
THE URGENT ISSUES OF LAND CONSERVATION IN UKRAINE

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Abstract. *The article addresses the issue of land conservation at war and post-war reconstruction. The complex understanding of land conservation issues at the current conditions is an important stage of their resolving in the future. The attention is paid to the examination of the issues of the degradation of land as the result of fighting within the scope of the general land degradation factors system. The research is aimed at the structural factor analysis which cause the disturbance, contamination and degradation of land and the determination of the rationalization trends of land use and conservation considering the fighting in Ukraine. The legislation on the disturbed, contaminated and degraded land from the perspective of their utilization has been analyzed. The key processes causing land contamination, reasons for land degradation, measures on land degradation prevention and reducing its consequences have been singled out. The results can be implemented at the planning of measures on land use and conservation at the current stage and post-war reconstruction, as well as in the future research.*

Key words: *land degradation, land contamination, fighting consequences, land conservation, land disturbance.*

Topicality.

The war in Ukraine and its consequences cause a number of social and economic issues. At the current stage, the issue of land conservation is often considered to have the minor importance. However, land rehabilitation is impossible without understanding of the reasons and consequences of land degradation and possible solution options. In this case, the structural analysis of land use and land conservation in Ukraine is necessary. Traditional approaches to land conservation are not ap-

plicable at war, when infrastructural facilities are being damaged or destroyed.

Only the complex understanding of the issue of land conservation at the current stage has a prospect of resolving it in the future. The issues of deterioration of land as the result of war should be considered from the perspective of general land deterioration factors system, otherwise, the post-war reconstruction may not be considered effective. The recovery of national economy and measures on the alteration of types and forms of land use without taking into consideration of these

factors can aggravate the ecologic damage.

The analysis of the latest researches and publications.

At the current stage, there is a set of research on the evaluation of damage due to war. The impact of war on the soil has been carried out by Spoldytel' A., Golubtsov O., Chumachenko S., Sorokina L. The influence of war on the environment has been examined by Michael N. Schmitt, Pfeiffer E.W. Koniuszewski A., Jay E. Austin et.al. The works of Kalsi A., Celin S. M., Bhanot P., Sahai S., Sharma J et.al. are dedicated to the methods and approaches to the rehabilitation of contaminated soil. However, it is reasonable to consider the impact of war on soil and environment in the scope of the demands on nature conservation according to the legal regulation of land use and conservation, social security system, and the economic substantiation of land use.

The aim of the research is to carry out a structural analysis of factors which lead to disturbance, contamination and degradation of land and define the trends of rationalization of land use and conservation taking into consideration the war in Ukraine.

Materials and methods.

At the examination of land conservation, at the current stage, it is reasonable to disturbance, contamination and degradation of land. The war predefines the need for revising the legislation on land use and conservation, which already have a number of conflicts [1].

According to the Law of Ukraine on Land Conservation, the disturbed land is the land that has lost its economic and ecologic value due to the disturbance

of the soil as the result of production or natural phenomena [2]. At the current stage, it is reasonable to spread the antropogenic impact on land to warfare in addition to production.

Geological prospecting and exploration, mining, construction, especially transport infrastructure and industrial construction as well as earthquakes, landslides, and floods are singled out as the key land disturbance factors.

In the course of war, these factors should be supplemented with building of defences, shell craters and the disturbance of land due to mine-clearing. Warfare can cause landslides and floods.

According to the Law of Ukraine on Land Conservation, soil contamination is the accumulation of substances in soil, which negatively impact the fertility of soil and its other useful properties [2]. It is reasonable to single out some of the most widespread contamination types (Fig. 1).

Traditionally, the main sources of ingredient contamination are industrial waste, transport, agriculture, and household garbage. Over the course of warfare, the territory is contaminated with combustible and lubrication materials, petroleum derivatives, heavy metals, etc. The contamination is caused by the demolition of buildings and structures, and destroyed military vehicles and ammunition. The contamination with artillery shells, cases, projectiles and their fragments, gunpowder and explosives should be singled out. According to the official data, 174 thousand square kilometres are mined. In addition to that, vast areas were contaminated due to flooding after a number of dams with Kakhovska hydroelectric dam as the most significant example (Fig. 2).

Warfare causes the parametric pollution: heat, light, sound, vibration. These types of contamination are connected to

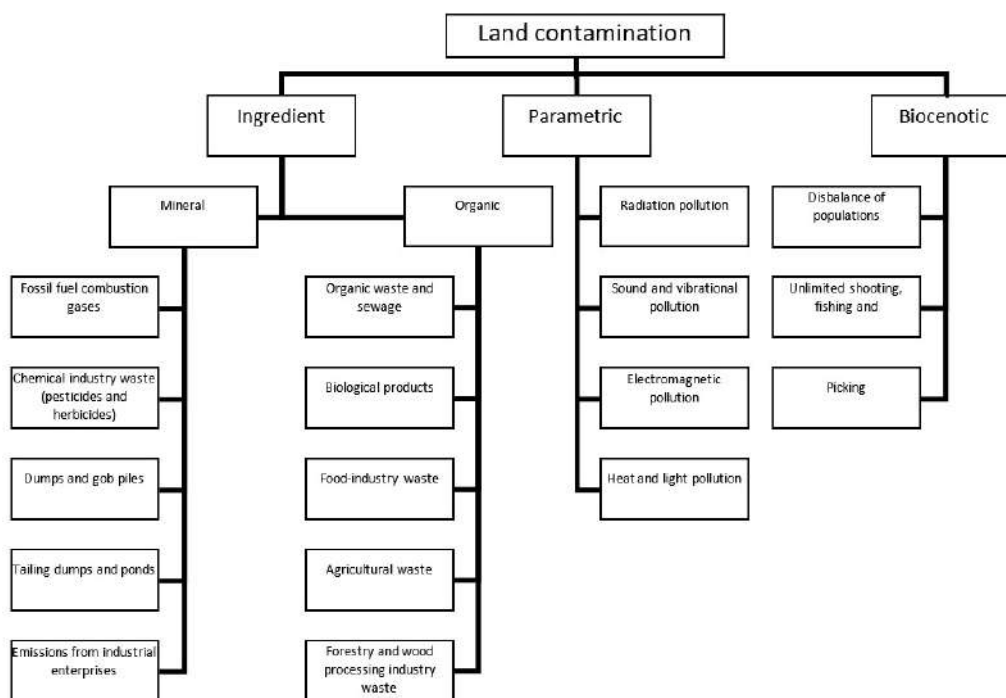


Fig. 1. Land contamination types

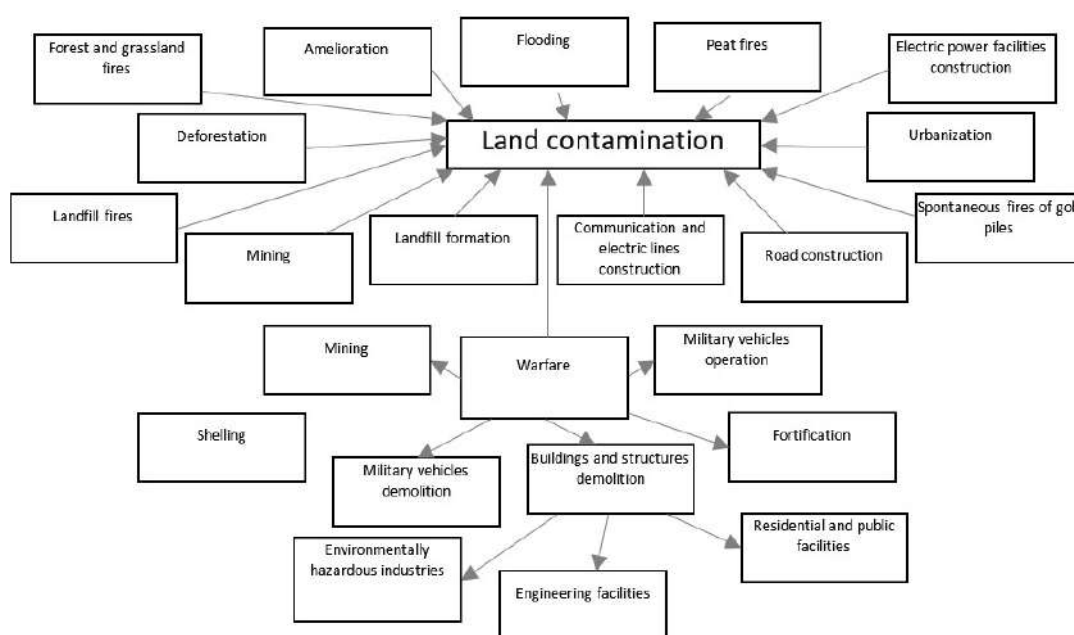


Fig. 2. Reasons for land contamination

explosions, military vehicles operation, predefined by the demolition of industrial enterprises, etc.

Contaminated and disturbed land falls into the degraded lands according to legislation. The Law of Ukraine on Land Conservation predefines the notion of land degradation - a natural or

anthropogenic simplification of landscape, the deterioration of state, composition, useful properties and functions of land and other organically connected to land natural components [2].

According to Article. 171 of the Land Code of Ukraine, into the category of degraded land fall:

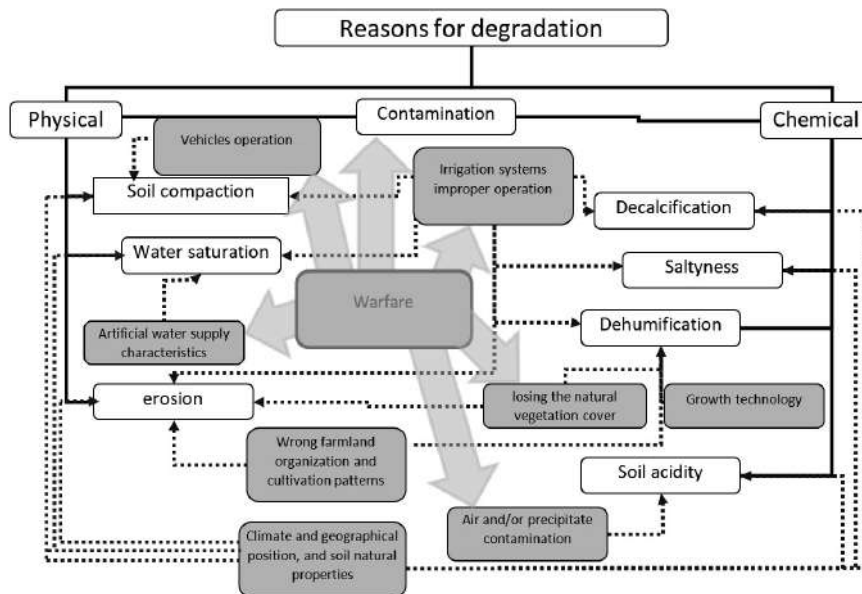


Fig. 3. Reasons for land degradation

- land plots the surface of which is altered due to earthquake, landslide, sinkhole, flood, mining, etc. [3];
- land plots with eroded, water-logged, acidic, salty, or contaminated with chemical substances soil, etc. [3].

According to the UN Convention on Desertification Control (Article. 1): «the degradation of land is the deterioration or losing of biological and economic productivity and complex structure of arable land, watered by rain or irrigated, or grassland, forest and forested areas in arid or semi-arid, dry and sub-humid areas as the result of land use or the impact of one or a number of processes, including those connected to the activity of men and resettlement structures, like wind or water soil erosion; deterioration of physical, chemical and biological or economic soil properties; long-term losing the natural vegetation cover» [4].

Soil degradation is usually pre-defined by the violation of nature conservation conditions of economic activities, especially, wrong irrigation organization, failing to comply with crop growing technology, lack of soil protection measures, etc. (Fig. 3).

The basis for all land disturbance and degradation factors classification is the distribution of factors into natural and anthropogenic. The human activities is of paramount importance considering the fact all the negative natural processes are mostly caused by human activities. The violation of demands on the nature conservation at the defining the allowable land use types aggravates the ecological harm from the pollution of soil, air and water. It is especially important when the land tenure is situated within the water conservation zones and areas potentially subject to flooding [5].

Results

Land pollution prevention measures can be divided into technological and organizational and technical (Fig. 4). Considering the nature of warfare, the soil contamination prevention is a challenging issue. From this perspective, it is reasonable to consider international treaties on the prohibition of certain weapon types and "the obligations on the neutralization of the explosive remnants of war" [6].

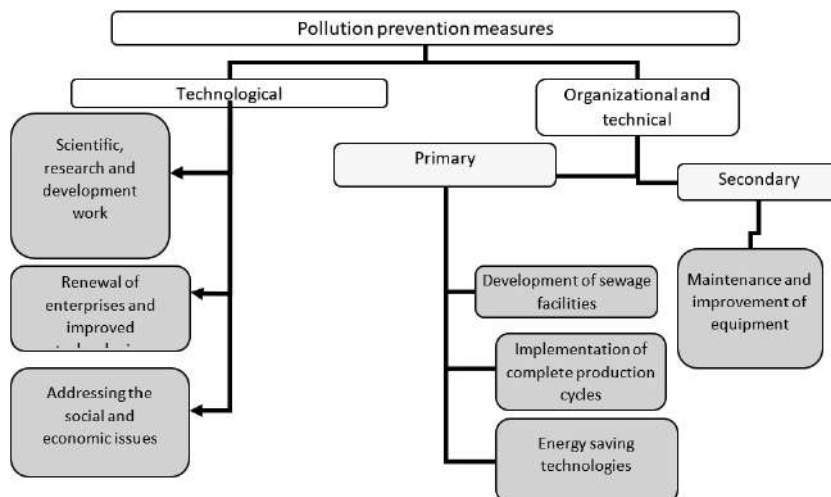


Fig. 4. Pollution prevention measures

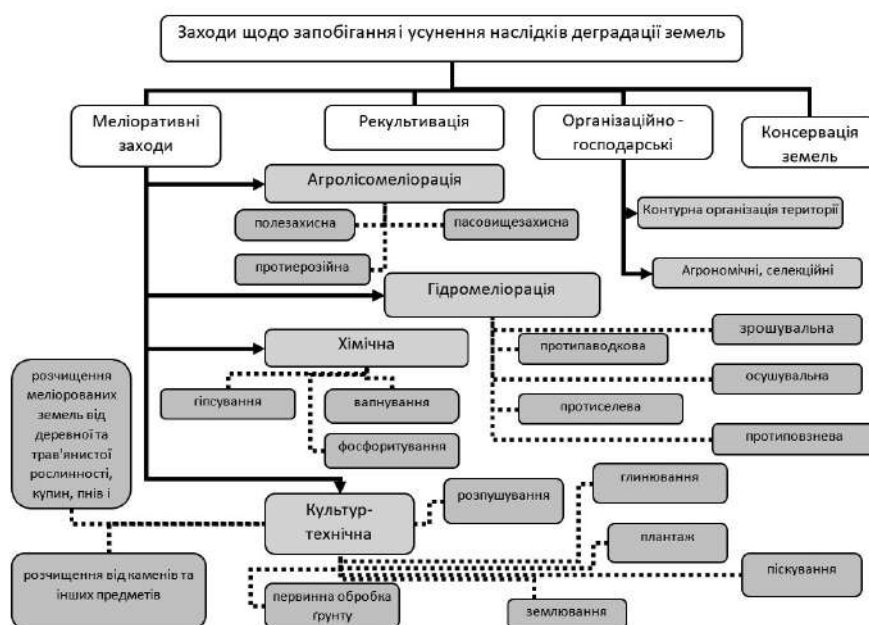


Fig. 5. Land degradation prevention measures and overcoming its consequences

For degraded land, amelioration, organizational and economic operations are carried out; land conservation or reclamation is carried out (Fig.5).

In the scope of land contamination due to warfare, the role of chemical and physical remediation and conservation.

Conclusions and prospects.

Warfare in Ukraine predefines the need for revising the approaches to land conservation and rehabilitation, and classifica-

tion of factors causing land pollution, disturbance, and degradation. At the current stage, the problematics of land deterioration due to warfare is not implemented in the nature conservation demands system. The legislation in effect should be expanded with disturbance, contamination and degradation of land due to warfare.

As the result of war, land conservation issues have become more urgent. The topicality of problems of alignment of land use types with nature conservation, especially within protective sani-

tary zones designated water areas, potentially flooded areas, etc.

At the current stage, the improvement of production technology and economic activities should be considered in the process of post-war reconstruction together with recultivation, remediation, and conservation. The sustainable development concept is an urgent task at managerial decisionmaking, especially, in order to avoid the aggravated deterioration of environment. The formation of environmental awareness through moral reasoning and cultural development of communities and legally established mechanisms of encouragement and responsibility is of major importance.

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ЩОДО АКТУАЛЬНИХ ПРОБЛЕМ ОХОРОНИ ЗЕМЕЛЬ В УКРАЇНІ

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Анотація. У статті розглядається проблема охорони земель в умовах воєнних дій та післявоєнної відбудови. Комплексне розуміння проблеми охорони земель в сучасних умовах є важливим етапом для вирішення їх в майбутньому. Увага акцентується на розгляді проблематики погіршення стану земель в результаті бойових дій у розрізі загальної системи чинників погіршення стану земель. Дослідження має на меті структурний аналіз чинників, які призводять до порушення, забруднення і деградації земель та визначення напрямів раціоналізації використання та охорони земель з урахуванням наслідків ведення бойових дій на території України. Проаналізовано положення чинного законодавства щодо порушених, забруднених та деградованих земель з огляду на доцільність їх застосування в сучасних умовах. Виокремлені основні процеси, які провокують забруднення земель у сучасних умовах, причини деградації земель, заходи щодо запобігання деградації земель та боротьби з її наслідками із врахування викликів сьогодення. Отримані результати можуть бути використані при плануванні заходів щодо використання та охорони земель в сучасних умовах та в контексті післявоєнного відновлення, в наступних наукових дослідженнях.

Ключові слова: деградація земель, забруднення земель, наслідки бойових дій, охорона земель, порушення земель.