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Implementation of Irrigation and Drainage Strategy: Political, Economic and Cultural Aspects

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► **Abstract.** The article is devoted to the current problems of institutional reform to attract investment in the modernisation and rehabilitation of irrigation infrastructure and cover the costs of its operation. To address these issues, in 2019 the Cabinet of Ministers of Ukraine approved the Irrigation and Drainage Strategy until 2030 and in 2020 a corresponding action plan for its implementation. However, the reform process is delayed conditioned upon systemic environmental, economic and cultural problems that create obstacles to change, primarily in the development and adoption of legislation regulating the formation and operation of new institutions (water user associations and management of state reclamation systems, etc.). The purpose of the article was to present the results of analytical studies examining Ukrainian and international experience in irrigation management reforms and assessing the likely risks that may arise in this way and forming a vision for managing the implementation of the Irrigation and Drainage Strategy until 2030. The study was performed using the following methods: systematic analysis of the functioning of the irrigation sector in Ukraine; comparison (determination of properties and characteristics based on collected information and statistical data on reform processes in the field of land reclamation in Ukraine and the world), abstract – logical (theoretical generalisations and formulations of categories and conclusions. The existing reform processes in the field of land reclamation in Ukraine are analysed, it is noted that in a market economy, effective maintenance and development of water reclamation complex can take place only in partnership with the state and the private sector. As a result of research of Ukrainian and international experience, the principles and mechanisms of effective implementation of transformations in irrigation management are proposed and consider socio-economic and cultural aspects of reform processes in Ukraine and possible risks arising from international experience. Specific recommendations for managing the reform process are provided. The application of the proposed methods of reform will ensure investment in the modernisation and rehabilitation of water infrastructure and further sustainable use of irrigated land

► **Keywords:** land reclamation, water management and reclamation complex, integrated management, institutional reform, transformation in irrigation management, water user associations, investments

► Introduction

According to the Food and Agriculture Organisation of the United Nations, today about 800 million people worldwide are chronically malnourished [1]. According to these international organisations, the world's population is expected to increase to at least 9.6 billion by 2050, so to ensure the food security of this growing population, agricultural production must grow rapidly and increase its volume by 60% (and almost 100% in developing countries) to the baseline indicators of 2005-2007 [2]. Thus, a new "green" revolution is needed [3], which this time, according to experts

of the International Commission on Irrigation and Drainage (ICID), can be carried out only with the use of integrated water and land management [4]. At the same time, optimal resource management, considering the requirements of reducing the risks of increasing climate variability, can be ensured only by providing fair and reliable irrigation services that will increase agricultural productivity and preserve ecosystems.

Reclamation agricultural production in Ukraine is not realising its potential explained by the reduction of the area of actual irrigation and inefficient

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management of water resources in irrigation systems, which hinders the achievement of these complex requirements. According to the FAO, Ukraine is able to provide food to 450-500 million people annually, currently these opportunities are used by a third [5]. As of 1990, soil irrigation was 2.29 million hectares, but since independence this figure has almost quadrupled to about 500,000 hectares, while existing reclamation systems do not provide the projected productivity of water and energy resources [6; 7].

Thus, the low efficiency of irrigation systems, the rapid growth of water demand from entities in other sectors, such as housing, utilities, industry and energy, are just some of the main problems. Efforts to ensure sustainable water management will require improving the efficiency of irrigation systems by modernising and revitalising their management systems. At the same time, the recent introduction of market relations in the water management and reclamation complex of the state, agrarian reform and active development of agricultural entrepreneurship have significantly increased the requirements of producers to the quality and cost of irrigation water supply services. Ukraine, like most developing countries with irrigation systems, faces difficulties in furthering the ever-increasing irrigation costs and reimbursing producers for the opaque cost of water services, in addition to the urgent need to speed up the innovative revival of irrigated agriculture.

There is a need to address these issues, first of all, the successful implementation of new institutions and organisational development of irrigation management with the participation of water users with the adaptation of known models of their creation and operation to the conditions of Ukraine. At the same time, in the reform process, it will be important to avoid uncoordinated actions, misinterpretation of legal provisions and unreasonable political decisions.

An analysis of recent research suggests that the problems of effective water management in the agricultural sector are the focus of both international bodies, such as the Food and Agriculture

Organisation (FAO), the Global Water Partnership, the United Nations, and public authorities. Different levels and the world scientific community [8-10]. Foreign researchers have focused considerable attention on the prospects of transferring control of irrigation systems to associations of water users and the identified shortcomings in certain countries [11-13]. Developed recommendations and prepared final reports on the implementation of irrigation management programmes with an emphasis on the privatisation of reclamation systems [14-16]. At the same time, Ukrainian scientists developed the scientific basis for irrigation restoration and development [7], analysed the institutional support for efficient use of water resources in Ukraine under land reform [6; 17; 18] and explored innovative approaches to transforming management in irrigated agriculture [19; 20]. However, for all the previous time, the approbation of these studies did not provide a fully acceptable scientifically sound basis for a comprehensive systemic approach of the state and Ukrainian society to modern reform of land reclamation, especially given the exacerbation of socio-economic and climatic challenges undermining food security. Given this and the presence of possible risks in the implementation of the state strategy of irrigation and drainage, we have formed the basic principles and methods of its implementation. The implementation of the State Strategy for Irrigation and Drainage in Ukraine until 2030 [21], adopted by the government in 2019, requires a scientific basis for the success of new institutions, building the latest organizational structure of the industry and creating a favorable environment for their development. World irrigation experience shows that the transfer of irrigation system management (TISM) to new NGOs, in the absence of strong support from relevant government agencies, lack of communication and the necessary analysis of the economic and financial condition of water management and reclamation complex – can pose significant problems, lead to ineffective or erroneous decisions [13-15]. In practice, three main inhibitory factors often manifest themselves (Fig. 1).

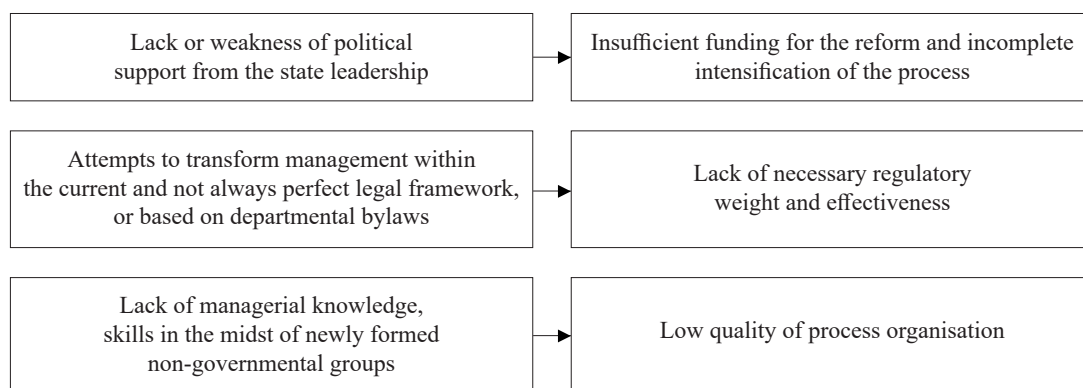


Figure 1. Inhibitory factors of TISM and their consequences for reform

Source: formed by authors based on literature sources [11-13]

To remove existing obstacles and increase the effectiveness of reform processes, it is necessary to comprehensively analyse the current state of government

policy and public administration in the field of land reclamation, study the experience of similar reforms in other countries, and identify key principles to be

followed in the reform process to ensure the effect of institutional change considering the likely risks.

It is advisable to refer to the international experience of similar transformations in countries with transit economies, especially post-Soviet, where the remnants of the administrative-command system and technocratic approaches to the development and implementation of public policy have long hindered effective results, delayed and sometimes discredited reforms [14; 22; 23].

Purpose of the article is to study the problems of development and implementation of state policy in the field of land reclamation in Ukraine and the relevant international experience of reforms in the irrigation sector, to identify the vision of the main principles and methods of managing the process of implementation of the Irrigation and Drainage Strategy until 2030.

► Materials and Methods

For the first stage, statistical data and publications in electronic media on the use of irrigated lands and water resources of Ukraine were used [24; 25], the results of our own research on the efficiency of irrigation systems in Southern Ukraine [17; 19; 20]. In the second stage, the reports of international organizations (FAO, the World Bank, the International Commission on Irrigation and Drainage, the International Institute of Water Resources Management-IWMI, etc.) were studied [11-13] on the effectiveness of projects to reform and modernize irrigation systems in countries with transit economy (Georgia, Armenia, Tajikistan, Uzbekistan, Kyrgyzstan, Bulgaria, etc.) [14-16]. At the third stage of the research general-scientific and specific methods were used: comparative-historical and monographic methods – to compare and evaluate the information collected in the previous stages of work, and statistical data reflecting the processes of land reclamation reforms in Ukraine and the world. The properties and characteristics of irrigation systems of different sizes and management were compared and evaluated; system analysis – for a comprehensive assessment of the current state of functioning and potential of irrigated agriculture in Ukraine (the use of systems analysis was explained by the complex construction of the studied management facility, which has natural, technical, socio-economic and environmental components and is an open dynamic system).

The main principles of the system approach were implemented in the system analysis: the task of improving irrigation management was formed comprehensively – considering all significant external conditions; the object of study was considered as a system – a hierarchically organised multilevel structure, which includes elements (subsystems), combined direct and feedback – to achieve a common goal for all elements, for example, the maximum number of additional products per unit water. The institutional method assumes that the research focuses on economic institutions, their structures, properties, functions and relationships, including formal and informal institutions (norms, rules, traditions, etc.) on the basis of which these institutions (organisations)

operate. Abstract-logical – for theoretical generalizations, formulation of categories and conclusions). The experience of the authors' cooperation with water users (managers and specialists of farms) in the irrigation zone in the South of Ukraine during 2015-2021 was also used.

The above methods and research methodology suggest that the theoretical and methodological principles of improving the management of irrigated agriculture can not be reduced to only one method, because each method is used not in isolation, but in combination with others.

► Results and Discussion

Currently, the realisation of the agricultural potential of reclaimed lands in Ukraine is constrained by a significant set of natural, technical, organisational, economic and environmental factors, including:

- the need to modernise the entire water management and reclamation complex, considering the climate crisis, including changes in water and land use conditions and the consequences of deteriorating technical condition of the main water infrastructure;
- reduction of the actual areas of artificial humidification due to the failure of part of the on-farm irrigation and drainage systems and the unsatisfactory technical condition of the infrastructure that continues to be used;
- fragmentation of land use arrays within the technological modules of irrigation systems;
- availability of various forms of ownership of domestic infrastructure;
- rising tariffs for water and electricity, inefficient management of water and energy resources;
- development of soil degradation processes, such as erosion, salinisation, waterlogging, depletion of mineral elements, desertification etc;
- deterioration of human resources in the industry.

To address these issues, and attract investment in the modernisation of reclamation systems, in 2019 the Cabinet of Ministers of Ukraine approved the Irrigation and Drainage Strategy until 2030 [21], and in 2020 – an action plan for its implementation [26]. The documents set out institutional changes in the industry management system, which provide for the transfer of authority (management transformation) for the operation of networks at the lower level to newly established water user associations, and their involvement in management at the regional system level. However, the complicated course of institutional change is still slowing down and not being implemented as a coherent, coherent and interrelated measure with other reforms, which in turn does not increase the efficiency of irrigation and drainage expected by stakeholders. Thus, in 2021, irrigation systems operated on only 25% of potentially irrigated agricultural land. Conditioned upon the low level of development of arable land reclamation systems, Ukraine annually loses at least \$ 1.5-2.0 billion in foreign exchange earnings, which is equivalent to almost 10 million tons of unharvested grain harvest. At the same time, the State Accounting Chamber concluded that only by irrigating the entire existing

area of irrigated land, it is possible to increase agricultural production and gross domestic product by almost UAH 8.8 billion [27].

It has become clear that the implementation of the action plan raises a number of issues related to conflicts of interest between different stakeholder groups, including existing traditional methods of communication between government officials and society and water and land users in particular. Thus, separate groups of stakeholders (so-called small water users, representing small farms or using their own land shares; united territorial communities with on-farm reclamation infrastructure and land transferred to community ownership; local environmental NGOs, which deal with conservation of water and land resources, etc.) did not participate in the development and discussion of the draft law on organisations of water users, and therefore have serious comments on the already, unfortunately, adopted by the Verkhovna Rada legislation [28].

Lack of theoretical knowledge and practical experience in carrying out irrigation management reforms creates many misinterpretations and difficulties in communicating initiators of change with society and various groups of water users. The bill received all new proposals and comments, which for a long time continued to be finalised in the working group and the Verkhovna Rada Committee. The most controversial provisions of the law are in the areas of environment, lease and ownership of land and infrastructure, ensuring fairness in management decisions in the interests of all members of the newly formed Water Users Association (WUA) and guarantees

of private investment protection. Each of these conflicting moments is related to the interests of a particular stakeholder group, their role and opportunities to influence reform processes.

At the same time, a significant obstacle to successful institutional transformations is the difficulty of creating a new transparent system for the formation and approval of tariffs for water supply and sewerage services. After all, over the last 5 years, tariffs for irrigation and electricity services, conditioned upon the impact of many technical, economic and organisational factors, have been growing steadily. Table 1 shows the growth dynamics of individual costs that form tariffs for water services for users only for water intake from the Kakhovka main canal, and also the cost of services of the district administration of one farm and the Basin management of water resources of the lower Dnieper, which in 2020 reached about 300 and 15 UAH/1000 cubic meters, respectively.

Under such conditions, and against the background of lower prices for agricultural products and rising energy costs, there is a danger of losing the expected profitability of irrigated agriculture. Therefore, it is extremely important to find ways to reduce operating costs through the implementation of measures to save resources, reduce non-productive water losses, optimise general production and other costs of water management organisations. It is important to create preconditions for their constructive dialogue to increase the efficiency of operation of inter-farm systems, improve the quality of services and avoid conflicts between water users and water management organisations (Table 1).

Table 1. Dynamics of costs for the collection and transfer (transportation) of irrigation water by the Department of the Kakhovka main canal, UAH/1000 cubic meters

Year	Cost of water intake	Cost of overturning (transportation), total	Including cost:		Direct costs for payment of labour	Capital expenses for updates and modernisation
			Electricity services	Electric power industry		
2016	145.8	250.8	52.2	198.6	8.3	20.5
2017	179.3	318.2	64.2	254.0	10.8	19.7
2018	245.5	355.6	87.9	267.7	15.0	26.3
2019	314.2	418.8	112.5	306.3	18.3	30.4
2020	314.2	411.5	112.5	299.0	25.4	29.9

Source: formed according to the annual orders of the Kakhovka Main Canal Department (No. 66/1 of 03/03/2016; No. 75 of 03/22/2017; No. 69/1 of 03/01/2018; No. 98 of 03/14/2019; No. 100 of 03/18/2019)

First of all, we need a new system of informing water users based on transparency, involving them in decision-making on the development of water distribution plans and the composition of operational work in some areas of government systems.

Another issue that requires coordination of the interests of different stakeholder groups (land users, landowners and united territorial communities) is the issue of land consolidation within the areas of technological modules of irrigation systems. In many cases, the lease term of landowners' shares does not exceed 5-7 years (based on the results of communication with water land users, managers, hydraulic engineers and agronomists of farms in the area of irrigation systems); however, there are cases

when individual landowners do not want to enter into or extend lease agreements with farmers for various reasons. It is known that the average area of land share in the south of Ukraine is 2-4 hectares, while the area of irrigated fields from 60-100 hectares within one irrigated field is located from 15 to 30 or more shares [29]. At the same time, some landowners form their own small farms or work as private farms, and some are waiting for better offers on the amount of rent or sale of land at a higher price. Under such conditions, farms invest their own funds in the restoration and modernisation of irrigation systems only in areas where long-term lease agreements have been concluded with landowners (more than 10-15 years). To solve the problem of undesirable

fragmentation of land use on irrigated lands, it is necessary to coordinate the reform of the irrigation sector with the results of land reform, which will ensure the effective implementation of land consolidation projects along with the establishment of water users.

Thus, it is becoming increasingly clear that in addition to modernising technical infrastructure and creating new organisations to manage irrigation systems, it is urgent to introduce a new culture of communication between stakeholders to form, implement and develop public policy in the field of nature. Existing outdated culturological principles and political and economic tools are the main obstacles to the effective implementation of reforms and implementation of large infrastructure projects. That is, the lack of a proper culture of stakeholder dialogue at the local level, lack of transparency of reform processes at both state and local levels, lack of coordinated intersectoral cooperation and participation in these stakeholder transformations, and underestimation of professional expert support for research and educational institutions for economic substantiation of new models of management of reclamation systems and dissemination of necessary knowledge among all participants of the reform process.

The government's efforts to accelerate reform and move to investment as soon as possible do not work without professional management of institutional change according to good governance standards (transparency, stakeholder participation, efficiency, accountability, interconnectedness) and a clear architecture of a multi-sectoral multi-disciplinary integrated approach.

Analysing the international experience, the answer was sought to the question under what conditions and through what mechanisms it is possible to achieve a balance of state, public and business interests in the implementation of reforms. According to experts from the World Food Programme (WFP), reforming the irrigation sector or transforming irrigation management primarily involves the transfer of management of irrigation systems from government to non-governmental organisations [6]. Beginning in the mid-1970s, governments in many countries began to successfully transfer control of irrigation systems from state water agencies to farmers' organisations or other non-governmental organisations [14].

In countries with transit economies, the post-Soviet republics of Central Asia and the Caucasus, and Eastern Europe, irrigation management reforms began with the transfer of irrigation infrastructure ownership or long-term management to water users, and then (or in parallel) there were changes in the management of the state water management and reclamation complex [19; 10]. Reform processes have been long, complex and very often adjusted or radically changed. As a result of ill-considered political decisions and the dominance of the interests of certain groups of water users or departmental interests of government agencies, numerous mistakes were made.

As a result of studying and in-depth analysis of the world experience of reform in these countries [10; 14; 23] we have established the following general patterns of this process and made certain conclusions

that may be useful for Ukraine. Yes, common to all countries was the following:

1. Everywhere, the reform process (since the early 1990s) has been very complex and lengthy, requiring serious expert support from international organisations in drafting legislation and drafting certain provisions of the law in the pilot territories.

2. Organisational models at all levels of irrigation system management have changed and adjusted many times, both at the establishment of the Water Users Association (WUA) and at the level of organisational structures for the management of major canals.

3. Small WUAs were economically incapable everywhere. The best results were achieved in case of creation of powerful associations (from 3000 ha) for the operation of the tertiary (grassroots) irrigation network and pumping stations, as well as their federations for the purpose of operation of secondary distribution channels (Kyrgyzstan).

4. Governments have often made hasty decisions to establish national or regional state-owned companies to manage trunk and secondary distribution channels, which have failed to ensure proper operation of systems and quality of service for water users explained by underfunding of the necessary costs (Armenia, Georgia, Bulgaria). To continue to provide irrigation services, governments were forced to increase government subsidies for these companies, which also did not address the issue of sustainability. To remedy the situation and improve the performance of state-owned companies, they have been restructured so that water users have influence in management decisions, and companies also have the opportunity to conduct business to obtain additional funds to cover infrastructure costs (Armenia, Bulgaria).

5. Reform plans changed when the next government changed, depending on the involvement of international technical assistance and the organisation of investment projects. At the same time, World Bank projects played a significant role in all countries, and in many cases were forced to correct mistakes made by governments at various stages of transformation.

6. The expected progress in the reform was observed after the emergence of quality legislation on the establishment of WUAs, providing financial and advisory support from the state (training, coaching, advisory support, implementation of special government programmes, and access to investment) [4].

7. The existence of a Reform Strategy, the development of an appropriate package of legislation and regulations, a state plan or programmes to implement reforms – all these countries had key conditions for ensuring positive changes in water management and restoration of artificial wetlands.

8. Reforms in irrigation management and the implementation of projects for the reconstruction and modernisation of irrigation systems everywhere were accompanied by the resolution of land issues in terms of consolidation of small land users.

Summarising the results of research [6; 18], the authors of the study note that institutional reform is a process that is constantly improving, adjusting and depends on society's readiness for new democratic decentralised forms of government. The state's

efforts to maintain its influence and its decisive role in management at the level of the main trunk canals are remnants of centralised hierarchical management from the past practice of the Soviet planned economy.

Unwillingness to transparent procedures, weak state institutions and lack of good experience in involving private water users in water infrastructure management are what all transition economies faced at the beginning of the reform.

At the same time, the countries that joined the European Union had some preferences in the possibility of receiving support from EU programmes. However, as the example of Bulgaria shows, comprehensive support from the EU and international organisations has not saved the country from numerous mistakes and negative consequences of the government's desire to maintain uncontrolled levers of public administration. The creation of a state-owned profitable company resulted in a significant reduction in the potential of irrigated agriculture conditioned upon the complete refusal of some farmers to use artificial moisture when water tariffs increase. A similar pattern was observed at the beginning of the new century in Georgia and Kyrgyzstan.

The main risks in carrying out reforms in irrigation management

All these examples are a warning to the Government of Ukraine and an argument to avoid repeating mistakes that have taken place in other countries. This is especially true of the choice of institutional model for the management of the state share of water infrastructure. Based on the study of the experience of implementing reforms in different countries and the reform process in Ukraine, we have identified the following main risks that should be considered when implementing the provisions of the Irrigation and Drainage Strategy.

1. *Risk of underfunding to cover the costs of operating the main state water management and reclamation infrastructure.* In the case of the creation of a national joint stock company (NJSC) or individual state joint stock companies at the level of main channels, there is a risk that it is impossible to cover operating costs without a significant increase in tariffs and increase government subsidies.

2. *Risk of privatisation of strategic water management infrastructure.* With significant underfunding of water infrastructure, government subsidies can be significantly increased to maintain the proper level of services for water users. In the absence of the necessary public funds, in such cases there is a risk of bankruptcy of a joint-stock state company and transfer of strategic state water infrastructure to long-term concessions or ownership to private companies and investors to overcome the critical situation and continue providing appropriate services to water users.

3. *Risk of tariff increases for water users and their organizations.* In the absence of a mechanism for control by water users and ensuring their direct participation in decisions on the formation and approval of tariffs, there will be a risk of inadequate growth of tariff levels, which will make unprofitable growing most crops under irrigation. With certain

jumps in world prices for agricultural products, high tariffs may lead to the complete abandonment of some farms from the use of artificial soil moisture, which will significantly affect the level of operation and efficiency of major systems, reduce farmers' profits and pose risks to the country's food security in dry years. First of all, it will have a negative impact on small and medium-sized farms, which will lead to the development of large debts and the inability of WUAs to operate in such conditions.

4. *Risk of lack of independent impartial control over the activities of state-owned enterprises.* The establishment of the NJSC envisages the development of a Supervisory Board for the activities of this state-owned company from representatives of government agencies, including a public council from representatives of WUAs. However, if the Supervisory Board is formed arbitrarily and without legislative participation of representatives of WUAs and other groups of water users in decision-making on the operation of systems, use of investment funds and tariffs, then any other type of so-called control will not be objective and impartial. At the same time, decisions aimed at improving the quality of services, regulating and/or establishing fair tariffs may be made not in the interests of water users.

Vision of the basic principles and methods of implementation of the Strategy

Given the potential problems of implementing the Irrigation and Drainage Strategy in Ukraine, the results of analysis of international experience and possible risks that may arise during the reform of the irrigation sector, we propose a system of principles and methods of reforms that change existing cultural and political – economic principles of regulation:

- ensuring integrated planning and coordination of various types of activities, primarily involving all stakeholder groups in the development of laws and regulations (proposals for amendments to the law on WUAs, laws on the creation of new businesses in public irrigation systems, protection of private investments, development of tariff policy, etc.);
- dissemination of knowledge about new institutions, training of those involved in the development of legislation and regulations, and the maximum number of water users in different regions;
- creation of structures supporting the reforms at the level of relevant ministries and agencies with the involvement of specialists with a sufficient level of training;
- ensuring transparency of the process of policy development and implementation according to the standards of good governance, including monitoring and reporting of responsible institutions on the results of reforms;
- deepening international cooperation in the framework of technical assistance projects to support the proper management of reform processes;
- development and implementation of existing state programs for the implementation of certain measures concerning economic and organisational reforms in the water management and reclamation complex of Ukraine;
- establishment of feedback links between the

government, water and land users and communities to inform the public and stakeholders, the introduction of a permanent dialogue of government agencies with stakeholders and the public;

- ensuring comprehensive interdepartmental cooperation by organising inter-ministerial coordination councils with the active participation of leading experts in the field of specialised knowledge;

- development of a “pool” of experts from various scientific and educational institutions for permanent specialised consultations of the government.

► Conclusions

The results of the study suggest that today, for the successful implementation of the State Strategy for Irrigation and Drainage in Ukraine, it is necessary to ensure a balance of interests of all stakeholders in the restoration and development of irrigated agriculture. At the same time, it remains important to regulate the implementation of reforms according to the standards of good management and administration recognised by experts. At the same time, social culturological transformations, improvement of feedback, coordination of relations in order to avoid conflicts, prevention of possible challenges and risks are ripe. In view of this, the recommended principles and methods of implementing measures to implement the Strategy, in our opinion, will ensure constructive cooperation of stakeholders at all levels of government, both on the transfer of WUA management and consolidation of land shares in irrigated land, and attracting investment to modernize irrigation infrastructure.

It is established that the dissemination of best international irrigation experience in creating and

building new governance structures involving water users, adapting it to the current conditions of Ukraine will allow stakeholders to avoid uncoordinated actions, incorrect or arbitrary interpretation of laws and regulations, prevent unreasonable political decisions in the process of reform. Creation of supporting structures at the level of state institutions with the involvement of relevant specialists and scientists, organisation of exercises and trainings, dissemination of knowledge, development of the necessary favourable environment for quality managerial transformations will allow to successfully complete large-scale restoration and innovative modernisation of water reclamation in the country.

Promising directions of research development in this topic will require: scientific substantiation of the implementation of certain statutory provisions regulating the activities of newly established water user organisations as corporate structures; development of normative documents ensuring their full-scale functioning as economic agents; improving the tariff policy of the cost of providing them with water management services; assessments of the effectiveness of irrigated agriculture in the context of climate crisis and limited water and energy resources; analysis of the effectiveness of pilot projects for the creation and development of WUAs and their associations in the new political and socio-economic conditions of irrigation regions. The results of the study can be used by the Ministry of Agrarian Policy and Food of Ukraine, the Ministry of Environment and Natural Resources of Ukraine, the State Agency of Water Resources of Ukraine, and its regional divisions, working groups at ministries involving agricultural and water users, scientists and educators.

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Імплементація стратегії зрошення та дренажу: політико-економічні та культурологічні аспекти

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► **Анотація.** Стаття присвячена актуальним проблемам проведення інституційної реформи для залучення інвестицій у модернізацію та відновлення зрошувальної інфраструктури та забезпечення покриття витрат на її експлуатацію. Для вирішення зазначених проблем у 2019 році Кабінетом Міністрів України було затверджено Стратегію зрошення та дренажу до 2030 року та у 2020 році відповідний план дій щодо її впровадження. Однак, процес реформ затримується внаслідок наявності системних екологічних, економічних та культурологічних проблем, що створюють перешкоди на шляху перетворень, насамперед, щодо розробки та прийняття законодавства регламентуючого порядок утворення та функціонування нових інституційних утворень (організацій водокористувачів та структур управління державними меліоративними системами й ін.). Мета статті полягала у викладенні результатів аналітичних досліджень з вивчення українського та міжнародного досвіду проведення реформ в управлінні зрошенням та оцінки імовірних ризиків, що можуть виникати на цьому шляху та формуванні бачення щодо управління процесом впровадження Стратегії зрошення та дренажу до 2030 року. Дослідження виконано за допомогою наступних методів: системного аналізу функціонування сектору зрошення в Україні; порівняння (визначення властивостей та характеристик на основі зібраної інформації та статистичних даних про процеси реформ у галузі меліорації земель в Україні та світі), абстрактно-логічного (теоретичні узагальнення та формулювання категорій та висновків). Проаналізовано існуючі процеси реформування у галузі меліорації земель в Україні, зазначено, що за умов ринкової економіки, результативне утримання та розвиток водогосподарсько-меліоративного комплексу може відбуватись лише за партнерства держави та приватного сектору. В результаті досліджень українського та міжнародного досвіду запропоновано принципи й механізми ефективної реалізації трансформацій в управлінні зрошенням та враховують соціально-економічні та культурологічні аспекти процесів реформування в Україні та імовірні ризики, що впливають з аналізу міжнародного досвіду. Надані конкретні рекомендації щодо управління процесом реформування. Застосування запропонованих методів проведення реформи забезпечить залучення інвестицій у модернізацію й відновлення водогосподарської інфраструктури та у подальшому стале використання зрошуваних земель

► **Ключові слова:** меліорація земель; водогосподарсько-меліоративний комплекс; інтегроване управління; інституціональна реформа; трансформація в управлінні зрошення; організації водокористувачів; інвестиції