Prospects for financing measures for post-war environmental restoration in Ukraine

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Abstract. Environmental protection requires significant financial resources to implement environmental protection measures and ecological programs, which are incredibly urgent. The effective financing of this area is necessary to ensure the safety of the environment and the rational use of natural resources. The peculiarities of state financing of environmental protection expenditures in Ukraine and its impact on environmental safety are studied in this article. The consequences of a full-scale Russian invasion are presented in the article. It analyses the dynamics of total environmental spending, the amount of actual and planned budgetary spending on environmental protection, and how it's structured. The results of the research have shown some problems in the field of budgetary financing of environmental protection, especially: the insufficient state of financing of environmental protection activities, failure to meet planned indicators of budget programs and other important problems. The authors propose to ensure adequate financing of environmental protection measures, targeted and effective use of environmental funds in order to solve these problems.

1 Introduction

The global environmental crisis emphasizes the need to find alternative ways of sustainable growth that prioritize the protection of natural potential over its exploitation. Russia's military aggression against Ukraine has made it necessary to strengthen both defence capabilities and environmental security, as the priorities in the field of national and global security have changed. The threats and challenges to the environment that Ukraine was facing up to 24 February 2022 have not been resolved and have only become more serious after the full-scale invasion.

The principles of the European Green Course and the use of advanced environmental tools should be the basis for the post-war reconstruction of our country. An important contribution to the future of environmental restoration was made at the Restoration Conference held in Lugano, Switzerland, on 4-5 July. One of the programs of the conference - "Restoration of a clean and protected environment" - envisages the

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implementation of 76 environmental protection projects for a total amount of 25,5 billion euros. It is expected that the practical results of this program in Ukraine will be the creation of 10 national parks according to EU standards, the construction of 9 forest seed centers for the cultivation of tree seedlings (which will allow the production of up to 30 million units per year and the planting of 6,700 hectares annually), as well as the establishment of new plants, which will create new jobs [17]. Ukrainian forests have suffered from military operations, and many areas with plantations remain mined. Therefore, all initiatives and European integration programs related to environmental policy must be adapted to the realities of war. Funds and international experts should be mobilized for demining, and natural resources should be used rationally.

2 Theoretical framework

A number of scientific studies devoted to the analysis of environmental protection, restoration of cities and territories subjected to military aggression have emerged in the wake of the deployment of hostilities in the east of the country since 2014 (O. Todorchuk). [17]. The attention of the authors is mostly focused on environmental issues and legal aspects of environmental destruction. In the same movement, the analytical review "Assessment of ecological damage and priorities of environmental restoration in Eastern Ukraine" [14] is being developed.

After the full-scale invasion, scientists took a much broader approach to the topic of environmental restoration in Ukraine. In particular, R. Strelets, who studies the impact of war on the environment[16].

A. Bugaichuk studied the influence of the Russian Federation's full-scale aggression against Ukraine on the situation of Ukrainian public environmental organisations and the change of their activity direction. It was noted that the study's relevance is due to the significant impact of the war on all areas of human activity, particularly on political processes, the activities of public organizations, and environmental and energy policy. Environmental public organizations are essential institutions for articulating public interests regarding protecting the environment and safe human living conditions. Therefore, their preservation and development are necessary for protecting the environment and developing sustainable ecological development practices in Ukraine. It was established that the war significantly impacted society's attitude to environmental problems in general, in the direction of decreasing attention to it compared to problems of personal safety and well-being. Nevertheless, a safe environment worries the public regarding personal health, clean air, water, and protection against man-made disasters [2].

O. Semerny [15] examines the characteristics of environmental safety in the conditions of martial law. By conducting surveys among ordinary citizens on environmental hazards in Ukraine, the scientists found that people understand the catastrophic nature of difficult situations and experience the psychological trauma of war.

This is the result of the enemy's interference in the sovereignty of Ukraine. Therefore, environmental safety as a component of the state's national security is extremely relevant for its solution - many infrastructure facilities have been destroyed, great damage has been caused to the surrounding natural environment. As one of the ways of recovery, scientists suggest developing directions for the development of environmental sustainability in the new sovereign state, updating the legislative framework of normative documents and rebuilding the destroyed.

In her publication, the Ukrainian scientist V. Kolodezhna states that the current number of contaminated Ukrainian soils is in the millions of hectares. Scientists study the issue of post-war reconstruction of the country primarily from the point of view of attracting financial resources.

However, only ecological considerations make it possible to weigh and rationally choose a plan of further actions. In this article the author examines the results of the research carried out by the Centre for Environmental Initiatives "Ekodiya" on the impact of the hostilities on the soil of individual Ukrainian communities. In order to influence decision-making on environmental protection, "Ekodiya" brings together experts and activists [6].

The team of authors T. Sak, I. Bilyo, Yu. Tkachuk studied the question of ecological and economic aspects of wine production in Ukraine [14]. The ecological and economic consequences of the Russian-Ukrainian war are studied in this study.

T. Galushkina and L. Kravtsova are convinced that environmental and resource taxes not only encourage users of nature to reduce their harmful impact on the environment (if you pollute less, you pay less tax), but also make it possible to create a source of financing for environmental protection activities from the funds received from environmental taxes [3]. That is, scientists consider the effectiveness of the use of environmental taxes not only through the prism of strengthening the regulatory influence on polluters, but also through the prism of their accumulation in the relevant public financial funds, which will contribute to increasing the amount of investment support for projects to modernize environmental infrastructure facilities. The effectiveness of investment support for the modernization of environmental protection infrastructure at the expense of public budget expenditures will be significantly higher under the condition of accumulation of environmental taxes in special funds, the main purpose of which should be the financing of ecologically oriented projects.

L. An economic assessment of the environmental consequences of the military aggression of the occupying state against Ukraine in the period 2014-2022 was carried out by L. Malko and D. Nikolayenko [7]. According to the scientists, in order to obtain an assessment based on correct evidence of economic losses in Ukraine, it is important to determine the extent of environmental pollution. The importance of this discussion also lies in the formation of a group of experts who take an active part in the practical assessment of damages caused to Ukraine. It is very important that experts from Moldova and Georgia take part in the discussion, because the occupying power caused great damage to these post-Soviet countries as well. After that, correct calculations are made and cases are initiated in international organizations against the occupying state.

As you can see, most of the existing publications examine the impact of war on the safety of people's lives, crimes against the environment: mass death of fauna, hundreds of thousands of hectares of burned forests, thousands of tons of fuel from bombed oil depots, poisoned land and water. However, although we believe that this is a relevant and important issue not only for Ukraine, but also for the world, there is currently almost no research on environmental restoration in Ukraine.

In the research process, the following methods were used: systematic generalization, economic-statistical, tabular and graphic, analysis and synthesis, abstract-logical.

3 Results

Environmental problems related to the hostilities in Ukraine include flooding of mines due to water table rise, air pollution from coal burning in industrial plants, and gas emissions from shelling of chemical, metallurgical and oil refineries. A particular threat to the entire planet is posed by the Zaporizhzhya nuclear power plant. It is also important to note the unsatisfactory sanitary conditions of drinking water in the regions of Ukraine where hostilities have taken place. Disinfection plants in cities have either failed or been damaged by shelling, meaning that drinking water reaches consumers almost untreated. Military operations have an unpredictable impact on the environment and their effects have an impact for many years after the end of hostilities.

Updating military equipment requires significant costs, including the cost of disposing of obsolete equipment. Disposal of military equipment can be a complex process, as some components can be harmful to the environment, such as heavy metals or hazardous chemicals. It is important to implement recycling and reuse programmes to reduce the negative environmental impact of the disposal of military equipment. It is not only the most dangerous nuclear and chemical weapons that cause environmental problems throughout their life cycle [22].

Ukraine has 35% of Europe's biodiversity. In the first year of the full-scale invasion of Russia, one fifth of Ukraine's nature reserves were affected by hostilities, and about 600 animal species and 750 plant species, including red list species, were at risk of destruction. As a result of the hostilities, 160 out of 271 objects of the Emerald network were damaged. The total area of these objects is 627 thousand hectares. These "Emerald" sites are part of the European system of protected natural areas and natural habitats of endangered species [2].

The existing system of financing the restoration of the environment and the rational use of natural resources in Ukraine fails to provide adequate amounts of capital injections and support for the current cost of environmental protection, and therefore the environmental issues that have been building up for decades remain unaddressed. Unresolved environmental problems, in addition to military aggression, are also connected with the slow increase in the production of various types of biofuels, which would make it possible to gradually reduce the economy's dependence on fossil hydrocarbons.

A distinctive feature of scientific approaches to the transformation of environmental protection financing is the justification of revising the priorities of using public funds for environmental needs, as well as increasing the level of motivation of enterprises regarding the financing of environmental protection activities [19].

At the current stage of economic development, the following tools of the economic mechanism for regulating environmental protection activities can be distinguished:

- fee for nature use;
- a system of economic stimulation of environmental protection activities;
- for environmental pollution and disposal of waste;

creation of the natural resources market;

- improvement of the pricing system taking into account environmental factors, especially for products of nature-exploiting branches of the national economy;
- creation of environmental funds;
- environmental programming;
- license trade; bail payments;
- environmental insurance.

Financing of environmental protection activities is the main regulatory instrument in the field of environmental protection [20]. It is carried out at the expense of the state budget, local budgets, extra-budgetary funds for environmental protection, voluntary contributions, as well as from the profit of enterprises, organisations and institutions or from the receipt of certain benefits in their taxation Fig. 1.

It should be noted that the financing of environmental protection and rational use of natural resources in Ukraine is limited and carried out on a residual basis. Budget expenditures on environmental protection measures remain insufficient to meet the needs of the environmental protection sector.

Financing of environmental protection can be classified according to various characteristics [1].

1. The directions of use depend on the types of environmental protection activities covered in [12]: for the protection and rational use of water resources, for the protection of air, for the protection and rational use of land, for the protection and rational use of mineral resources, for the protection and rational use of natural plant resources, and so on.

2. According to the methods of formation of funds of financial resources in the field of environmental protection: tax and non-tax.

3. By sources of formation: GDP, funds of foreign states, international organizations, funds.

4. According to sources of financing: resources from the state and local budgets, resources from special funds, resources from enterprises, grants, international transfers, etc.

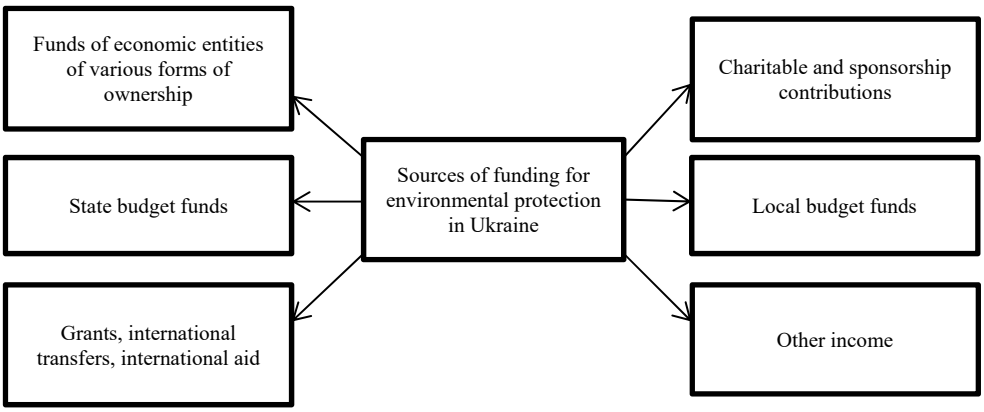


Fig. 1. Sources for financing environmental protection in Ukraine [13].

Financing of environmental protection in Ukraine, which includes both capital investments and current costs, is a key component of the financial mechanism of environmental management [18]. Currently, this financing is implemented through state targeted programs, the funds for which come from the State Budget in accordance with the developed plans for nature protection and resource conservation measures. These plans and estimates are approved by the chief managers of the budget funds in accordance with the procedure established by law.

Having analyzed the indicators of financial support at the expense of budget funds of Ukraine, we see that it is not sufficient and needs to be increased. This is evidenced by the ratio of budget expenditures on environmental protection to GDP (Fig. 2).

The data presented in fig. 2 indicate a long-term low level of indicators and indicate a decreasing trend for the period 2021 - 2023. This may have serious consequences for the environment and the health of citizens. A decrease in environmental safety can lead to an increase in air, water and soil pollution, which can threaten people's quality of life and cause a number of serious diseases.

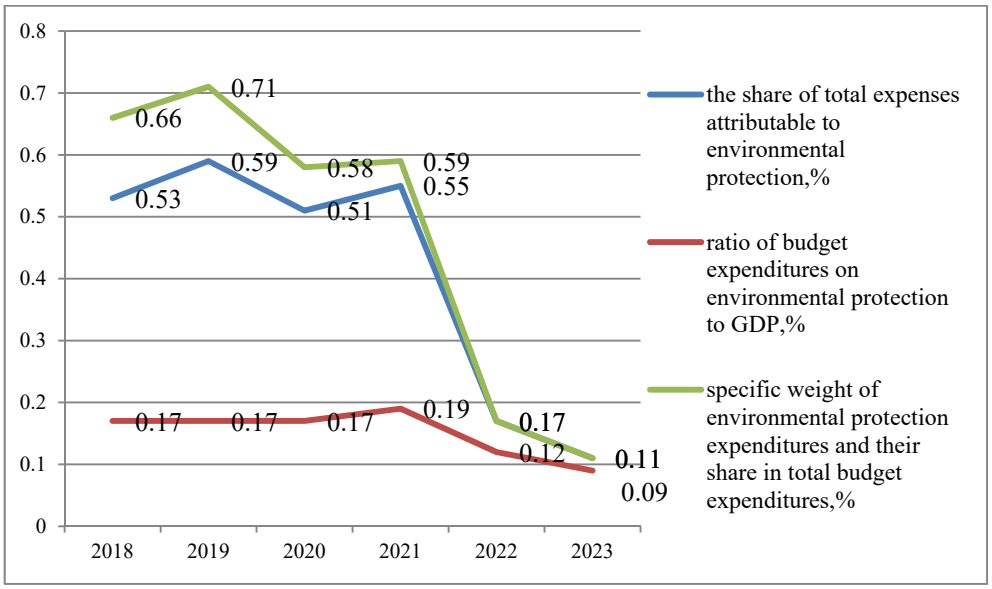


Fig. 2. Dynamics of expenses for environmental protection in the general expenses of the budget of Ukraine, % [9, 10].

The ratio of budget expenditures on the environment to GDP during 2018–2023 is also marked by a downward trend, which may have significant consequences for the country's environmental sustainability. Low spending on environmental protection compared to GDP can lead to deterioration of the country's environmental conditions. A decrease in funding in this direction also threatens the achievement of international standards for environmental sustainability and the fulfillment of obligations under international agreements. Despite the fact that the share of the budget is insignificant, but taking into account the scarcity of budget resources, the need for their targeted use, on the one hand, and the limited financial resources of economic entities in crisis conditions, on the other hand, the role and importance of budget financing increases significantly.

During the period of martial law in 2022-2023, Ukraine reduced spending on environmental protection, which is explained by the fact that the authorities are paying much attention to military operations and defense spending. It is quite understandable that in such conditions, environmental issues often become a lower priority compared to military action and security. In the conditions of a military conflict, the government can redistribute resources to immediate needs, leaving less money for long-term environmental protection programs (Fig. 3).

From Fig. 3, we see that in 2021, the lowest ratio of revenues to expenditures was 0,48. This indicates the inefficiency of the use of funds in a certain period, namely the ignoring of environmental initiatives or projects, the wrong direction of financial resources. From another point of view, inefficient environmental tax rates or improper adjustment of the tax system could have had an effect. Starting from 2022, the indicator begins to grow, this indicates that the country promotes sustainable development, creates positive incentives to invest in green technologies and activates business and various sectors of the economy to environmental initiatives.

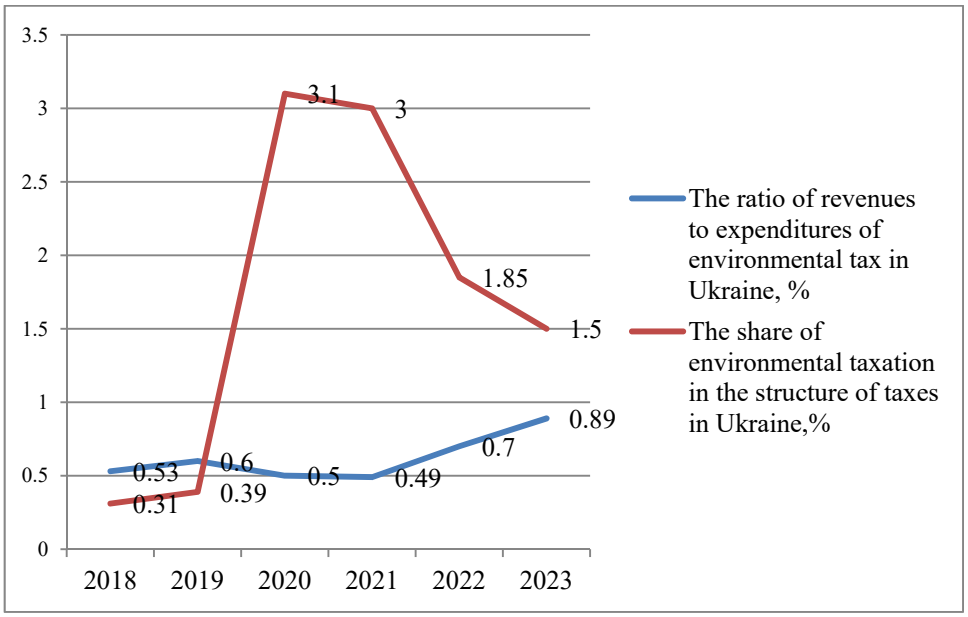


Fig. 3. Role of environmental taxes in Ukraine's tax structure [9, 10].

In terms of the ratio of environmental tax revenue to expenditure, it can be an indicator of how successfully the financial resources generated by environmental taxes are used to support and implement projects and programmes in the field of environmental protection and restoration possibilities. In the period of 2018-2019, we observe a pronounced low indicator, namely 0,30-0,39 in 2018-2019. This indicates a catastrophically low attention to environmental issues in tax policy, namely the lack of incentives for enterprises and citizens to reduce emissions and preserve natural resources from environmental taxation, which ultimately led to a low share in the tax structure. The indicator reaches its highest level in 2020-2021. Its growth could be related to the increase in environmental awareness of taxpayers and citizens, the efficient use of funds and the development of "green" technologies. In the period 2022-2023, the indicator is on the decline again as a result of a full-scale invasion.

4 Conclusions

The high level of military spending causes a decrease in funding for environmentally important projects. States invest heavily in the armed forces, instead of investing in measures to protect the environment, restore natural resources and develop ecological technologies. In addition, the high level of military spending can contribute to the growth of international tensions, which complicates the possibility of international cooperation in solving global environmental problems. For example, countries may be less inclined to cooperate in reducing greenhouse gas emissions or managing water resources when they are in conflict or in military competition. Therefore, in order to ensure sustainable development and the preservation of the environment for future generations, it is important to find a balance between military spending and spending on environmental measures.

The study of such an important source of financial support for environmental protection as budget funds showed that in Ukraine this resource is not fully used and requires additional research on the effectiveness of the use of funds from environmental taxation.

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