Norwegian Journal of development of the International Science

№109 2023

NORWEGIAN JOURNAL OF DEVELOPMENT OF THE INTERNATIONAL SCIENCE

№109/2023

Norwegian Journal of development of the International Science

ISSN 3453-9875

It was established in November 2016 with support from the Norwegian Academy of Science.

DESCRIPTION

The Scientific journal "Norwegian Journal of development of the International Science" is issued 24 times a year and is a scientific publication on topical problems of science.

1000 copies

Norwegian Journal of development of the International Science

Iduns gate 4A, 0178, Oslo, Norway

email: publish@njd-iscience.com

site: http://www.njd-iscience.com

CONTENT

BIOLOGICAL SCIENCES

EARTH SCIENCES

ECONOMIC SCIENCES

MEDICAL SCIENCES

PEDAGOGICAL SCIENCES

PHILOLOGICAL SCIENCES

SOCIAL SCIENCES

TECHNICAL SCIENCES

EARTH SCIENCES

MODERN CHALLENGES FOR THE FOREST RESOURCES OF UKRAINE

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https://doi.org/10.5281/zenodo.7989463

Abstract

Forest resources, as a source of supply of raw materials to many sectors of the economy, play an important role in Ukraine. According to their purpose and location, they mainly perform water protection, protective, sanitary and hygienic, health and other functions, and provide the needs of society in forest resources.

Wars and hostilities have a significant destructive effect on the environment. They cause the death of living organisms, lead to the destruction of natural ecosystems. War brings the most devastating losses to forests.

Of all the regions, the South of the country, and especially the Kherson region, suffers the most from military operations. During the period of full-scale invasion and occupation of the region, Kherson region lost hundreds and thousands of hectares of forest due to constant fires, a large percentage of forests were mined and littered with explosive objects, which greatly complicates the restoration of the territories.

Keywords: forest resources, forest cover, reforestation, forest fires, industry reform, forest industry development strategy.

INTRODUCTION

The total area of the forest fund of Ukraine is 10.4 million hectares, of which 9.6 million hectares are covered with forest vegetation. Over the past 50 years, the area of forests has increased by 21%, and the supply of wood has almost tripled. Forest cover is 15.9% (the world average is 30%) (Table 1). There is less than 0.2 hectares of forest per inhabitant of the country (the world average is 1.4 hectares). Ukraine provides only 30% of its own needs with forest resources [1].

A feature of the age structure of the country's forests is the predominance of medieval forests. The insignificant area of mature, growing and stagnant forests indicates excessive exploitation of Ukraine's forests in the past [2]. Only one-fifth of the entire forest stock accounts for forest areas where mass logging can be carried out. In other age segments, only selective felling can be carried out. In recent years, opportunities for the development of the logging sector have sharply decreased, which requires an immediate review of approaches to this sector.

In Ukraine, more than 50% of forests are man-made and require increased care. Current forest areas are mostly the result of artificial planting.

The forests of Ukraine, according to their purpose and location, mainly perform water protection, protective, sanitary and hygienic, health and other functions and provide the needs of society in forest resources [3, 4]. The main forest resources are located in Polissia and the Carpathians. In the rest of the country, they are mainly of soil and water protection importance.

Forests on the territory of Ukraine are very unevenly distributed. They are concentrated mainly in Polissia and the Ukrainian Carpathians. Forest cover in different natural zones has significant differences and does not reach the optimal level at which forests have the most positive effect on the climate, soils, water resources, mitigate the consequences of erosion processes, and also ensure the production of a larger amount of wood (Table 1).

For the last twenty years, forest restoration activities have been taking place with an average annual volume of 38-40 thousand hectares. Partly this happens naturally, partly through artificial planting of young trees. And although there is a slight increase in forest cover (up to 4%), forest areas are unevenly located.

Table 1

Territory and forest cover of administrative-territorial units of Ukraine (01.01.2019)

Administrative territorial units	Total territory, thousand ha	Including land area, thousand hectares	Area covered by forest vegetation of forest plots, thousand ha	Forest cover, %	
				by total area	by land area
Crimea	2608,1	2391,5	278,7	10,7	11,7
Vinnytska	2649,2	2606,2	346,5	13,1	13,3
Volynska	2014,4	1969,2	624,6	31,0	31,7
Dnipropetrovska	3192,3	3035,8	179,2	5,6	5,9
Donetska	2651,7	2610,1	184,1	6,9	7,1
Zhytomyrska	2982,7	2934,4	1001,6	33,6	34,1
Zakarpattia	1275,3	1257,1	656,7	51,4	52,2
Zaporizhzhska	2718,3	2542,8	101,0	3,7	4,0
Ivano-Frankivska	1392,7	1369,3	571,0	41,0	41,7
Kyivska	2812,1	2638,3	624,1	22,2	23,7
Kirovohradska	2458,8	2383,4	164,5	6,7	6,9
Luhanska	2668,3	2646,4	292,4	11,0	11,1
Lvivska	2183,1	2140,6	621,2	28,5	29,0
Mykolayivska	2458,5	2331,0	98,2	4,0	4,2
Odeska	3331,3	3118,2	203,9	6,1	6,5
Poltavska	2875,0	2726,6	247,4	8,6	9,1
Rivnenska	2005,1	1962,9	729,3	36,4	37,2
Sumska	2383,2	2352,6	425,0	17,8	18,1
Ternopilska	1382,4	1363,1	183,2	13,3	13,4
Kharkivska	3141,8	3081,9	378,3	12,0	12,3
Khersonska	2846,1	2412,9	116,3	4,1	4,8
Khmelnytska	2062,9	2023,3	265,1	12,8	13,1
Cherkaska	2091,6	1955,2	315,1	15,1	16,1
Chernivetska	809,6	791,1	236,7	29,2	29,9
Chernihivska	3190,3	3122,8	665,7	20,9	21,3
Kyiv	83,6	76,9	31,3	37,2	40,7
Sevastopol	86,4	85,5	32,8	38,0	38,4
Total	60354,8	57929,1	9573,9	15,9	16,5

Unfortunately, over the last ten years in Ukraine, about 2.5 thousand hectares of forest plantations suffered from industrial emissions, 3.3 million hectares of forests were exposed to radiation pollution as a result of the accident at the Chernobyl nuclear power plant.

The share of destroyed forests exceeds the share of their restoration (Table 2).

Table 2

Volumes of illegal felling of trees by regional forestry and hunting management (2020), m^3 [5]

Kharkivska	Vinnytska	Zakarpattia	Khersonska	Zhytomyrska	Kyivska	Lvivska	Dnipropetrovska	Volynska	Odeska	Rivnenska	Ivano-Frankivska	Chernivetska
31585	5190	2412	1974	1872	1485	1358	1314	1013	837	830	668	504
Poltavska	Donetska	Luhanska	Khmelnytska	Ternopilska	Mykolayivska	Zaporizhzhska	Zaporizhzhska	UkrNDILGA	Cherkaska	Sumska	Chernihivska	
454	442	367	322	262	259	256	250	247	204	119	92	

The scope of protective afforestation measures does not ensure full afforestation of territories unsuitable for agricultural production. There is great concern about the intensive exploitation of forests, especially in the Carpathian and Polissky regions, where 29% and 33% of wood reserves are concentrated, respectively.

Forest fires cause significant damage to the industry (Figure 1). In 2020, losses from fires reached 19.1 billion hryvnias.

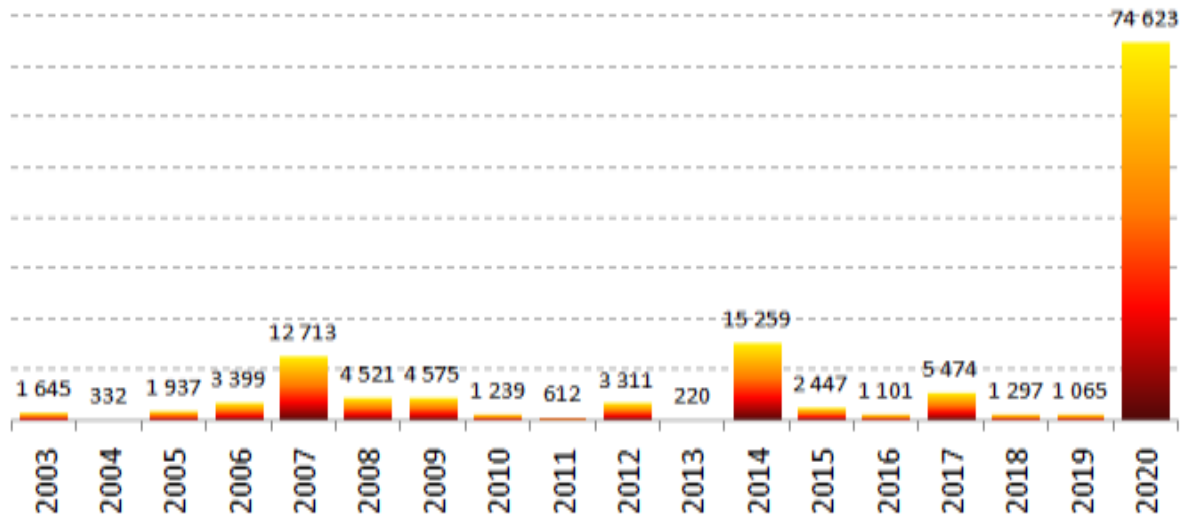

Fig. 1. Dynamics of the area of forest fires, ha [6]

The system of management of forests, which are an important part of the environment, and forestry, which includes state bodies and business entities, should be based on general principles of management and principles of environmental management and orient the development of the sector to sustainable development. Sustainable management of forestry should be considered and carried out in such a way as to ensure their biodiversity, productivity, ability to perform appropriate ecological, economic and social functions at the local, national and global levels, without harming other ecosystems [7–9].

RESULTS AND DISCUSSION

Wars and hostilities have a significant destructive effect on the environment. They cause the death of living organisms, lead to the destruction of natural ecosystems. War brings the most devastating losses to forests, followed by steppes and meadows, followed by other types of biotopes [10].

The environment of Ukraine did not escape this tragedy. In almost a year of the full-scale invasion of the Russian army on the territory of our country, the damage to the environment exceeded $38 billion. But this figure, according to experts, will be much higher when specialists get access to the currently occupied territories and the front-line zone [11].

According to the Operational Headquarters for Fixing Environmental Crimes of the Russian Federation, of which more than 2,200 cases have already been recorded, up to 3 million hectares of forests were affected, which is almost a third of the state's forest fund. Some forests are lost forever.

The amount of damages cannot reflect the real picture of losses, as dangerous substances enter the air every day due to forest fires, the burning of petroleum products and the burning of industrial facilities. Since the beginning of the war, the number of such emissions has exceeded 67 million tons.

In addition, the war taking place on our territory threatens not only the environment of Ukraine, but has already caused a number of problems for the environment in Europe. Pollution of atmospheric air, soil, destruction of forest resources, pollution of water bodies, including the Black and Azov Seas, are components of the environment that have already caused significant damage. It will take more than a decade to restore the ecological state of some territories and environmental components (Figures 2).

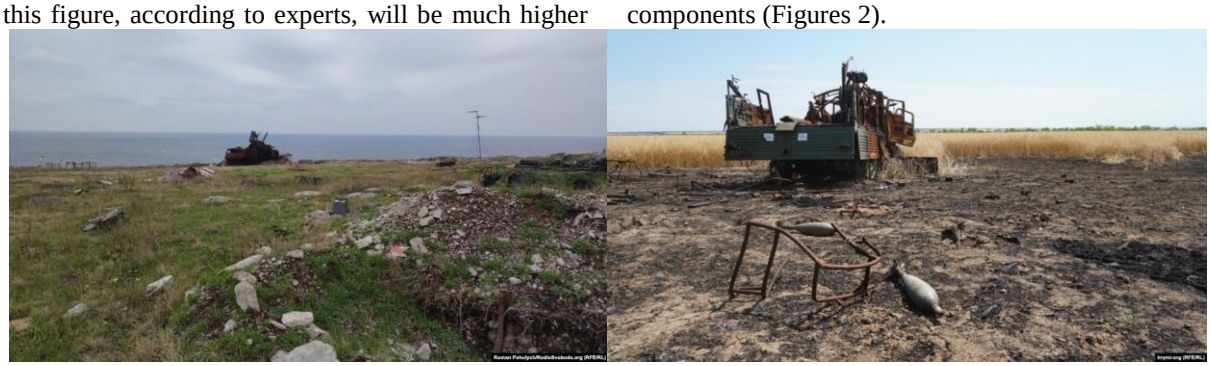

Fig. 2. A huge Ukrainian territory was under occupation or in a zone of active hostilities

Each shelling and explosion, unexploded projectiles cause contamination of soils, water bodies, and air with the remains of burning fuel materials, pollution occurs with chemical compounds such as heavy metals, lead, which will remain and accumulate in soils, plants, and water bodies for a long time.

The territories of Zaporizhia and Kherson regions, which have access to the coast of the Sea of Azov and which are still under occupation today, also have an extremely negative impact on the ecosystem. All Azov parks and recreational infrastructure facilities are located on the banks of protected areas where military operations are currently taking place. Unfortunately, all

forest belts and steppes are mutilated by remnants of military equipment, explosives, and various disposable materials that the occupiers bring with them. Destruction of forests and forest strips as a result of hostilities can lead to a change in the microclimate in the southern regions. The problem of dry weather and droughts, which was inherent in these territories, was solved before the war thanks to the creation of forest strips and the planting of artificial forests, which retained moisture, protected settlements and agricultural land from the negative impact of natural disasters.

Of all the southern regions, the Kherson region and its surroundings suffer the most from military operations. It was in the spring that large-scale fires began in the region, as the South of Ukraine, in particular Kherson Oblast, was occupied by the Russian military from the first day of the Russian-Ukrainian war. During the period of the full-scale invasion and occupation of the region, Kherson Oblast lost hundreds and thousands of hectares of forest. Yes, even on the territories liberated by the Armed Forces, the enemy is shelling, including cluster shells, guided aerial bombs. Such shelling leads not only to the destruction of civilian homes, but also to large-scale fires that spread across the steppe and cover forests [12].

The State Forest Resources Agency sounded the alarm about the destruction of forests in the Kherson region back in the spring. The total area of fires increased 49 times. The average area of one fire increased 18 times (Figure 3).

Fig. 3. A forest fire in Southern Ukraine (Photo "Ukrainian South" from 05/10/2022)

With the occupation of the region, 4.5 thousand hectares of forest plantations burned down in the spring alone. It is currently impossible to give an exact figure, because hostilities in the region continue. The Russian military considers the forests dangerous for themselves - because of the potential shelter for partisans and Ukrainian special units working behind enemy lines, and in the liberated territories - because of the possible placement of the equipment of the Armed Forces. That is why forests continue to burn on the front line, which now passes through the Beryslav district.

In the spring of 2022, forests burned in the Oleshkiv and Skadovsky districts. Foresters have never faced a tragedy of this scale in the past. There was no opportunity to influence the situation, those who were concerned turned to social networks with a request to spread the word and influence the situation.

Only with the approach of the flames to the fortifications and checkpoints of the Russian military, rescuers, foresters, whose equipment and fuel were taken the day before, as well as local residents, were allowed to put out the fires.

In May 2022, forest fires in the Kherson region covered about 800 hectares, and the Russian military also did not allow anyone to extinguish the fires.

In June 2022, the forest was saved from a large-scale fire near the village of Zagradivka (Kherson region) by local residents and the arrival of the fire and rescue unit of the Kochubey community (Figure 4). Since this fire has already occurred in the de-occupied territory, the situation differs from those occurring in the occupied territories, where neither the local population, nor foresters, nor rescuers can quickly put out the fires.

Fig. 4. After the fire on June 23, 2022
(Kochubeivska community, Zahradivka. Photo by Lydia Grigoriev)

The Kochubey community, which includes the village of Zagradivka, was the first to be liberated from the Russian invaders on March 31, 2022. The fire and rescue unit, which was created at the end of 2021, is now actively involved in extinguishing fires, because the community understands that it is important to preserve forests, the environment, and unique vegetation.

The forests near Ingulets are artificially created, they are more than a hundred years old and they perform an important anti-erosion function. During the period of their existence, quasi-natural forest vegetation was formed, which today is represented by rare plants, some of which are listed in the Red Book of Ukraine. It will not be possible to quickly restore forests and vegetation after large-scale fires.

Another large-scale fire occurred in May 2022 on the Kinburn spit, threatening the destruction of the environment and unique ecosystems. The fire lasted more than a week. The fire covered about 4,000 hectares of forests on the border of the Kherson and Mykolaiv regions. The entire plant world was under threat of destruction.

Sandy lands of the peninsula, covered with steppe vegetation and planted with coniferous trees - Crimean and common pine. In swampy lowlands there are remnants of relict natural forests where oaks, birches, willows, and alders grow. On the Kinburn spit, there is also the largest field of wild red orchids in Europe, with an area of about 60 hectares. Herodotus Forest is also a special place: swampy bushes, emerald semi-darkness, coolness and twisted, moss-covered tree trunks. During fires, unique vegetation that has been formed for centuries is destroyed.

Today, due to active hostilities in these territories, it is impossible to study the areas of destroyed forests, flora, and fauna, as well as to assess the current state of forests after fires, as well as to calculate damages. The Russian military not only prevents forest farm workers from performing their functional duties, but also takes away equipment, fuel, takes foresters prisoner, and uses physical violence.

Forests in the Kherson region are artificially planted, so it will take years to restore them. Oleshkiv forests were artificially created during the 19th and 20th centuries. The purpose of afforestation of the sands was to stop their movement by the wind. Artificial forests are formed by pines of several species, and white acacia, maple, olive tree, rowan tree, rowan, hawthorn and other trees also grow here. There are also natural forests on the Oleshkiv sands - the remains of Gilea. Natural forests are formed by common oak, Dnipro birch, aspen, common alder, and the highest ash. Natural forests have a very high conservation value.

Therefore, the longer the hostilities in the Kherson region continue, the more areas of forests will be lost due to fires, and the problems related to their demining will increase.

Before the start of the war, the climatic conditions were largely softened thanks to the artificial forest massifs and forest strips created in the past, which formed the microclimate. In particular, the disruption of ecosystem services caused by the invasion affected the inhabitants of the steppe zone of Ukraine, the most affected by military actions. Destruction of forest belts leads to large-scale wind erosion and devastation of entire regions. The loss of even artificially created, but healthy forests in the south and east of Ukraine will lead to drier, windier conditions, as well as significantly higher temperatures in summer and significantly lower temperatures in winter. In the new climatic conditions, it will be much more difficult to restore the lost forests.

The restoration of the objects of the nature reserve fund, forest resources, and land plots is key and is part of the plan to restore Ukraine after our victory.

The southern part of Ukraine is extremely suffering from the full-scale invasion of the Russian Federation. In addition to constant fires, a large percentage of forests are mined and littered with explosive objects, which greatly complicates the restoration of territories. But the task of preserving forests and creating new ones is urgent.

In today's conditions, it is the Southern region that needs the most support. As already mentioned above, the forest farms of the region have always been subsi-

dized, they did not have enough funds either for development or even for survival. This crisis was exacerbated by the war due to the increase in the number of fires and their areas, the littering of forest areas with dangerous objects. And it takes an average of at least 30-20 years to grow burned and damaged trees.

CONCLUSION

For the restoration of forest resources, along with the time factor, the availability of finances is also important. Almost half a billion dollars is only a preliminary estimate of the damage caused to Ukrainian forests by the war. The hostilities negatively affected more than 3 million hectares of the country's forest fund, almost half a million hectares of forests are still under occupation [13].

Today, the state, authorities, and public activists are actively looking for ways out of the current situation, are holding meetings with international donors, and are conducting negotiations on the provision of aid. Some joint work with international partners is already underway. A memorandum was signed with UNDP Ukraine (United Nations Development Program), there are preliminary agreements on cooperation with the Food and Agricultural Organization of the United Nations (FAO) on the first stage of damage assessment, which will be carried out according to international methods.

Important aspects of effective cooperation with international partners are the transparency of mechanisms for managing financial revenues, the share and sources of funding for the implementation of the reforestation program from Ukraine, the creation of instruments for stimulating investors, including private ones.

Partial answers to these questions have already been provided in the decision of the NSDC on the protection, protection, use and reproduction of forests of Ukraine in a special period [14]. The creation of the State Forestry Fund and revision of the tax regime of the forest industry were proposed.

The state forest special fund in Ukraine will have a wide range of tasks: from the sources of its filling to the restoration of forestry in the east and south of the country, most of which have been destroyed or almost destroyed, the creation of selection and seed centers, technical re-equipment and digitization of the industry, other programs and projects aimed at on reforming the industry.

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ECONOMIC SCIENCES

THE CURRENT STATE OF DIVERSIFICATION OF AZERBAIJAN'S FOREIGN TRADE

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СОВРЕМЕННОЕ СОСТОЯНИЕ ДИВЕРСИФИКАЦИИ ВНЕШНЕЙ ТОРГОВЛИ АЗЕРБАЙДЖАНА

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Abstract
The article examines the foreign trade activities of Azerbaijan in 2022. Due to the strategy of development of trade and economic relations implemented in Azerbaijan over the past 20 years, the real volume of the national economy has increased 4 times, and exports - 15.6 times. In this regard, the total volume of foreign investments invested in the country's economy, the foreign trade turnover of the AR, its main trade partners, the structure of export and import of goods are considered.

Аннотация
В статье исследуется внешнеторговая деятельность Азербайджана за 2022 год. Благодаря реализуемой в Азербайджане за последние 20 лет стратегии расширения торгово-экономических отношений реальный объем национальной экономики вырос в 4 раза, а экспорт - в 15,6 раза. В связи с чем, рассматриваются общий объем зарубежных инвестиций, вложенных в экономику страны, внешнеторговый оборот АР, его основные торговые партнеры, структура экспорта и импорта товаров.

Keywords: Azerbaijan's economy, investments, foreign trade activity, diversification.
Ключевые слова: экономика Азербайджана, инвестиции, внешнеторговая деятельность, диверсификация.

Страны мира веками старались устроить экономическое отношение в первую очередь с соседними странами. Почему в первую очередь с соседями? Поскольку, чем ближе партнеры, тем меньше будут транспортные и другие расходы. Торговые отношения требуют массового перемещения сырья, материалов и готовой продукции. К чему приводит, в первую очередь, неравномерное распределение экономических ресурсов, несоответствие уровня экономической развитости стран, различные комбинации в использовании производственных ресурсов, удовлетворение потребностей потребителей стран мира в том и в другом виде продукции за счет импорта и экспорта произведенных в разных странах. При этом каждая страна и в том числе Азербайджанская Республика, как суверенное государство, устанавливает в основном двусторонние взаимовыгодные торговые отношения с заинтересованными странами мира.

Азербайджан как равноправное государство уделяет особое внимание в основном к двухсторонним торговым отношениям как со странами ближнего зарубежья, так и со странами дальнего зарубежья, которые в свою очередь создают логическое единство в развитии и углублении внешнеэкономических отношений.

Сегодня Азербайджан движется вперед, четко определяя цели своего развития. В этом глобализационном мире появляются более конкурентоспособные нации, которые вкладывают огромные средства во всестороннее развитие человеческого капитала и информационные технологии, ставшие основными факторами развития государства в целом. Стремление модернизировать нацию, повысить ее конкурентоспособность, приспособиться к растущим требованиям новой истории и добиться будущего процветания Азербайджана – неизбежные реалии времени.

Уже в начале XXI века Азербайджан превратился в одну из динамично развивающихся с экономической точки зрения стран на постсоветском пространстве. Так, в мировом рейтинге глобальной конкурентоспособности, ежегодно составляемом Всемирным экономическим форумом (ВЭФ), Азербайджан в 2019 г. поднялся на 11 ступеней, заняв 58 место в рейтинге среди 141 государства. Она заняла 3-е место по «Бремени государственного регулирования», 5-е место по «Уровню ответственности правительства за перемены», 8-е место - по «Количеству дней, необходимых для начала бизнеса» и 10-е место по «Долгосрочной стратегии правительства» [1]. В частности, в мировом рейтинге глобальной конкурентоспособности, Азербайджан в 2017-