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European Integration of Ukraine in the Field of Water Resources Management: Adaptation and Implementation of the EU Water Framework Directive

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ABSTRACT

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The article reveals the conceptual foundations of Ukraine's European integration in the field of water resources management, taking into account the provisions of the Association Agreement and the EU Water and Environmental Acquis. which forms an integrated model of protection of surface, coastal and groundwater and determines the systemic tasks of sustainable water use. The need to transition to ecosystem approaches that provide for the prevention of degradation of aquatic ecosystems, gradual reduction of pollution and achievement of natural background levels of priority substances is emphasized. The importance of the directive on reducing the risks associated with floods and droughts in the context of climate change and increasing pressure on water resources was emphasized. The importance of the implementation of Directive (EU) 2020/2184, which leads to the updating of drinking water quality standards, monitoring methods and risk assessment systems, has been stated. The need for the introduction of integrated river basin management and standardization of environmental monitoring in accordance with European technical regulations has been identified. The role of the Law of Ukraine "On Drinking Water and Drinking Water Supply" in approximating national standards to EU standards and increasing the institutional consistency of procedures for assessing the quality of drinking water was noted. Regulatory changes in the field of radiation safety control of water are outlined, reflecting the deepening of integration processes with the EU. The content of the Water Strategy of Ukraine as a tool for adapting legislation to the requirements of the Water Framework Directive and Directive (EU) 2020/2184 is formulated. Ukraine's progress in the implementation of European standards, including the approximation of legislation, the creation of basin councils and the modernization of the monitoring system, was emphasized.



KEYWORDS

European integration, water resources management, EU Water Framework Directive, drinking water quality, river basins, water policy, adaptation of legislation.



Європейська інтеграція України у сфері управління водними ресурсами: адаптація та імплементація водної рамкової директиви ЄС

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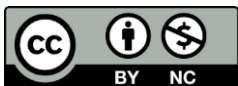
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У статті розкрито концептуальні засади європейської інтеграції України у сфері управління водними ресурсами з урахуванням положень Угоди про асоціацію та водно-екологічного acquis ЄС. Встановлено нормативно-правові орієнтири, що визначають напрям модернізації національної водної політики відповідно до вимог статей 361 і 365 Угоди про асоціацію, спрямованих на охорону довкілля та формування галузевих стратегій. З'ясовано зміст Водної рамкової директиви ЄС як базового документа, що формує інтегровану модель охорони поверхневих, прибережних і підземних вод та визначає системні завдання сталого водокористування. Наголошено на необхідності переходу до екосистемних підходів, що передбачають запобігання деградації водних екосистем, поетапне зниження забруднення та досягнення природних фонових рівнів пріоритетних речовин. Підкреслено важливість директиви щодо зменшення ризиків, пов'язаних із паводками та посухами, у контексті кліматичних змін і зростання навантаження на водні ресурси. Констатовано значущість імплементації Directive (EU) 2020/2184, що зумовлює оновлення стандартів якості питної води, методів моніторингу та системи оцінювання ризиків. Визначено потребу у впровадженні інтегрованого управління річковими басейнами та стандартизації екологічного моніторингу відповідно до європейських технічних регламентів. Зауважено роль Закону України «Про питну воду та питне водопостачання» у наближенні національних нормативів до стандартів ЄС та підвищенні інституційної узгодженості процедур оцінювання якості питної води. Окреслено нормативні зміни у сфері контролю радіаційної безпечності води, що відображають поглиблення інтеграційних процесів із ЄС. Сформульовано зміст Водної стратегії України як інструменту адаптації законодавства до вимог Водної рамкової директиви та Директиви (ЄС) 2020/2184. Підкреслено прогрес України у впровадженні європейських стандартів, включно з апроксимацією законодавства, створенням басейнових рад і модернізацією системи моніторингу.



КЛЮЧОВІ СЛОВА

європейська інтеграція, управління водними ресурсами, Водна рамкова директива ЄС, якість питної води, річкові басейни, водна політика, адаптація законодавства.

1. Introduction

The problems of adaptation and implementation of European approaches to water resources management are especially important in the context of the deepening of Ukraine's European integration course, because the state of aquatic ecosystems directly determines environmental safety, quality of life of the population and sustainability of socio-economic development. In this context, there is a need for a scientifically grounded definition of ways to adapt the national water policy to European standards, which is an important task of modern science and ensures the formation of an effective, sustainable and environmentally oriented water resources management system.

2. Literature Review

The analysis of works on the problems of European integration in the field of water resources management shows the significant attention of scientists to the issues of adaptation of legislation, institutional mechanisms and management tools. First of all, N. Palyanychko and V. Sakharnatsky substantiate the importance of financial and economic instruments in the modernization of water resources management systems [11]. V. Bredikhina analyzes the normative aspects of the approximation of the water legislation of Ukraine to the EU *acquis* [1]. N. Tarasiuk, I. Magdyuk and V. Kovalska investigate the mechanisms of integration of the requirements of the EU Water Framework Directive into the national hydrological management system [17]. The work of S. Vykhryst substantiates the importance of digitalization of environmental monitoring as a prerequisite for the effective fulfillment of Ukraine's environmental obligations to the EU [20]. M. Serbov considers the possibilities of adapting the world experience in freshwater resources management in the context of the implementation of the Water Framework Directive [14]. G. Shtogrin determines the importance of introducing the principles of integrated management into sectoral subcomplexes of water management [16].

3. Problem Statement

The article is aimed at analyzing the main aspects of Ukraine's European integration in the field of water resources management with an emphasis on adaptation and implementation of the provisions of the EU Water Framework Directive.

4. Methods and Materials

The study is based on a comprehensive analysis of the regulatory, conceptual and institutional foundations of Ukraine's European integration in the field of water resources management. In the course of the work, the following groups of materials were used: international legal documents of the European Union, in particular: EU Water Framework Directive 2000/60/EC; Directive (EU) 2020/2184 on the quality of water intended for human consumption; related technical documents and methodological recommendations of the European Commission and the European Commission environmental agencies for environmental monitoring, basin management and risk assessment; national regulations of Ukraine, including: the EU-Ukraine Association Agreement (Articles 361, 365); the Law of Ukraine "On Drinking Water and Drinking Water Supply"; the Law of Ukraine "On Environmental Protection"; by-laws of the Cabinet of Ministers of Ukraine and the Ministry of Health on sanitary standards, radiation and chemical safety of water; the Water Strategy of Ukraine and strategic documents on river basin management; analytical and statistical sources, including: official data of the State Agency of Water Resources of Ukraine; reports of the European Environment Agency; materials of international organizations (WHO, UNECE, OECD) related to water resources management and adaptation of sectoral reforms. For the processing of these materials, a system of modern scientific methods was used, in particular:

Method of normative and legal analysis. It is used to systematize European and Ukrainian legal acts, determine the scope and content of Ukraine's obligations in the field of adaptation of water legislation, as well as assess the compliance of national standards with the requirements of the EU Water Framework Directive and Directive (EU) 2020/2184. Method of comparative legal analysis. It made it possible to compare the provisions of the EU *acquis* with the Ukrainian regulatory framework, identify gaps, determine the priorities of harmonization and the degree of consistency of mechanisms for river basin management, monitoring and control of water quality. System method. Aims to consider water

management as an integrated ecosystem and administrative system that includes environmental, institutional, sanitary and technological components. Content analysis method. The EU strategic, technical and monitoring documents, reports of the Ukrainian authorities were developed, which made it possible to identify key trends, management tools and compliance indicators. Method of scientific generalization and synthesis. It was used to form a comprehensive picture of the implementation of ecosystem approaches, modern standards of drinking water quality, pool management and monitoring systems.

5. Results and Discussion

The current stage of Ukraine's European integration is characterized by the deepening of sectoral cooperation in strategically important areas, among which water resources management occupies a special place. In this context, the provisions of the Association Agreement between Ukraine and the European Union [19], which form the regulatory framework for cooperation in the field of environmental protection, are of particular importance. Thus, Article 361 of the Association Agreement between Ukraine and the European Union [19] regulates the comprehensive direction of cooperation in the field of environmental protection, which includes the preservation, protection, improvement and reproduction of the quality of the natural environment. In this context, the focus on public health, rational use of natural resources, as well as support for international actions aimed at overcoming regional and global environmental challenges, in particular in the direction of improving water quality and water resources management, including the marine environment, is decisive. The above wording sets the conceptual framework for harmonizing Ukrainian environmental policy with European approaches, which actualizes the modernization of the water resources management system.

It is noteworthy that Article 365 of the Association Agreement between Ukraine and the European Union [19] specifies the direction of cooperation, focusing on the development of sectoral strategies in the areas of water quality improvement and water resources management, also covering marine ecosystems. The document emphasizes the need to form financial mechanisms and incentives to attract investment in infrastructure and technological solutions that ensure sustainable water management.

It is appropriate to emphasize that the adaptation of these norms to the Ukrainian legislative field requires simultaneous updating of methodological, organizational and financial mechanisms. That is why the provisions of the Agreement serve as an important methodological guide for the formation and implementation of a strategically coordinated water management policy.

It should be noted that the important purpose of Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy [4], i.e., the EU Water Framework Directive, is to form a comprehensive regulatory framework for the protection of inland surface, transitional, coastal and groundwater waters. It is noteworthy that this directive defines several system blocks of tasks that cover environmental and resource-economic aspects of water policy. In particular, the document provides for the prevention of further degradation of aquatic ecosystems and the improvement of their ecological status, including land and wetlands, the functioning of which is determined by the relevant water regimes.

The analysis of the content of the directive also focuses on the need for a gradual transition to sustainable water use models based on long-term conservation of water resources. In this context, mechanisms for minimizing discharges, emissions and leakage of priority substances and phasing out their flow into water bodies are especially important. Along the way, it is worth emphasizing that this provision is integrated into the broader European environmental policy, focused on eliminating priority hazardous substances and achieving such levels of their concentrations that correspond to natural background values or tend to zero for synthetic components [4].

At the same time, the directive outlines a fundamentally important goal – to ensure a progressive reduction in the level of groundwater pollution and prevent its further spread. The complexity of the methodology here is due to the fact that groundwater plays a critical role in maintaining water balance and providing the population with drinking water, and therefore requires increased institutional attention. Additionally, the need for measures aimed at reducing the risks associated with floods and droughts, which is becoming increasingly relevant in the context of climate change, is emphasized.

Significantly, these tasks are aimed at achieving integrated results, including: guaranteeing sufficient reserves of surface and groundwater of good quality; significant reduction in groundwater pollution; increased level of protection of territorial and sea waters; fulfillment of obligations stipulated by international agreements on the prevention of pollution of the marine environment and the elimination of its consequences [4].

In this regard, it is appropriate to emphasize that Ukraine has undertaken to implement a set of European environmental norms and standards, among which Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption (recast) (Text with EEA relevance) [6] (hereinafter Directive (EU) 2020/2184) on water quality is of particular importance, intended for human consumption. Obligations to adapt this directive necessitate the modernization of national standards for controlling the quality of drinking water, revision of monitoring methodologies and updating approaches to risk assessment in the field of water supply [12].

It should be noted that the implementation of the provisions of the directive provides for a significant transformation of management models in the water sector. Therefore, the Ukrainian water management system requires a transition to integrated approaches at the level of river basins, which corresponds to the conceptual foundations of the Water Framework Directive. It is also important to standardize environmental monitoring procedures, because the reliability and consistency of data directly create the basis for a correct assessment of the ecological state of water bodies. In this aspect, it is useful to introduce complex-level surveillance systems that integrate modern methods of laboratory analysis, remote sensing and digital data processing technologies [7; 15].

It should be noted that Article 6 of the Law of Ukraine “On Drinking Water and Drinking Water Supply” of 10.01.2002 No. 2918-III [10] forms the fundamental guidelines of the state policy in the field of providing the population with high-quality drinking water. It is noteworthy that this article focuses on the need for gradual approximation of drinking water production technologies, wastewater treatment standards, as well as measuring tools and assessment methods to the relevant practices adopted in the EU Member States.

In addition, the provisions of Article 28 of the same Law [18] determine the mechanism for approving safety indicators and individual indicators of drinking water quality. In particular, it is envisaged that the relevant decisions are made by the central executive body responsible for the formation and implementation of state policy in the field of healthcare. Along the way, it should be emphasized that the competence of this body includes the approval of the list of reference methods for measuring the content of pollutants and pesticide residues in drinking water, which significantly increases the integrity and reproducibility of assessment procedures.

Safety indicators and individual indicators of drinking water quality, in accordance with the provisions of the article, should be approved on the basis of international and state sanitary standards, sectoral instructions and recommendations, as well as documents of relevant international organizations. At the same time, in the absence of such requirements, priority is given to EU standards, which rationally correlates with Ukraine’s European integration trajectory in the field of water resources management [18]. Noteworthy is the requirement according to which the approval of indicators that are not in the documents of international organizations or establish a higher level of health protection is carried out only if there is scientifically based evidence that meets the criteria approved by the same international institutions.

In this context, it is appropriate to emphasize that the mechanism for adapting drinking water quality standards defined in the legislation actually creates institutional conditions for synchronizing the national water supply policy with the environmental and sanitary requirements of the EU. This synchronization is of strategic importance because it ensures the compatibility of Ukrainian practice with the provisions of Directive (EU) 2020/2184 and the methodological approaches of the Water Framework Directive.

It should be noted that the Order of the Ministry of Health of Ukraine “On Amendments to the Order of the Ministry of Health of Ukraine dated May 12, 2010 No. 400 and to the State Sanitary Norms and Rules “Safety Indicators and Certain Indicators of Drinking Water Quality under Martial Law and Other Emergencies” dated 29.11.2024 No. 1984 [10] was adopted based on a significant regulatory complex, which includes amendments to part two of Article 26 of the Law of Ukraine “On the Public Health System”, subparagraph 4 of paragraph 115 of the Action Plan for the implementation of the recommendations of the European Commission set out in the Progress Report of Ukraine under the 2023 EU Enlargement Package, as well as the provisions of government acts regulating the activities of the Ministry of Health. It is noteworthy that this order is aimed at ensuring an adequate level of protection of the population by taking into account the requirements of Council Directive 2013/51/Euratom of October 22, 2013 [5], which establishes standards for the permissible content of radioactive substances in water intended for human consumption.

In addition, the analysis of the provisions of the same order details the procedural aspects of hygienic assessment of drinking water quality. In particular, it is indicated that control over radiation

safety parameters in places of water intake of surface and underground sources is carried out in accordance with the established parametric values of sanitary standards [10]. It is advisable to emphasize that the update of sanitary requirements in the direction of monitoring the radiation safety of drinking water indicates the deepening of integration processes between Ukraine and the EU in the field of water management.

It should be noted that the Water Strategy of Ukraine [2] (hereinafter referred to as the Strategy) outlines the basic principles of state policy in the field of protection and rational use of water resources, as well as defines systematic approaches to their reproduction based on integrated management. The document formulates interrelated areas for improving water policy, which provide for increasing the level of water security and reducing risks associated with the use of water resources. It is noteworthy that the strategic provisions are structured taking into account Ukraine's obligations in the field of European integration, which necessitates the harmonization of national norms with the provisions of EU legislation.

In this context, the Strategy contains a detailed orientation on the elimination of terminological inconsistencies in terms of defining the concept of "drinking water", adaptation of the system of standards to the requirements of Directive (EU) 2020/2184 on the quality of water intended for human consumption, as well as the development of environmental standards for surface and groundwater bodies in accordance with the EU *acquis*. It is appropriate to emphasize that special emphasis is placed on ensuring the preparation and implementation of river basin management plans in accordance with the provisions of Directive 2000/60/EC, as well as on the development of flood risk management plans in accordance with Directive 2007/60/EC. Incidentally, it should be noted that the strategic benchmark is a phased expansion of the water monitoring network, which must meet the requirements and technical standards of the EU, including increasing the number of observation stations and improving the quality of analytical capabilities.

Significantly, the implementation of the directions defined by the document optimizes the internal water resources management system, as well as forms holistic conditions for the transition to the full implementation of the EU water and environmental policy. In this regard, it is worth highlighting the methodology aimed at the formation of environmental standards that provide assessment of the state of water according to integrated indicators and correspond to the ecosystem rationality of the Water Framework Directive.

Despite the ongoing armed aggression, Ukraine has made significant progress in implementing the provisions of the Water Framework Directive. According to the competent authorities [14], the approximation of the main norms of national water legislation to EU law has been completed, the boundaries of river basins have been defined, basin councils have been formed as institutions for stakeholder participation, and the water monitoring system has been modernized, including through the creation of four modern laboratories. Significantly, these developments have received a positive assessment of the European Commission, which confirms the compliance of national measures with the requirements of the European water policy.

The Government of Ukraine has already approved river basin management plans for nine basins, within which 9173 surface water bodies and 173 groundwater bodies have been identified. These include plans for the management of the river basin of the Danube, the Black Sea region, the Crimea, the Azov region, the Vistula, the Dniester, the Southern Bug, the Dnieper and the Don for 2025–2030 [9]. It is worth noting that these plans integrate elements of water body pressure analysis, environmental assessment, action programs and monitoring mechanisms, which are fully correlated with the provisions of the Water Framework Directive.

Significantly, the development of European integration structures in the field of ecology was reflected in the launch of the EU4Green Recovery East program on March 12, 2025, aimed at supporting the Eastern Partnership countries in green reconstruction processes. The program provides EU funding of €21.3 million for 2025-2028, which makes it possible to support the reform of environmental management systems and strengthen institutional capacities in the field of circular economy and sustainable water use.

In this context, it is appropriate to emphasize that EU4Green Recovery East opens up additional opportunities for Ukraine to modernize the water management sector, in particular in the direction of economic assessment of water use, pollution reduction and the development of cross-border cooperation. At the same time, the program expands resources for government agencies and businesses, especially small and medium-sized ones, which will contribute to increasing resource efficiency and strengthening innovative approaches to water system restoration.

At the same time, the order of the Cabinet of Ministers of Ukraine “On Approval of the Concept of the State Target Social Program for the Improvement of Drinking Water Supply of Ukraine for the Period up to 2035” dated 19.11.2025 No. 1271-p [3] emphasizes that solving complex problems of providing the population with high-quality drinking water requires a systematic methodology. In particular, the insufficient level of access of households to the infrastructure of centralized water supply is emphasized, which is especially typical for rural areas, as well as the deepening of risks associated with the unsatisfactory technical condition of water supply facilities and the unprofitability of water supply enterprises [3]. It was stated that these challenges have been significantly intensified as a result of the large-scale destruction of water infrastructure caused by the armed aggression of the Russian Federation against Ukraine, which additionally actualizes the need to form a unified regulatory approach to ensuring water quality.

In this context, it is envisaged to develop and implement the State Standards of Ukraine (DSTU), which should ensure the gradual approximation of national legislation to the EU requirements in the field of drinking water supply [3]. This measure is aimed at unifying technical and sanitary standards in accordance with EU regulations, which in turn creates the necessary prerequisites for adapting the industry to the provisions of the Water Framework Directive and related European acts [13]. It should be noted that the harmonization of standards will help strengthen the institutional capacity of authorities in the field of monitoring, control and planning of water resources.

It is also worth emphasizing that the implementation of DSTU, harmonized with the EU requirements, will create prerequisites for the formation of a single technical space, in the structure of which the processes of production, transportation and quality control of drinking water is subject to unified criteria.

At the same time, the introduction of updated standards implies the need to modernize equipment, digitalize quality control processes and update laboratory analysis methods, which requires significant investments [8]. However, it is these institutional transformations that make it possible to form a modern model of water resources management focused on risk prevention, ensuring the sustainability of water supply and compliance with environmental goals defined in EU policy. In view of this, the adaptation of national standards to European requirements is an important element of Ukraine’s integration progress in the field of water policy.

6. Conclusions

Summarizing the above material, it is advisable to state that the European integration of Ukraine in the field of water resources management provides for the harmonization of national policy with the provisions of the EU Water Framework Directive, Directive (EU) 2020/2184 and the relevant provisions of the Association Agreement between Ukraine and the EU, consistently ensures the modernization of regulatory, institutional and technical mechanisms of water management. At the same time, the implementation of these acts actualizes the need to implement integrated approach to river basin management, improvement of monitoring systems and harmonization of water quality standards in accordance with European requirements. In addition, the strategic provisions of the Water Strategy of Ukraine and the update of sanitary standards in the field of drinking water supply confirm the systemic nature of the state policy aimed at increasing the level of water security and environmental sustainability. Finally, the progress made in the development of river basin management plans, the modernization of laboratory infrastructure and the launch of European support programs testify to the progressive strengthening of Ukraine’s institutional capacity and its approximation to the comprehensive standards of EU water and environmental policy.

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