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PREREQUISITES FOR CREATING THE AGRICULTURAL LAND RESOURCES MONITORING SYSTEM

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The article considers the problems of land monitoring in Ukraine as one of the main components of the environmental monitoring system and a means of control in the field of land use and nature management. There is a need to maintain the natural potential of the cultural landscape, preserve the natural fertility of soils and ensure the balanced development of agricultural production and nature management, and therefore there is a need for information on its condition to ensure its maximum diversity and differentiation, ie mosaic of its structural units.

It is proposed to create a monitoring system, which must be based on a single methodological basis and provide comprehensive research to protect the environment and create a policy that will form a highly productive system «man — nature».

Keywords: *observation, land monitoring, balanced development, environment, sustainable development.*

INTRODUCTION

At the present stage of the development of society, there is a need for in-depth study of the interaction of man and nature, identifying the consequences of this interaction and ensuring balanced agricultural production and environmental management. The problem of ecological and economic support of balanced agricultural production and environmental management is due to the intensive development of technology, rapid population growth, and the growing negative effects of human economic activity, which have led to the imbalance of the ecological balance in many regions. To avoid the threat of depletion of natural resources, it is necessary to develop scientific and organizational bases for the creation of a land monitoring system to ensure balanced agricultural production and nature management. Only regional land use in modern conditions can provide comprehensive and inexhaustible development of resources that will allow avoiding both local and world ecological cataclysms to harmonize relations of the person and the nature. Works are devoted to this topic V.V. Medvedieva [4], S.Iu. Bulyhina, S.A. Baliuka [6], O.P. Kanasha [2] and others.

ANALYSIS OF THE LAST RESEARCH AND PUBLICATIONS

As a result of air pollution, destruction of the ozone layer, polluting of the environment in which people, reducing of water resources and deterioration of water quality, ignoring agronomic measures during the production of agricultural products land and forest degradation occurs, loss of biological diversity, pollution by toxic chemicals and hazardous waste. All these negative phenomena have contributed to intense climate change, the creation of an ecological crisis, and, as a result, have created an unfavorable demographic situation, hunger, and poverty in many regions of the world. Humanity is quite clearly

faced with the problem of survival and continued existence. [7; 8; 9; 10].

To overcome the current situation in agriculture, it is necessary to achieve a balanced development of agricultural production and nature management, which will provide a more effective system of land resources protection and will improve their use, agro-landscape structure, and optimization.

Setting objectives. The implementation of balanced development of agricultural production and nature management should be raised to the level of state priorities of ecological, economic, and social development of Ukraine. Maximum achievement of balanced development of agricultural production and nature management is one of the most important tasks of the Concept of sustainable development of agroecosystems in Ukraine for the period up to 2025. It is necessary to demand the performance of these tasks, they must be required to be one of the most important areas of public policy in the field of economics and environmental protection. Solving these problems is possible in solving the problem of land monitoring in Ukraine.

MATERIALS AND RESEARCH METHODS

legislative and normative acts, methodological and instructive materials, statistical and analytical data of ministries and departments of Ukraine, data of own researches concerning an ecological situation of the Carpathian region, materials of previous scientific researches.

The following research methods were used to solve the set tasks: monographic analysis (to study and generalize the existing scientific approaches to the problem of land use); abstract-logical analysis (to clarify the essence of the main categories, concepts, and definitions in the field of nature management, including land use, land relations, and land management); settlement and analytical (during the study of the ecological, economic and organizational and legal status of land use); comparative, landscape and geosystem approaches; methods of studying land use.

RESULTS AND DISCUSSION

Global ecosystem change is the most important environmental problem affecting large areas in both developed and developing countries. This problem is particularly acute in developing countries, while the problems of salinization, waterlogging, soil contamination, and loss of productivity are growing in all countries. The problem of balanced agricultural production and nature management is serious, as the productivity of vast areas decreases precisely when there is rapid population growth and increasing demand for food, fiber, and fuel created on earth. Efforts to combat the deterioration of the environmental situation, especially in developing countries, so far have had only limited success. Today, long-term national and regional programs for the conservation and restoration of nature use are needed, which would be well planned and accompanied by strong political support and adequate funding.

Thus, the rationality of nature management largely depends on an extensive, comprehensive study of natural resources, which is to determine the optimal norms for the use of natural resources; substantiation of the most efficient location of industries and proposals for management; ecological and economic assessment of natural resources; development of regional management systems, forecasting, and assessment of the consequences of economic activity, etc. Given that regional nature management is an important element of natural reproduction, it is necessary to develop and implement an economic mechanism that would ensure its balanced development. This is primarily the development of socio-economic criteria for the state of the environment, related to the main purpose of the perspective plan. The use of labor costs to restore and improve the natural environment is a necessary condition for accelerating economic development and raising living standards. The natural environment has not only economic, but also health, aesthetic and educational value [5]. Taking this into account when developing the ecological and economic foundations of balanced development is especially necessary for our time because the depleting use of resources inevitably leads to the destruction of productive forces.

Currently, the economically developed countries of the world have already formed the principles of balanced development of society, while considerable attention is paid to informing citizens about the policies and steps of the government on the practical implementation of action plans at the state and local levels. Countries with economies in transition, including Ukraine, are just beginning the process of advancing to the balanced development of society and have their peculiarities of transition. Therefore, achieving ecological balance requires a fundamentally new approach to economic activity to ensure balanced agricultural production and nature management. It is mandatory to have a multifaceted analysis, reliable, and regularly updated data on the state of land resources. All this determines the need for the organization of systematic comprehensive observations by the state of the environment and especially the land.

According to Art. 191 of the Land Code of Ukraine, land monitoring is a system of monitoring the condition of lands to timely identify changes, their assessment, prevention, and elimination of the consequences of negative processes [1]. State monitoring hereinafter referred to as «land monitoring» is intended to play a basic unifying role for all other monitoring and inventories of natural resources and should have state status. This approach provides comprehensive information about the land, minimal costs for the operation of the monitoring system, and is part of a single state information system on the state of the environment and natural resources of Ukraine as well as Global Monitoring of the Environment and Climate according to the international geosphere-biosphere program «Global Change».

Land monitoring is conducted on all categories of land, regardless of their legal status and nature of use. Thus the earth is considered as an ecological and economic self-regulating open system, a place of life and sphere of activity of the person, the main means of production in agriculture and forestry, as well as a spatial resource with its inherent territorial limitations for the location of objects of all branches of economic, environmental and other activities. This is also caused by a complex systemic nature of the research object; territories of legal and physical subjects — landowners and land users, units of production and economic use of land plots, and ecological-landscape complexes, which are separated in the form of land monitoring objects on the basis of ecological-landscape zoning of the territory[3].

In our opinion, it is important to find out the structure and content of the land monitoring system, which should be consistent with both the environmental monitoring system and agri-environmental monitoring, especially at the regional level.

Given the complexity of the objects observed, the diversity of natural origin, and functioning at different levels of organization of genomic systems, the need for simplification in the regulatory process in practice carry out their structuring. Therefore, depending on the territorial coverage, there are biosphere monitoring (global), regional, local (impact), environmental, biological, sanitary-toxicological, international, national, basic (background), direct, and remote (including aviation and space), etc.

Global land monitoring, as already noted, is carried out in accordance with the international geosphere-biosphere program «Global Change».

Regional monitoring is carried out in areas with physical-geographical, landscape-ecological, administrative or other boundaries, covers large areas related to natural-economic, historical, and other conditions.

Local monitoring of lands is conducted at the territorial level below the regional level.

The structure of land monitoring is mainly determined by the administrative-territorial division of Ukraine, the use of land for its intended purpose, the nature of changes in the state of the land fund, etc. At each level of administrative-territorial division, the land monitoring structure provides subsystems that correspond to the main categories of land [1]. Depending on the nature of the change in the condition of the land distinguish between background and impact monitoring. Background monitoring involves monitoring the condition of lands without superimposing the results of human activities on them and is carried out in biosphere reserves or areas specifically designated for these works. Impact monitoring is also the observation of the condition of lands in places of direct influence of anthropogenic factors, especially in the zones of influence of large industrial facilities, cities, nuclear power plants, etc.

Depending on the origin of changes in the state of the land, the following processes are distinguished: evolutionary (related to historical development processes); cyclical (associated with diurnal, seasonal, annual, and other periods of changes in natural change); anthropogenic (related to human activity); emergencies (related to industrial accidents, natural and environmental disasters, water management disasters and other) on which depend the terms and frequency of observations of changes in the state of lands. They are divided into four groups: basic (weekend, which records the state of the objects of observation at the time of the start of land monitoring); periodic (in a year or more); operational; retrospective (historical analysis of previous observations).

The content of land monitoring is systematic observations and searches, inquiry and chorometry, research and production developments that characterize such phenomena and processes:

1) change of borders and areas: administrative-territorial formations; land use and land tenure; farming and hunting acreage, fields, plots, etc;

2) change in the state of the territory — its geological environment, the relief of the hydrographic network: landscape-ecological complexes, their local geosystems; landforms caused by moving sands, landslides, mudslides, earthquakes, channel processes, etc; water balance, the regime of the chemical and hydrobiological composition of groundwater; shorelines of seas, lakes, reservoirs, estuaries and other objects; flooding, drainage of lands adjacent to the water area; change caused by cryogenic processes and phenomena; changes

caused by disturbed lands, including existing and worked quarries, dumps, heaps, developed and worked peat bogs, subsidence of the earth's surface under the influence of water withdrawals and spent subsoil;

3) change in the condition of lands that are negatively affected by production facilities: treatment facilities of industrial and agricultural enterprises; reclamation systems; transport, in terms of land pollution; manure storages, sites for composting of fertilizers, dumps, warehouses of loose fertilizers, warehouses of fuel, liquid fertilizers, parking of motor transport, burials of dead animals, places of burial of radioactive, physiologically active chemical wastes of production, etc.;

4) change in soil condition: development of water erosion; desertification of the territory; soil degradation on pastures, flooding of lands; waterlogging, waterlogging of lands; salinization of soils; overgrowth, including shrub invasion of tillage; violation of soil aggregates, formation of deflationary dangerous unstructured powder surface, washed away soil surface; change in humus stocks; change in soil pH (acidity, alkalinity); changing retention of trace elements in the soil; soil contamination with pesticides, heavy metals, sprayed chemical elements, radioactive elements, and other toxicants; change in the state of reclaimed lands (irrigation erosion, secondary salinization, waterlogging, excessive drainage);

5) change in the state of vegetation (crops, pastures, forests, perennials, etc.) by phenological characteristics (phases, stages of development, the timing of their (occurrence); phytopathological ranges; biomass; the spread of drug-containing vegetation (natural and illegal crops); the condition of forest and tree-shrub plantations that are not included in the State Forest Fund (field protection, water protection, and other plantations); condition of forest areas that are part of the State Forest Fund, covered with forest (phytopathological data, fires, felling) and non-forested lands — possible reserves of agricultural land, etc.

Monitoring results are expressed in quantitative and qualitative indicators that characterize changes in land conditions. Indicators can be displayed in absolute or relative terms, reduced to a specific time or period. Integral indicators are used for the general characteristics of the object, for example, the degree and intensity of soil degradation, desertification, and others. Based on the results of the received information, operational reports, reports, scientific forecasts, thematic maps are compiled.

According to some authors, primary information should be focused on agricultural research stations, which should become the mainstay for geosystem monitoring bases.

CONCLUSIONS

Development of production and growth of economic activity, during which man uses more and more natural resources, cause an imbalance in the natural environment, which, in turn, leads to exacerbation of socio-economic problems. Simultaneously with the reduction of stocks of non-renewable raw materials and energy resources, there is the pollution of the environment, especially water resources and atmospheric air, the area of fertile lands decreases, some species of plants and animals disappear, etc. All this, ultimately, hurts human health.

To prevent the adverse effects of nature management, it is necessary to create a system of monitoring the entire land fund of the state, regardless of the forms of land ownership and the nature of land use, which should be carried out in terms of administrative-territorial units, and its subsystems to form, taking into account the category of land. In general, monitoring should cover the national, regional, and local levels with a certain frequency of observations of the state of the lands.

REFERENCES

1. Zemelnyi kodeks Ukrainy [Land Code of Ukraine]. (2002). *Verkhovna Rada of Ukraine. Official publication of VVR, 3–4*, 27 [in Ukrainian].
2. Kanash, O.P. (2013). Grunty — providna skladova zemelnykh resursiv [Soils are a leading component of land resources]. *Zemleustrii i kadastr — Land management and cadastre, 2*, 68–76 [in Ukrainian].
3. Hutsuliak, H.D., Trehobchuk, V.M., Andriishyn, M.V., Hutsuliak, Yu.H. (1999). Landshaftno-ekolohichne raionuvannia terytorii Ukrainy [Landscape and ecological zoning of the territory of Ukraine]. *Visnyk ahrarnoi nauky — Bulletin of Agricultural Science, 5*, 50–56 [in Ukrainian].
4. Medvedev V.V. (2002). *Monitoring pochv Ukrainy. Kontseptsiya, predvaritelnyye rezultaty, zadachi [Monitoring of soils in Ukraine. Concept, preliminary results, tasks].* Kharkiv: Antikva. 428 p. [in Russian].
5. Furdychko, O.I. (Ed.). (2013). *Naukovi osnovy staloho rozvytku ahroekosystem Ukrainy. U 2-kh t. Tom 1: Ekolohichna bezpeka ahropromyslovoho vyrobnytstva. Tom 2: Naukovo-metodychni osnovy zbalansovanoho pryrodokorystuvannia v ahropromyslovomu vyrobnytstvi. Monohrafiia [Scientific bases of sustainable development of agroecosystems of Ukraine. In 2 volumes. Volume 1: Ecological safety of agro-industrial production. Volume 2: Scientific and methodological bases of sustainable nature management in agro-industrial production. Monograph].* Kyiv: DAI. 704 p. [in Ukrainian].

6. Medvediev, V.V., Bulyhin, S.Iu., S.A. Baliuk S.A. at al. (2001). *Stan rodiuchosti gruntiv Ukrainy ta prohnoz yoho zmin za umov suchasnoho zemlerobstva [The state of soil fertility of Ukraine and the forecast of its changes under modern agriculture].* V.V. Medvediev, M.V. Lisovyi. (Ed(s)). Kharkiv: STRIKH. 100 p. [in Ukrainian].
7. Trehobchuk, V. M., Hutsuliak, H.D., Hutsuliak, Yu. H. (2002). *Stan navkolyshnoho seredovyshcha i yoho vplyv na trudovi resursy Zakarpatskoi oblasti [The state of the environment and its impact on the labor resources of the Transcarpathian region].* Chernivtsi: Prut. 164 p. [in Ukrainian].
8. Trehobchuk, V.M., Hutsuliak, H.D., Hutsuliak, V.D. (1995). *Stan navkolyshnoho seredovyshcha i yoho vplyv na trudovi resursy Ivano-Frankivskoi oblasti [The state of the environment and its impact on the labor resources of Ivano-Frankivsk region].* Kosiv. 130 p. [in Ukrainian].
9. Trehobchuk, V. M., Dolishnii, M.I., Hutsuliak, V.D. at al. (1999). *Stan navkolyshnoho seredovyshcha i yoho vplyv na trudovi resursy Lvivskoi oblasti [The state of the environment and its impact on the labor resources of Lviv region].* Chernivtsi: Prut. 156 p. [in Ukrainian].
10. Trehobchuk, V.M., Hutsuliak, V.D., Hutsuliak, H. D. at al. (1998). *Stan navkolyshnoho seredovyshcha i yoho vplyv na trudovi resursy Chernivetskoi oblasti [The state of the environment and its impact on the labor resources of Chernivtsi region].* Chernivtsi: Prut. 152 p. [in Ukrainian].

ПЕРЕДУМОВИ СТВОРЕННЯ СИСТЕМИ МОНІТОРИНГУ ЗЕМЕЛЬНИХ РЕСУРСІВ АГРОСФЕРИ

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У статті розглянуто проблеми моніторингу земель в Україні як одного із головних компонентів системи спостереження за станом довкілля та засобу контролю у сфері земле- та природокористування. Є необхідність підтримати природний потенціал культурного ландшафту, зберегти природну родючість ґрунтів та забезпечити збалансований розвиток аграрного виробництва і природокористування, а тому є потреба в інформаційній базі даних про його стан, щоб забезпечити максимальну різноманітність і диференціацію, тобто мозаїчність структурних одиниць.

Пропонується створити систему моніторингу, яка обов'язково має ґрунтуватися на єдиній методологічній основі й передбачати комплексні дослідження з метою забезпечення захисту навколишнього середовища та створення такої політики, яка сформує високопродуктивну систему «людина — природа».

Ключові слова: *спостереження, моніторинг земель, збалансований розвиток, навколишнє природне середовище, сталий розвиток.*

ЛІТЕРАТУРА

1. Земельний кодекс України / Верховна Рада України. Офіц. Вид. ВВР. 2002. № 3–4. С. 27.
2. Канаш О.П. Ґрунти — провідна складова земельних ресурсів / О.П. Канаш / *Землеустрій і кадастр.* 2013. № 2. С. 68–76.
3. Ландшафтно-екологічне районування території України / Г. Д. Гуцуляк, В. М. Трегобчук, М. В. Андріїшин, Ю. Г. Гуцуляк / *Вісн. аграр. науки.* 1999. № 5. С. 50–56.
4. Медведев В.В. Мониторинг почв Украины. Концепция, предварительные результаты, задачи / В.В. Медведев. Х.: Антиква, 2002. 428 с.
5. Наукові основи сталого розвитку агроекосистем України. У 2-х т. Том 1: Екологічна безпека агропромислового виробництва. Том 2: Науково-методичні основи збалансованого природокористування в агропромисловому виробництві. Монографія / За ред. О.І. Фурдичка. К.: ДАІ, 2013. 704 с.
6. Стан родючості ґрунтів України та прогноз його змін за умов сучасного землеробства / В.В. Медведєв, С.Ю. Булигін, С.А. Балюк та ін.; за ред. В.В. Медведєва, М.В. Лісового. Х.: ШТРІХ, 2001. 100 с.

7. Трегобчук В.М. Стан навколишнього середовища і його вплив на трудові ресурси Закарпатської області / В.М. Трегобчук, Г.Д. Гуцуляк, Ю.Г. Гуцуляк. Чернівці: Прут, 2002. 164 с.
8. Трегобчук В.М. Стан навколишнього середовища і його вплив на трудові ресурси Івано-Франківської області / В. М. Трегобчук, Г.Д. Гуцуляк, В.Д. Гуцуляк. Косів: 1995. 130 с.
9. Трегобчук В.М. Стан навколишнього середовища і його вплив на трудові ресурси Львівської області / В.М. Трегобчук, М.І. Долішній, В.Д. Гуцуляк та ін. Чернівці: Прут, 1999. 156 с.
10. Трегобчук В.М. Стан навколишнього середовища і його вплив на трудові ресурси Чернівецької області / В.М. Трегобчук, В.Д. Гуцуляк, Г.Д. Гуцуляк, та ін. Чернівці: Прут, 1998. 152 с.

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Новини

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Чернігівська обласна рада на сесії 22 жовтня ухвалила рішення про створення в області двох нових ландшафтних заказники — “Берізки” та “Лопата”. Нові об’єкти природно-заповідного фонду створені на землях громад без їх вилучення і становлять науково-дослідний, рекреаційний та освітньо-виховний інтерес. За інформацією департаменту екології та природних ресурсів ОДА, Чернігівська область посідає перше місце в Україні за кількістю заповідних територій. На сьогодні ця мережа нараховує понад 670 об’єктів загальною площею понад 262 тис. га, що становить 8% площі області. Проте цього, зазначають у департаменті, недостатньо. Адже частка заповідних територій в Україні залишається значно меншою, ніж у більшості країн Європи, де площі, зайняті ПЗФ, займають, у середньому, 15% території.