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LAND USE STRUCTURE IN CHERKASY REGION: FORMATION, CURRENT STATE, DYNAMICS

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The article deals with the formation, current state and dynamics of changes in the structure of land use in Cherkasy region. The influence of historical, geographical, natural, environmental and economic factors on the development of the land fund of the region is analyzed. The key stages of formation of the land use structure, which determined the specifics of land distribution between the main categories: agricultural, forest, industrial, environmental and other, are identified.

Particular attention is paid to the current state of land use, which is characterized by significant anthropogenic pressure, soil degradation, and disruption of the ecological balance. The article highlights in detail the issue of imbalance between agricultural and protected lands, which is an important challenge for ensuring sustainable development of the region.

The paper also examines the dynamics of changes in the structure of land use in Cherkasy region over the past decades. It is shown how global climate change, anthropogenic factors and urbanization affect the use of land resources. The necessity of integrating economic, environmental and social approaches to optimize land use and preserve the natural potential of the region is substantiated.

The results of the study allow identifying the main problems in the management of land resources in the region and offering recommendations for their rational use. The article presents practical proposals for optimizing the structure of land use, in particular, taking into account the need to restore ecological balance, increase the efficiency of the agricultural sector and ensure sustainable development of the region.

The study will be useful for scientists, experts in the field of earth sciences, land use, ecologists, farmers, as well as representatives of government and local authorities involved in land management. *Key words:* land use, Cherkasy region, agricultural land, arable land, land fund, land resources.

Структура землекористування в Черкаській області: формування, сучасний стан, динаміка. Сопова Н.В.

У статті розглянуто питання формування, сучасного стану та динаміки змін структури землекористування в Черкаській області. Проаналізовано вплив історико-географічних, природно-екологічних та економічних чинників на розвиток земельного фонду регіону. Визначено ключові етапи становлення структури землекористування, які зумовили специфіку розподілу земель між основними категоріями: сільськогосподарськими, лісовими, промислового призначення, природоохоронними та іншими.

Особливу увагу приділено сучасному стану землекористування, який характеризується значним антропогенним навантаженням, деградацією ґрунтів та порушенням екологічного балансу. У статті детально висвітлено питання дисбалансу між сільськогосподарськими та природоохоронними землями, що є важливим викликом для забезпечення сталого розвитку регіону.

У роботі також досліджено динаміку змін у структурі землекористування Черкаської області за останні десятиліття. Показано, як глобальні кліматичні зміни, техногенні фактори та урбанізація впливають на використання земельних ресурсів. Обґрунтовано необхідність інтеграції економічних, екологічних та соціальних підходів для оптимізації землекористування та збереження природного потенціалу регіону.

Результати дослідження дозволяють виявити основні проблеми в управлінні земельними ресурсами області та запропонувати рекомендації щодо їхнього раціонального використання. У статті представлено практичні пропозиції для оптимізації структури землекористування, зокрема з урахуванням необхідності відновлення екологічної рівноваги, підвищення ефективності аграрного сектору та забезпечення сталого розвитку регіону.

Дослідження буде корисним для науковців, експертів у галузі наук про Землю, землекористування, екологів, аграріїв, а також представників органів влади та місцевого самоврядування, які займаються питаннями управління земельними ресурсами. *Ключові слова:* землекористування, Черкаська область, сільськогосподарські землі, рілля, земельний фонд, земельні ресурси.

Relevance of the research. The relevance of studying the structure of land use in Cherkasy region is due to the importance of rational use of land resources, which are the basis for economic, environmental and social development of the region. Cherkasy region has a significant potential of the agricultural sector, while its territory is subject to significant anthropogenic impact, which affects soil quality, ecological balance and land use efficiency.

The formation of the land use structure in the region was conditioned by historical, geographical, economic and natural factors, but the current state of land use needs to be rethought in light of the challenges of today. The issues of soil degradation, optimization of agricultural land use, protection of natural areas, and harmonization of environmental and economic interests are of particular importance.

The dynamics of changes in land use is an indicator of the region's adaptation to new conditions, in particular, to reforms in land relations, the introduction of market-based management mechanisms, and global climate change. Analyzing these processes will allow us

to identify trends in land use, assess the effectiveness of management decisions, and develop recommendations for sustainable development of the region.

Thus, the study of the structure of land use in Cherkasy region, its formation, current state and dynamics is important not only for regional policy, but also for ensuring sustainable development of land resources at the national level.

Analysis of research and publications. Research on the structure of land use in Ukraine, in particular in Cherkasy region, is widely covered in the works of domestic and foreign scholars. The main attention is paid to the analysis of historical aspects of land use formation, modern problems of rational use of land resources and assessment of the impact of anthropogenic and natural factors on their condition.

A significant contribution to the study of land use in Ukraine was made by such scholars as Shuvar I. A., Hnativ P. S., Lopotych N. Y., Kachmar N. V. [1], Kovalenko N. P. [2], Savchuk O. I., Melnychuk A. O., Drebot O. V., Dankevych E. M. [3], who analyzed land use issues in terms of optimizing agricultural production and environmental safety. Their works emphasize the importance of preserving soil fertility and ecological balance.

Sonko S. P., Kyselov Yu. O., Shchetyna M. A. [4], Denysyk H. I. [5] and other scholars in their studies highlight the spatial aspects of land use, focusing on the interconnection of natural conditions and land use features. Their works contain a thorough analysis of landscape and environmental factors that affect the structure and dynamics of land use in Ukraine, in particular in regions with a high level of agricultural development, which includes Cherkasy region.

Studies of the current state of land use in the Cherkasy region are covered in the works of Slavgorodska Y. V. [6], Bytko M. M., Kuznetsova O. V., Volontyr A. V. [7], who focus on the problems of imbalance between agricultural and environmental lands. Their works offer recommendations for improving the efficiency of land management.

Special attention is paid to the impact of land reform on the structure of land use. The studies of such scientists as A. M. Tretyak, V. M. Tretyak, T. M. Pryadka, N. A. Tretyak [8; 9] analyze the introduction of market mechanisms for land management and their impact on the economic performance of the regions, and also consider the issues of the strategy for the development of the land structure of Ukraine and its regions in the postwar period.

Important aspects of the dynamics of land use change in the context of climate change were also studied by Budziak O., Budziak V., Drebot O. [10] and Kucher A. [11], who focused on the adaptation of regional land use to global environmental challenges.

Despite the wide range of studies, there is a need for a comprehensive analysis of the dynamics of changes in the land use structure in Cherkasy region. The issues of integrating economic, environmental and social aspects into the development of sustainable development strategies for the region remain insufficiently covered. This determines the need for new research aimed at developing innovative approaches to the rational use of land resources in Cherkasy region.

Presentation of the main material. Cherkasy region, located in the heart of Ukraine, is an important region with significant agricultural and natural potential (Fig. 1).

Its land resources are the basis for socio-economic development, contributing to the growth of agriculture, industry and environmental balance. The region's geographical location, rich soils and favorable climatic conditions have made it one of the leading agricultural production centers in the country. At the same time, constantly changing economic, environmental and social factors require a detailed analysis of the land use structure. Such a study allows not only to assess the level of efficiency of land use, but also to identify the dynamics of their changes, outline problems and find ways to optimize their use in the future.

The land use structure of Cherkasy region was shaped by a complex interaction of natural conditions and socio-economic processes. Rich natural resources, in particular highly fertile black soil, became a key factor in the development of agriculture in the pre-revolutionary period. Thanks to these conditions, in the nineteenth century the region turned into a center of agricultural production, where the main crops were cereals, in particular wheat and barley, as well as sugar beets, which became the basis for the development of the sugar industry.

In Soviet times, land use in the region underwent significant changes. Collectivization, which began in the 1930, contributed to the creation of large collective farms – collective and state farms. This made it possible to increase agricultural production, integrate new technologies, and centralize land management. However, this policy also had negative consequences. Overexploitation of land led to the loss of some of its fertility, in particular through intensive plowing and the use of chemical fertilizers. In addition, soil degradation has become one of the most serious environmental problems that remains relevant today. The current state of the land use structure has deep roots in the historical processes that shaped the region's territory.

The current structure of land use in Cherkasy region [12] is characterized by the following main categories (Fig. 2):

1) Agricultural land. Cherkasy region's agricultural land is the basis for the region's economic development and food security. They cover more than 70 % of the region's territory, which demonstrates their importance for the local economy and social well-being. The main components of the land are arable land, where key crops are grown, pastures for livestock and perennial plantations, including orchards and vineyards.

Fig. 1. Map of Cherkasy region

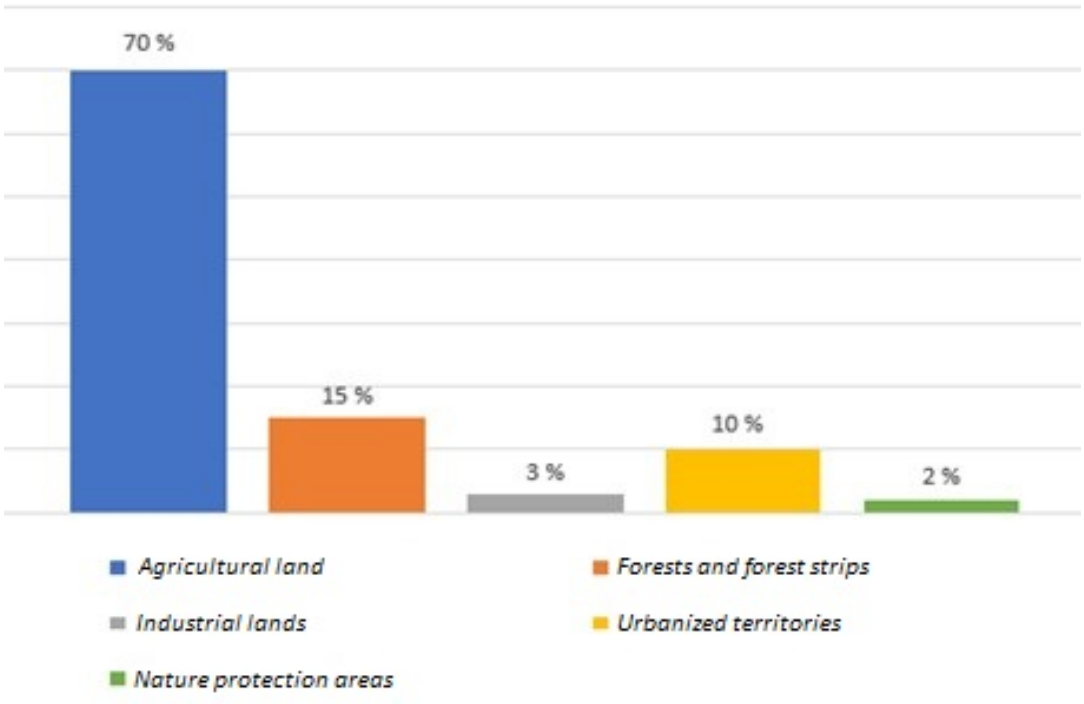

Fig. 2. Current structure of land use in Cherkasy region

Out of the total area of Cherkasy region (2,091.6 thousand hectares), agricultural land is 1,486.88 thousand hectares, including 1,450.82 thousand hectares of agricultural land (Fig. 3), of which [12]

– arable land – 1,271.86 thousand hectares;
– fallow land – 8.47 thousand hectares;
– perennial plantations – 27.34 thousand hectares;
– hayfields – 64.75 thousand hectares;
– pastures – 78.40 thousand hectares.

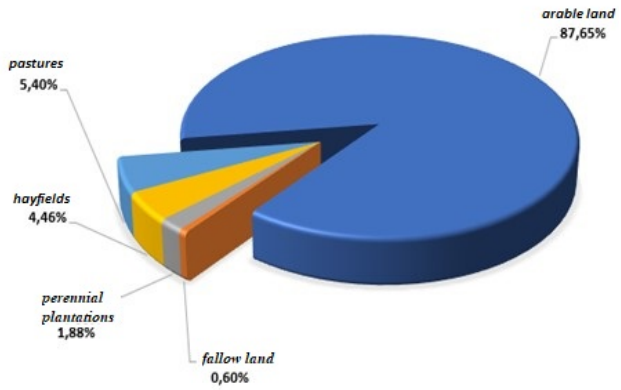

Fig. 3. Structure of agricultural land in Cherkasy region

The main crops of Cherkasy region are cereals (wheat, barley), which occupy a significant share of arable land, oilseeds (sunflower, rapeseed), which are a source of important export goods, and industrial crops, including sugar beet, which provides raw materials for the local food industry.

Due to its high soil fertility, especially black soil, and favorable climatic conditions, the region is one of Ukraine's leaders in agricultural production. The sector accounts for a significant share of the gross regional product, creating jobs and generating export earnings. The importance of Cherkasy region's farmland is emphasized by its role not only in the region's economy, but also in ensuring the stability of the national food system.

2) Forests and forest belts. Forests and forest belts occupy about 15 % of the territory of Cherkasy region and play an important ecological, economic and social role for the region [14]. Cherkasy forests, mostly represented by oak, pine and other mixed forests, provide habitat for numerous species of plants and animals, contributing to the conservation of the region's biodiversity.

Forest belts, which are located mainly along fields and water bodies, perform a number of vital functions. They protect fertile soils from wind and water erosion, reduce the negative impact of strong winds on agricultural land, thereby increasing yields and sustainability of agricultural production. In addition, forest belts help regulate the microclimate, retaining moisture in the soil and improving conditions for crop growth.

The ecological importance of Cherkasy region's forests is also manifested in their role as natural air filters, which helps to cleanse the atmosphere of harmful substances and improve air quality in the region. They are an important resource for local communities, providing timber, recreational areas for recreation, and maintaining a stable water balance.

Thus, forests and forest belts in Cherkasy region are not only natural environmental protection, but also a key factor in the region's sustainable development, contributing to the conservation of natural resources, improving conditions for agriculture and enhancing the quality of life.

3) Industrial land. Industrial land in Cherkasy region occupies about 3 % of the total area of the region [14]. Despite their small territorial share, these lands play an important role in ensuring the economic development and industrial potential of the region. They are used to locate industrial enterprises of various profiles – from machine building and food industry to processing industries, as well as for quarries, construction of transport infrastructure and other facilities necessary for the functioning of the region.

Cherkasy region has a significant potential for industrial development due to a developed network of industrial centers, in particular in the cities of Cherkasy, Smila, Uman and others. Industrial land provides for job creation, development of innovative technologies, and attraction of investments. In addition, industrial infrastructure plays a key role in supporting the agricultural sector, ensuring the processing of agricultural products and the production of materials and equipment necessary for farmers.

Thus, although industrial land in Cherkasy region occupies a small share of the territory, it is strategically important for ensuring economic stability, growth and modernization of the region, contributing to the formation of a balanced economic structure.

4) Urbanized areas. The urbanized areas of Cherkasy region occupy approximately 10 % of the total area of the region and include cities, urban-type settlements, and adjacent residential areas [13]. These areas include residential neighborhoods, transportation network, utility systems, and social facilities such as schools, hospitals, cultural institutions, and parks.

The cities of Cherkasy region, in particular the regional center of Cherkasy, as well as such towns as Smila, Uman, and Zolotonosha, are important centers of economic, cultural, and administrative life. The development of urbanized areas in the region contributes to improving living standards, creating new jobs, developing education and healthcare, and attracting investment.

At the same time, active urbanization places demands on competent urban planning and land management. It is necessary to avoid overbuilding, which can lead to a decrease in the quality of life, a shortage of green areas, overloading of transport infrastructure, and problems with water supply and sewage. Modern approaches to the development of urbanized areas in Cherkasy region include a balance between residential development,

infrastructure development, and preservation of ecological balance.

Thus, the urbanized areas of Cherkasy region are an important factor in the socio-economic development of the region, which requires thoughtful planning and investment to ensure a sustainable and comfortable living environment.

5) Nature protection zones. The nature protection zones of Cherkasy region cover approximately 2 % of its territory and include various protected areas, such as nature reserves, national parks, regional landscape parks, and wildlife sanctuaries [14]. These zones were created to preserve unique natural complexes, the richness of flora and fauna, and to maintain the ecological balance of the region.

The Cherkasy region is home to important nature conservation sites that act as the «green lungs» of the region, preserve water resources, purify the air, and contribute to the preservation of natural landscapes. These include the Kaniv Nature Reserve, known for its biodiversity and rare species of plants and animals, as well as regional parks that are popular with tourists and locals for recreation and outdoor activities.

The protected areas of Cherkasy region are also of great educational and scientific importance: they serve as a base for research on ecosystems, natural processes, and the preservation of rare species. In addition, the protection of such areas helps maintain environmental stability, protect soil and water resources, and preserve cultural heritage.

Thus, Cherkasy region's protected areas are an integral part of the region's ecological system, ensuring the preservation of the natural environment, maintaining biodiversity and creating conditions for sustainable development both environmentally and socially.

This distribution of land use reflects the natural conditions of the region, historical development and current socio-economic needs. Most of the land is used for agricultural production, but the growing pressure on the ecosystem requires attention to nature protection zones and sustainable management of other categories of land.

Over the past decades, the land use structure of Cherkasy region has undergone the following changes (Fig. 4):

1) Intensification of agriculture;
2) Environmental challenges;
3) Expansion of urbanized areas;
4) Increase in protected areas;
5) Climate change.

Conclusions. The structure of land use in Cherkasy region is formed under the influence of a complex interaction of natural conditions and anthropogenic factors that have long determined the nature of economic activity in the region. The current state of land use is characterized by the dominance of agricultural land, which covers a significant part of the region's territory, as well as its intensive use for growing grain, industrial crops and livestock.

However, this structure also poses a number of challenges. Environmental issues, such as soil degradation, declining biodiversity, and water pollution, threaten ecosystem stability. In addition, the impact of climate change, such as rising average annual temperatures, changing precipitation patterns, and increased frequency of extreme weather events, poses additional risks to land use.

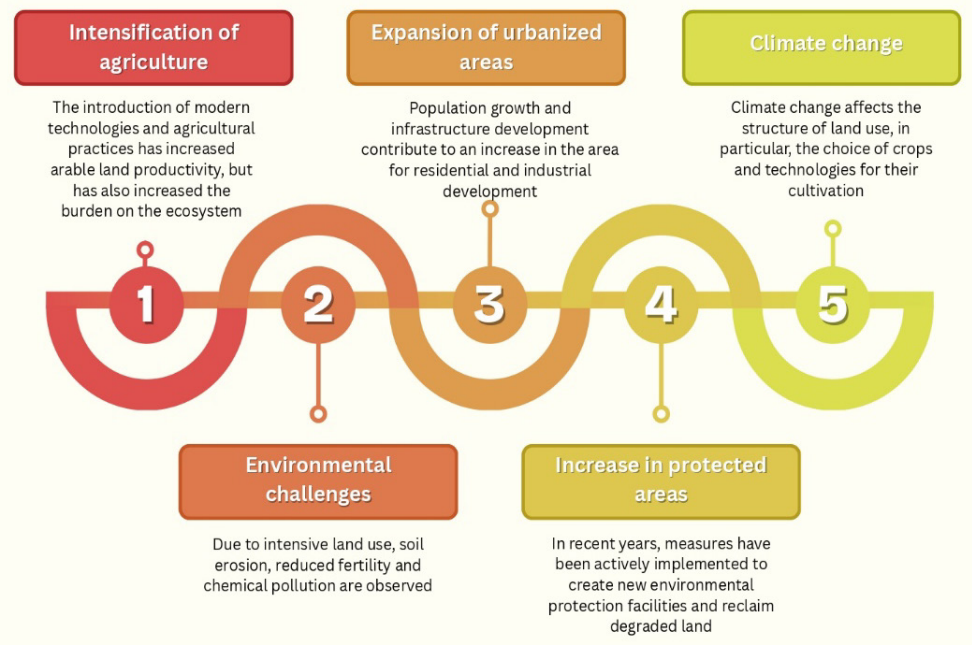

Fig. 4. Changes in the structure of land use in Cherkasy region in recent decades

To ensure the sustainable development of Cherkasy region, it is necessary to implement a set of measures aimed at the rational and environmentally balanced use of land resources. This includes:

1) Application of modern technologies: use of innovative approaches to soil cultivation, irrigation and fertilization to minimize negative environmental impact.

2) Greening agricultural production: expanding organic farming practices, introducing crop rotation and protecting soil fertility.

3) Preservation of the natural environment: creation and maintenance of protected areas, restoration of degraded lands and prevention of their further depletion.

4) Adaptation to climate change: development of risk management programs and implementation of adaptation strategies, such as growing drought-resistant crops and improving water supply.

5) Public and investor engagement: stimulating environmental initiatives through government programs, grants and investments in the region's sustainable development.

As a result of such actions, a harmonious balance between the economic needs of the population and the preservation of the natural environment can be achieved, which will contribute to the long-term environmental stability and social well-being of the region.

References

1. Шувар І. А., Гнатів П. С., Лопотич Н. Я., Качмар Н. В. Вплив сільськогосподарського землекористування на екосистеми басейну Дністра. *Науковий вісник НЛТУ України*. 2022. т. 32. № 1. С. 68–72. DOI: https://doi.org/10.36930/40320110
2. Коваленко Н. П. Сільськогосподарське землекористування в Україні на початку XXI століття: аналіз тенденцій розвитку. *Вісник аграрної історії*. 2019. Вип. 27–28. С. 311–320. URL: http://nbuv.gov.ua/UJRN/Vai_2019_27-28_42
3. Савчук О. І., Мельничук А. О., Дребот О. В., Данкевич Є. М. Оптимізація землекористування сільськогосподарських угідь Житомирської області. *Агропромислове виробництво Полісся*. 2014. Вип. 7. С. 7–10. URL: http://nbuv.gov.ua/UJRN/avpol_2014_7_2
4. Сонько С. П., Кисельов Ю. О., Щетина М. А. Сільськогосподарське районування Черкаської області в контексті проблеми раціонального використання земельних ресурсів. *Наукові записки Тернопільського національного педагогічного університету імені Володимира Гнатюка. Серія: географія*. Тернопіль: СМП «Тайп». №1 (випуск 48). 2020. С. 139–148. DOI: https://doi.org/10.25128/2519-4577.20.1.16
5. Denysyk H., Kanskyi V., Kanska V., Denysyk B., Mykhailo V. Anthropogenic landscapes of Ukraine and their reconstruction. *Czasopismo Geograficzne*. 2022. № 93(3). P. 417–433. DOI: https://doi.org/10.12657/czageo-93-16
6. Славгородська, Ю. В. Сучасний стан та динаміка змін земельних ресурсів центрального Лісостепу України. *Scientific Progress & Innovations.* 2018. № 2. С. 120–124. DOI: https://doi.org/10.31210/visnyk2018.02.19
7. Битько М. М., Кузнецова О. В., Волонтир А. В. Оптимізація ефективності використання земельних ресурсів на рівні Черкаської області. *Формування сталого землекористування: проблеми та перспективи* : матеріали І Міжнародної науково-практичної конференції (19-20 листопада 2020 року). Київ, 2020. С. 12–15. URL: https://dglib.nubip.edu.ua/server/api/core/bitstreams/cce66612-e7a7-41e4-9a2d-c0dc60028312/content
8. Третяк А. М., Третяк В. М., Прядка Т. М., Третяк, Н. А. Наукові засади стратегії розвитку земельного устрою України і її регіонів у повоєнний період. *Ефективна економіка*. 2023. № 3. DOI: https://doi.org/10.32702/2307-2105.2023.3.9
9. Третяк А. М., Третяк В. М., Прядка Т. М. Земельний устрій України: понятійні і інституційні аспекти розвитку. *Агросвіт*. 2020. № 24. С. 3–11. DOI: https://doi.org/10.32702/2306-6792.2020.24.3
10. Будзяк О., Будзяк В., Дребот О. Управління кліматоорієнтованим землекористуванням. *Agricultural and Resource Economics*. 2022. Vol. 8. № 3. С. 98–122. DOI: https://doi.org/10.51599/are.2022.08.03.06
11. Кучер А. Адаптація аграрного землекористування до змін клімату. *Agricultural and Resource Economics*. 2017. Vol. 3. № 1. С. 119–138. URL: https://are-journal.com/are/article/view/95/97
12. Фондові матеріали Головного управління Держгеокадастру у Черкаській області. URL: https://cherkaska.land.gov.ua
13. Державна служба статистики України. URL: https://www.ukrstat.gov.ua
14. Стратегія розвитку Черкаської області на період 2021–2027 роки. URL: https://ck-oda.gov.ua/wp-content/uploads/2022/08/18082022.pdf