	2016	2017
Cereals and legumes	1666	1515	1166	1683	1620
Sugar beet	335	508	485	488	590
Potatoes	1052	1036	940	1058	1334
Vegetable cultures	178	190	217	239	240
Fruit and berry crops	35	35	41	34	33
Meat	43	41	43	43	43
Milk	472	468	462	456	443
Eggs, pcs.	444	477	471	532	557

* [p. 75, 6].

The second position takes animal husbandry, the third – eggs production. Observing the production of these main components, one can note the tendency to reduce their share both in production of agricultural products and in the years of research (table 2).

Observing the production of agricultural products per person, it can be noted that provision of population with crop and livestock products in Zhytomyr region during the years of research was different. In the case of grain and legume crops production over the past five years it has decreased, and sugar beet production, by contrast, has almost doubled (table 3).

According to our research, today it is observed the increasing of the role of potatoes. For example, in 2017, the provision of population by this product was 1334,0 kg per person, which is 26,8% more than in 2013. The same tendency is observed also for vegetable growing. As for livestock products over the period under investigation, only egg production increased significantly (by 25,4%) while meat and milk remained on the same level (table 3).

Zhytomyr region today occupies leading positions in production of basic agricultural products. Particularly, in the potatoes cultivation the region occupies second rank, other vegetable crops – the fifth. Not enough high results are observed in grain crops production – among other regions of Ukraine Zhytomyr region occupies only the 20th place. The reason for this is the low proportion of grain and legumes in the structure of the crop area of the region and, accordingly, in the structure of agricultural products (table 4).

Zhytomyr region occupies the fifth, tenth and eighth position in production of meat, milk and eggs, respectively (table 4). In general, the provision of the region with the main types of agricultural products is quite

4. The rating of Zhytomyr region among the regions of Ukraine in crop and livestock production in 2017*

Agricultural products	Cereals and legumes	Sugar beet	Potatoes	Vegetables	Fruit and berries	Meat	Milk	Eggs
Rating position	20	12	2	5	12	5	10	8

* [p. 1, 4].

good. As a result, the share of Zhytomyr region in the gross production of Ukraine of such products as potatoes, vegetable crops, meat and eggs is significant.

Conclusions and prospects of research.

Consequently, according to the results of our studies, it can be concluded that the use of land resources by agricultural enterprises in Zhytomyr region is quite effective. This is evidenced by the agricultural production index of the region, which in 2017 amounted to 105,2% compared to the previous year. The average index in Ukraine was 97,3%. Also, this year, Zhytomyr region with high growth rates of agricultural production, has occupied the fourth position among another regions of our state. Crop production in Zhytomyr region is represented mainly by the following crops: cereals and legumes, potatoes, vegetable crops, sugar beet, fruit and berry crops. The livestock sector has a dairy-meat direction. Among the agricultural products in the sector of crop growing the largest share belongs to potatoes and other vegetable crops (24,2%), and in the field of animal husbandry – to milk production (14,7%). Accordingly, providing the population of the region by these products is the best but for cereals and legumes the situation is not the same. The share of sown areas for these crops both in households and agricultural enterprises is insignificant, and therefore the rating of Zhytomyr region for the production of gross output is low (20th place). Also, our studies have shown that the indices of crop and livestock production in households are higher (116,9 and 101,0%) than in agricultural enterprises (100,6% and 97,1%).

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ЕФЕКТИВНІСТЬ ДІЯЛЬНОСТІ СІЛЬСЬКОГОСПОДАРСЬКИХ ПІДПРИЄМСТВ ЖИТОМИРСЬКОЇ ОБЛАСТІ ЗА НАЯВНОСТІ ЗЕМЕЛЬНО-РЕСУРСНОГО ПОТЕНЦІАЛУ

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Анотація. *Україна належить до сільськогосподарських держав та має достатньо високу розорюваність угідь. Така сама тенденція характерна і для Житомирської області, на території якої виділяють понад 350 тис. га високородючих ґрунтів. Проте висока розорюваність угідь та наявність сприятливої сировинної бази не завжди свідчить про високий економічний розвиток сільського господарства на території адміністративно-територіального утворення. Завданням наших досліджень був аналіз розвитку рослинництва*

та тваринництва, їх частка у структурі сільськогосподарської продукції, а також рівень забезпечення нею населення Житомирської області.

Встановлення ефективності використання земельних ресурсів досліджуваного регіону здійснювали методом статистичного аналізу.

Рослинництво Житомирської області представлене переважно такими сільськогосподарськими культурами: зернові та зернобобові, картопля, овочеві культури, цукровий буряк, плодово-ягідні культури. Галузь тваринництва має молочно-м'ясний напрям. Серед сільськогосподарської продукції області у галузі рослинництва найбільша частка належить картоплі та іншим овочевим культурам (24,2%), а у галузі тваринництва – виробництву молока (14,7%). Індекси продукції рослинництва і тваринництва у господарствах населення є дещо вищими (116,9 та 101,0%), ніж у сільськогосподарських підприємств (100,6% та 97,1%). Використання земельних ресурсів господарствами Житомирської області є достатньо ефективним. Про це свідчить індекс сільськогосподарської продукції регіону, який становить 105,2% у порівнянні з попереднім роком та середнім показником по Україні за 2017 рік (97,3%).

Ключові слова: *земельні ресурси, ефективність, індекс сільськогосподарської продукції, господарство, рейтинг, продукція рослинництва, продукція тваринництва*

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ЭФФЕКТИВНОСТЬ ДЕЯТЕЛЬНОСТИ СЕЛЬСКОХОЗЯЙСТВЕННЫХ ПРЕДПРИЯТИЙ ЖИТОМИРСКОЙ ОБЛАСТИ ПРИ НАЛИЧИИ ЗЕМЕЛЬНО-РЕСУРСНОГО ПОТЕНЦИАЛА

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Аннотация. *Украина относится к сельскохозяйственным государствам и имеет достаточно высокую степень использования угодий. Такая же тенденция характерна и для Житомирской области, на территории которой выделяют более чем 350 тыс. га высокоплодородных почв. Но высокая степень использования угодий и наличие оптимальной ресурсной базы не всегда свидетельствуют о высоком экономическом развитии сельского хозяйства на территории административно-территориального объединения. Задачей наших исследований был анализ развития растениеводства и животноводства, их доля в структуре сельскохозяйственной продукции, а также уровень обеспечения ею населения Житомирской области.*

Установление эффективности использования земельных ресурсов изучаемого региона проводили методом статистического анализа.

Растениеводство Житомирской области представлено преимущественно такими культурами: зерновые и зернобобовые, картофель, овощи, сахарная свекла, плодово-ягодные культуры. Отрасль животноводства имеет молочно-мясное направление. Среди сельскохозяйственной продукции области в отрасли растениеводства наибольшая часть принадлежит картофелю и другим овощным культурам (24,2%), а в отрасли животноводства – производству молока (14,7%). Индексы продукции растениеводства и животноводства в хозяйствах населения немного выше (116,9 и 101,0%), чем у сельскохозяйственных предприятий (100,6% и 97,1%). Использование земельных ресурсов хозяйствами Житомирской области достаточно эффективно. Об этом свидетельствует индекс сельскохозяйственной продукции региона, который составляет 105,2% по отношению к предыдущему году и среднему показателю по Украине за 2017 год (97,3%).

Ключевые слова: *земельные ресурсы, эффективность, индекс сельскохозяйственной продукции, хозяйство, рейтинг, продукция растениеводства, продукция животноводства*