

IMPROVING THE MANAGEMENT OF UKRAINE'S IRRIGATION AND DRAINAGE INFRASTRUCTURE WHILE APPLYING ESG REQUIREMENTS

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Abstract: *The main problems of managing irrigation and drainage infrastructure facilities in Ukraine are considered in connection with the practice of applying ESG methods for environmental, social and management components in relation to the provision of irrigation and drainage services. In the context of harmonizing the financial reporting of Ukrainian enterprises with the reporting requirements of the EU countries, a regulatory framework is being prepared for the implementation of sustainable development reporting as part of public reporting of enterprises. According to the requirements of ESG-reporting, information disclosure is provided for the following items: presentation of consequences of the use of natural resources in the format of ESG-reporting, which discloses information about the activities of companies in the field of Environmental aspects, Social responsibility and corporate Governance. Including irrigation and drainage engineering infrastructure in the scope of activities and reporting will contribute to a significant improvement in the condition and return on such assets of water users. The article substantiates the need to provide water users of Ukraine with information on the management of infrastructure facilities in ESG-reporting. The introduction of ESG management elements into the practice of operators and water users will contribute to the restoration of engineering infrastructure facilities and the increase in the area of irrigated land, drainage systems, achieving and maintaining good condition of river basin areas, protecting territories and settlements from the harmful effects of water. The paper highlights the problems of managing irrigation and drainage infrastructure facilities in Ukraine, reflects the practice of applying ESG methods.*

Key words: *ESG, ESG reporting, sustainable development, infrastructure management.*

JEL: Q25, Q56, Q58

Introduction

In Ukraine, due to the low level of natural moisture supply and the poor condition of the irrigation and drainage engineering infrastructure, there is an urgent need for significant restoration of irrigation and drainage engineering infrastructure facilities, which has been confirmed in regulatory legal acts [1, 2]. Previously, the solution of the problems of applying ESG factors was highlighted [3], the importance of developments in ESG reporting [4], ESG indicators in the priority of irrigation and drainage infrastructure in Ukraine [5], and the role of ESG reporting of companies in water resources management was indicated [6]. The works reveal individual aspects of ESG regarding the regulation of the irrigation and drainage sector [9-13]. The rational use of irrigation and drainage infrastructure facilities and water resources by water user companies requires the development of strategies and adherence to their chosen policies in terms of managing these facilities: drawing up programs and plans; implementing environmental protection actions, reflecting the economic effect and documenting all transactions; minimizing negative impacts on the environment. Previously, the use of ESG indicators to stimulate the development of the irrigation and drainage sector was not considered. Despite the current lack of experience in reporting water users in Ukraine according to ESG rules, research and problem-solving of best management practices are needed. **The purpose of the study:** to indicate the directions for improving the management system of the engineering infrastructure of irrigation and drainage of Ukraine through the implementation of ESG-factor components.

Materials and methods Comparison, analysis

Basic content

A modern element of management in the global world is the responsibility of business entities and the publication of reports on their activities according to ESG standards. The growing importance of regulatory influence on the practice of operating enterprises in Ukraine is due, in particular, to the introduction of requirements for mandatory disclosure of information on sustainable development in their reports into regulatory acts on accounting and financial reporting of enterprises. The composition and structure of ESG reporting will be based on the approved taxonomy, consistent with EU practice. ESG performance is measured by integrating quantitative and qualitative indicators. Quantitative indicators are measurements of physical indicators: water supply and withdrawal volumes, use of drainage water for irrigation; rational energy consumption, number of accidents at work; qualitative indicators are policies, procedures and systems implemented by the company: anti-corruption rules, codes of ethics, carbon footprint reduction plans, etc. [7].

Problems of management of irrigation and drainage infrastructure facilities in Ukraine

Based on the recognized facts that with insufficient moisture supply, crop yields directly depend on the ability of irrigation systems to function effectively, it is necessary to provide water for irrigation of crops at the right time and in sufficient quantities. Growing high and stable yields on irrigated and drained lands is possible provided that the engineering infrastructure facilities of land reclamation systems are in proper, operational technical condition. Scientific research has proven that the situation in the irrigation sector in Ukraine is in crisis and the existing engineering infrastructure of irrigation and drainage systems is further deteriorating. In recent years, there has been a significant reduction in the area of actual irrigation; outdated pumping and power equipment in irrigation systems has reached its standard operating life, the water supply process is characterized by high energy intensity and is accompanied by high costs for water supply, which means that water users, agricultural producers, and farmers cannot pay for significantly increased services and irrigate their lands. The scientific and conceptual principles of the restoration and development of irrigation and drainage in Ukraine have become the basis for the justified introduction of an innovative and investment model of management in the field of irrigation and drainage through the implementation of the "Irrigation and Drainage Strategy..." using an integrated approach with the simultaneous implementation of measures to modernize land reclamation systems, institutional reform, and legislative support [1, 8].

Further development of the reform of the field of management of irrigation and drainage infrastructure facilities involves a transition to the process of generating revenues by organizations providing services from the performance of work on the provision of services for the abstraction (delivery) and/or diversion of water for the needs of hydrotechnical land reclamation. The operator, as a person providing services, is obliged to provide services for the abstraction (delivery) and/or discharge of water for the needs of hydrotechnical land reclamation, as well as to meet other needs of water users in water resources not related to hydrotechnical land reclamation, subject to the availability of appropriate technical capabilities and water resources, to all owners (users) of land plots included in the service area of the land reclamation network (another component of the land reclamation system) operated by it, as well as to other water users. The specified management system model provides for increasing the level of reliability and ensuring the effective functioning of engineering infrastructure facilities of land reclamation systems of Ukraine, which are state-owned and provide services to water users, based on the essence of the land reclamation system as a technologically integrated complex that ensures the intake and delivery of water from the water discharge point/its discharge to the water discharge point. When implementing such foundations, measures should be taken to ensure the sustainable functioning of irrigation and drainage systems, in particular through the restoration and modernization of engineering infrastructure facilities and the operation and maintenance of existing systems, and a well-founded selection of priority facilities for

system restoration should be made; necessary work should be carried out to ensure a high operational condition of engineering infrastructure facilities and the operating mode of such facilities; sufficient volumes of water for irrigation are taken into account, the deficit in water supply capacity is eliminated, etc. It is also envisaged to implement investment programs of the operator of engineering infrastructure facilities of land reclamation systems that are in state ownership on the basis of relevant calculations, justification of the feasibility and effectiveness of such measures [2]. Therefore, it is necessary to introduce the latest models of management of land reclamation infrastructure facilities. In Ukraine, there is already positive experience in the functioning of a progressive form of servicing engineering infrastructure facilities - water user organizations (WUs) - a water user organization is a non-profit legal entity created to ensure the use, operation, maintenance, construction and/or restoration of engineering infrastructure facilities of land reclamation systems in order to provide services to customers [2]; currently, 77 WUs have been established in 14 regions of Ukraine, of which 64 organizations are in irrigation, and 13 units are in drainage. Of the total number, 10 WUs have already become owners of land reclamation infrastructure, and 35 units have registered land reclamation infrastructure objects in the State Land Cadastre of Ukraine, thereby acquiring the right to acquire them as property.

The successful implementation of the reform of the management of the engineering infrastructure of land reclamation systems in Ukraine involves the use of effective management elements, among which measures based on ESG approaches occupy a prominent place.

Practice of applying ESG methods

When developing the main principles of the management methodology regarding the environmental component - promoting the sustainable development of entities managing irrigation and drainage infrastructure through the use of methods to stimulate the introduction of the latest technologies for the conservation and rational use of water and land resources in the management of irrigation and drainage systems infrastructure; the introduction of resource-saving technologies and the preservation of the natural **environment**. Significant efforts are being made to use renewable energy sources, reduce the impact of climate change, implement water users' own environmental policies, use natural resources with low impact on nature, recultivate agricultural lands, promote the development of a "circular" economy, and stimulate the expansion of the production of eco-products. In the implementation of this component in Ukraine, educational seminars, trainings and consultations are conducted for farmers on the implementation of environmental practices, technologies that reduce the negative impact on the environment, such as water-saving irrigation systems or organic farming methods [9]; management methods that ensure environmental sustainability are analyzed, namely investments in organic farming, soil restoration, water resource conservation; energy efficiency is ensured by promoting the implementation of technologies and practices that reduce energy consumption [10]. The environmental component of the management system model includes indicators that characterize the impact of the enterprise's activities on the environment: the level of energy efficiency, indicators of the use of water and material resources [11, 13]. It is expected to reduce losses from the deterioration of the impact of climate change, ensure the protection of territories from the harmful effects of water, contribute to the improvement of the ecological state of water (river) basins, carry out the restoration (including those damaged after hostilities) of objects, etc. In Spain, for example, any agricultural investment must take into account ESG criteria, primarily out of conviction, but also due to market and investor demands; an important direction is considered to be the application of irrigation systems and technologies for efficient water use [12].

Social component - encouraging the creation of new jobs, attracting highly qualified specialists and ensuring the active participation of employees in the management of the water management and reclamation complex, reducing the extraordinary humanitarian impact of the war on the population of the area served by the reclamation network, participating in social projects to assist people affected by the war (social housing, social protection and volunteer movement, etc.), data protection and

confidentiality, employment of war veterans; expanding the possibilities of using infrastructure facilities, for example, tourism, recreation, implementation of gender policy, restarting the Ukrainian model of development in the deoccupied territories, etc. Currently, the role of communities in self-government tariff setting is being strengthened. Social aspects include workers' rights, gender equality, training, occupational safety, and supply chains [13].

The management (corporate **Governance** component) is moving towards a model of decentralized management of irrigation and drainage infrastructure with financial support for the functioning of the irrigation and drainage sector from the funds of service users (fully/partially) using budget funds until the transition to a self-financing regime. It is planned to apply modern management elements, in particular, it is believed that inclusive institutional reform should prioritize decentralization, management models and accountability mechanisms to promote more responsive and participatory management of irrigation and drainage. The purpose of the irrigation and drainage infrastructure is to ensure the functioning of structural objects in a single technological complex on a systemic basis. The formation of a supervisory board and other governing bodies provided for by the charter of the operator of engineering infrastructure objects of land reclamation systems that are in state ownership determines the efficiency and timely adoption of effective management decisions. This makes it possible to ensure the renewal and avoidance of infrastructure decay, reasonably ensure the attraction of investments in the restoration of infrastructure facilities, finance land reclamation facilities with a short payback period and postpone the need for significant investments in other facilities. The flexible nature of irrigation and drainage infrastructure management should meet the requirements of new market-oriented models of private commercial management and farming. The management component also includes anti-corruption measures, transparency, corporate ethics and risk management [13]. The development of audit and internal control is envisaged, the widespread introduction of environmental, including water, audits, economic recovery and elimination of losses from destruction, an adequate management system, risk accounting, restructuring of companies, strengthening their business reputation and adjusting the current and long-term strategy, as well as promoting the development of new forms of infrastructure management, in particular, WUs.

Conclusions

Improving the management of irrigation and drainage infrastructure using ESG indicators requires simultaneously considering the prospects for activating two factors: providing financial resources for the maintenance and renewal of infrastructure facilities and increasing the impact of environmental and social factors on business processes in the development of irrigation and drainage in Ukraine, on the one hand, and the prospect of influencing the assessment and strengthening the competitive positions of business entities based on ESG indicators in the markets, on the other. The irrigation and drainage infrastructure management model based on the use of ESG metrics and characteristics will allow business entities to effectively manage transformational programs that stimulate positive changes in the business, attract investments in the implementation of innovative projects, and strengthen their status as a competitive partner in the market.

References

1. Irrigation and Drainage Strategy in Ukraine for the period until 2030. Approved by the Resolution of the Cabinet of Ministers of Ukraine dated August 14, 2019 No. 688-r. - Kyiv –Available at:<<https://www.zakon.rada.gov.ua/laws/show/688-2019-%D1%80#Tex10>> [Accessed 12 february 2026].
2. On Amendments to Certain Legislative Acts of Ukraine Regarding Improvement of the Management System of Engineering Infrastructure Facilities of Reclamation Systems Law of Ukraine of February 25, 2026 No. 4795-IX Available at:< <https://zakon.rada.gov.ua/laws/show/4795-20#Text>> [Accessed1 may 2026].
3. Panteleiev, V.P., 2021. Solving the problems of applying ESG factors. *Development Strategy of Ukraine: Financial, Economic and Humanitarian Aspects: Proceedings of the VIII International Scientific and Practical Conference*. Kyiv, "Information and Analytical Agency", pp.125-129, (in Ukrainian).

4. Panteleiev, V.P., 2022. In-depth developments on ESG reporting in the service of overcoming aggression *Development Strategy of Ukraine: financial, economic and humanitarian aspects: materials of the IX International Scientific and Practical Conference.* ", pp.286-291, (in Ukrainian).
5. Panteleiev, V.P., 2023. ESG indicators in the priority of irrigation and drainage infrastructure in Ukraine *Development strategy of Ukraine: financial, economic and humanitarian aspects: materials of the X International Scientific and Practical Conference.* Kyiv, pp. 313-318, (in Ukrainian).
6. Panteleiev V.P., Derun I.A., Romashchenko M.I., Polishchuk V.V. 2024.The Role of Esg Business Reporting in Water Management. *Land Reclamation and Water Management*, 1, pp. 67-75.
7. ESG reporting: what changes bill No. 13598 and how to prepare for business today 2025. Available at: <<https://mind.ua/openmind/20294960-esg-zvitnist-shcho-zminyue-zakonoproekt-13598-i-yak-pidgotuvatisya-biznesu-vzhe-sogodni>> [Accessed1 may 2026].
8. Romashchenko M.I, Yatsiuk M.V., Zhovtonoh O.I., Dekhtiar O.O. 2017. Naukovi zasady vidnovlennia ta rozvytku zroshennia zemel v Ukraini v suchasnykh umovakh [Scientific principles of restoration and development of land irrigation in Ukraine in modern conditions] *Land Reclamation and Water Management*, 2, pp. 3-8.
9. ESG Strategy: a new tool for increasing the social responsibility of agribusiness, 2024. Available at: <<https://agroportal.ua/blogs/esg-strategiya-noviy-instrument-dlya-pidvishchennya-socialnoji-vidpovidalnosti-agrobiznesu>> [Accessed1 may 2026].
10. Sholudko O., 2024. Integration of green financing into the organizational and economic mechanism of the agro-industrial complex. *Theory and practice of the development of the agro-industrial complex and rural areas: materials of the XXV International Scientific and Practical Forum, October 2–4*, pp. 171-173. Available at: <<https://lnup.edu.ua/attachments/article/8804/Forum%20LNUP%202024.pdf>> [Accessed1 may 2026].
11. Bogatchyk, L., Lopatovsky, V., Lopatovska, O., & Melnychuk, I., 2025. Accounting and reporting of ESG indicators as a tool for increasing business transparency in the context of sustainable development. *Herald of Khmelnytskyi National University. Economic Sciences*, 346(5), pp. 464-472. Available at: <<https://doi.org/10.31891/2307-5740-2025-346-5-68>> [Accessed1 may 2026].
12. Villalba P., 2025. Nuestro objetivo es mitigar los riesgos para construir activos agrícolas sólidos. *Agro elEconomista.es Revista mensual | 19 de julio de 2025 | N°111* pp.30-32 Available at: <https://s03.s3c.es/pdf/d/1/d1010ce5e6ef513ff8b2a01bb0f1991b_agro.pdf> [Accessed1 may 2026].
13. ESG reporting: analysis of disclosure practices, 2025. Available at: <https://s03.s3c.es/pdf/d/1/d1010ce5e6ef513ff8b2a01bb0f1991b_agro.pdf> [Accessed1 may 2026].