



Forest Policy Report

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Post-war restoration of effective organization and structure of the Ukrainian State Forest Management Planning Association

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About the Project “Sustainable Forestry Implementation” (SFI)

The project “Technical Support to Forest Policy Development and National Forest Inventory Implementation” (SFI) is a project established in the framework of the Bilateral Cooperation Program (BCP) of the Federal Ministry of Food and Agriculture of Germany (BMEL) with the Ministry of Environment and Natural Resources of Ukraine (MENR). It is a continuation of activities started in the forest sector within the German-Ukrainian Agriculture Policy Dialogue (APD) forestry component.

The Project is implemented based on an agreement between GFA Group, the general authorized executor of BMEL, and the State Forest Resources Agency of Ukraine (SFRA) since October 2021. On behalf of GFA Group, the executing agencies - Unique land use GmbH and IAK Agrar Consulting GmbH - are in charge of the implementation jointly with SFRA.

The project aims to support sustainable forest management in Ukraine and has a working focus on the results in the Forest Policy and National Forest Inventory.

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INTRODUCTION

Forest management plays a key role in the forest industry of Ukraine, because the efficiency of forest management of the country depends on the objectivity and reliability of determination of quantitative and qualitative indicators of forest areas. Materials of forest inventory are mandatory for forest management, planning and forecasting the use of forest resources, they are the basis for the state forest cadastre and forest accounting, are the basis for the organization of new objects of natural reserve fund, hunting, research, etc.

In recent years, forest management in Ukraine has been going through hard times: since 2015, there has been no state funding for basic forest management; shortage of personnel as a result of low salaries and a decrease in the prestige of the profession; morally and technologically outdated software and imperfect technological processes that lead to significant costs (economic, time, etc.) in the formation of the final product and decision-making; frequent and drastic changes in forest legislation that lead to frequent and significant adjustments of forest management processes.

The military attack of Russia on Ukraine in February 2022 and the ongoing war brought a lot of damage to the forestry of Ukraine and forest management in particular. As a result of the war, Russian troops destroyed the main office of Ukrderzhlisproekt in Irpin, motor transport facilities, many workers were left homeless as a result of the destruction and damage of the hostels and private houses, many workers were mobilized to the Armed Forces of Ukraine, property and equipment were destroyed and damaged, etc. Much of the territory of Ukraine, where the hostilities took place and which was or is occupied, is mined, forest plantations and shelterbelts are damaged by explosive fragments and fires as a result of the war. After the end of the war, objective information on the quantitative and qualitative condition of such areas of the forest fund will be required, therefore, forestry works have a great responsibility and their quality and safe conduct requires significant economic and human resources.

Taking into account the current state of forest management and new challenges that the forest industry and the country will face in the post-war period, in order to effectively and quickly solve the tasks, the structure of forest management needs to be reformed using the best European practices.

1. FOREST MANAGEMENT: REGULATIONS GOVERNING LEGAL RELATIONS

According to the Forest Code of Ukraine, forest management is a package of measures aimed to ensure the effective organization and scientifically proven forest management, protection, preservation, rational use, improvement of ecological and resource potential of forests, forestry culture, obtaining reliable and detailed information about the forest fund of Ukraine.

Forest management includes:

- 1) restoration in the prescribed procedure of the boundaries of the territory of the forest fund of Ukraine and determination of the internal economic organization;
- 2) performance of relevant topographic and geodetic works and special mapping of forests;
- 3) determination of the breed and age composition of tree stands, their condition, qualitative and quantitative characteristics of forest resources;
- 4) identification of tree stands requiring felling in order to improve the quality of forests;
- 5) justification of forests division into categories depending on their main functions;
- 6) calculation of the estimated cutting area, volumes of use of other types of forest resources;
- 7) determining the scope of work on forest restoration and afforestation, protection of forests from fires, protection against pests and diseases, other forestry measures, as well as the procedure and methods of their implementation;
- 8) landscape, soil, forest-typological, forest-biological and other surveys and studies of forest natural complexes;
- 9) Identification of virgin forests, quasi-virgin forests, natural forests, typical and unique natural complexes, places of growth and habitat of rare and endangered species of fauna and flora and are subject to preservation, inclusion in the ecological network;
- 10) arrangement of hunting grounds;
- 11) ensuring primary accounting of forests and the state forest cadastre;
- 12) conducting research works to ensure scientifically based use of forest resources, protection, preservation and restoration of forests;

13) drafting projects for the organization and development of forestry and the implementation of author's supervision over their implementation;

14) participation in the development of programs for the protection, preservation, use and restoration of forests; other forest management activities.

Forest management is mandatory on the entire territory of Ukraine and is carried out by state forest management organizations according to a unified system in accordance with the procedure established by the central executive body that ensures the formation of state policy in the field of forestry (Article 47 of the Forest Code of Ukraine; paragraph 1.1.3 of the Procedure for forest management). In state-owned forests, forest management is carried out at the expense of the state budget, in communal forests - at the expense of the local budget, in privately owned forests - at the expense of their owners. Forest management can be carried out at the expense of other sources not prohibited by law.

The object of forest management is forest plots and non-forest lands, which are provided for use or ownership in accordance with the established procedure and are used for forestry needs, including shelter belts located on agricultural lands, provided for permanent use to state or municipal specialized enterprises or leased to individuals and legal entities.

The peculiarities of forest management growing on lands belonging to forestry lands, as well as forests located on other categories of lands (shelter belts located on agricultural lands, forests on lands of nature reserve and other nature protection purpose, forests on lands of industry, transport, communications, energy, defense and other purposes) are determined by technical documentation for forest management (Instruction on forest management of the forest fund of Ukraine, Irpin – 2006. Currently, the Scientific and Technical Council of the State Forest Resources Agency in accordance with the Procedure for forest management approved and recommended new technical documentation for forest management, which is essentially a modified Instruction...

According to the purpose, forest management is divided into primary basic and re-basic. Primary basic forest management is carried out in forests that are being managed for the first time. Re-basic forest inventory is carried out in previously managed forests. Materials of primary basic and periodic re-basic forest inventory may be amended in order to maintain up-to-date taxation and cartographic databases containing quantitative and qualitative information on forest areas and to produce up-to-date forest inventory materials. Forest management materials are updated on the basis of annual forest inventory works and/or information on changes received from the forest user. Amendments to forest management materials are made on the basis of forest inventory works and updated forest management materials.

Forest management in forests of all forms of ownership with a total area of 100 hectares or more for each of the permanent forest users and forest owners is mandatory on the entire territory of Ukraine and is carried out once every 10 years, in forests of all forms of ownership with a total area of up to 100 hectares - once every 20 years.

Forest management in the forests of all forms of ownership with the total area of up to 100 hectares for each of the permanent forest users and forest owners is mandatory throughout the territory of Ukraine and is carried out once in 20 years by enterprises, institutions, organizations of all forms of ownership under a unified system in accordance with the procedure established by the Cabinet of Ministers of Ukraine.

The main method of forest inventory is the method of age classes, which consists in grouping allotments into farms and management sections. All forest inventory calculations by this method are based on the results of the distribution of areas and stocks of management units by age classes. The primary accounting unit for forest inventory according to the age class method is the allotment, and the primary calculation unit is the management section.

The materials of the forest inventory provide qualitative and quantitative characteristics of each forest area, a comprehensive assessment of forest management, which is the basis for the design, on the principles of sustainable development, of the forest management organization and development project for the corresponding forest area.

The project of forest management organization and development provides for environmentally sound forest management and is elaborated in accordance with the legal acts regulating the organization of forest management. The project of forest management organization and development defines and substantiates the main directions of forest management organization and development of the object of forest management taking into account the state and prospects of economic and social development of the region.

Materials of forest management are approved in the established order by the executive authority on forestry of the Autonomous Republic of Crimea, the central executive body that implements the state policy in the field of forestry, in coordination with the executive authority on environmental protection of the Autonomous Republic of Crimea, the central executive body that implements the state policy in the field of environmental protection. Approved forest management materials are mandatory for forest management, planning and forecasting of forest resources use.

Thus, the main legal acts that regulate the implementation of forest management are the Forest Code of Ukraine and the Procedure for forest management, and

the peculiarities of forest management are determined by the Instruction on the management of the forest fund of Ukraine. According to these documents, forest management of the territory of the forest fund of Ukraine is carried out exclusively by state forest management organizations, and the main method is the method of age classes.

2. FOREST MANAGEMENT: STRUCTURE, STATUS AND FEATURES OF WORK TECHNOLOGY

2.1. Organizational structure of "Ukrderzhlisproekt"

Forest management throughout the territory of Ukraine is carried out by the Ukrainian State Forest Management Planning Association "Ukrderzhlisproekt" under a unified system in accordance with the Procedure for forest management. The SFMPA includes:

a) on a separate balance sheet:

- Lviv State Forest Management Planning Expedition;
- State Enterprise "Kharkiv State Forestry Expedition";

б) reporting expeditions:

- - Kyiv State Forest Management Planning Expedition;
- Complex Forest Management Planning Expedition;
- Ukrainian Forest Management Planning Expedition;

в) other units that are directly subordinate to the association:

- information and computer centre;
- National forest inventory centre;
- road transport unit;
- other units.

The detailed structure of SFMPA is shown in Figure 1.

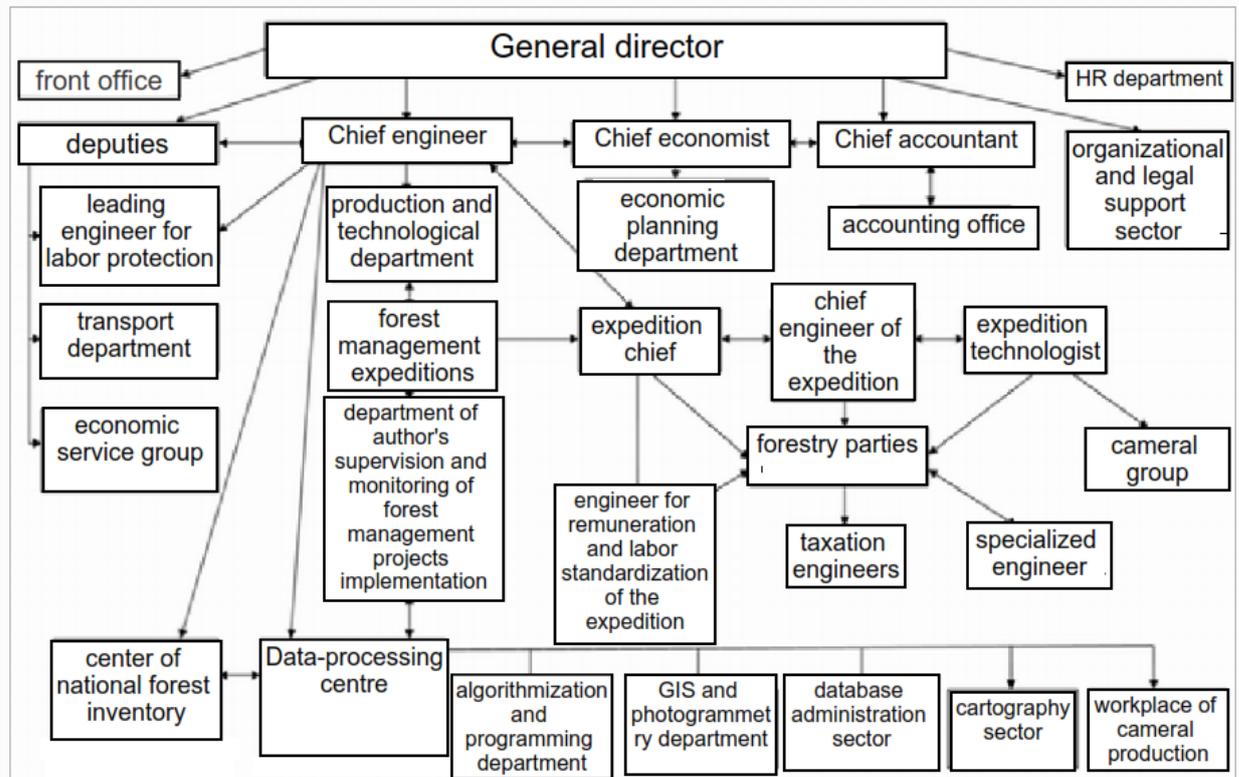


Рис. 1. Structure of "Ukrderzhlisproekt"

2.2. Organization of works on forest management

Forest management is carried out in the following stages: preparatory works; field works; chamber works. The main primary production unit that carries out direct primary collection of information and its further processing is the forest inventory party. It is headed by the head of the party and consists of the appropriate number of taxation engineers of certain categories. The expedition consists of about 5-6 parties, each of which consists of 3-5 taxation engineers. In the entire forest management association there are about 120 taxation engineers involved in the primary collection of primary information, which is about 30% of the total number of employees. All other production units (except for the CNFI) and the administration perform the function of organizing the management of production processes, control, technological support, logistics and maintenance of forestry operations.

The final product that the customer receives as a result of forest management is the Project of organization and development of the enterprise ... (hereinafter referred to as the Project), which consists of a descriptive and project part. The descriptive part includes a description of the physical, geographical and socio-economic conditions of the enterprise location, analysis of the economic activities of the enterprise for the project period, etc. The project part of the Project includes scientifically justified volumes of forest use and additional forest

uses, reforestation and afforestation, project of measures for fire protection, recreation, etc. arrangement of the territory, justification of the division and allocation of the relevant categories of forests and especially valuable for protection of forest areas, etc.

An integral part of the Project are the minutes of forest management meetings (first, second, third, technical, coordination and technical), planning and cartographic materials (maps, thematic plans of forest plantations, tablets, etc.) and the inventory and taxation characteristics of each forest area (taxation description).

All new forest inventory materials shall pass through various approval procedures before they are implemented. If continuous felling with an area of more than 1 hectare is planned in forest management materials, they fall under the law "On Environmental Impact Assessment", and forest management materials undergo an environmental impact assessment procedure. These procedures, today due to the bureaucratic component and unfounded comments on materials, are stretched in time and often last from months to several years. And making changes and adjustments to forest management materials leads to additional economic costs and delays their receipt to the customer, and therefore makes it impossible to effectively and promptly make production decisions, because every year some of the materials lose their relevance.

2.3. Factors affecting the efficiency of forest management

Currently, forest management in Ukraine is faced with a number of negative factors, both internal and external, which have accumulated over the past decades and directly or indirectly affect the efficiency and quality of forest management.

Among the main factors are the following:

- lack of state policy on the development of forest management, lack of the Program for the development of forest management (which contained the scope and sequence of forest management works in the context of the Regional Forestry and Hunting Administration); underestimation of the importance of forest management for the effective functioning of the forest industry;
- lack of state support and funding for forest management (since 2015);
- imperfect legislation on tariff rates and salaries;
- destruction of buildings and equipment as a result of military operations;
- mobilization of the company's employees to the armed forces of Ukraine.

- Inefficient organizational structure of the association;
- personnel problems and loss of prestige of the profession;
- inefficient production and technological processes and outdated material and technical base;
- age component of the staff, etc.

2.3.1. Management of production and technological processes

After the collapse of the Soviet Union and the proclamation of Ukraine's independence, forest management was part of various ministries and departments, which, to a greater or lesser extent, paid attention to it mainly only from the point of view of obtaining the necessary information on the qualitative and quantitative characteristics of the country's forest fund. The processes themselves, regarding the efficiency of collection, methodology and quality of information collection, automation and digitalization in forest management, were not given due attention. Until a certain time, budget funds were allocated for forest management works (until 2015), the work was carried out on time, customers received the necessary materials, and the authorities received the necessary information about the state of the forests, certain people were satisfied with everything, so no one thought about the future and development of forest management. And in fact, the current forest management of the country, being a monopoly, has its "roots" in the Soviet past, which it does not want to leave. Therefore, in its work it uses the Soviet approach to the organization of production and technological processes, which is becoming less adapted to the modern realities of forestry and the development of new technologies. This has led to inefficient use of resources, increased labor costs in the production of products, lack of automation of production processes, which leads to difficulties (economic, time) and efficiency of decision-making at all levels.

2.3.2. Remuneration and productivity standards

Two main forms of remuneration are applied in "Ukrderzhlisproekt" - hourly and piecework. Hourly remuneration is used mainly for employees of administrative and managerial level and management staff. Piecework - for employees based on the results of the work performed or services rendered, these are mainly taxation engineers going to carry out field forestry works, employees of cameral groups and other structural units that manufacture products, that is, employees working according to the relevant production standards. The main problem of remuneration is that the salaries of the forestry project employees are related to the monthly tariff rate of the first category worker on forestry works, which is essentially incorrect, since "Ukrderzhlisproekt" is a project organization. Another problem is the use of outdated production standards that have not been revised since Soviet times and are not relevant in the current realities of intensive forestry. For example, when calculating the difficulty of field forestry work and,

accordingly, the daily rate of production for taxation of plantations by taxation engineers, such an indicator as the "average area of the quarter" is used, although in real conditions it is necessary to start from the "average area of allocation". Because with the same area of forest blocks, the number of allocations in them is different and, accordingly, different amounts of time are spent on their taxation, etc.

2.3.3. Personnel

An equally important problem of the current forest management is the personnel problem, namely the lack of qualified engineering and technical workers (taxation engineers) to perform field and desk forest management works. It is directly related to the amount of remuneration and the specifics and type of forestry work. The average salary for the association for 2021 is about 21 thousand UAH, and is much lower than at advanced forestry enterprises, so the best graduates of higher education institutions go to work in forestry. The size of the salary of a taxation engineer depends on the category assigned to him, which is lower for young specialists, and in fact everyone performs the same work regardless of the category. The specifics of forest management work requires that employees stay annually in the field approximately from May to December and has its own characteristics (difficult working and difficult weather conditions, frequent travel and different social and living conditions, etc.) All these factors generate a significant turnover of personnel and of the 3-5 young specialists who come to work for the first time, in a year 1-2 people remain working.

2.3.4. Technology of work performance

One of the most important problems of forest management should also include inefficient technology of work and lack of automation in the formation and output of information. Until now, there is no full-value geodatabase for all forest users, and this database now consists, in fact, of two separate ones - cartographic and attributive. This creates difficulties for the introduction of automation of production processes and increases the cost of prompt information and decision-making. It is worth paying attention to the peculiarities of collecting field information and its further cameral processing.

Work with cartography (vector and raster data), contour decoding, topology control, etc. is carried out using the Digitals program in the SK-63 coordinate system, and the formation and issuance of all cartographic materials for the customer - in the ArcGIS 9.3 application (which has not been supported by the developer since 2017) using the Software Package for the formation and issuance of materials ... in the WGS 84 coordinate system. The technology of making changes to cartographic materials when updating during continuous forest management is also inefficient and requires many unnecessary operations. All this leads to high labor costs and deterioration of accuracy and quality of cartographic forest management materials.

For the collection of attributive information and the input of forestry and taxation indicators for each plot of the forest fund, a paper taxation card is provided in which the taxation engineer records the necessary data. Further data entry into the database, their control, the formation and issuance of forest management documentation, calculations of the volume of use is carried out using a software package called "Forest Resources Management" (ULR), which was developed in the last century on OC DOS. In parallel, a set of programs for creating and converting data from the DOS system into a relational database on the MSSQLServer is used and supported, from which some of the materials necessary for forest management design are formed and issued. That is, in fact, now support and maintain two sets of programs that are necessary for full-valued work on information processing and the formation and issuance of forest management materials. One of these complexes is technically and morally outdated, which causes problems with the selection and purchase of personal computers and laptops necessary to install this software.

The project of organization and development of forestry..., which is being developed for the enterprise, based on the results of basic forest management work, contains a significant amount of documentation and cartographic materials that have no practical use in production and are issued only because it is provided for by the structure of the Project, which has not been revised or changed since the Soviet period. By the way, in March 2021, the public organization "Forest Initiatives and Society" conducted a survey of forestry enterprises subordinated to the State Forest Resources Agency of Ukraine on the use of forest management materials.

It should be noted that according to the results of the survey, the forest management materials that are most often used in the work are as follows: forest management maps; taxation description with information on quarterly results of land areas and reserves; information on proposed measures; forestry plans painted by dominant species (M 1:25 000); explanatory note to the project of organization and development of forestry with annexes (only part). Forest management materials that are rarely or not used at all in the work include: all materials for school forestries; overview plans for the placement of non-wood raw materials (M 1:25 000); forestry plans unpainted (M 1:25 000); schemes of forestry enterprises are not painted; schemes of forestry enterprises by forest categories. All other forest management materials are used in almost 50/50 ratio depending on the specifics of the work.

Regarding the receipt of additional materials (information) that are necessary for work, but are not produced (provided) during the basic forest management, the following proposals were received: to receive materials of basic and continuous forest management in electronic form (digital cartography, subdivision databases, taxation descriptions, etc.); to produce thematic maps necessary for

forest certification (especially valuable protective forest plots, representative plots, location of rare species of flora and fauna, etc.); for hunting farms, specialized maps are required in accordance with the Guidelines for the management of hunting grounds (types of land, valuation, etc.); creation of maps of enterprises in the context of territorial communities, etc.

It is important to note that some of the regulatory and reference information and terminology used by forest management is not relevant in the current realities of forest management. For example, some of the proposed economic measures designed by forest management for specific areas of the forest fund are not fully regulated by the current legislation (felling of sparse forests, reforestation or afforestation measures, etc.) In fact, there are still terms used that have been "inherited" from the Soviet Union, the relevance of which is no more than 30%.

Therefore, summarizing the above information, it is worth pointing out the following main factors that negatively affect the effective work of modern forest management:

- lack of state support and the Forest Management Development Program, outdated regulatory framework;
- inefficient structure of the association's organization, remuneration and personnel policy;
- lack of clear technology of work and automation of production processes;
- unwillingness to "leave" the previous structure, methods of approaches to the organization and delivery of materials;
- material and human losses as a result of russia's military aggression, etc.

3. POST-WAR RESTORATION OF EFFECTIVE ORGANIZATION AND STRUCTURE OF FOREST MANAGEMENT

For the effective work, quality and efficiency of work in the post-war years, it is necessary to outline the ways of reforming the forest management of Ukraine and its adaptation to the real conditions and challenges facing the forest industry. It is necessary to develop a detailed roadmap for the phased reform of forest management, which would minimize all possible risks, taking into account existing best foreign practices.

One of the options for effective reform of the forest management organization in the post-war years is to involve the private sector (legal entities and individuals) in carrying out forest management works or part of them. However, for this purpose, it is necessary to properly organize the legislative and logistical framework, create a reliable basis and develop clear "rules of the game" for the admission of private structures to forest management works. The following needs to be done:

Amendments to regulatory legal acts

1. To amend the current legislation regulating forest management works in the following formulation "...forest management is carried out by state and private forest management organizations..." or "...forest management is carried out by state forest management organizations with the possibility of involving private organizations to perform part of the work..." (Article 47 of the Forest Codex of Ukraine, paragraph 1.1.3 of the Procedure for forest management).

It is also necessary to amend the Procedure for forest management regarding the approval of forest management materials, which would contain clear terms of approval and requirements for the structure of materials that are subject to the approval procedure. To approve the Forest Management Development Program (by order of SFRA or MENR).

2. It is necessary to bring forest management terms and definitions in accordance with the current legislation. Optimize the list of measures that are projected when carrying out forest management works, formulate their clear terms and definitions and reflect them in the State standards of Ukraine... or as annexes to current laws, etc. Make the necessary changes to the regulatory and reference information used for the collection and processing of forest inventory information.

3. Optimize the list of documentation and cartographic materials of forest management, which are developed and provided by the current Project..., to the modern realities of forest management and their practical use.

Organizational and legal measures

4. It is necessary to develop a new tariff scale for forest management works, which would take into account all the features of forest management planning and make it possible to form a competitive salary. It is also necessary to revise the standardization of forest management works, adapt the norms to real conditions, where the area of the average allocation of the forest fund plot should be used as a basis. To cancel the categories for taxation engineers, because regardless of the category, specialists perform the same work. Admission of a taxation engineer to perform forestry work should be based on a certificate confirming his qualifications (on the principle of certified land surveyors).

Technological measures

5. To take into account the course of digitalization of the forest industry, announced by the State Forest Resources Agency of Ukraine, and to attract investments to create a full-fledged geodatabase of Ukrainian forests and a geoportal, the creation of which is provided for by the State Forest Management Strategy until 2035. Develop licensed software for the full functioning and support of this geodatabase. Create a set of programs for filling, control and formation of source materials from the geodatabase, which are provided by the current legislation and provided to permanent forest users or authorities during the development of the Project... This will ensure automation and optimization of production and technological processes in the collection and processing of forest management information and reduces costs (economic, labor, time) for the efficiency of information and decision-making. Thus, a favorable conditions will be created for:

- promptly making changes to the geodatabase in order to update information about each forest area when updating materials or conducting continuous forest management for each forest user;
- creation of a full-fledged forest cadastre, which involves the formation of thematic maps and their visualization;
- exchange of digital information between forest management organizations and forestry enterprises and all stakeholders;
- creation of a full-fledged geoportal with information on the qualitative and quantitative characteristics of Ukrainian forests with equal access to it for authorities, forestry specialists, NGOs and all stakeholders (in accordance with the Law of Ukraine "On National Geospatial Data Infrastructure).

It is necessary to reform the forest management in Ukraine in stages, at the first stage it is necessary to involve private legal entities and individuals to carry out field forest management works and collect forestry and taxation information about each forest area.

The state forest management organization (such as "Ukrderzhlisproekt") should be the leading one and perform the following functions and have the appropriate powers:

- development and support of specialized software and its transfer to private legal entities or individuals, for example, under a franchise agreement;
- to create, support and conduct advanced training courses for taxi engineers, etc;
- admission to forestry works;
- control over the quality of work and delivery of initial information;
- choosing to use existing formats or developing and maintaining an interchangeable data format and deadlines for the delivery of collected information;
- development of the standard structure of the Project...;- preparation (or control over preparation?) of all forest management materials and writing (or control over writing?) of the Project...

Private legal entities or individuals must:

- have in their staff qualified employees with access to perform forestry works (legal entities);
- to carry out forest management works in a timely manner and to provide the necessary information in a certain format and in due time.

Conducting the second stage of forest management reform, based on a detailed analysis of the results of the first stage, if necessary, may provide for the admission of private legal entities and individuals who have recommended themselves for 3-5 years, to the full cycle of forest management works and writing the Project ..., if specialists are available to perform such work.

Thus, the implementation of the above tasks will allow to reform the forest management of Ukraine in the post-war period, which will allow to perform its functions efficiently and quickly and to optimize production and technological processes and, as a result, to obtain the necessary information for prompt decision-making.

4. PECULIARITIES OF THE MANAGEMENT OF FORESTS CONTAMINATED BY EXPLOSIVE MATERIALS AND FORESTS IN THE TEMPORARILY OCCUPIED TERRITORIES OF UKRAINE

According to the Ministry of Internal Affairs of Ukraine, as of September 9, 2022, the potentially dangerous territory in Ukraine due to contamination with explosive objects is approximately 18.5 million hectares (185 thousand km²). The Ministry of Environment reported that in the six months of the war unleashed by Russia in Ukraine, almost three million hectares of forests have been damaged, which is a third of its forest fund, 20% of Ukraine's protected areas are affected by the war, 8 reserves and 12 national parks are under occupation, the damage caused to flora and forests is approximately UAH 183 billion, etc. In total, among the enterprises and organizations that take care of forests, 114 state forestry enterprises, 20 agricultural enterprises, 14 municipal and 12 other forest users and forest owners were affected by the hostilities. Most of the forests that fell into the war zone are in Chernihiv and Sumy regions. For 6 months since the beginning of the war in Ukraine, fires have covered a total area of 2.4 million hectares, of which 1.5 million hectares (64%) in the territories with military operations and occupied territories. The area of protected areas burned by fires (Emerald Network <http://emerald.net.ua/>) is 425 thousand hectares, of which 292 thousand hectares (69%) are in the territories with military operations and occupied territories (according to the report "Forest management in the territories contaminated by explosive objects"/"Contamination of the territory of Ukraine by explosive objects. Assessment of landscape damage by fires").

The negative impact of the war on forests and forestry in Ukraine is manifested in the following

- mortal danger for forestry specialists, project organizations and the population;
- threats to representatives of fauna and flora from explosive objects;
- significant areas of damaged forests as a result of hostilities and fires from them;
- uncontrolled logging in the combat zone (for heating, for dugouts and fortifications);
- lack of updated information on the state of forests due to limited access to forests for project and scientific organizations;
- lack of implementation of economic activities in forests, proper forest protection, harvesting of forest resources for general and special use;
- personnel problems, etc.

Forests are the most difficult object for demining. International experience shows that a quick and effective solution to the problem of mined forests in the world has not yet been found. Mines, unexploded ordnance and ammunition storage facilities remain in the forests. All these objects can detonate from direct contact with humans or vehicles. Some may also detonate or lose their tactical role due to fires. No information on demining of forests is currently available, as the survey and demining was carried out locally, on small areas, primarily forest roads.

Considering the above, in order to obtain up-to-date quantitative and qualitative information on forests and track their dynamics in the areas contaminated with explosive hazards, it is necessary to switch to remote methods of collecting the necessary information during forest management. This requires the following:

- development of a national program for management of forests contaminated/potentially contaminated with explosive hazards;
- mapping of forests contaminated/potentially contaminated by explosive hazards and their visualization (creation of an appropriate online geoportal);
- collection of qualitative and quantitative silvicultural and taxation indicators of forest plantations, monitoring of their condition using remote sensing materials (medium and high resolution);
- use of UAVs with a combination of selective and enumeration methods of taxation for monitoring forests and promptly obtaining additional information;
- close cooperation with the authorities and special units involved in demining the territory to obtain operational information and make appropriate changes to the demined areas for further planning of effective forest management on them.