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## Environmental Security of Territories: Challenges of Today and Guidelines for Strengthening in War

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## Abstract

The article aims to develop methodological approaches to assessing the environmental security of territories, identifying the regions most affected by hostilities, and substantiating the strengths of strengthening during the war. Methodical courses are offered, and the corresponding express analysis of the balance of economic, social development and ecological safety of regions of Ukraine based on the related indicators is carried out. The results on a ten-point scale characterizing the standardized deviations of the above indicators from the median value by region showed significant imbalances in achieving the vectors of sustainable development. That is, implementing one or two vectors is currently carried out by neglecting others, which confirms the urgent need to find mechanisms for their effective balancing. It is determined that during the war in Ukraine, the strategic task of the state was to develop guidelines for strengthening environmental security due to significant destruction of infrastructure and ecosystem damage. Among the main strategic approaches for strengthening are identified: identification of settlements and areas in need of humanitarian demining, marking of dangerous sites, cleaning (demining) of territories, involvement in the elimination of the consequences of hostilities and emergencies of international aid, and others.

**Keywords:** ecological security; ecosystem; pollution; landmarks, war.

**JEL Classification:** H56; Q28; Q29; R00.

## Introduction

The military aggression of the terrorist state against Ukraine obliges to mobilize and simplify the reconstruction work to eliminate the consequences of armed attack and hostilities during martial law and in the reconstruction period after the end of hostilities, including their inclusion in those not needing environmental impact assessment (Ecobusiness 2022).

The sphere of ecological safety and efficient nature management remains one of the most vulnerable segments during the war, where the Black Sea region, Kharkiv, Donetsk, Luhansk, and Zaporizhia regions suffered the most. The current environmental problems of the area are the result of extensive production and nature management, as well as fierce fighting. This is typical for the industrial and agricultural complex of the region. Furthermore, the predominance of economic determinants of management decisions at all levels, residual funding of environmental programs, and insufficient ecological education lead to deteriorating environmental security.

An essential aspect of developing models for ensuring the synergy of economic, social, and environmental vectors in the Regional Development Strategies is to identify the current profile of the ecological situation, outline the most problematic issues and identify the vector of environmental security that illustrates the direction and achievements or gaps in the region's environmental policy.

## 1. Literature Review

It is worth noting that ecology has recently become one of the critical issues on the agenda of public authorities. In particular, in the drafts of the Strategies of the regions of the Black Sea region, Kharkiv, Donetsk, Luhansk, and Zaporizhia - environmental goals and measures to ensure ecological security of the region are recognized as one of the priorities. Military action in most regions of Ukraine has led to significant infrastructure damage. That is why in the construction of infrastructure Alina Lizunova (2019) believes that "with the issues of assessing the impact of road construction on the environment and the measures to reduce the level of environmental pollution by introducing environmental, technological, sanitary-technical and organizational measures». It should be noted that during the hostilities on the territory of Ukraine, most large enterprises suspended their activities or moved to safer areas. However, the article's authors emphasize that monitoring the region of enterprises will increase the level of environmental safety of the territory and adjacent settlements. In addition to the monitoring system during the liquidation process and the post-reclamation period, the liquidation project should include ecological analysis of the enterprise and environmental forecasting (Pohrebennyk *et al.* 2019).

The article defines at the theoretical level the essence of economic and environmental security, as well as of the restructuring of industrial and urbanized territories. Based on the expert survey, the main factors of restructuring of industrial areas are determined including directions, goals, and objectives of integrated restructuring of industrial areas. Recommendations are given for restructuring of industrial areas with respect to their planning structure, functional organization, and provision of an ecological condition (Shaimerdenova, Aigul *et al.* 2020).

The experience of countries where the war took place shows the collapse of environmental security in them, such as Iraq. The collapse of Iraq's environmental protection is a cautionary tale that reminds us why this concept deserves more priority in the global debate related to climate change, natural resources, and armed

conflicts. Addressing the conflict-environment nexus is becoming more urgent as more armed conflicts around the world damage ecosystems upon which people depend (Zwijenburg 2018).

The team of authors also consider the impact of globalization processes, decentralization on ensuring the environmental safety of socio-economic systems (Vyshnevskaya *et al.* 2022; Irtysheva *et al.* 2022). However, the evaluation of the impact of the introduction of waxing actions on ecosystems has not been paid enough attention. That is why the article aims to study environmental security and the formation of the ecosystem in the conditions of Russia's war against Ukraine.

## 2. Methodology

An essential step in assessing the effectiveness of sustainable development is the choice of mathematical assessment tools that will simultaneously identify weaknesses in the region to ensure progress in environmental security, evaluate progress in certain areas and ensure accessible interpretation of the data. To this end, we have proposed the following estimation algorithm:

1. Determine the direction and length of the vector of each target indicator for assessing the effectiveness of public administration in a particular area by the formulas:

$$\bar{G}_1 = \frac{1}{n} \sum_{i=1.1}^{1.n} (I_s \times 100 - 100) \quad 2.1$$

where  $\bar{G}_1$  – is the overall target within the selected vector. Shows the overall progress (+) or lag (-) of the region on a particular aggregate indicator;

$I_s$  – The standardized value of the indicator;

$I_f$  – The actual value of a single indicator of goal achievement;

$I_e$  – reference (target, comparative) value of the needle;

n – Number of indicators

Provided that the comparative indicators are expressed in absolute or relative terms, except for percentages or shares of the unit:

$$I_s = \frac{I_f}{I_e} \text{ (for stimulants) or } I_s = \frac{I_e}{I_f} \text{ (for destimulators)} \quad 2.2$$

Provided that the benchmarks are expressed as a percentage or fraction of a unit:

$$I_s = I_f - I_e \text{ (for stimulants) or } I_s = I_e - I_f \text{ (for destimulators)} \quad 2.3$$

2. Determine the total length of the vector of sustainable development:

$$\bar{V} = \frac{1}{m} \sum_{i=1}^m \bar{G}_i \quad 2.4$$

where  $\bar{V}$  - vector environmental safety region points.

m – Number of aggregate indicators.

The length of the vector of sustainable development is defined as the sum of aggregated indicators in the chosen direction (economic, social, and environmental).

3. Assessment of the general situation of the region in the context of achieving the goals of sustainable development is determined by the coordinates of the three-dimensional space:  $V_r$  (SEZ; CPR; SEB).

Optimal is the development in which economic, social, and environmental components are steady positive growth. The larger the obtained plane and, accordingly, the scalar length of the vector, the more effective the public management of sustainable development in the region. Other variants of the wrong triangle indicate the presence of specific development imbalances and require a review of economic, social, or environmental policies, as well as the intensification of public administration.

Given the different starting conditions for sustainable development of the regions of Ukraine, it is proposed to carry out the analysis in three stages.

At the first stage, the position of the region in the base year is determined in comparison with the best achievements in the field of sustainable development among other VT regions. That is, the maximum value (for progressors) or minimum (for regressors) value is selected as a reference value and compared with the corresponding actual data of the evaluated region.

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The second stage is to determine the region's progress toward achieving sustainable development goals. To this end, the actual value of each indicator is compared with the value achieved in the previous period (GT).

An essential stage of the evaluation is also the analysis of progress in the effectiveness of public governance of the region, carried out according to the proposed methodological approaches. At the same time, it is necessary to consider a certain time lag, management results, that are the consequences of the implementation of democratic and transparent procedures and decisions that are manifested in the economy not immediately but with an unavoidable delay, 2-3 years.

Methodological approaches assessed the current profile of the environmental situation in the Black Sea region and the vector of achievements in this area. A system of relevant indicators and indicators is proposed to determine the ecological component of greening management of regional development, listed in Table 1.

Table 1. Indicators and indicators of the environmental vector of sustainable development of the region

Indicators	Indicators	Marking indicator
Rational use of natural resources (P)	Use of fresh water per capita by region, m <sup>3</sup>	p <sub>1</sub>
	The share of discharged polluted water in% before their collection	p <sub>2</sub>
	The capacity of treatment facilities, million m <sup>3</sup> per 1 m <sup>3</sup> of collected surface water	p <sub>3</sub>
State of the air (A)	Volumes of pollutant emissions from stationary ones per unit area, kg	a <sub>1</sub>
	Emissions of pollutants into the atmosphere from stationary sources of pollution per capita, kg	a <sub>2</sub>
	Emissions of pollutants into the atmosphere from road transport per capita, kg	a <sub>3</sub>
Energy efficiency (E)	Share of thermal energy produced in the region from alternative fuels or renewable energy sources, %	e <sub>1</sub>
	Volumes of fuel and energy resources consumed in the region during the reporting period per capita of the region, ie oil equivalent	e <sub>2</sub>
	Share of a total capacity of boiler houses on alternative fuels in the region,%	e <sub>3</sub>
	Share of households that have concluded credit agreements within the framework of mechanisms to support energy efficiency measures in the housing sector at the expense of the state budget (including co-financing from local budgets),%	e <sub>4</sub>
Waste management efficiency (B)	Waste generation of I-III hazard class per capita, kg	B <sub>1</sub>
	Generation of hazard class IV waste per capita, kg	B <sub>2</sub>
	The proportion of waste disposed of specifically	B <sub>3</sub>
	allotted places or objects or burned (without energy), %	B <sub>4</sub>

Source: Systematized by the author

Thus, the proposed methodological approaches with a certain degree of adjustment to the monitoring objectives can be used to assess the region's achievements towards sustainable development, identify weaknesses and develop management decisions to optimize the functioning of certain areas of the economy.

### 3. Results and Discussion

Analysis and determination of the ecological profile of the Black Sea region, the indicators for 2015 and 2020 listed in Table 1 were collected and calculated. Using these tables, we consider the progress made in the Black Sea region in the context of greening regional development in terms of the main groups of indicators and criteria for 2015-2020.

One of the main goals of sustainable development of the regions is effective water resources management. This is because the problem of providing the population with quality drinking water is one of the critical tasks of local authorities, which affects the quality of life and health of the people and is an essential criterion for sustainable development. In particular, the National Report "Sustainable Development Goals of Ukraine" identifies the following recommendations for water resources management:

- achieving and maintaining the proper quality of natural waters through the introduction of integrated basin management of water resources;
- providing the population and other users with water of appropriate quantity and quality;
- ensuring access of the population to proper sanitary and hygienic means, first of all - to environmentally friendly drainage systems;

▪ improving the efficiency of water use in all sectors of the economy "(Sustainable Development Goals Ukraine, 2021).

In general, the supply of fresh water is one of the critical problems of the Black Sea region, in particular the Kherson region, the quality of which uses more than 23% of all collected water in Ukraine. This is primarily due to the peculiarity of agriculture in the region, which uses more than 90% of all water for irrigation. Despite the decline in population and total industrial production, freshwater use in Ukraine is growing. Thus, only for the period from 2015 to 2020, water use increased in Ukraine by 14% and in the Kherson region by 78%. At the same time, the region is one of the least freshwater regions in Ukraine. Problems of the region also include water loss during transportation (the largest% in Ukraine), obsolescence of water and sewage networks, and the share of wear in some locations is over 68%.

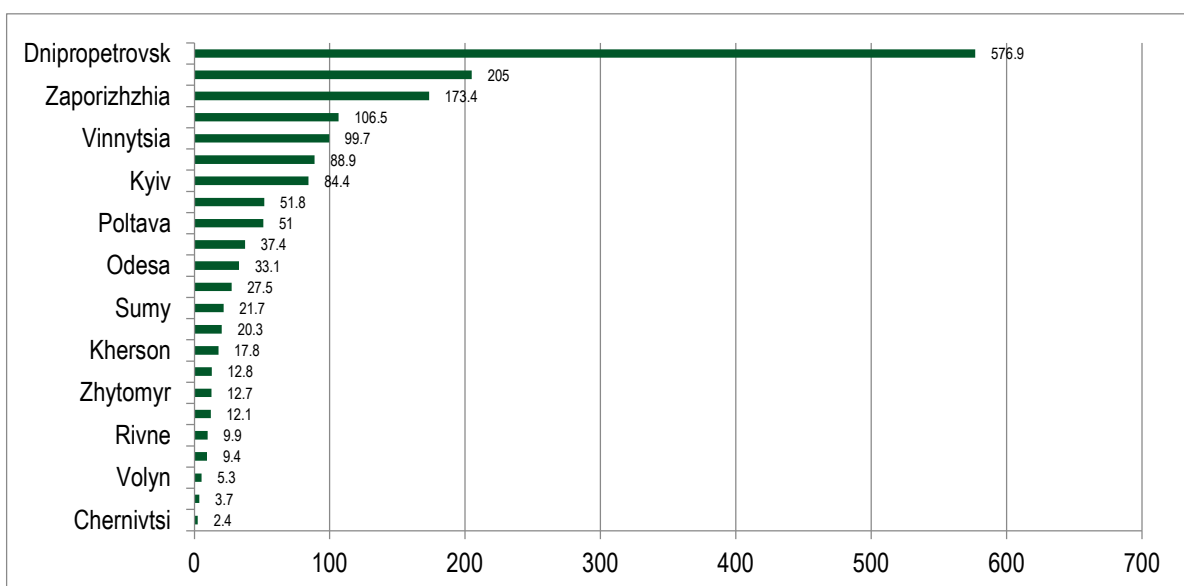
There is an increase in water consumption per capita in Ukraine and Odesa and Kherson regions. In particular, from 2015 to 2020, the volume of freshwater use per capita increased by 4.6% per region. In the Odesa region, the growth rate is over 10.9%, and in Kherson + 2%. Against the background of the general increase in water intake, the capacity of water treatment facilities is decreasing due to the decommissioning of some facilities due to their emergency condition. Among these indicators, the decrease in the share of discharged polluted water into natural water bodies in% before their collection by 0.4-1.6% on average is positive. These trends show that in water resources management, there are somewhat regressive trends that do not contribute to implementing the region's Sustainable Development Goals.

Atmospheric air protection is at the forefront of environmental policy and the Concept of Sustainable Development at both the global and national levels. Thus, the Draft Strategy for Sustainable Development of Ukraine until 2030 considers this area in the context of combating climate change and, among other things, provides:

- Integrating climate change response into policies, strategies, and planning at the national, sectoral, and regional levels; harmonizing national approaches with international requirements and standards.
- Development of the Strategy of low-carbon development of Ukraine for the period up to 2030 and ensuring its implementation.
- By 2030, reducing greenhouse gas emissions in all sectors of economic activity to a level not exceeding 60% of 1990 emissions.
- Introduction by 2020 of a national system of emissions trading (quotas) for emissions to stimulate the reduction of greenhouse gas emissions from significant stationary sources in a cost-effective and low-cost way (Sustainable Development Concepts, 2022).

Analyzing the trends in the field of emissions of pollutants into the atmosphere for the period 2015-2019, it should be noted that in general, in Ukraine their volume decreased by 14%.

Figure 1. Rating of regions of Ukraine on the volume of emissions of pollutants into the atmosphere from stationary sources of pollution, thousand tons in 2020



Source: Created by the author according to the data (State Statistics Service of Ukraine, 2022)

This was facilitated primarily by the reduction of production in industry, including metallurgy and the chemical industry, the gradual introduction of new technologies, and the modernization of treatment facilities. Donetsk, Dnipropetrovsk, and Ivano-Frankivsk oblasts, where the most significant production potential of the oil, refining, and metallurgy industries is concentrated, traditionally leading in the ranking of Ukraine's regions for 2020 (Figure 1) in terms of producing harmful emissions into the atmosphere. The oblasts of the Black Sea region occupy 12 (Odesa oblast), 16 (Kherson oblast), and 19 (Mykolaiv oblast) places, respectively. That is, the situation of hazardous emissions into the air in the region can be called the level of medium danger.

The calculations showed significant disparities in trends in the effectiveness of air protection policy among the regions of the Black Sea region and in comparison, with the average value in Ukraine. In particular, on average, in the areas of Ukraine for the last five years the volume of emissions into the atmosphere from stationary sources of pollution per unit area is 14%, and per capita by 12.3%. Similar trends are observed in the Mykolaiv region, where these figures are reduced by 16.7 and 21.3%, respectively. At the same time, in Odesa oblast, this period is characterized by an increase in emissions by 25% and 27.5 per capita, which indicates an increase in environmentally harmful production. According to statistics, more than 46% of harmful emissions in the Odessa region are generated by heat companies, which increase the urgency of developing regional programs for the development of alternative energy. In addition, the Odessa region is proliferating in terms of carbon emissions from mobile sources, including road transport, due to the general increase in the number of cars in the population and the region's growing role as an essential transport hub.

The situation is highly critical with the growth of harmful emissions from stationary sources of pollution in the Kherson region, where their volume per unit area and capita increased two times during the study period. Furthermore, air pollutants from road transport are also growing relatively fast in the region (+ 22.4% in 2019 compared to 2015).

Closely related to environmental security in the regions are the effectiveness of energy efficiency programs, which aim to reduce energy consumption on the one hand while ensuring high levels of productivity and quality of life, and on the other - will have a positive impact on the environment, formation of energy security of the region and economic stability.

The following indicators were used to assess the efficiency of public authorities in ensuring energy efficiency of production and consumption in the region: the share of heat produced in the region from alternative fuels or renewable sources; volumes of fuel and energy resources consumed in the region during the reporting period per capita of the region; the share of the total capacity of boiler houses on alternative fuels in the region; the percentage of households that have concluded credit agreements within the framework of mechanisms to support energy efficiency measures in the housing sector at the expense of the state budget (including co-financing from local budgets).

The regressors in this sample of indicators should include the amount of fuel and energy resources consumed per capita in the region. This indicator during the analyzed period, despite a significant increase in prices for energy resources and heat for the population, tends to increase in all regions. In particular, in Ukraine, this figure increased by 30%, and in the Black Sea region, there is a maximum increase - more than 43.7% in the Odesa region. On the other hand, the minimum increase during this period is observed in the Kherson region, which is characterized by a relatively high level of progress in terms of transition to alternative fuels and the implementation of energy efficiency measures in the residential sector.

Analyzing the motivating indicators, some positive trends in the gradual transition to alternative fuels and renewable energy in the regions should be noted. This was facilitated by implementing government programs and business lending in the field of energy efficiency and establishing "green tariffs". However, the pace of introducing energy-saving technologies and the transition to alternative fuels in the heat sector is insufficient to build an energy-efficient model of economy and housing in the regions.

A complex and acute problem that is characteristic of almost all regions of Ukraine is the problem of waste management. According to the authors of the monograph, the domestic waste management system is designed to ensure the appropriate impact on the environment and human health, which involves several tasks: complete collection and timely disposal and disposal of waste, compliance with environmental safety rules; minimizing waste generation and reducing their hazard; promoting the maximum possible disposal of trash through direct reuse or alternative use of resource-intensive waste; ensuring safe disposal of non-recyclable waste by developing appropriate technologies, environmentally friendly methods and means of waste management, etc."

Unfortunately, currently in most regions and OTGs, the issue of efficient waste management, and even more so the development of investment projects for waste disposal and recycling, is at the stage of understanding and finding the most effective models and resources for their implementation.

Analyzing the volume of waste generation in Ukraine for 2015-2020, the negative trends in their growth should be noted. In particular, the volume of waste generated increased by 150105 thousand tons (48.1%). At the same time, there is a steady annual trend toward their accumulation. Table 2 shows the main trends in waste generation and management in Ukraine.

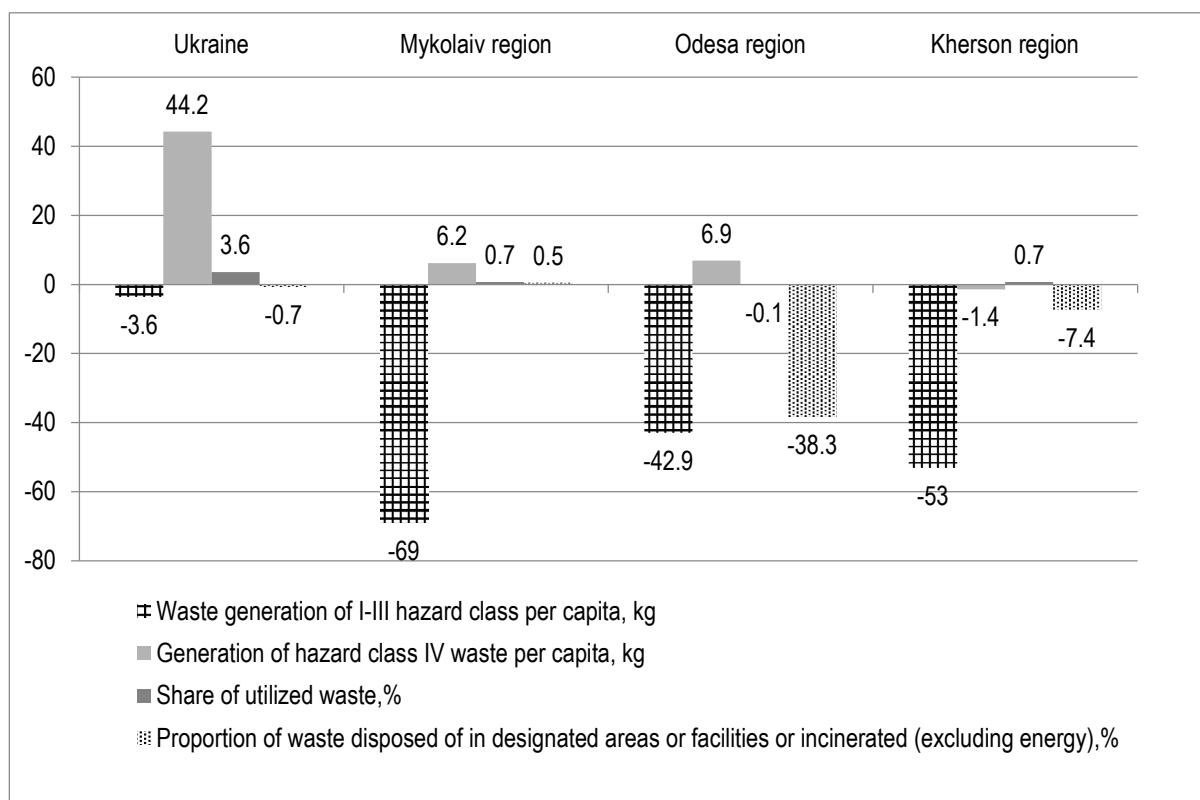
Table 2. Waste generation and management in Ukraine

Indicators, thousand tons	2015	2016	2017	2018	2019	2020	Growth rates, %
The amount of waste generated	312267.6	295870.1	366054	352333.9	441516.5	462373.5	48.1
The amount of garbage disposed of	92463.7	84630.3	100056.3	103658.1	108024.1	100524.6	8.71
The amount of incinerated waste	1134.7	1106.1	1064.3	1028.6	1059	1008.0	-11.16
The amount of waste disposed of in specially designated places and facilities	152295	157379.3	169801.6	169523.8	238997.2	275985.3	81.22
The total amount of waste accumulated during operation, in specially designated places and facilities	12505916	12393923	12442169	12972428	15398649	15635259.6	25.02

Source: Data from the State Statistics Service of Ukraine (2021)

These tables show that despite the increase in the amount of waste generated, some work is carried out on their disposal, sorting, and disposal in specially designated areas. Thus, the growth rate of generated waste exceeds the growth rate of accumulated waste by almost 25%. During the analyzed period, the share of recycled waste increased (25.02%). It is disposed of in specially designated places by 81.22%, the number of natural landfills decreases, administrative and explanatory work with the population on household waste management is carried out, and the level of ecological culture increases.

Figure 2. Indicators of progress in terms of indicators of waste management efficiency on average in Ukraine and in the regions of the Black Sea region for 2015-2020



Source: built and calculated by the author

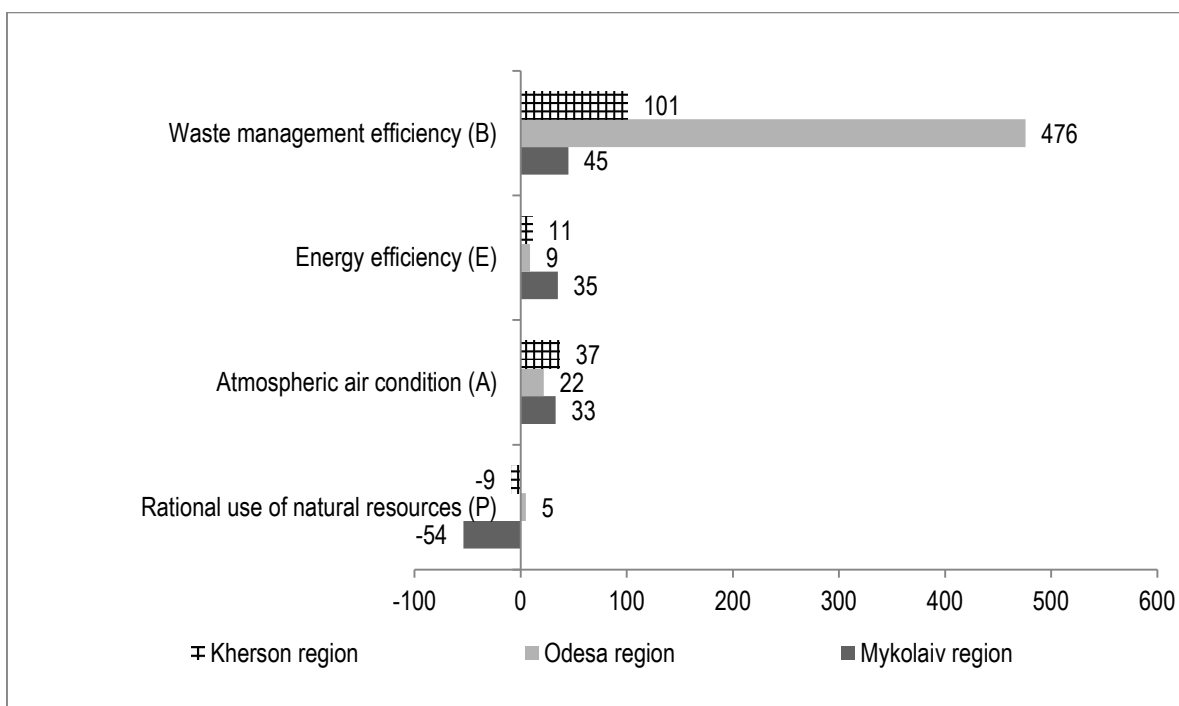
In the Black Sea region, there are divergent trends in the generation and management of waste, which indicates a lack of systemic unity in the organization of relevant work within the region and some settlements and OTG. In

Figure 2 the vectors of indicators of the waste management system in the context of the Black Sea region are given.

The decrease in the volume of hazard I-III waste generation per capita in all regions is positive. The most significant reduction (-69%) was achieved in the Mykolaiv area. The volume of hazard class IV waste generation in the region is growing but much slower than the average in other regions of Ukraine. Little progress has been made in disposing of generated waste and disposing of it in designated areas. The calculations showed that in the context of waste generation and management, the dynamics of the Black Sea region had made some progress compared to the average in Ukraine. However, this progress is insufficient and requires a significant amount of work at all levels of public administration to develop an effective waste management policy, construct recycling plants, and provide the population with quality services to remove household waste from settlements.

The ecological profile of the Black Sea region in 2020 is determined, shown in Figure 3.

Figure 3. Ecological profile of the Black Sea region (comparison with the average value in Ukraine), %



Source: built and calculated by the author

The obtained ecological profile of the regions of the region illustrates the weighted average indicators of the environmental situation of the region compared to the average value achieved in the regions of Ukraine in 2019, provided that all hands are given the same weight, taking into account their positive or negative impact on the environment. All indicators except the rational use of water resources are generally positive. Considering the peculiarities of the methodological approaches used, it is possible to conclude that there are specific achievements and advantages in the context of environmental safety. At the same time, given the general ecological situation in Ukraine, these indicators can be considered only relatively positive.

In addition to the considered elements of environmental security in the region, many other problems need to be addressed in the framework of sustainable development. The most significant are: unsatisfactory condition and use of land resources; negative anthropogenic impact on the restoration and conservation of forest resources; reproduction and protection of fish stocks and bioresources of the region; unsatisfactory technical condition of housing and communal services; water management systems and heat energy, etc.

Studies have shown that the region has several acute environmental problems that need to be addressed for sustainable development, particularly by balancing the vectors of economic, social development, and ecological security in Sustainable Development Strategies at all levels: national, regional, regional, and regional and individual OTG.

Based on the analysis and generalization of scientific works on the formation of the ecological model of regional development, the strategic priorities of greening sustainable development of the Black Sea region are identified, which should be implemented in relevant regional strategies at all levels of public administration, namely:

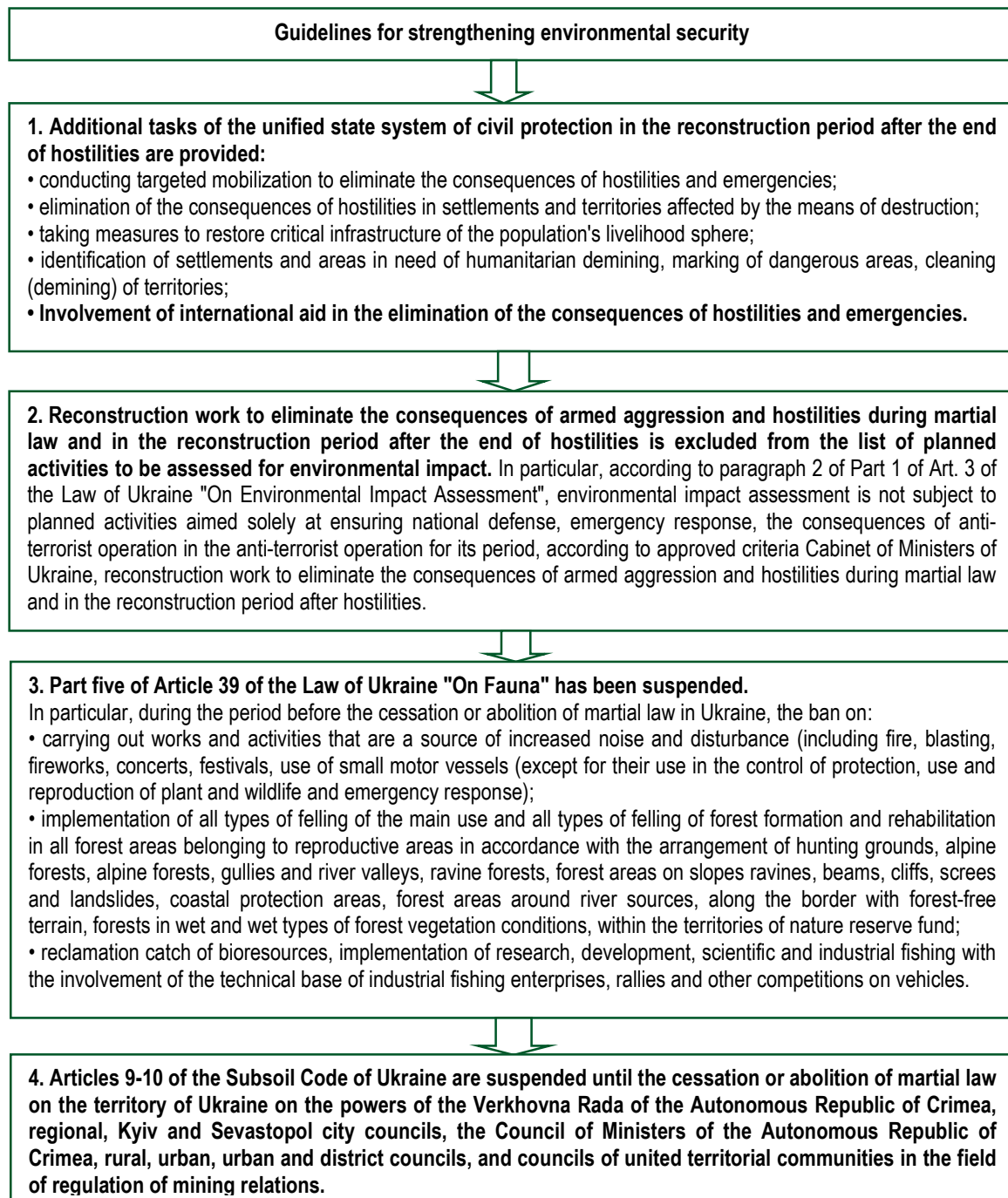


- 1) In the field of rational use of water resources, the priority tasks in the Black Sea region are:
  - resolving issues related to the allocation of funds for the restoration of drainage systems that are excessively worn out, the reconstruction of treatment facilities and sewerage networks;
  - Development of water supply infrastructure, in particular in rural settlements;
  - Providing the population with quality drinking water.
- 2) In the field of improving the state of the air, the most urgent tasks are:
  - Development of regional standards and quotas for harmful emissions from stationary sources, which are as close as possible to European standards in this area;
  - Priority state investment of projects involving the transition to the use of alternative energy sources, including solar and wind;
  - Preferential lending to enterprises that install equipment for cleaning emissions, gas traps, equipment for neutralizing the exhaust of internal combustion engines, neutralizers of toxic emissions, and other technological innovations to offset harmful emissions into the atmosphere produced by production and economic activities.
- 3) In the field of energy efficiency, it is essential to continue the gradual thermal modernization of housing and administrative and social infrastructure; intensification of cooperation between condominiums and OTG management bodies in the direction of creating funds and transparent use of funds for the implementation of thermal modernization projects; reconstruction and construction of new boilers and other heating systems in the order of transition to the use of alternative energy sources, reduction of energy consumption in energy transportation, etc.
- 4) In the field of waste management, the most important tasks are:
  - Construction of waste processing and incineration plants with electricity and heat generation in the suburbs of administrative centers, which will solve two problems simultaneously, namely - waste disposal and providing additional energy resources to cities and large settlements;
  - Ensuring waste sorting, increasing education and responsibility of the population in this area;
  - Organization of effective removal of household waste to specially equipped disposal sites.Equally important is the development of effective institutional, administrative, financial, and organizational mechanisms aimed at forming synergetic models of development and use of natural resources and the territories' human and economic potential.

Ukrainian and international environmental NGOs note that "we see our goal in the operational support and cooperation with public authorities at all levels to make and implement decisions that best meet the urgent needs of the war while creating minimal negative consequences for the security of the country from such decisions shortly. This refers to Ukraine's national security, including environmental security. In the short and long-term perspective, environmental security is a guarantee of a decent standard of living, safe for the environment, and is an integral part of further integration into the EU through the introduction of European standards in all areas" (IBO "Ecology-Law-Human", 2022).

In turn, domestic and international environmental NGOs offer "professional expertise and analysis of regulations, analysis of their impact on the period of martial law in the short and long term after the war. We are ready to involve leading national and international experts with experience in crisis and post-crisis management to mitigate the effects of hostilities and the negative impact of war on the environment. We are convinced that our operational support and expertise in the legislative process will help us make quick decisions that consider the conditions of martial law and help preserve Ukraine's natural resources in the future. Together, we must not only achieve victory and ensure the preservation of a healthy and safe environment and a decent standard of living in the context of further European integration" (IBO "Ecology-Law-Human", 2022).

Figure 4. Guidelines for strengthening environmental security during the war



Source: generated by the author (Ecobuzness, 2022).

## Conclusions

It is emphasized that one of the most vulnerable segments of the economy of most regions is in the field of environmental safety and efficient use of nature. Based on the principles of sustainability, developing a strategy for sustainable development of the region requires an assessment of the current situation and identification of major environmental problems and opportunities to overcome them from a strategic perspective. To this end, a system of indicators and indicators for the analysis of the ecological component of the regional economy in terms of the following features: rational use of natural resources, air quality, energy efficiency of production and livelihood systems, and waste management efficiency. Using the proposed system of indicators, indicators of progress in the development of each component and the current profile of the environmental situation of the Black Sea region as of the end of 2019 were determined. The analysis allowed us to identify several positive

achievements and problematic issues in the field of environmental security of the Black Sea region, which can be taken into account when developing the environmental Strategy of regions and individual OTG.

Methodical approaches are offered, and the corresponding express analysis of the balance of economic, social development and ecological safety of regions of Ukraine based on the related indicators is carried out: volumes of GRP, available incomes, and importance of harmful emissions per capita in the region. The results on a ten-point scale characterizing the standardized deviations of the above indicators from the median value by region showed significant imbalances in achieving the vectors of sustainable development. That is, implementing one or two vectors is currently carried out by neglecting others, which confirms the urgent need to find mechanisms for their effective balancing. It is determined that during the war in Ukraine, the strategic task of the state was to develop guidelines for strengthening environmental security due to significant destruction of infrastructure and ecosystem damage. Among the main strategic approaches for strengthening are identified: identification of settlements and areas in need of humanitarian demining, marking of dangerous sites, cleaning (demining) of territories, involvement in the elimination of the consequences of hostilities and emergencies of international aid, and others.

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