Environmental Protection on the Example of Agricultural Lands

Denys L. Kovach[1,*], Volodymyr V. Brulevych[1] and Olena V. Levada[2]

[1]*Department of Life Safety and Law, Kharkiv Petro Vasylenko National Technical University of Agriculture, Kharkiv, Ukraine*

[2]*Department of Administrative Management, IT Company "Simcord LLC", Kharkiv, Ukraine*

Abstract: Agricultural land is the most valuable resource of today because the issue of food security in the world community now comes first. Unfortunately, the ecological condition of lands suitable for agricultural use in Ukraine and the situation in the field of their use is constantly deteriorating. The quality of land resources is declining and approaching catastrophic levels. In this regard, the purpose of the study is to explore the main aspects of legal and environmental regulation of fertile land protection and to suggest ways to improve the protection and preservation of agricultural land. The main research method is the method of analysis, thanks to which the world experience in the field of environmental protection in general and the protection of agricultural lands was comprehensively analysed. The normative-legal acts of Ukraine, which regulate the issues of land use, as well as protection and preservation of agricultural lands, were analysed. The proposed mechanisms of environmental protection on the example of agricultural lands can be used to form targeted government programs.

Keywords: Soil, agricultural lands, fertile lands, pollution, environmental protection, food security.

INTRODUCTION

Today, the issue of rational land use in agriculture and protection of fertile lands is of great economic importance. Fertile agricultural lands are subject to significant anthropogenic impact, which leads to their degradation and depletion. The Constitution of Ukraine (1996) declares the lands a national treasure that is under special state protection. The Constitution of Ukraine (1996) stipulates that the rational use and protection of land is an important economic, environmental and social requirement for the sustainable development of Ukraine. According to Law of Ukraine "On land protection" (2003), agricultural lands include lands that are provided for the production of agricultural products, agricultural research and training activities, the location of relevant production infrastructure or intended for these purposes. The structure of agricultural land in Ukraine consists of land used for sowing crops (33.19 million hectares) and land used for grazing livestock and harvesting plant food for livestock (7.63 million hectares). The total area of agricultural land in Ukraine is 41.84 million hectares of fertile land (Resolution of the Verkhovna Rada of Ukraine… 1998). According to the Basic Principles (strategy) of the State Environmental Policy of Ukraine till 2020, approved by the Law of Ukraine of December 21, 2010 No. 2818-VI (Law of Ukraine "On Basic Principles… 2010), it should be noted that the state of fertile lands of Ukraine is approaching a critical, almost irreversible state (land ploughing reached 72%, and in some regions exceeds 88%) (Fedotova *et al.* 2020; Khudyakova *et al.* 2020; Kostruba 2020; Kravtsov *et al.* 2020; Pavenkov *et al.* 2018a; Shmelev 2020).

Land that has undergone significant depletion and degradation is used for agriculture. Such lands need reclamation and protection measures to restore fertility. The issue of land protection and conservation is being studied in many countries around the world, because the issue of food security directly depends on the quality of fertile land and their preservation. Among the scientists involved in the development of scientific and scientific-practical approaches to the protection of agricultural land should be noted D. Adhikari (Adhikari *et al*. 2016), H.Y. Sintim and M. Flury (2017), S. Kolb (Kolb *et al.* 2020), Baia. Z. and T. Caspari (Baia *et al.* 2018), S. Gionfra (2018), P. Benalcazar (2019), A.L. Misinkevych (2014), S. Bogatyrchuk-Kryvko (2014), S.A. Rodomanskaja (2018) and others.

The difficult and, in some regions, catastrophic state of Ukraine's land resources is a consequence of overactive depletion of agricultural lands and their pollution (Bogaevskaya *et al.* 2020; Ermilova 2019; Kostruba and Lukianov 2019; Kostygova *et al.* 2019; Magsumov *et al.* 2018). Until now, only fragmentary studies of certain aspects of this issue have been conducted. Representatives of land law science usually focused on the problems of land use and protection. This problem becomes especially relevant in the period of reforming agricultural and land relations, which require proper legal support. Given that the Legislative Power of Ukraine has adopted a number of laws and

*Address correspondence to this author at the Kharkiv Petro Vasylenko National Technical University of Agriculture, Kharkiv, Ukraine; Tel: +38(057) 732 79 22; E-mail: den-kovach@ust-hk.com.cn

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regulations aimed at regulating land relations and actively developing the movement of environmental NGOs, and the issue of pollution and degradation of agricultural land remains open, there is a need to find ways to improve legal and other mechanisms for the protection of agricultural land. Therefore, the purpose of the article is to explore the main aspects of legal and environmental regulation of fertile land protection, as well as to suggest ways to improve the protection and preservation of agricultural land.

LITERARY REVIEW

An important stage of the study is the analysis of modern approaches, mechanisms, directions and scientific approaches to addressing the protection of agricultural land, reducing the level of pollution and degradation. Z. Petrovic, D. Manojlovic and V. Jovic (2014) noted that the most important function of soils was fertility and the ability to supply flora with water, oxygen and minerals. R. Kanianska's (2016) study was also devoted to the study of legal aspects of land protection. Work of Y. Jialing and J. Wu (2018) was devoted to the issue of sustainable development of China, in terms of protection of land resources, including agricultural land.

D. Abler (2015) noted that environmental sustainability has become a priority policy in China. Research of X. Wan, J. Yang and W. Song (2018) was devoted to the development of mechanisms for levelling pollution. A study of S. Jin, B. Bluemling and A. Mol. (2018) was conducted in a similar direction. The author's team examines the impact of pesticides on agricultural land in China, and recommends ways to solve this problem. T. Gopalakrishnan, M.K. Hasan, A.T.M.S. Haque, S.L. Jayasinghe, and L. Kumar (2019) aimed to preserve agricultural lands that were used in the coastal zone and were subject not only to pollution but also degradation due to climate change.

S. Gionfra (2018) considered and analysed five aspects of soil safety: ability, condition, capital, communication and codification. The author detailed each of these indicators of the quality of land resources, and their importance in the system of their protection. Scientific work of A. Martin and others (Martin *et al.* 2020) was devoted to the issue of rational use of agricultural land and their protection in Canada (Ontario). Article of H. Harizanova-Bartos and Z. Stoyanova (2019) was devoted to topical issues of agricultural land protection in Bulgaria. P. Benalcazar's (2019) study was devoted to the issue of pollution of land resources by various types of plastic waste. P. Batary, L.V. Dicks, D. Kleijn, and W.J. Sutherland (2015) focused on the management and conservation of agricultural land in Europe. The main mechanism is the development of agro-ecological schemes (AES). They are the main source of funding for nature protection within the European Union (EU).

S. Mallick's (2013) study was devoted to the issue of the impact on the environment of intensive use of agricultural land in the Republic of Bangladesh. Komarivska's (2017) work was aimed at the issue of irrational approach to the use of agricultural land by agricultural holdings of Ukraine. Krasnorutska's (2019) study was devoted to determining the level of contamination of agricultural land with pesticides and agrochemicals. The research of N.V. Bobrovska and O.O. Zavoloka (2015) was devoted to the characteristics of the theoretical aspects of environmental-oriented approach in the use of land resources, including agricultural purposes. Lyushyn's (2015) work was devoted to the characteristics of the main aspects of the ecological and economic provision of balanced use and protection of agricultural lands. M.Sh. Makhotlova (2018) stated that in order to protect land, owners of land plots, land users, landowners and land tenants were required to take measures to restore the fertility of agricultural land. Rodomanskaja's (2018) work was devoted to the degradation of fertile lands, including through the use of heavy machinery. Qualitative and quantitative indicators characterising the fertility of agricultural lands were considered.

Thus, the analysis of literature sources shows a constant scientific search for mechanisms to solve the problem of protection of agricultural land, their rational and careful use. World scientists and professional ecologists are constantly trying to develop mechanisms that would promote the rational use of nature, including in the field of agricultural services. Ukraine is a country where the role of the agro-industrial complex in the country's economy is extremely high, and accordingly agricultural land is subject to significant depletion and pollution. Therefore, this issue is relevant and requires solutions.

MATERIALS AND METHODS

Theoretical research methods were used in the work, namely the analysis of literature sources in which the issues of approaches to the protection of agricultural lands that include legal, economic, environmental and resource-saving mechanisms. The

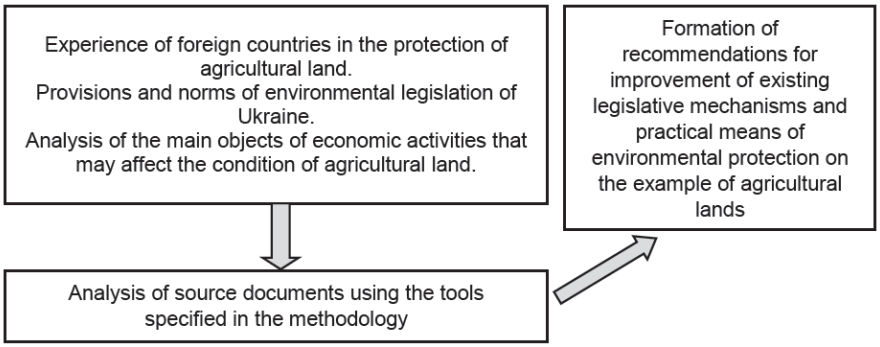

Figure 1: System module of the research algorithm.

study was based on the general principles of scientific knowledge – systems analysis, process analysis and objectivity. The methodological basis of scientific research was a system of general and special methods of scientific knowledge. The theoretical basis of the study were the works of Ukrainian and foreign scholars in the field of law, agricultural law, ecology and environmental management (Astapov *et al.* 2019; Molchanova *et al.* 2020; Bondarenko *et al.* 2018a; Kostyukhin 2016; Bondarenko *et al.* 2018b; Khudyakova *et al.* 2019; Kostruba and Hyliaka 2020; Sidorova and Tikhonova 2017).

The use of general scientific methods of formal logic in the work was due to the need to study the mechanisms of formation of legal norms and search for factors that directly or the consequences of which may provoke a deterioration in the quality of agricultural land. This, in turn, will provoke the application of the current legislation to violators and the possible prosecution of guilty individuals and legal entities. The material and initial basis of the study were the Constitution of Ukraine (2003), the Law of Ukraine "On Land Protection" (2003), the experience of countries in addressing agricultural land protection, regulations governing nature management and environmental protection, as well as the Strategy of Environmental Policy of Ukraine until the 2020 year (Law of Ukraine "On Basic Principles…" 2010).

Using the method of content analysis, domestic and international legal laws and regulations were studied. Their comparison was made, recommendations on legal aspects of protection of fertile lands from pollution were developed. The empirical basis of the study consisted of data obtained as a result of analysis and generalisation: information contained in various sources of reporting, including environmental control bodies and control bodies of offences of individuals and legal entities. Thus, based on the above methodology, it is possible to create a system module of the research algorithm (Figure **1**).

RESULTS AND DISCUSSION

Land protection is one of the mechanisms for achieving the rational use of agricultural land. Land protection is a system of legal, organisational, economic and other measures aimed at rational land use, prevention of unjustified withdrawal of agricultural and forestry lands, protection against harmful anthropogenic impact, reproduction and increase of forestry soil fertility, ensuring a special regime for the use of land for environmental, health, recreational and historical and cultural purposes (Law of Ukraine "On land protection"… 2003). Land protection in Ukraine, according to regulations, is based on the principles shown in Figure **2**.

Ukraine should focus on the protection and preservation of agricultural land, increase environmental sustainability and soil fertility, and control the removal of fertile land for non-agricultural purposes and misuse. The experience of such countries as Italy, France and Denmark should also be singled out. These countries require a license to conduct agricultural activities, which also includes items on environmental protection (Pavenkov *et al.* 2018a; Petrovsky and Shmelev 2019; Polyakova and Balanyuk 2018). Thus, farmers are obliged to adhere to the principles of environmental protection in their practical activities. Summarising the experience of foreign countries, it should be said that a state plays a leading role in monitoring compliance with legislation and regulations on environmental protection in terms of protection of fertile lands; a state grants licences for agricultural activities and controls the legality of the transfer or sale of land to other owners and a purpose of such actions (Bondarenko *et al.* 2016; Degtyarev *et al.* 2019; Subaeva *et al.* 2018; Dotsenko *et al.* 2017;

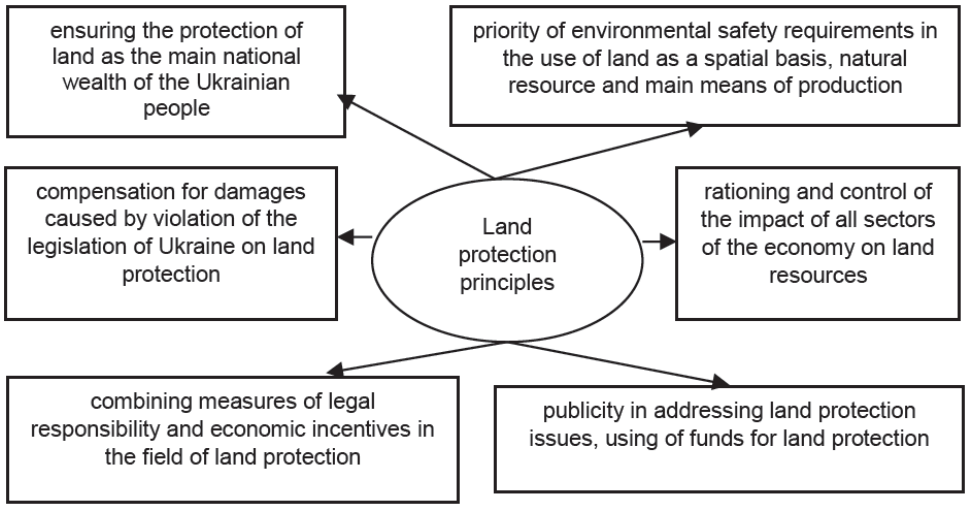

Figure 2: Principles of land protection in Ukraine.

Ezdina 2017; Kostruba and Vasylyeva 2020; Sidorova *et al.* 2019; Trusova *et al.* 2017; Nosik 2018; Maydanyk 2018).

The situation with the protection and preservation of land, including agricultural land, has needed and still needs effective means of influence, in particular, of a legal nature. To better understand the processes and mechanisms of agricultural land protection, it is necessary to analyse the global approaches to this process. Table **1** shows the experience of some countries in the protection and preservation of agricultural land (Tretyak 2006; Barashkin and Samarin 2005; Fedotova *et al.* 2019a; Fedotova *et al.* 2019b; Kostruba 2018; Krasilshchikov *et al.* 2014; Trusova *et al.* 2019a; Kot 2018). It should be noted that in most developed countries of the world regulations on environmental protection, including in the field of land protection, adopted in the 80-90s of the 20th century, and are still effective today.

Table 1: The Experience of Countries Around the World in the Protection and Preservation of Agricultural Land

Country	Ways to protect and preserve fertile lands in the world
USA	In the United States, due to the excessive pursuit of overprofits in the mid-20th century, agricultural land was severely degraded and depleted, especially in the steppes. Therefore, the government took urgent measures to protect fertile lands, issuing a number of laws that strictly regulate agricultural activities, conducted educational activities with farmers, launched programs to provide financial support to farmers. The US government has concluded that without the introduction of coercive measures in the conservation of nature, to achieve a positive result in environmental policy, including fertile land, is impossible. Therefore, the controlling bodies were empowered to inspect the activities of farmers for environmental pollution, punish violators with fines of various levels, as well as forcibly confiscate land or request their sale from persons who systematically violate the law.
EU	The European Union uses for effective agriculture a fertile land monitoring system with an emphasis on environmental protection, which aims to identify potential threats to land pollution in a timely manner.
Germany	In Germany, agriculture is considered one of the most important elements of environmental security in the country. The issue of environmentally-oriented management of this type of economic activity is paid attention to in a number of legislative acts of Germany, in which soil protection is one of the leading places. The processes of preservation and protection of soils, as an element of comprehensive protection of the environment in the country, the German government conducts in a consolidated manner with public organisations and the public. German law prohibits the alienation of agricultural land for non-targeted programs and projects.
Italy	In Italy, according to the law, all landowners who are suitable for agriculture must use them efficiently and for their intended purpose. If the supervisory authorities conclude that a farmer or farm or owner is using the land for other purposes, he will have to lease or sell a land.
France	The peculiarity of land legislation in France is that all land plots that owners are trying to sell are registered in a special state register. These actions are aimed at ensuring that agricultural land is always used only for its intended purpose and, accordingly, are protected as a valuable resource for the state. This contributes to the consolidation of lands and the preservation of their intended agricultural purpose.
Japan	In Japan, improper use of agricultural land is prohibited, the relevant rules are prescribed in the laws of the country and are strictly observed. In addition, farmers monitor compliance with all environmental regulations.

Two main aspects should be considered when assessing possible options for approaches to the protection of agricultural land. The first aspect is the consideration and development of the legal mechanism of protection and defence of fertile lands, the specification of methods of punishment for violations of norms and laws. The second aspect is the development of the ecological and economic component of the development of nature management, and first of all in the field of agriculture and use of agricultural lands (Molchanova *et al.* 2018; Zinchenko 2018; Pylypenko 2020a; Pylypenko 2020b; Shmelev and Petrovsky 2020; Trusova *et al.* 2020; Trusova *et al.* 2019b; Trusova 2016; Ushakov and Ermilova 2020; Zykova *et al*. 2021). The devastation of fertile lands is at a critical level, and therefore it is necessary to take a very balanced approach to the functioning of agriculture as a branch of economic activity in Ukraine, because the intensification may cause irreversible consequences for the lands of Ukraine. In the field of protection and conservation of land resources, three tasks need to be solved: to minimise land pollution and damage caused to lands by farmers, to preserve the fertility of lands and to encourage farmers to protect lands. This can be achieved by establishing effective legal levers. Table **2** shows the regulations of Ukraine governing land use, as well as protection and preservation of agricultural land. As for what forms of legal influence to apply, O.S. Lysanets (2014), for example, notes that important forms of the legal protection of agricultural land from pollution should be waste accounting and certification, systematic monitoring of natural resources. To respond to the identified cases of gradual land pollution in Ukraine, it is necessary to use the data of reports on the assessment of the impact of agricultural activities on the environment, survey and forecasting of further development of negative phenomena in the field of land protection. It is worth emphasising the importance of the Resolution of the Cabinet of Ministers of Ukraine No. 1218 “On the State Technological Centre for Soil Fertility” (2000) on the way to land protection and which defines the main activities of the State Technological Centre for Soil Fertility.

An important aspect of achieving the goal of agricultural land protection is to encourage landowners and land users to implement land protection measures through the mechanism of economic incentives, as well as to influence them through the mechanism of taxation of agricultural land (in particular, to pay a fixed agricultural tax and apply preferential tax land users who implement measures on soil fertility). In addition, in order to achieve effective protection of agricultural land, it is necessary to take into account the factors of environmental priorities and areas of optimisation. Among the most important environmental measures are:

- development, introduction and implementation of modern scientific and technical programs in the field of land protection, preservation,

Table 2: Regulations of Ukraine Regulating Land Use, Protection and Preservation of Agricultural Land

Regulation	Characteristics
Constitution of Ukraine (1996)	Creates a basis for legitimate relations in the field of land protection and greening of agricultural production.
Law of Ukraine “On Fundamentals of National Security” (2003)	Forms the priorities of national interests of Ukraine in the field of ensuring the development of agricultural production and greening of agricultural production relations.
Law of Ukraine “On Land Protection” (2003)	Creates a system of legal, organisational, economic and other measures aimed at rational land use, protection from harmful anthropogenic impacts, as well as the reproduction and increase of land fertility.
Law of Ukraine “On Pesticides and Agrochemicals” (1995)	Regulation of the use of hazardous substances in agricultural activities.
Law of Ukraine “On Basic Principles (strategy) of the State Environmental Policy of Ukraine till 2020” (2010)	Creation of conditions for the widespread introduction of environmentally friendly and organic technologies of agriculture, as well as increasing the sown area for their implementation.
Law of Ukraine “On state control over land use and protection” (2003)	Formation of state policy in the field of state supervision (control) in the agro-industrial complex and in the field of environmental protection, rational use, reproduction and protection of natural resources.
Resolution of the Cabinet of Ministers of Ukraine “About the Main directions of state policy of Ukraine in the field of environmental protection, use of natural resources and providing ecological safety” (1998)	Defining the mechanisms for implementing the necessary measures to ensure the rational use of nature, environmental protection and environmental safety.

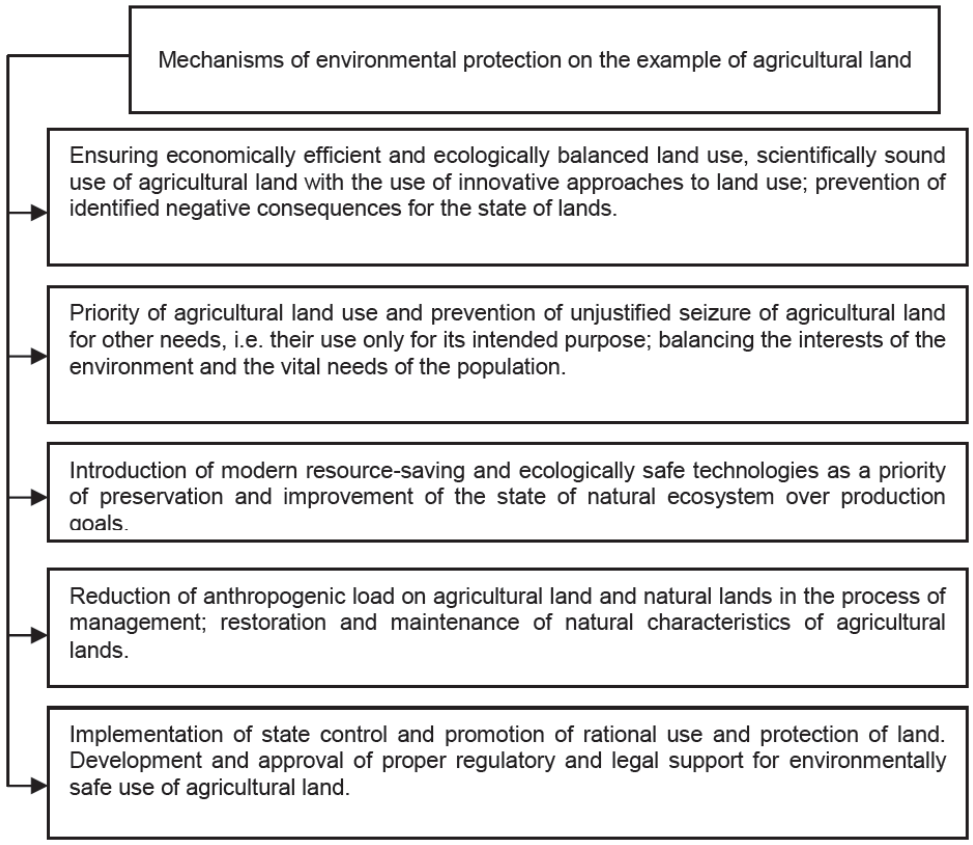

Figure 3: Mechanisms of environmental protection on the example of agricultural land.

reproduction and increase of soil fertility, using domestic and world innovative approaches;

- training of specialists who would be able to provide qualified consulting assistance to legal entities and individuals in the field of agriculture on the implementation of measures and means for the protection of fertile lands;
- to increase the level of soil fertility, their withdrawal from economic circulation for a period of 10 to 25 years, depending on the level of degradation;
- introduction of alternative farming systems;
- development of a mechanism and procedure for financing measures to improve the ecological condition of lands;
- introduction of environmentally friendly methods of production and use of resource-saving, low-waste and waste-free technologies.

The problems of soil protection in Ukraine should be solved comprehensively, using program-targeted approaches. Therefore, analysing the above in the study, it is possible to form a list of mechanisms that could be the basis for an appropriate action program, and which would reduce the level of negative impact on the environment on the example of agricultural land and its protection. Schematically, the mechanisms are shown in Figure **3**.

CONCLUSION

Given the above, it should be noted that the protection of agricultural land is provided through the implementation of a set of mechanisms and measures to preserve the productivity of agricultural land, increase environmental sustainability and soil fertility. An important task is to prevent the use of fertile land for other purposes. Restoration of degraded lands should be based on a system of measures aimed at restoring disturbed lands through their reclamation, consolidation, conservation of degraded and unproductive lands.

Intensive land pollution can be stopped by establishing in the legislation and proper use of effective legal mechanisms for the protection of agricultural land. Legislative and executive authorities need to pay attention to such forms of land protection

as: control over their use; encouragement of individuals and legal entities to protect land from pollution; monitoring the condition of lands; application of innovative approaches to agriculture. Comprehensive application of the above forms of protection and preservation of fertile lands will reduce the level of pollution of agricultural lands and improve the quality of land in Ukraine as a whole. Further development of the study is seen in more detailed development of the list of financial and economic mechanisms of incentives for individuals and legal entities to conduct economic activities on the use of environmental technologies for the protection of agricultural land.

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