

4.3 Monitoring of land relations in Ukraine: regulation and educational provision

The Constitution of Ukraine, based on the irreplaceability of land as a natural resource, quite naturally recognized it as the main national asset under special state protection. (Fig. 1)



Figure 1. Land as a natural resource

Frugal, efficient, rational, and environmentally safe use of land, as well as their protection in modern conditions, are among the most urgent problems of national security for the state. [74]

The situation has significantly worsened due to the armed aggression of the Russian Federation against Ukraine, which has led to the destruction, partial damage, or contamination of one-third of agricultural land. Eliminating the consequences of hostilities is associated with demining, cleaning up fortifications, and restoring the topsoil layer.

Compliance with the principle of prioritizing environmental safety requirements in land use, protecting it from harmful anthropogenic influence, restoring soil fertility,

preventing unjustified withdrawal of agricultural and forest lands, as the main means of production, ensuring a special legal regime for land use depending on the categories of the land fund, can be considered as components of special **protection of land** as the main national asset, according to Article 14 of the Constitution of Ukraine. (Fig. 2)

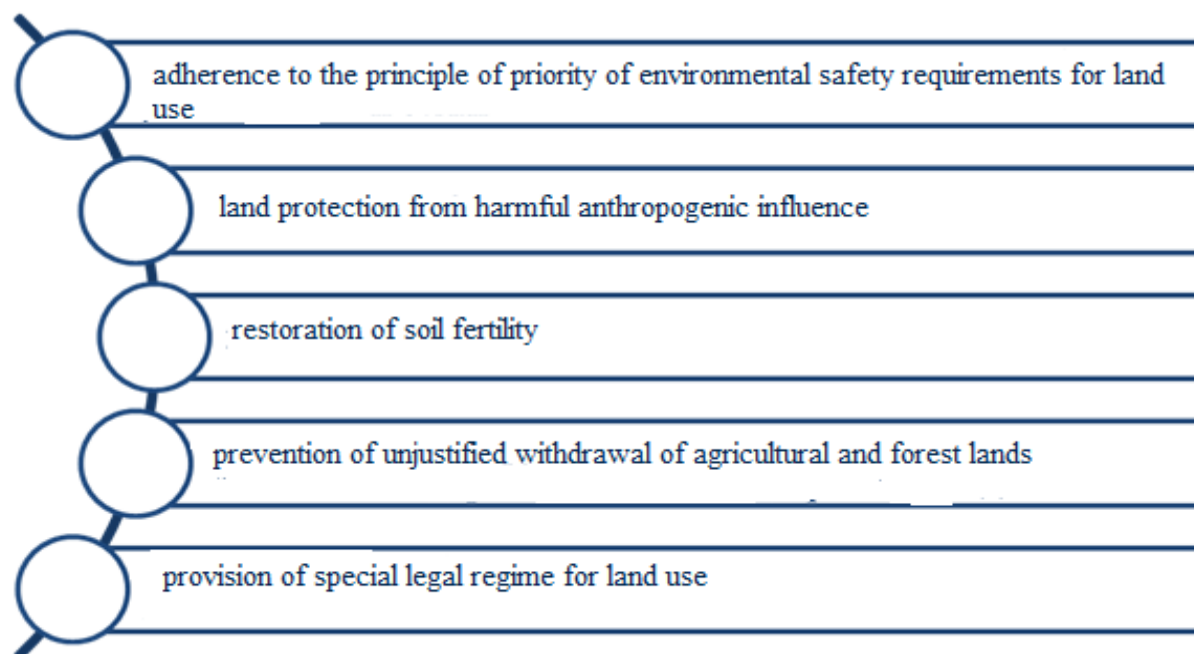


Figure 2. Components of special land protection as the main national asset

As is known, monitoring of land plays an important role in its protection. For the first time in Ukraine, it was introduced by the Land Code (in the edition of the Law of Ukraine No. 2196-12 of March 13, 1992). The Cabinet of Ministers of Ukraine approved the "Regulations on Land Monitoring" by a resolution dated August 20, 1993, which was amended nine times between 2003 and 2021.

In connection with the adoption of the new Land Code on October 25, 2001, which came into force on January 1, 2002, land monitoring was defined as an independent chapter of Chapter 33 of Section VII of the Code "Management in the field of land use and protection."

According to the legislation, the object of monitoring is all land, regardless of ownership. The division of monitoring depending on the purpose of observations and the degree of coverage of territories is presented in Fig. 3.

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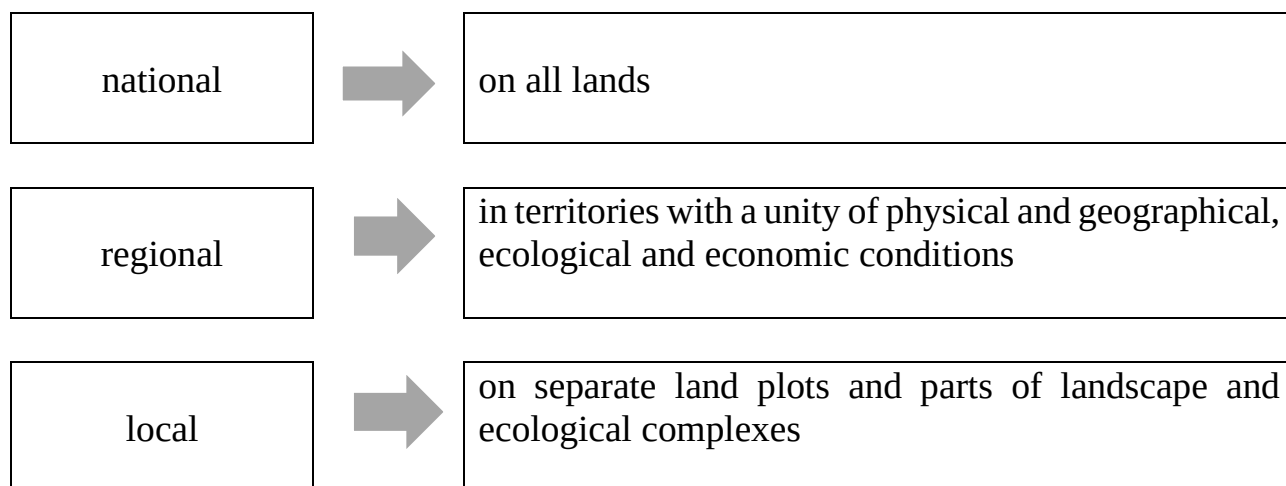


Figure 3. Division of monitoring depending on the purpose of observations and the degree of coverage of territories

Land monitoring consists of systematic observations of the state of land (agrochemical passports of land plots, mapping, surveying and search), identifying changes in it, and conducting assessments of:

- processes related to changes in soil fertility (development of water and wind erosion, loss of humus, deterioration of soil structure, waterlogging and salinization), overgrowth of agricultural land, soil pollution with pesticides, heavy metals, radionuclides, and other toxic substances;
- the state of river, sea, lake, bay, reservoir, estuary, and hydraulic structures;
- processes related to the formation of gullies, landslides, mudflows, earthquakes, karst, cryogenic, and other phenomena;
- the state of lands of settlements, territories occupied by oil and gas facilities, treatment facilities, manure storages, fuel and lubricant depots, fertilizer storages, parking lots, toxic industrial waste and radioactive materials disposal sites, as well as other industrial facilities. [76]

According to Article 191 of the Land Code, land monitoring is carried out by the central executive authority that implements state policy in the field of land relations and the central executive authority that implements the the state policy in the field of environmental protection. According to the Order of the Ministry of Agrarian Policy

of Ukraine dated February 26, 2004 No. 51 "On Approval of the Regulation on Soil Monitoring on Agricultural Lands" [78], the performers include the executive authorities - the Ministry of Agrarian Policy, the Ministry of Ecology and Natural Resources, the State Committee for Land Resources, and the State Water Resources Agency. Due to optimization, these agencies no longer exist, and the regulation has not been codified.

So, according to the Regulation approved by the Cabinet of Ministers of Ukraine, there is no system or logic in defining those responsible for land monitoring. An automated system for technical support of monitoring has not been created yet. The main measures for creating a land monitoring system, approved by the State Committee for Land Resources of Ukraine in March 1997 from 1997 through 2005, remained unfulfilled. Central executive authorities and local self-government bodies were rarely provided with reports, forecasts, and recommendations for taking appropriate measures to prevent the elimination of the consequences of negative processes. [79]

At the national, regional, and local levels, the moratorium is associated with the administrative-territorial division. However, in connection with the reform of local self-government and decentralization of power, monitoring is extremely necessary for territorial communities in addition to regions and districts. Significant areas of agricultural land outside of settlements belonging to state ownership are transferred to their ownership. Therefore, monitoring the state of land on the territory of communities to identify changes, their assessment, prevention, and elimination of the consequences of negative processes becomes quite a relevant task for organizing rational land use. [80]

Despite the fact that the Regulation on the state environmental monitoring system was approved by the Cabinet of Ministers of Ukraine on March 30, 1998 [81] (the Regulation on land monitoring was approved by the Cabinet of Ministers on August 20, 1993), and according to the current Land Code (Article 191), land monitoring is a component of the state environmental monitoring system, such a norm is still not included in the Regulation on land monitoring. This partially explains why there is no single land monitoring system in Ukraine.

The environmental monitoring system is directed to the measures provided in

Fig. 4

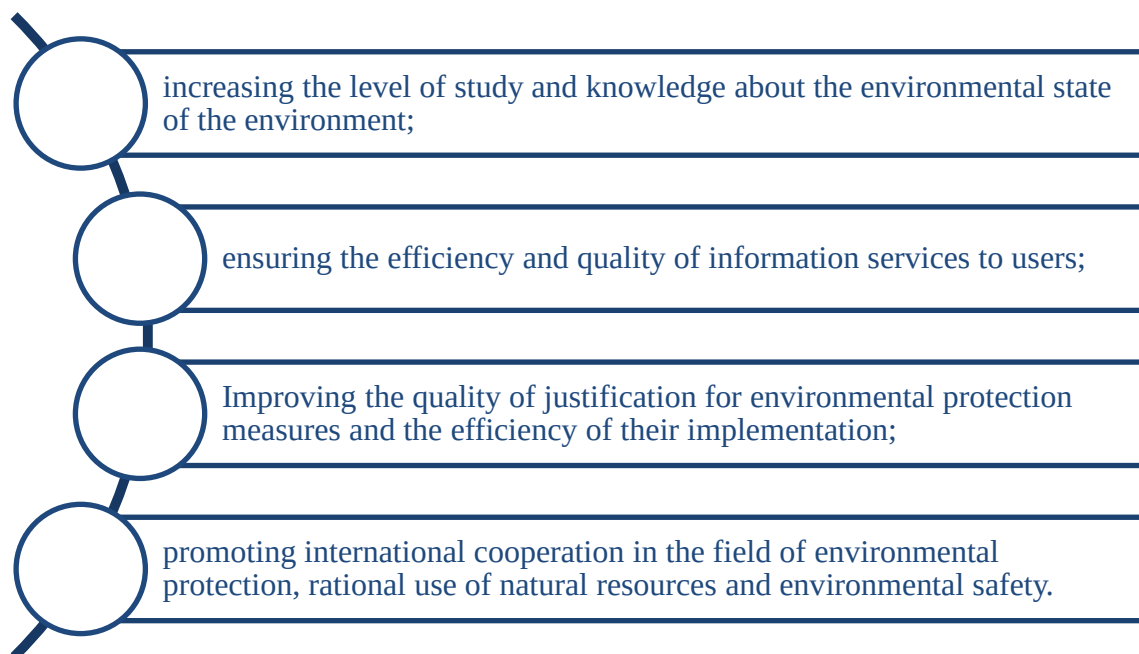


Figure 4. Tasks of the environmental monitoring system [81]

Soil monitoring was introduced as an independent component of land monitoring in 2003 according to the Law of Ukraine "On Land Protection" [82]. Article 16 of this Law stipulates that the central executive body responsible for implementing state policy in the field of land relations is responsible for ensuring soil monitoring and agrochemical passportization of agricultural land. According to Article 54, the State Geocadaastre also conducts soil monitoring on agricultural land with comprehensive soil surveying every 20 years. However, the Regulation on Land Monitoring, approved by the Cabinet of Ministers on August 20, 1993 (with amendments), states that soil monitoring should be carried out by the Ministry of Agrarian Policy following the approved regulations (this regulation was approved by the ministry on February 26, 2004, but is not codified).

According to current Ukrainian legislation, from 1993 to 2017, land monitoring and soil monitoring functioned in Ukraine as a component of land monitoring. Practically speaking, during this period, one land monitoring system (Land monitoring) was in operation, which was referred to as land monitoring. In the scientific literature,

terms such as "monitoring of land resources," "monitoring of land use," and "monitoring of agricultural land use" were also used.

Both land monitoring and soil monitoring had an ecological focus - the conservation of one type of ecosystem - land resources, the prevention of crisis changes in the environmental state, and the prevention of environmental emergencies. Undoubtedly, the information contained in these monitoring systems is incomplete, largely inaccessible, unorganized and scattered, and, most importantly, cannot be effectively used to address critically important social and economic issues related to the rational use of land, the development of land relations in the country, both in terms of issues of land use ecologization, and socio-economic problems of special protection of land as the main national asset following current legislation. [83]

In connection with the above, it is completely natural and timely to introduce monitoring of land relations in Ukraine in 2017 following the Decree of the Cabinet of Ministers of Ukraine dated August 23, 2017 No. 639 "On the implementation of a pilot project on monitoring land relations and making changes to some resolutions Cabinet of Ministers of Ukraine". [84] Two statistical yearbooks were published: "Monitoring of land relations in Ukraine. 2014-2015" [85], and "Monitoring of land relations in Ukraine. 2016-2017" [86] The resolution of the Cabinet of Ministers of Ukraine dated August 23, 2017, became, in essence, a provision on the structure, principles, and procedure of monitoring.

The National Academy of Agrarian Sciences of Ukraine held a round table on October 4, 2017 "Monitoring and protection of land: solution directions" and on June 23, 2022 "Ukrainian chernozem: protection, monitoring, land management"



Figure 5. Monitoring of land relations

It is well known that land relations are social relations. Therefore, they concern society as a whole, and the subjects of land relations are citizens, legal entities, local self-government bodies, and state authorities.

The objects of these relations are the lands within the territory of Ukraine, land plots, including land shares (shares). (Fig. 6)



Figure 6. Land within the territory of Ukraine, land plots, including land shares as
objects of land relations monitoring

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Land relations are considered to be those related to the ownership, use, and disposal of land. This triad unites property relations to land. It is considered that the protection of lands and land use management should also be considered types of land relations. In connection with this, the composition of land relations monitoring can be expanded, which is supported by many scientists. [90]

The procedure for implementing the pilot project on monitoring of land relations, which was approved by the resolution of the Cabinet of Ministers of Ukraine dated August 23, 2017, No. 639, establishes that "monitoring of land relations (hereinafter - monitoring) is a systematic collection, preservation, summarization, and dissemination of information about the state of land relations provided by entities of information interaction under the recommended list of data and indicators that are submitted in the process of information interaction for monitoring." [84]

The recommended list of indicators submitted in the process of information interaction is presented in the appendix, which allows timely supplementing or changing them, to create an open information system that reflects the state of development of land relations in Ukraine and ensuring their transparency. However, the mechanism of mutual exchange of information between entities of information interaction to systematize and summarize data on ownership, use, and disposal of land plots cannot be considered as completed monitoring of land relations. More precisely, it is a system of mutual exchange of information. [74]

Confirmation of the existence of monitoring of land relations at the legislative level is the provision of article 25 of the Law of Ukraine "On Land Valuation" regarding monitoring of the land market in the edition of the Law No. 1423-IX dated April 28, 2021. "Monitoring of the land market is carried out as part of the monitoring of land relations by the central executive authority that implements the state policy in the field of land relations based on information from the State Register of Real Rights to Immovable Property and their Encumbrances on the price (value) of land plots, the price (value) of other property rights to land plots, the amount of payment for the use of other people's land plots. The results of the land market monitoring are published at

least once every three months. Monitoring of the land market is carried out in the manner prescribed by the Cabinet of Ministers of Ukraine." [87]

The lack of detailed and reliable information to characterize the development of land relations in the country based on available reporting data in local authorities and the high level of corruption in land relations have necessitated the acceleration of work related to ensuring transparency in the use and protection of land resources. Within the framework of the Project "Support to Agricultural and Land Reform in Ukraine" with the assistance of the World Bank in cooperation with the Ministry of Agrarian Policy and Food of Ukraine, the State GeoCadastre and other central executive authorities, two stages of pilot projects for monitoring land relations have been carried out:

- 1) unofficial pilot stage (2014-2017), which was carried out by the relevant authorities on the initiative and with the support of the World Bank;

- 2) official pilot stage (2017-2019), which is being carried out based on a sublegal act - the Cabinet of Ministers of Ukraine Resolution No. 639 of August 23, 2017 "On the implementation of a pilot project for monitoring land relations and amending certain resolutions of the Cabinet of Ministers of Ukraine". The Procedure for the implementation of a pilot project for monitoring land relations approved by the said resolution became a regulatory document for the implementation of the moratorium itself. According to the resolution of the Cabinet of Ministers of Ukraine, the monitoring includes 65 indicators. Preference was given to those of them that correspond to the practice of developed countries and the recommendations of the World Bank (LGAF, 2013). These indicators are combined and include different characteristics of transactions with land plots, land tax, court disputes, land privatization, and land withdrawal, ensuring the rights of different categories of landowners and land users. The introduction of monitoring of land relations is in line with the principles declared in the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries, and Forests in the Context of National Food Security of the UN Food and Agriculture Organization. [76]

Monitoring is based on the following principles (Fig. 7):

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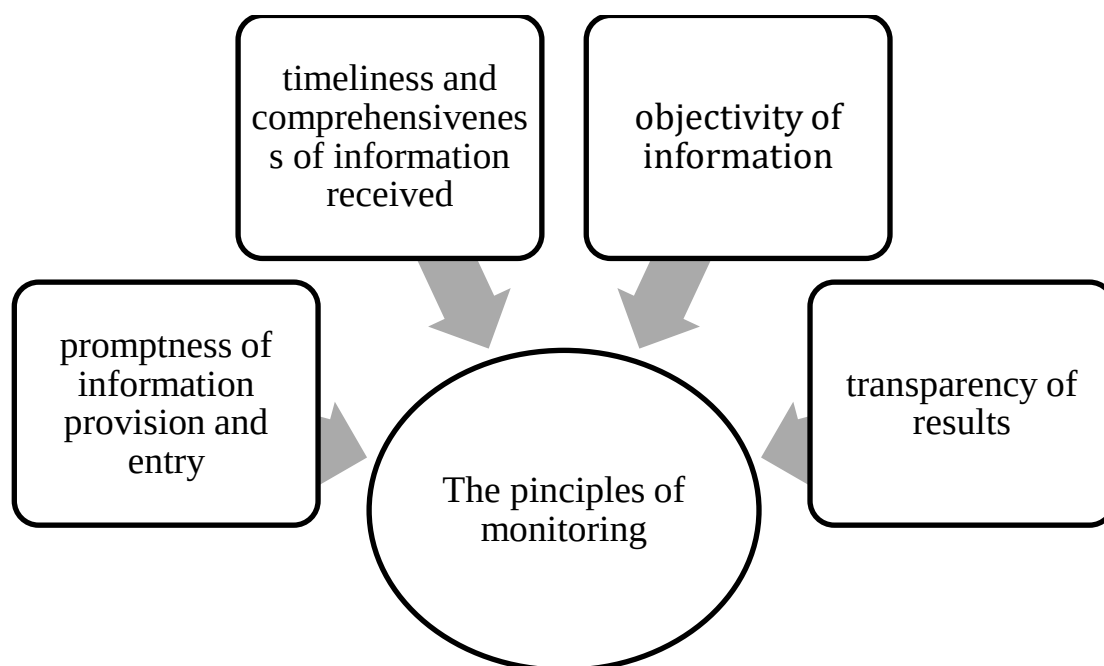


Figure 7. The principles of monitoring

The provision of information is carried out on electronic media or by means of direct automated exchange of electronic data or other agreed methods. The organization of monitoring is entrusted to the Ministry of Agrarian Policy. A land monitoring portal has been launched on the State Geocadaastre website. Timely information is published on the agricultural land market. [74]

Thus, land monitoring and land relations monitoring have started working as a comprehensive mechanism. This will allow the creating of a system of monitoring land resources on a scientific basis, which would be unified, automated, public, and reliable. Ensuring the publicity of information and its availability has become a prerequisite not only for the effective and environmentally safe ownership, use, and disposal of land but also as a means of forming a system of special protection of land as the main national asset of the state, with observance of the principles of land use ecologization and socio-economic principles of land turnover in market conditions.

Following the Land Code of Ukraine, the Law of Ukraine "On Land Protection", and the Law of Ukraine "On Land Assessment", it is necessary to develop regulatory legal acts regarding the procedure for conducting land monitoring, monitoring of soils

on agricultural land, monitoring of land relations, and monitoring of the land market. The Regulation on Land Monitoring (with changes and additions) approved by the Cabinet of Ministers of Ukraine in August 1993 is outdated, does not correspond to the name that this document should have according to the legislation (Land Code), and contains some conflicting provisions. The provisions on soil monitoring, approved by the Ministry of Agrarian Policy in February 2004, have not been codified since adoption, and put the implementation of soil monitoring work on central executive authorities that no longer exist, and some norms of the regulation contradict the Land Code and the Regulation on Land Monitoring approved by the Cabinet of Ministers.

Instead of an established procedure for monitoring land relations, which has not yet been approved, a temporary document on the implementation of a pilot project for monitoring land relations and making changes to certain Cabinet of Ministers resolutions, which was approved by the Cabinet in August 2017, is currently in effect. A draft Cabinet of Ministers resolution "On ensuring the monitoring of land relations" and a corresponding draft procedure for this monitoring, including monitoring of the land market, have been prepared [88].

Thus, the Cabinet of Ministers of Ukraine could consider four options for the provision (on monitoring of land, soil, land relations, land market); three provisions (on monitoring of land, soil, land relations, including the land market); two provisions (on monitoring of land and soil; on monitoring of land relations, including the land market). Another option that cannot be ignored is a single document, the draft of which could be adopted and which could be called "Procedure for conducting land monitoring" or "Procedure for conducting land relations monitoring".

As one of the main sources of land-cadastral information is called the public cadastral map (Figure 8), and the use of an electronic procurement system, which is associated with the functioning of the land market, is considered public procurement, land monitoring or monitoring of land relations should also be public.

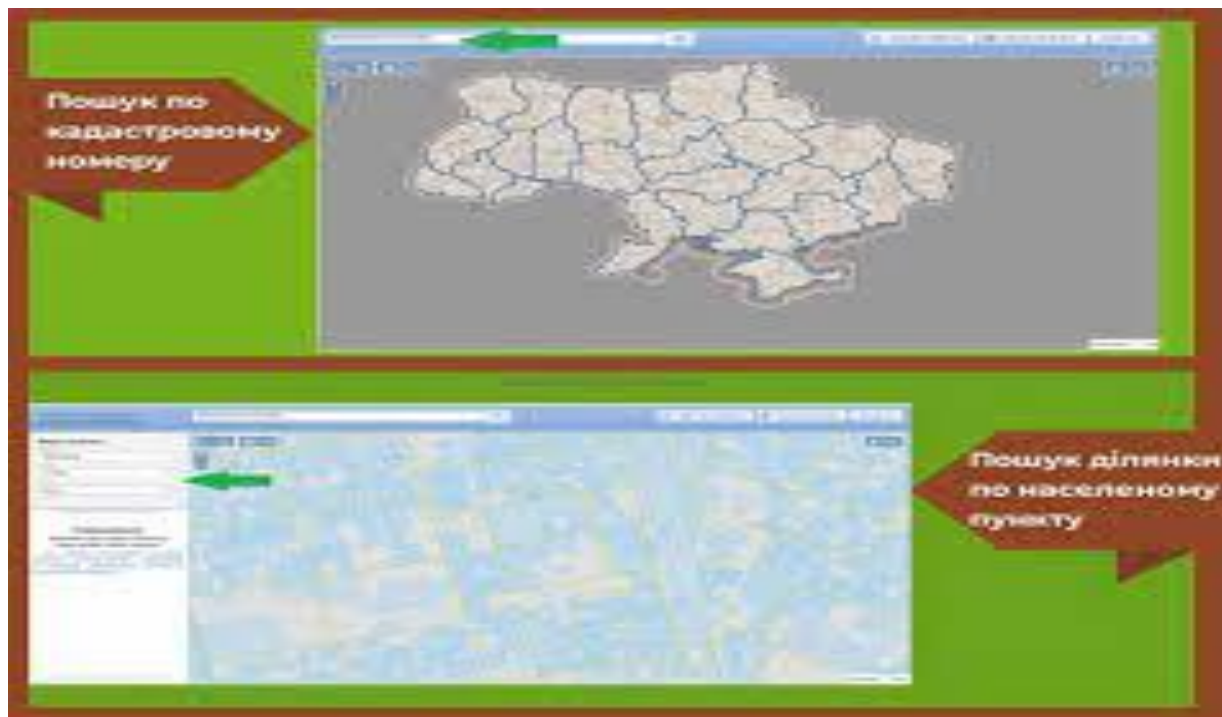


Figure 8. Public cadastral map of Ukraine [89]

One of the legislative acts must define the essence of land monitoring, especially monitoring of land relations. First of all, such provisions should be contained in the Land Code of Ukraine as one of the fundamental sources of land legislation. This proposal is supported by many scientists. [90, 91]

As for the published draft "Procedure for monitoring land relations, including monitoring of the land market", this title does not contain the provision of the Law "On Land Valuation" on monitoring, meaning "monitoring" not as a process (action), but as a name of the system. The title of the draft Government Resolution "On Ensuring Monitoring of Land Relations", in our opinion, is more reasonable. It is unnecessary to indicate in the title of the Procedure that the monitoring of the land market is set out, including as part of the monitoring of land relations.

The launch of land monitoring in the country coincided with the beginning of land reform, the introduction of private land ownership, and the legalization of the principles of legal regulation of land protection.



Figure 9. Interaction of land monitoring with land reform

The thirty-year period of formation and development has expanded the spheres of influence of this monitoring, including the observation of the soil cover (in 2003), land relations (in 2017), and the land market (in 2021). However, these monitoring processes do not yet constitute a single state system that meets the requirements of environmental monitoring, scientific substantiation of land relations development and regulation, and effective circulation of land plots (land market).

The Regulation on Land Monitoring (1993) requires significant substantive updating. The information base regarding the quantitative and qualitative state of lands and land use, the inventory updating of the land resource and soil cover, remains unsatisfactory. The necessary norms and standards in the field of soil fertility reproduction, acceptable anthropogenic loads, and the level of agricultural land capacity have not been developed.

The legal regulation of further development of land monitoring should aim to create a system of land observation that would be unified, automated, public, reliable, based on satellite observations and take into account the structure and practice of the European Community Land Monitoring Service. Taking into account the peculiarities of the formation of the existing monitoring system, it should include Land Monitoring and Land Relations Monitoring with the relevant regulatory framework. [74]

The educational provision for training masters is as follows. With the beginning of land reform in Ukraine, the Verkhovna Rada made a decision in December 1990 on providing the necessary number of land management specialists in educational institutions. Currently, junior bachelors are trained in colleges in Ukraine, while bachelors and masters are trained in higher education institutions. According to the Cabinet of Ministers Resolution of April 29, 2015 No. 266, specialty 193 "Geodesy and Land Management" is included in the field of knowledge "Architecture and Construction" and has the following educational programs: geodesy; land management and cadastre; geoinformation systems and technologies; land and real estate appraisal; space monitoring of land. Almost 30 higher education institutions in Ukraine train masters in the specialty of 193 "Geodesy and Land Management." Part of the classical national universities and universities and academies - agricultural, technical, construction and architecture, oil and gas, water management, nature management, agrarian-technological, and urban management - are involved in training the mentioned specialists.

To provide students with theoretical knowledge and practical skills regarding information support for ownership, use, and management of land plots, as well as outlining the prospects for further development of land relations in 2022, a new discipline "Land Relations Monitoring" was introduced in higher education institutions in the training of students in the specialty of 193 "Geodesy and Land Management" of the Master's degree program. The description of the new program is provided based on the example of the Land Management Faculty of the National University of Life and Environmental Sciences of Ukraine. (Table 1.)

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Table 1.

Description of the academic discipline "Monitoring of land relations" [92]

Field of knowledge, field of study, specialty, educational qualification level		
Field of knowledge	19 - Architecture and construction	
Field of study	193 - Geodesy and land management	
Specialty	Valuation of land and immovable property	
Educational qualification level	Master's degree	
Characteristics of the academic discipline		
Type	Mandatory	
Total number of hours	120	
Number of ECTS credits	4	
Number of content modules	2	
Research paper (if included in the curriculum)	-	
Form of control	Exam	
Indicators of the academic discipline for full-time and part-time study		
	Full-time form of study	Part-time form of study
The year of study	2022-23	2022-23
Term	1	1, 2
Lectures	15 h.	8 h.
Practical, seminar classes	15 h.	4 h.
Laboratory classes	.	
Self-study	90 h.	108 h.
Individual assignments		
Number of weekly hours for full-time students:		
-in auditorium	2 h.	
-self-study	6 h.	

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The objectives of the discipline include the study of the system for collecting, preserving, and publishing data and indicators regarding land relations in Ukraine, while the main components of the study of the discipline "Monitoring of Land Relations" are to clarify the institutional prerequisites and economic foundations of the system for collecting and exchanging information, preserving and publishing a set of data and indicators necessary for making management decisions. [92]

The specified program for the training of postgraduate students, as an option, consists of two modules of the following content. (Table 2.)

Content Module 1.

Institutional framework for monitoring land relations

Topic 1. Purpose and objectives of monitoring land relations

The essence of the land relations monitoring system and its peculiarities of development. Objectives, principles, and directions for implementing stages of monitoring. Organizational provisions for monitoring land relations. Regulatory framework for the implementation of a system for collecting and exchanging information on land relations between state authorities, local self-government bodies, and other entities of information interaction. Main indicators of land relations monitoring.

Topic 2. Characteristics of the administrative-territorial system and land use

Administrative-territorial units. Demographic characteristics of administrative units. Composition of land (by purpose, land use, ownership form, average sizes, quality condition). A number of landowners and land users. A number of territorial communities and settlements. Legal status regarding the registration of rights and land use types.

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Table 2.

Structure of the academic discipline "Monitoring of Land Relations" [92]

Names of content modules and topics	The number of hours												
	Full-time form of study								Part-time form of study				
	weeks	Total hours	including					total	including				
			l	p	lab	ind	s-s		l	p	lab	ind	s-s
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content module 1: Institutional framework for conducting monitoring of land relations													
Topic 1: Purpose and objectives of land relations monitoring	2	15	2	2			11	20	2				18
Topic 2. Characteristics of administrative and territorial structure and land use	2	14	2	2			10	17	2				15
Topic 3. Number and value of different types of land transactions, land use restrictions	2	14	2	2			10	15					15
Modular control No. 1	-	10	-	1			9	-					-
Total for content module 1	6	53	6	7			40	52	4				48

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Continuation of the Table 2.

Content module 2. Mechanisms for regulating the monitoring of land relations and land protection													
Topic 4: Legal transactions with land plots	2	14	2	2			10	15					15
Topic 5: Land market	2	14	2	2			10	19	2	2			15
Topic 6: Ecologization of land use	2	14	2	2			10	19	2	2			15
Topic 7. Liability in the field of land relations and sanctions for violation of the law	2	15	2	2			11	15					15
Modular control No. 2	1	10	1	-			9						-
Total for content module 2	9	67	9	8			50	68	4	4			60
Total hours	15		15	15	-	-	90	120	8	4	-	-	108

Topic 3. Number and value of different types of land transactions, land use restrictions

Subjects and completeness of state registration of land plots. Transactions of purchase and sale. Land plots inherited, exchanged, or gifted. Transfer of land into mortgage, lease. Lands registered with the right of emphyteusis. Permanent land servitudes. Restrictions on land use and land plots.

Content module 2.

Mechanisms for regulating land relations monitoring and land protection

Topic 4. Legal transactions with land plots

General provisions and legal principles of land lease. Rent for land plots of state and communal property and their designated use. Taxation of land plots. Privatization and withdrawal of land for public needs. Gender equality in land rights implementation.

Topic 5. Land market

General provisions and legal basis of the land market. The current state of the land market. Normative monetary evaluation of land plots. Quantity and area of land plots sold after the lifting of the moratorium on the purchase and sale of agricultural land. Dynamics of changes in the designated use of agricultural land.

Topic 6. Ecologization of land use

Agronomic, sanitary, and comprehensive assessment of soil quality. Area of irrigated and drained land, eroded arable land. Dynamics of changes in the area of arable land, forest plantations, and natural reserve fund. Ecological-economic classification of land suitability for use in agriculture. Special protection of land as the main national wealth.

Topic 7. Liability in the field of land relations and sanctions for violation of the law

Types of responsibility in the field of land relations. Types of control and supervision in the field of land relations. Types of violations and sanctions in the field of land relations. Control over the use and protection of land. Monitoring of agricultural land. [92]

After completing this course, students should **know**: the basics of the theory of formation and development of land relations and their problems; the essence and peculiarities of the formation of land relations monitoring; the main indicators of land relations monitoring; directions for the implementation of land relations monitoring stages; economic, ecological, and social mechanisms for regulating land relations. Students should acquire practical skills in analyzing trends in the development of land relations, solving problematic issues that arise during the collection and analysis of

information, forming a system for collecting, preserving, and publishing a set of data and indicators for regulating land relations, and justifying the composition and content of the set of data and indicators for transforming and ecologizing land use. They should also be able to calculate the indicators of the main characteristics of land resources and land relations and prepare proposals for measures to ensure the effective use of land resources. [92]

Thus, the primary tasks that need to be accomplished today in the implementation of the directions for solving the problems of land monitoring development in Ukraine should be considered:

- amendments to the Land Code and other legislation regarding the status and peculiarities of land relations monitoring, as well as the development of provisions (procedures) for conducting monitoring;

- development of norms and standards for land protection and restoration of soil fertility, which were provided for in the 2003 Law of Ukraine "On the protection of land";

- development of a scientific program of comprehensive soil surveys, taking into account the consequences of changes in land use, and the use of modern technologies for their implementation; [74]

One of the important directions for the implementation of the mentioned measures should be the training of specialists to study the system of collection, preservation, and publication of datasets and indicators on the state of land relations in Ukraine based on the introduction of the educational discipline "Monitoring of Land Relations" into the structure of the Master's degree program.