

## FOREST MANAGEMENT IN UKRAINE UNDER WAR CONDITIONS

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**Abstract:** Attention is drawn to scientifically based theoretical and practical approaches to the implementation of the concept of sustainable forest management and, accordingly, to ensuring the principles of sustainable forestry aimed at the adequate protection, use, and regeneration of forest resources in Ukraine during Russia's war against Ukraine. The main socio-economic and ecological aspects that influence the implementation of the concept of sustainable forest management at the national and regional level in the current conditions of Russia's military aggression against Ukraine are considered. The changes in the forest sector in the conditions of war are reflected, which must be considered from the point of view of understanding the principles of sustainable development, sustainable forestry, and the concept of sustainable forest management. It is proposed to develop and implement a theoretical, methodological, and practical approach to the implementation of the concept of sustainable forest management in Ukraine which would take into account the regional differences regarding the organisation and development of forestry in Ukraine.

**Key words:** sustainable forest management, forest ecosystems, forest economics, Ukraine.

### 1. Introduction

One of the current problems regarding the protection, use, and regeneration of forest resources in Ukraine is the implementation of a scientifically based concept of sustainable forest management and, accordingly, ensuring the principles of sustainable forestry. In

the current conditions of Russia's war against Ukraine, one of the most important and complex tasks is to ensure the implementation of the concept of sustainable forest management at the national level, which would comply with ecological and economic principles, the Strategy of Sustainable Development of Ukraine until 2030, and the principles of

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sustainable forestry. Nowadays, special approaches are needed for the development of theoretical provisions, methodological foundations, and practical recommendations for the implementation of the concept of sustainable forest management. Russia's war against Ukraine has caused many problems in all spheres of human activity, including the forestry sector. In the conditions of war, it is impossible to ensure a proper management system in forestry, which would comply with the principles of sustainable forestry, the state strategy of forest management of Ukraine, international agreements in this area, etc.

The main problems that are currently preventing the implementation of the sustainable forest management concept in Ukraine are the mined territories of the forest fund; forest fires arising as a result of hostilities; territories of the forest fund contaminated with ammunition; illegal felling of forests by the Russians in the temporarily occupied territories of Ukraine; limited opportunities for protection, use, and regeneration of forest resources, etc.

Russia's full-scale war against Ukraine affects people and animals, destroys the natural environment, particularly forests, etc. Since there are many complex problems related to the practical implementation of sustainable forest management in Ukraine in war conditions, there is a need to develop relevant theoretical provisions, methodological bases, and practical recommendations that would contribute to the implementation of the sustainable forest management concept and, as a result, to the effective protection, rational use, and regeneration of forest resources, the preservation of forest ecosystems and

therefore, the implementation of the principles of sustainable forestry in Ukraine.

As such, the aim of this paper is to analyse the importance of implementing the sustainable forest management concept in Ukraine in war conditions.

## 2. Materials and Methods

Some theoretical, methodological, and practical aspects of the implementation of the sustainable forest management principles are reflected in the works of such Ukrainian scientists as Deyneka [11], Gulyck [13], Synyakevich et al. [14], Synyakevich [15], Tunytsia [16], and others, as well as foreign ones - Costanza et al. [9], Daly and Farley [10], and others. Along with this, the analysis of published scientific works shows that most of them are aimed at the analysis of certain (social, ecological, economic, or legal) aspects in the field of forest management in peace time, in conditions where it is possible to put into practice scientists' developed theoretical and methodological recommendations.

Before the start of the full-scale war (February 24, 2022) in Ukraine, there was a clear understanding of social and economic development, which would correspond to the principles of sustainable development, including ensuring a safe living environment for the population. However, Russia's barbaric war against Ukraine, which claimed thousands of human lives, disrupted and damaged the natural environment, ruined hundreds of thousands of civilian and military infrastructures, destroyed possibilities and changed the understanding of the practical provision of environmental security and the gradual transition to

sustainable development and sustainable forest management in the country.

We believe that in the current conditions of Russia's war against Ukraine, more grounded theoretical-methodical and applied scientific research in the field of forest management is necessary. It is necessary to take into account the regional differences in the field of organisation and development of forestry in Ukraine and the peculiarities of the social and environmental security of the regions (mined and munitions-contaminated territory of the forest fund, forest fires, limited opportunities for protection, use, and regeneration of forest resources, etc.).

In the process of achieving the aim of the article, general scientific and special scientific methods were used: scientific abstraction - to justify the implementation of the sustainable forest management concept; generalisation, abstraction and analysis - during the study of the ecological economy tools for the implementation of sustainable forestry aimed at the effective protection, use, and reproduction of forest resources; framework analysis - for the implementation of the concept of sustainable forest management in the conditions of war in Ukraine; retrospective analysis - for the study of sustainable forest management in peacetime, in conditions where it is possible to put into practice scientists' developed theoretical and methodological recommendations; strategic analysis - to evaluate the strategic directions regarding the implementation of the sustainable forest management concept in Ukraine in war conditions, taking into account the regional differences in the field of organisation and development of forestry;

the normative method - for the development of scientific and practical recommendations in the field of formation of normative legal acts on issues of sustainable forestry; the graphic method - for visual display of the level of forest destruction due to fires.

During our study of the regional differences in the field of organisation and development of forestry in Ukraine, modern territorial features were taken into account for the implementation of the sustainable forest management concept in Ukraine in war conditions.

### **3. Results and Discussions**

As one of the many natural resource systems of Ukraine, the forests sector is of particular interest to scientists, politicians, public organisations, etc. in the conditions of Russia's military aggression against Ukraine. In the current conditions of war, forestry can become one of the most important budget-forming areas, if strategically important complex reforms in the forest sector are implemented.

As a multifunctional system, the forest has a wide range of useful potential. A forest is a system of interconnected potential products and services (timber resources, non-timber resources, animal life, multifaceted forest functions). As a type of natural wealth, the forest is the main component of the natural environment and, as a natural object, it is characterised by corresponding features - social, ecological, economic, and legal. For a long time, the value of the forest was assessed only by the produced wood and non-wood products, and such criteria as the evaluation of ecological (water protection, soil protection, climate regulation, etc.) and social (health,

recreation, aesthetic, etc.) functions of the forest, the importance of which is difficult to overestimate, were not taken into account enough.

Since forests perform more than 70 important functions for humans, it is necessary to effectively protect, use, and reproduce forests according to the principles of sustainable development and sustainable forestry. Considering the importance of the functions of the forest, forestry measures are designed to support and, where possible, contribute to the improvement of water protection, recreational and other useful functions of the forest, as well as to contribute to the increase of its resources and their sustainable use. Harvesting volumes of all forest products cannot exceed the level that would ensure continuous forest use. In this direction, special attention at the international level was paid to forest resources within the framework of the Sustainable Development Goals, which were reflected in the resolution of the UN General Assembly "Transforming our world: Agenda in the field of sustainable development for the period until 2030". Among them is Goal 15 "Preservation of terrestrial ecosystems", the task of which is, among other things, the implementation of methods of rational use and restoration of forests, preservation of forest ecosystems, etc. Since one of the important functions of the forest is climate regulation, within the scope of Goal 13 "Combating climate change", certain steps are necessary for the implementation of sustainable forest management in the world and in every country [2].

It should be noted that the government of Ukraine started the creation of a single enterprise "Forests of Ukraine" instead of

hundreds of forest farms. This approach is an important step in the development of forestry in the European integration process of Ukraine and in the implementation of the sustainable forest management concept. The main discussions among specialists arose due to the duplication of the same functions by consolidated regional forestry administrations, which were performed by forest farms before the merger into one enterprise "Forests of Ukraine"; the need for the functioning of a separate forest firefighting structure in the conditions of Russia's war against Ukraine (this is explained by the fact that the State Emergency Service of Ukraine has a more coherent organisational and logistical basis); issues of performing the functions of care, protection, regeneration of forests, the control and supervision functions, etc. As an example, it is noted that forest protection is a function that should not necessarily be performed exclusively by forestry workers, because there are various national law enforcement and other bodies, in particular, the police, the State Environmental Inspection of Ukraine, and others that can replace them [6]. In our opinion, changes in the forest sector in the conditions of war should be considered, first of all, from the point of view of understanding the principles of sustainable development, sustainable forestry, and implementation of the concept of sustainable forest management. That is why we believe that the functions of protection, use, and regeneration of forests can be effectively performed by experts in the forest sector.

Since Ukraine is a forest-deficient country (the forest cover of its territory reaches approximately 15.9% (in 2021), at

the optimal level of 20-24%), the implementation of the sustainable forest management concept in Ukraine is of significant importance. Sustainable forest management (defined in the general declaration of the Conference of Ministers on Forest Protection in Helsinki, 1995) means the stewardship and use of forests and forest lands in a way, and with such intensity, which maintains their biodiversity, productivity, capacity for regeneration, vitality, and their potential to fulfill, now and in the future, relevant social, ecological and economic functions at all levels (local, national, and global) without harming other ecosystems [1].

The history of the development of the sustainable forest management concept can be traced practically from the moment of the emergence and improvement of the basic principles of sustainable development.

The main principles of sustainable forest management include ensuring the social, ecological, and economic sustainability of forests. This means that forest resources must be used in such a way to meet the needs of the present generation without compromising the ability of future generations to meet their own needs for the use of these valuable resources. Raising awareness of the negative impact on forest ecosystems due to unjustified anthropogenic influence and the problem of the continuous provision of forest resources for society and economic needs becomes dominant in this context.

Features of the modern understanding of sustainable forest management are related to taking into account the principles of sustainable forestry, in particular the material and non-material functions of the forest. Previously, the non-material functions of the forest were

not taken into account.

Implementation of the sustainable forest management concept means periodic monitoring of the condition of forests, provision of ecological and economic conditions aimed at the rational use of forest resources, preservation of forest ecosystems, improvement and implementation of an effective system of forestry management, raising environmental awareness of the population, etc. Sustainable forest management involves various human interventions, ranging from actions aimed at protecting and maintaining forest ecosystems and their functions, to those that promote certain socially or economically valuable forest types to improve the production of goods and services. Sustainable forestry is the practice of managing forests, which ensures long-term preservation and improvement of forest ecosystems, taking into account social, ecological, and economic objectives. Sustainable forest management is aimed at ensuring a balance between the social, ecological, and economic functions of forests. This approach does not deplete forests and helps preserve forest ecosystems.

The concept of sustainable forestry is aimed at the effective protection, rational use, and regeneration of forests, which is important for ensuring sustainable development and accordingly, plays an important role in overcoming population poverty, large-scale reduction of deforestation, stopping the process of forest ecosystem loss, land degradation, depletion of natural resources, and also contributes to the improvement of human well-being, increasing the level of food security, the access to high-quality drinking water, etc.

Important measures for the implementation of sustainable forest management in Ukraine are the integrated application of social, ecological, economic, and legal tools for the formation of a system of sustainable forestry, as well as updating certain provisions of the current Forest Code of Ukraine in accordance with the principles of sustainable development.

Nowadays, the main problem that leads to the degradation and destruction of Ukraine's forests is Russia's war against Ukraine and the Russians' deliberate destruction of forest ecosystems in the temporarily occupied territory of Ukraine by the armed forces of the Russian Federation. Other problems that lead to forest degradation are related to the population's attitude to forest resources. Today, the attitude of a large part of the population towards forests is distinctly consumerist, where forest resources are perceived only as a factor affecting the development of the economy. Such a social approach to forest resources is wrong and leads to the deterioration of the condition of forests and the destruction of forest ecosystems.

So, the main reason for the difficult ecological situation in the forest sector of Ukraine, which developed as a result of the war, is connected with the neglect of objective ecological and economic principles and accordingly, with the impossibility of effectively protecting and rationally using and reproducing forest resources.

If proper scientific-based theoretical-methodical and practical approaches to the implementation of the concept of sustainable forest management in Ukraine which would correspond to the present challenges and take into account the

regional differences in the field of organisation and development of forestry are not developed and implemented shortly, then deforestation, degradation, and destruction of forest ecosystems will amplify.

One of the important factors in ensuring the practical implementation of the sustainable forest management concept is the transition to a new ecological and economic thinking of society and a new way of forestry at all levels (national, cross-border, international) and in each region.

Today, the need to introduce effective ecological economy tools in the forest sector is determined by many factors: the level of economic development, the level of environmental awareness of the population, the provision of regulatory and legal acts, as well as the destruction of the forest ecosystem as a result of Russia's war against Ukraine. Effective introduction of ecological economy tools for the implementation of the sustainable forest management concept is possible only based on appropriate legal regulation [12].

It is worth noting that in the process of introducing ecological economy tools, it is necessary to take into account the possibility of their practical implementation, especially in the conditions of war; the efficiency of their use; the expenses related to their provision, etc. That is why, at all levels (global, national, regional, and local) that form a functional system of ecological economics, it is necessary to create such conditions that would contribute to the formation and implementation of priority tools of the ecological economy for sustainable development, sustainable forestry, etc.

In the current complex socio-ecological conditions, it is recommended to choose priority tools of ecological economics, that is, those that take into account national and regional ecological and economic features, the protection, use, and regeneration of forest resources, the state of the national and regional economy, and the environmental safety of the population.

The experience of various states and scientific justifications indicate that for the implementation of the sustainable forest management concept, different approaches to the formation and application of ecological economy tools should be used.

The need to create effective tools for ecological economics involves educational and scientific support for ecological economics, proper training of specialists for sustainable forestry, the strengthening of the institutional capacity of the forestry management system, the development of legislation on the protection, use, and regeneration of forest resources, the improvement of economic and financial mechanisms for the implementation of the concept of sustainable forest management, the development of international cooperation in this area, etc.

The theoretical-methodical approach and practical recommendations for the implementation of the sustainable forest management concept in Ukraine envisage ecological and economic partnership and the involvement of stakeholders in the decision-making process - state and local authorities, industrialists and entrepreneurs, scientists and educators, public organisations, etc.

For the effective practical implementation of the developed theoretical provisions and methodological

foundations regarding the implementation of the concept of sustainable forest management in Ukraine in war conditions, regional differences in the field of organisation and development of forestry must be taken into account:

- I. the territories of Ukraine temporarily occupied by the Russians (Crimea Republic, parts of Donetsk and Luhansk regions);
- II. the temporarily captured territories of Ukraine since the beginning (February 24, 2022) of the full-scale war (parts of Kherson, Zaporizhzhia, and other regions);
- III. the territories where active hostilities are taking place (regions near the front line - Donetsk, Luhansk, Kherson, and other regions);
- IV. the regions with an increased risk (regions bordering the Russian Federation - Sumy, Kharkiv, etc.), which Russians frequently shell them;
- V. the regions in the risk zone (regions bordering Belarus - Volyn, Rivne, and Zhytomyr, as the Russians can attack Ukraine from the north as well);
- VI. the regions where forestry management is more or less safe (Zakarpattia, Ivano-Frankivsk, Chernivtsi, and other regions far from the border with the Russian Federation).

It should be noted that the given classification of regional differences is undergoing constant changes related to the military actions on the territory of Ukraine.

The regional differences, which must be taken into account when implementing the concept of sustainable forest management in Ukraine in war conditions, are presented in Figure 1.

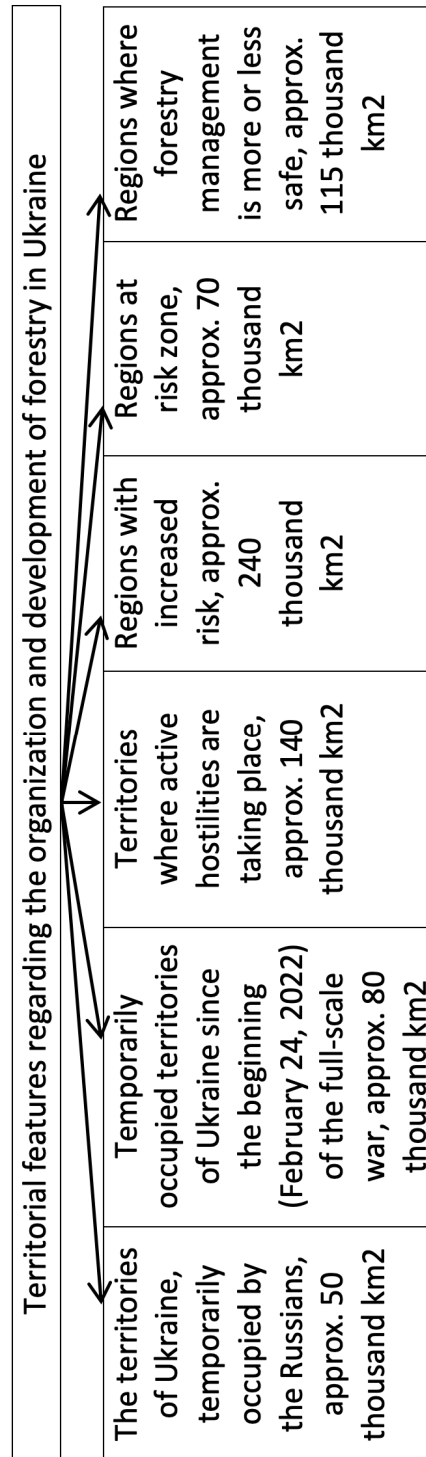


Fig. 1. Distinctive characteristics of Ukrainian territories in war conditions



Therefore, analysing the current state of forest resources in Ukraine in the conditions of war, the gradual practical implementation of the concept of sustainable forest management is possible only through the timely development of theoretical provisions, methodological foundations, and practical recommendations, taking into account the regional features in the field of organisation and development of forestry in Ukraine and the introduction of effective tools of ecological economics. Ecological economics tools are a set of certain means (organisational, psychological, political, legal, etc.) aimed at solving social, environmental, and economic problems. Experience shows that the application of various tools of ecological economics does not always mean achieving the expected results.

Today, it is necessary to implement such tools of ecological economics that would ensure the implementation of sustainable forest management in war conditions and the transition from a consumerist way, where forest resources are perceived only as a factor influencing the development of the economy, to a model of sustainable forestry.

It is worth noting that, according to the Voluntary National Survey, it was planned to increase forest cover in Ukraine from 15.9 to 18.5% by 2025, and to 20% by 2030, which would be close to the optimal value for Ukraine [3], but Russia's war against Ukraine led to catastrophic consequences in the forest sector for many regions of Ukraine. The war has a negative impact on the gradual implementation of the Sustainable Development Goals and the principles of

sustainable forestry in Ukraine, and accordingly, increases the relevance of the policy on the implementation of sustainable forest management. For Ukraine, Russia's attack jeopardises the achievement of all established sustainable development goals by 2030.

It should be noted that significant areas of the forest cover of Ukraine were destroyed as a result of wildfires (Figure 2).

Today, when Russia has been waging a full-scale war against Ukraine since February 24, 2022, the natural environment, including forests, is being destroyed. In 2022, the area of forest fires in Ukraine increased 73 times. Since the beginning of the large-scale war in Ukraine (since February 24, 2022), there have been 322 forest fires, 40 of which were large. As of May 2022, wildfires have been recorded on a total area of 5.5 thousand hectares, mainly in the territory of active hostilities, which is characterised by low forest cover (5-8%) [7].

Today, according to the UN, Ukraine is one of the most mined countries in the world. It is necessary to demine 82.5 thousand square kilometers in Ukraine. Hundreds of hectares of the territory of the forest fund of Ukraine are mined. For example, in the Bucha district, near Kyiv, almost 300 hectares of forest were mined [4]. According to experts, demining the territory of Ukraine, including the forest fund, may last approximately 10 years [5].

Damages caused to the forestry industry of Ukraine as a result of Russian aggression reach about 500 million dollars [8].

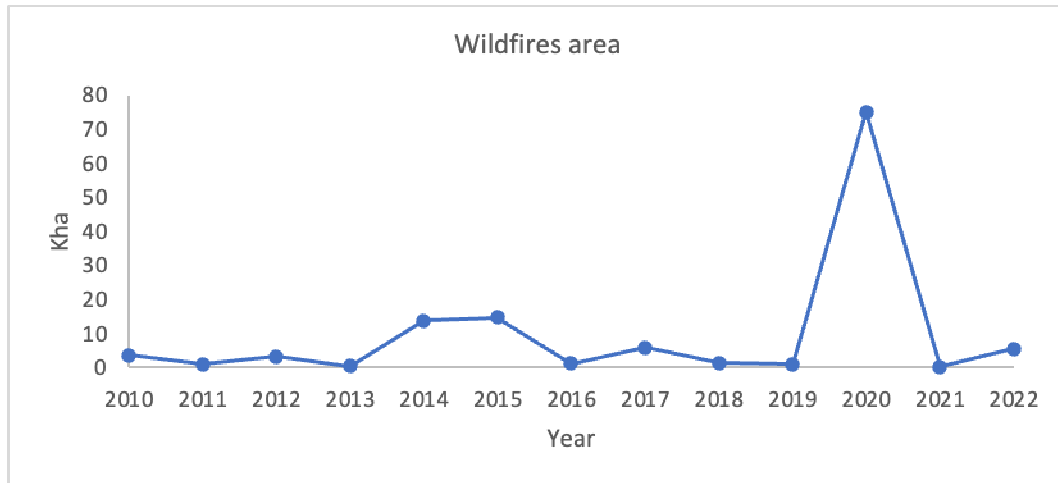


Fig. 2. *Wildfires area during 2010-2022 years*

We believe that the current situation of the forest sector in many regions of Ukraine is alarming. In the territories of Ukraine that are temporarily occupied by the Russians, as well as in the region where active hostilities are taking place, forests are destroyed, mined, damaged, polluted, etc. Fires often occur on a significant part of the territory of the forest fund of Ukraine, which is under the temporary occupation of Russian troops or constant shelling.

Russia's war against Ukraine creates danger for forestry workers. In the current conditions in Ukraine, it is impossible to fulfill professional duties in the field of protection, use, and regeneration of forest resources on the territory of Ukraine, since many forestry specialists have to protect Ukraine from Russian military aggression against Ukraine.

Since we should consider forests, and nature as a whole, as a single global whole, the world community must come out with a joint statement of condemnation and prosecution of the representatives of the Russian government and the Russian military who

are deliberately destroying the natural values of Ukraine - forests, water bodies, land resources, etc.

#### 4. Conclusions

1. Since forests perform many important functions (water protection, soil protection, climate regulation, health, recreation, aesthetics, etc.), it is necessary to effectively protect, rationally use, and regenerate forests, in accordance with the principles of sustainable forestry and the concept of sustainable forest management;
2. In the current conditions of Russia's war against Ukraine, one of the most important and complex tasks in the forest sector of Ukraine is to ensure the implementation of the sustainable forest management concept at the national level, which would correspond to the Strategy of Sustainable Development of Ukraine until 2030 and to the principles of sustainable forestry;
3. Nowadays, special approaches are

needed for the development of theoretical provisions, methodological foundations, and practical recommendations regarding the implementation of the sustainable forest management concept in Ukraine in war conditions, which would take into account regional differences in the field of organisation and development of forestry in Ukraine;

4. The main problems that are currently hindering the implementation of the concept of sustainable forest management in Ukraine are the mined fields in the forests; forest fires arising as a result of hostilities; forests contaminated by ammunition; illegal felling of forests by the Russians in the temporarily occupied territories of Ukraine; limited opportunities for protection, use, and regeneration of forest resources, shortage of forestry professionals due to their participation in the defense of Ukraine against Russian military aggression, etc.

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