



CAPACITY
BUILDING WJO ON WATER
MANAGEMENT FOR
SUSTAINABLE AGRICULTURE IN
VOLYN, UKRAINE

**REPORT ON PROJECT
PCB23UA01**

2024



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The existing Law on Water User Organizations and current practice of its implementation relate only to the irrigation and drainage systems that have only one type of water service – water management for agriculture. To test opportunities on establishment of the WUO under current Law on the multifunctional drainage systems and if necessary, develop recommendations for it improvement, the Dialogue and interactive communication with all groups of the regional and local stakeholders was organized during this PSD project. The training on the institutional, technical and agricultural issues were supported by this Dialogue to familiarize stakeholders with existing legislation, technical and technological innovations for water management and drained land use. To understand better the current situation of the pilot system functioning, the basic technical, economic and institutional information was collected by the expert group of NGO Primavera. The most important cases of the Dutch and other EU countries experiences were presented and discussed. The intensive communication with local, regional and national stakeholders and visits to the pilot area helped to reach agreement between local stakeholders and create an initiative group on establishment of the WUO on the agriculture areas of the Krychevychivska drainage system. This is to start the longer-term process of participatory decentralised water management for multifunctional drainage systems located in the basins of small local rivers. For this decision the scenario analysis was done and a road map on step-by-step development of the WUO was developed as well as a first draft of the statute of WUO named "Prolisok".

This report was prepared under the general coordination and editing of Olga Zhovtonog, Director of the NGO «Primavera», Doctor of Science in Irrigation Management and Professor in Agronomy and Water in cooperation with the NGO expert team. The communication with local stakeholders, analysis and training on institutional issues and report organization by PhD experts and on institutional and water management issues under climate change conditions was done by PhD Tetiana Matiash. The technical and economic data collection, data mapping and technical training of local experts on the



water management of drainage systems were implemented by Professor Vasyl Turcheniuk and PhD Serhii Klimov. The general consultations on water resource availability under climate change, on institutional issues and risk analyses as well as training on water resource management was done by PhD Mykhailo Yatsiuk. The stakeholders analysis, development of the Road map on establishment of the WUO's in the pilot area and organizational issues of the project activities, were taken care of by the deputy director of the NGO «Primavera», PhD Vitalii Polishchuk. Training on the issues of ecological monitoring and protection of water ecosystems resources and biodiversity was done by PhD Olena Sydorenko. Local support on communications, data collection and analysis of the local situation within the pilot drainage system the local NGO «Primavera» expert Mrs. Iryna Demchko was responsible. Valuable contributions to the report chapters on the Dutch experience and recommendations for the follow-up projects were done voluntarily by the Dutch NGO «Primavera» experts Mr. Koen Roest and Mr. Henk Moen. The NGO «Primavera» team highly appreciates also their help and advice during all project implementation and reporting and for very useful training on the local water management based on cases for the Netherlands and other countries.

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The project team is very thankful for permanent communication and advices during the project of RVO representative Mrs. Synara Sánchez Sotomayor and representative of the Dutch Embassy Mrs. Kateryna Tushynska.

1.Executive summary

Background

The government of Ukraine is continuing with reforms in the water sector for water resource management and irrigation and drainage with the objective to implement the Irrigation and Drainage Strategy till 2030. The approved Law on Water users' organizations (The Law of Ukraine: Organization of Water Users and Stimulation of Hydrotechnical Land Reclamation (№ 2079-IX) entered into force on May 7, 2022) and the recent creation of more than 32 Water User Organizations (WUO's) in different regions in Ukraine is opening an opportunity for attracting investments for modernization, renovation and enhancing of irrigation and drainage systems in Ukraine to adapt agriculture to climate change. Existing Law and first experiences on establishment of the WUOs are focused on water management for agriculture and should be adapted also to the conditions of multifunctional drainage systems in the North and North - West regions of Ukraine that provide services on water management for agriculture but also for floods risk management for population and water regulation for forest and nature to



protect wetlands, small rivers and reduce emission of CO₂ from peat soils. Sustainable agriculture production through improvement of multifunctional drainage systems is an important way to compensate for the production losses of the occupied areas where irrigation is no longer possible due to the destruction of the systems. Creation of WUOs on this type of the drainage will open opportunities for their modernization to adapt agriculture to the climate change in that regions and will support a rural development within Territorial communities.

Pilot drainage system and involvement of the stakeholders

The NGO “Primavera” expert team with the support of the Dutch Embassy and Dutch PSD program of the RVO, implemented a Project PCB23UA01 "Capacity development for the creation of WUO's for water resources management for sustainable agricultural production in the Volyn region" on the selected representative pilot multifunctional drainage system in Kolodyazhnenska territorial community in the Kovel district of Volyn region. Interactive ‘live’ and on- line seminars and trainings for the all groups of local stakeholders were organized on how to use existing legislation on WUOs in the current technical, economic and institutional conditions of water management within this pilot drainage system. The following groups of stakeholders were involved and actively participated in the seminars and communications with NGO experts: large agriculture enterprises and SMEs; territorial community leaders and specialists; regional and district water management organizations; the forest Company “Kovel Lisgosp”, district administration representatives. All of them were highly interested in modernization of the drainage system and support changes in water governance via establishment of the WUO for operation and maintenance of the multifunctional drainage system. They consider transfer of responsibilities on operation and maintenance of the drainage system to the WUO as a possible solution for sustainable water management and agriculture production in future in case when all needed legal conditions and knowledge transfer will be organized.

Problem analysis and main reasons for establishment of the WUO

Based on the communication with stakeholders, data collection and a field visit, the main technical, economic, organizational, financial, social and environmental problems of the pilot drainage system functioning were defined. Study of the current problems and current legislation helped to formulate clear reasons for the establishment of a WUO in the pilot multifunctional drainage system. These are the following general reasons:

- identification and enabling of a broad range of new opportunities for internal and external investments for modernization of the drainage infrastructure;
- more transparent and efficient organization of operation and maintenance of the drainage system and provision of the water management services for all groups of stakeholders according to their needs;
- implementation of nature protection measures and introduction of agriculture practices according to the Green deal EU principles including measures on reduction of the CO₂ emission by peat soils.



Missing points and recommendations on improvement of the WUO legislation

The main criteria for sustainable functioning of the WUO on the multifunctional drainage systems couldn't be reached in frame of the current legislation. The following missing points were defined via testing of the main WUO law statements on the pilot drainage system:

1. There is no regulation to provide membership fixed fee for all water users that have a different benefit from the drainage (village citizens, agricultural and other enterprises, forest company etc) as well as guarantee on cost recovery for the water management and operation and maintenance of the drainage system;
2. There are a limited number of services that can be provided by WUO on the drained areas that are related to the water management for agriculture, nature and Rural Development;
3. The tariffs set up for the different water users that serves business or public interests is not regulated;
4. There are no regulations to provide needed environment flow from the drainage system to nature and drainage water quality monitoring needs and state support for such measures;
5. There is lack of regulations of the water management and conditions for the conservation of drained lands on peat soils to reduce CO₂ emissions.

The main features needed for WUO legislation in the case of multifunctional drainage systems would be a public organization similar to the WB RIDO model or Water Boards in Netherlands. Such WUOs have **public- private corporative governance** structure and the right of **long-term use or property of public infrastructure**. This solution is needed because in conditions of the multifunctional drainage the water services for business, local communities and for nature resources protection has a public value for the rural areas. A large number of additional articles and regulations should be developed in frame of existing WUO Law or within special Law that will regulate establishment of the WUO on multifunctional drainage systems. The main additional regulations should be the following.

- The WUOs on the multifunctional drainage should have the right for a broader amount of functions: drainage and water regulation on agricultural lands; drainage to limit harmful effects of floods on the population of villages; water regulation to preserve aquatic ecosystems and biodiversity.
- Obligatory mandatory involvement of the all groups of water and land users, TCs, Forestry and environmental protection organizations should become members of WUO that is needed to collect fees and have cost recovery for operation and maintenance of the infrastructure.
- The integrated water and land use plans should be developed by WUO's that will fit to the RD plans of the territorial community to ensure sustainable water management on the local level.
- Modernization of the drainage systems should be in balance between economic and ecological requirements for the development of rural areas.
- Restoration of drained lands with peat soils and introduction of alternative agricultural production on peat soils to reduce CO₂ emissions could be included as a part of WUOs tasks and obligations.
- Three levels of taxation and tariff set-up should be foreseen: fix tax for the water services per hectare for the operation and maintenance of the drainage infrastructure; dynamic tariffs per ha for flood water withdrawal services and regulation of the ground water table (water supply) during the summer dry periods for farmers; separate tariffs per group of business companies and citizens within the village areas based on the different type of benefits that they have from the drainage services.
- Special subsidies from the national, regional, district and TC budgets should be foreseen to support nature and water ecosystems protection measures.



- Flood protection management requirements, or more specific management of the ecological flow to the ecosystem should be regulated according to the Nature protection and flood risk management Directives of EU.
- Drainage water quality issue should be regulated via water quality monitoring task of the WUO.
- The government support on capacity building of the WUOs on multifunctional systems should be fixed in the Law.

Scenarios for and the process of establishment of the WUO on the pilot drainage system

Regional and local stakeholders proposed a step- by step process of water governance changes in the pilot area. Three scenarios were defined, discussed and analysed based on the criteria of sustainable economic functioning of the future WUO. The “minimum” scenario as the most realistic first step was selected by the local stakeholders to start the process of establishment of the Water user organization in the frame of the existing legislation. Such WUO will provide service only for operation and maintenance of the on-farm drainage infrastructure that according to the Law will be transferred to the property of the WUO organization. The state district water management organization will continue their activities on flood protection for population and agriculture on the level of the main and secondary drainage canals, as well as deliver water to the farmers from the reservoir during the dry periods and care on the environmental issues of water management. The other two scenarios can be realized as a further step of WUO development later when needed legal base and capacities will be organized. A road map on establishment of selected WUO model was developed that demonstrates the ordering and timing for the needed actions to establish the WUO and put it into functioning. The key group of the most active regional and local stakeholders agreed to establish an initiative group to start this process (Regional water management department, the large agroholding ‘Pyatydni’, Kolodyazhenska territorial community).

Capacity building and recommendations for follow up in bilateral cooperation

In order to disseminate results of this project and prevent institutional management risks for establishment of many WUOs in the drainage systems in Volyn and other regions, it is proposed to develop a regional training program for interested parties. Such a program should have at least five main training modules: institutional/organizational; technical and technological; green deal principles and innovations; nature protection; and social standards. The governance structure of the Dutch Water Board concept could be used as inspiration for the further development of the local water management structures in Ukraine. The mapping of key public and private stakeholders in the Netherlands is presented to involve them in the next steps of the reform process and invite them for the knowledge and experience sharing for learning and adaptation to the Ukrainian situation.

There are **6 key topics** proposed where the Netherlands could provide its added value for further bilateral collaboration.

Key topics of Netherlands’ added value.

Key topics with high added value from the Netherlands are:

Key topic 1: An awareness and training programme with input from the Dutch Water Authorities (DWA) and a Dutch Water Board and the international experience of the Hague Academy for Local



Governance to benefit from the lessons learned of the current PSD project in Kolodyazhnenska Territorial Community.

Key topic 2: Organization of workshops to define and expand the roles of WUO's and RIDO's in the southern regions for irrigation water management and for central and northern regions for drainage water management. These workshops should focus on the challenges to come to a uniform institutional set-up that fits both regions and enables investments in the water infrastructure by water users and attract (international) loans for this purpose. It is strongly recommended to involve the World Bank and FAO in these considerations since they were involved in the initial development of the WUO and RIDO concepts.

Key topic 3: A support project with involvement of the DWA on the organization of a federation of WUO's and a federation of RIDO's. Definition of joint interests of these federations and common fact finding.

Key topic 4: Continue piloting WUO organizations both in the drainage and in the irrigation regions of Ukraine to continue the learning by doing process to further develop local water management institutions. The same should be done with the RIDO concepts that operate on a larger scale and a wider mandate than WUO's.

Key topic 5: Dutch UPF- or Invest-international- support to Ukraine/Volyn ++ in composing an ambitious Program with plan-preparation of Irrigation and Drainage Rebuilding projects, and request for implementation money from the IFI's.

The **list of 8 concrete recommendations** for development of collaboration and concrete follow-up projects between Ukraine and the Netherlands in Water management and WUOs topic are presented.

Recommendations for bilateral collaboration between Ukraine and the Netherlands

Recommendation 1: It is recommended to develop a broad Dutch-Ukrainian Training program for Ukraine about all aspects of local water management institutions including WUO's, RIDO's and other institutional set ups, taking into account the importance of agricultural water management. Dutch organizations that could be involved in this broad training could be a.o. the Dutch Water Authorities, the VNG-I organisation (International branch of the umbrella organisation of the Dutch Municipalities) and the Hague Academy.

Recommendation 2: It is recommended to create a support Dutch-Ukrainian support project for establishing WUO's and RIDO's in different regions in Ukraine. The project would support learning by doing and provide suggestions for improving and broadening the local water management legislation and support establishment of a Union or Federation WUO's in Ukraine.

Recommendation 3: It is recommended that the Netherlands Embassy continues to support Dutch water and agriculture companies to cooperate with Ukrainian companies.

Recommendation 4: It is recommended that the Netherlands avails its knowledge and experience in local water management to start and participate in a Government to Government dialogue on local water management and water policy.



2. Current water resource management and amelioration sector reform in Ukraine

2.1. Integrated management of water resources at river basin level

The main legislative document of Ukraine on the use of water resources is the Water Code, which entered into force on July 20, 1995 with the appropriate changes and additions. According to the Water Code, the task of water management is to coordinate legal regulations to ensure the preservation, scientifically based rational use of water for the needs of citizens and branches of the economy of Ukraine. The latest changes to the Water Code and a number of other regulatory acts are related to the signing of the Association Agreement between Ukraine and the European Union in 2014, and, accordingly, the need to harmonize Ukrainian legislation with EU directives. Implementation of the provisions of Directive 2000/60/EC of the European Parliament and the Council "On establishing the framework of the Community's activities in the field of water policy" of October 23, 2000 into the practice of water resources management in Ukraine started with the adoption of the Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine Regarding the Implementation of integrated approaches in the management of water resources according to the basin principle" (adopted by the Verkhovna Rada of Ukraine on October 4, 2016, No. 1641-VIII). On December 14, 2023 negotiations on Ukraine's accession to the EU took place after meeting the EU requirements.

Implementation of integrated water resources management on the river basin focussed now more on the measures to reach good status of water quality and the creation of surface water monitoring system and developing river basin management plans. In the Analytical Report of the European Commission dated November 8, 2023, progress in the implementation of these issues was confirmed. As part of the adaptation to the European requirements for the surface water monitoring system, the State Authority for Water Resources, created, with the support of the EU, 4 modern laboratories for water quality monitoring. Projects for the introduction of integrated water resources management were developed and published on the website of the State Authority for Water Resources river basin management plans (RBMP), a public discussion of these plans has now begun, which will continue during the next six months.

According to the basin principle of the water management organization, 9 river basin departments (RBO's) have been established. The Strategic Environmental Assessment of these plans is currently underway, including a public discussion, after which changes will be made to the draft plans and their approval by the basin councils. The approval of the RBMP's is expected in the summer of 2024, and their implementation will begin in 2025.

In general, as it happens in those countries that are adopting RBMP's for the first time, the cornerstone of the developed plans is the improvement of sanitation during the next 6 years. A total of 1,635 measures are foreseen, 92% of which are aimed at improving sanitation and reducing pollution of water bodies by construction and modernization of treatment facilities, sewage networks, etc. The total cost of the planned activities over 6 years is about 8.2 billion euros.

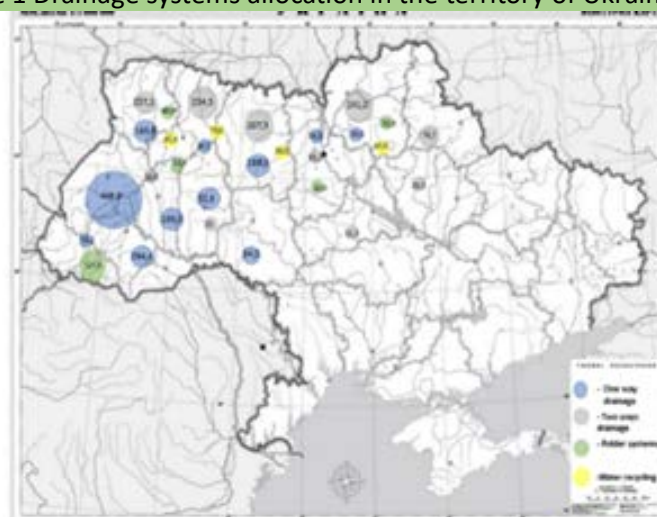
In the Polissia zone, where most of the drainage multifunctional and dewatering-wetting drainage systems are concentrated, there are basin managements on the rivers Pripjat and Western Bug. The river basin management plans have already been developed for these basins, taking into account the functioning of the drainage systems and their possible impact on the water resources of the region.

Drainage areas in Polissia region

Analysis of the natural and climatic conditions of the Polissia region and existing agriculture practice show that profitable crop production is only possible if measures are taken to eliminate or mitigate water shortages in summer and excess water in winter. In the Polissia region of Ukraine, 1,671 drainage and reclamation systems (3.2 million hectares) have been built. This includes:

- 1.7 million hectares (835 units) with a simple one-way drainage system;
- 1.1 million hectares (585 units) with two-way regulation multifunctional drainage systems;
- 0.4 million hectares (251 units) with a polder system.

Figure 1 Drainage systems allocation in the territory of Ukraine



On approximately 50% of the drained land area, the water regime is unregulated and does not meet the agronomic requirements of the crops grown. Legislative acts on the establishment of water user associations should be adapted to the specifics of solving multifunctional problems on drained lands. The experience of developing local multifunctional drainage systems with decision-making by local water users will contribute to the implementation of the National Recovery Program of Ukraine to implement a new agricultural policy and support the integration of the Ukrainian agricultural sector into the EU through high environmental and social standards.

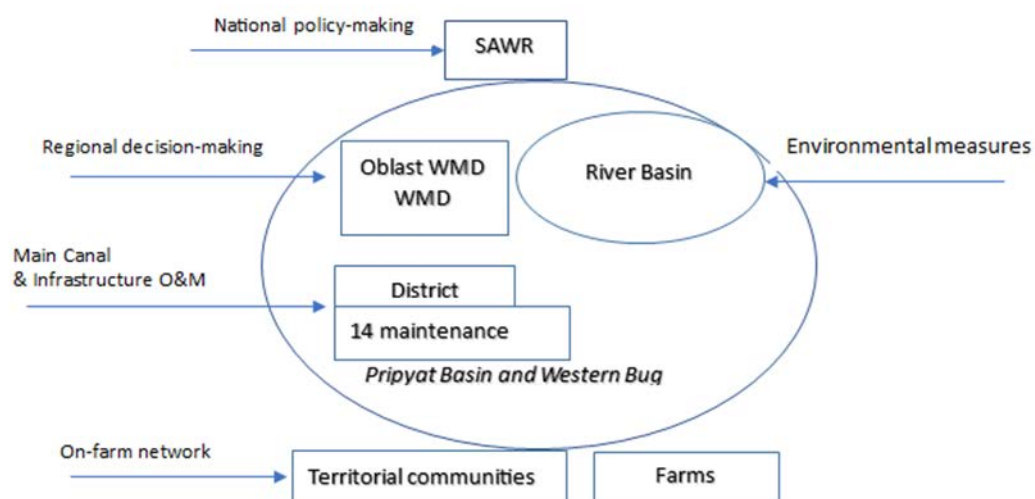
Problems of land and water management in Polissia region

- 1) Increased number of extreme climate events, such as floods and droughts within a single year. Such a case has been observed in recent years in Prypiat, when, after spring floods, high temperatures during the summer months caused the water flow in the river to dry up.
- 2) Fragmentation of land use due to land privatization and appearance of the many small farmers within the service area of the drainage infrastructure. These farms cannot be profitable without cooperating to restore on-farm drainage systems and thus cover the costs of operation and maintenance of the drainage or improve land use.

3) Development of larger territorial communities that start rural development and spatial planning to move to new activities (tourism, hunting, nature conservation) additionally to the agricultural business within their areas.

4) Social issues such as (un-)employment, health, living conditions, etc. are also connected with water and land management issues and need to be taken into account. The drainage infrastructure ownership and management are presently shared between government authorities, territorial community and farmers. On the figure below the sharing of the responsibilities on the operation and maintenance of the main, secondary and on- farm drainage infrastructure between different stakeholders is presented.

Figure 2 The management structure of water resources



2.2 Basic principles of the Irrigation and Drainage Strategy and their use in the reform process

With the growing shortage of water resources, the conditions of the natural moisture supply of the territory of Ukraine are deteriorating significantly. In the period 1991-2020, the area of arable land with a deficit of the annual climate balance of more than 300 mm exceeded 10 million hectares. This figure is characteristic for Ukraine's general need for irrigation. At the same time, the actual state of use of the available irrigation and drainage potential (more than 3 million ha) can be characterized as a crisis, because in recent years (until 2022) the actual irrigated area did not exceed 550 thousand ha, and the areas of actual irrigation use were even smaller (about 300,000 ha). The intra-farm network is especially critical.

Currently, there is no reliable and systematic information about the technical condition of the engineering infrastructure objects and the operation of reclamation systems, distribution by owners and water users, location, etc. This makes it difficult to make effective management decisions regarding their use, modernization and restoration.

Restoring the functioning of drainage systems in the "Irrigation and Drainage Strategy up to 2030" is considered as an important component of increasing the efficiency of drainage systems, especially in



the Polissia zone. The strategy provided for the restoration of drainage systems through the reconstruction and modernization and the improvement of the efficiency of drainage melioration measures, in particular, the cultivation of high-profit crops on drained lands, which was previously impossible due to adverse natural conditions.

The imperfection of the management system requires legislative regulation of reform issues of the organizational structure of water resources management and the effective use of reclaimed land, taking into account the interests of all water users. Legal and institutional reforms are needed to achieve this. Therefore, measures to reform the system of water resources management and land reclamation developed with the participation of experts from the World Bank, FAO and approved by the Cabinet of Ministers of Ukraine "Irrigation and drainage strategy for the period until 2030" (2019) and the Plan of measures for its implementation (2021) are urgent. Among the priority measures in the Strategy, the Law on WUO and the Law on the Operator (in the process of discussion) were adopted.

The main tasks of the WUO's in the current WUO Law are focused on irrigation and drainage services for agriculture. This means that other functions of existing drainage or irrigation systems are ignored. This applies to such functions as water resource management for protection against floods, inundation of territories, implementation of environmental protection measures, accumulation of water for fighting fires and providing water for fish breeding etc.

In international practice, especially European WUOs, in most cases perform a multifunctional role in the management of water resources and provide services not only for agriculture, but also for the development of rural areas. Therefore, local communities and municipalities are also members of the WUO in this case. Such multi-functional activities make WUOs economically stronger and ensure integrated management of water resources (this helps to avoid cases where part of the infrastructure is used by WUO's and another part is managed by municipalities or government organizations). But WUOs can become involved in more integrated functions of water resources management at the local level only when the entire reclamation infrastructure at the local level is fully transferred to them.

The Ministry of Agrarian Policy and Food supports establishment of WUO's. This process has now started, and is most active in the irrigated areas in the South of Ukraine namely in Odesa oblast, which is not occupied and is not in the proximity to the hostilities.

The current Law on WUO's does not cover the specifics of solving the multifunctional problems on the multi-functional drainage systems. Integrated water management, cost-recovery for flood protection for villages and water for nature are not yet clearly regulated in the law. At the same time, improvement of water management in the regions with drainage needs has gained special importance. Because of the war and occupation important irrigated areas in the south of Ukraine cannot fully function, so agriculture in the north and west parts of Ukraine has to compensate the loss of decreased production in the south of Ukraine.

North-west of Ukraine (also referred to as "Polissia zone": Volyn (the geographical scope of this project), Rivne, Zhytomyr, Kyiv, Chernihiv regions) is the area with drainage, irrigation, flooding and nature needs. These drainage areas are of high relevance for agriculture in Ukraine in the current situation where the east and parts of the south region are seriously affected by the war.

The next stage of the reclamation reform is the adoption in the second reading of draft law No. 7577 "on improving the management system of engineering infrastructure objects of state-owned reclamation systems, developed by experts of the Ministry of Agrarian Policy and the USAID AGRO



Program." This law will create institutional structure for operation and maintenance of the state own main and secondary irrigation and drainage canals called Operators. In the WB Irrigation and drainage strategy such organizations called RIDOs (regional irrigation and drainage organizations). The Operators or RIDOs will provide water services for WUOs and other water users that take water from the main infrastructure. Operators of RIDOs can have a governance structure similar to the WUOs but still keep infrastructure in the government property, and have also strong government participation in decisions making within the Board of organization as well as use state budget for modernization of the infrastructure.

According to the Irrigation and Drainage Strategy, the WUOs in the area of drainage systems have differences in terms of tasks and the composition of the organization's members. Under the conditions when meliorative systems, in addition to providing services to private water users, also provide services to the population, they already have public importance and membership in the organization can be mandatory for everyone who uses these services.

At the same time, the developed Law No. 7577 "On the operator" will not contribute to the decentralization of water resources and engineering infrastructure management, but on the contrary will preserve a centralized management system for almost every existing irrigation and drainage system. Considering the reform process, the transfer of small-sized irrigation systems to the WUO management will reduce the burden on the budget and is already the first step in the process of reforming the water resources management system. On the other hand, the payment of VAT upon the transfer of property from the state to the WUO in the specified amount upon their creation significantly slows down the rapid process of changing the owners of irrigation/drainage systems. Tariff creation mechanism according to Law No. 7577¹ is also not fully worked out and can slow down the process of creating WUO on drainage systems.

2.3. Problems of WUO establishment in (multifunctional) drainage systems

The main obstacles to the process of reforming and forming WUO's in the irrigation and drainage area are the slow and contradictory procedures for the distribution of property and responsibilities for the transfer of irrigation and drainage infrastructure from SAWR to the Land Reclamation Agency. Currently, more than 32 WUO's have been created and registered (among them one in the area of drainage systems), but none of these organizations, in accordance with the law, has yet received ownership of pumping stations and secondary channels from regional and district organizations of SAWR. (The transfer of the network to the ownership of the WUO is accompanied by a payment in the prescribed amount, and newly created WUO's do not have funds for reimbursement, so they seek to apply a special transfer procedure. This procedure can be avoided when receiving state property for long-term use instead of ownership). That is, WUO's cannot begin to operate and maintain this infrastructure. SAWR is categorically against the transfer of main multifunctional channels, which in the

¹As the drafters of the Law themselves note: *In the case of the adoption of Draft Law No. 7577, a different principle of payment of the permanent component of the tariff will be established, namely - paid by water users in proportion to the water intake limit specified in the water user's special water use permit, to the total volume of water intake limits of all water users to whom the UWC provides water delivery services, in if the WUO system operates drainage systems, in proportion to the area of the land plot of the person to whom water drainage services are provided. Sounds logic...?!*



drainage area are often the channels of small and medium-sized rivers, and also provide services for flood control and environmental protection issues. The only WUO system created now in the area of drainage systems is focused on irrigation management, i.e. providing the drainage system with new functions. In fact, the problem of the multi-purpose functioning of drainage systems after the transfer to the WUO is obvious. Such drainage systems besides importance for agriculture under climate change has significant social functions that must be supported by local and regional budgets.

Another serious drawback of the reform is that the legal and institutional aspects are not connected and not integrated with the technical, technological and economic issues of further sustainable operation and management of the irrigation and drainage systems of the WUO or the future Operator. A clear example is multifunctional drainage systems, where the current law on WUO and the draft law on the operator could not be implemented, as there are no clear calculations of the mechanism for reimbursement of costs for operation and maintenance of the systems.

2.4. Description of the pilot Krychevychivska Drainage System

In recent years, during heavy rainfall in the territory of the Volyn region, especially in certain parts of the region, significant areas of agricultural land were flooded. Estates, farm buildings and homestead plots, suffered considerable damage for residents and agricultural producers. In 2023, 19.5 thousand hectares of agricultural land were flooded in the region.

Inundation and flooding in the territories of the Krychevychivska drainage system is caused by climate change and is aggravated by the unsatisfactory state of the engineering infrastructure of the reclamation systems Both the intra-farm and inter-farm in the Volyn region were built mainly in 1960-1980. During the summer period, part of the land that needs water to prevent crop damage is not supplied with water due to the unsatisfactory condition of the pumping station, which provides water regulation of this territory.

The Krychevychivska drainage system was selected as a pilot area for project implementation. *(In December 2023 a concrete detailed proposal is submitted to the Dutch UPF-program. Until now we have no indication whether this proposal will be rewarded. This will become clear in late March 2024.)* The drainage system plays a multifunctional role in water management in the Kolodyazhnenska territorial community. It is representative for the whole region and characterised by outdated infrastructure and imbalances in water management that adversely impact agricultural lands and result in flood risks (see figure below).

The Krychevychivska drainage system has an important role for sustainable development of the Kolodyazhnenska territorial community. Water management efficiency on the area of the community totally depends on the technical characteristic of the drainage system and existing institutional and economic conditions of its operation and maintenance.

To understand whether the existing WUO Law can be implemented on the multifunctional drainage systems, technical, economic and ecological data were collected and communication with local stakeholders was organised during two live visits to the Kolodyazhnenska territorial community. (Annex 1). The working group, together with the community, summarized the most important management issues of the dual-regulation multifunctional drainage system. (see in the table below).

A systematic analysis was implemented to defined technical, environmental, financial, legislative and social problems at the Krychevychivska drainage system.



Technical problems identified are: improper operating conditions; siltation of main and secondary channels; low-quality regulation (reservoir, Pumping Station, regulator locks), two-way regulation is not provided; emergency condition of bridges and roads; undefined areas of regulation (forest reclamation or discharge into the water network); malfunction of water intakes; the need to wash or replace inspection structures; state of pottery drainage; restoration of emergency services; land levelling of basins and saucers; lack of a monitoring network; non-compliance with operating modes of the Krychevychivkyi reservoir; high energy costs for emergency power plants.

Environmental problems include: beaver riddles and channel flow disorders; failure to take into account environmental requirements when planning, cleaning and restoration works; peatland fires; Krychevychivkyi reservoir; ecosystem of existence of red book animal species; waterlogging of new territories; the drainage system is part of the ECO-Network of the Volyn region (part of the Emerald network); renaturalization of individual areas; inadequate quality of drinking water.

Financial problems are defined as: insufficient financing of the drainage system operation and maintenance in the local and state budgets.

Legislative problems include: unclear distinction between forest reclamation and agro-reclamation networks; legislative problems in clearing canals in the forest; the unresolved issue of bio melioration in the Krychevychivkyi reservoir; lack of operating rules and the procedure for writing off reclamation networks; lack of integrated plans for the modernization of drainage systems; lack of water use management in the Turya river basin.

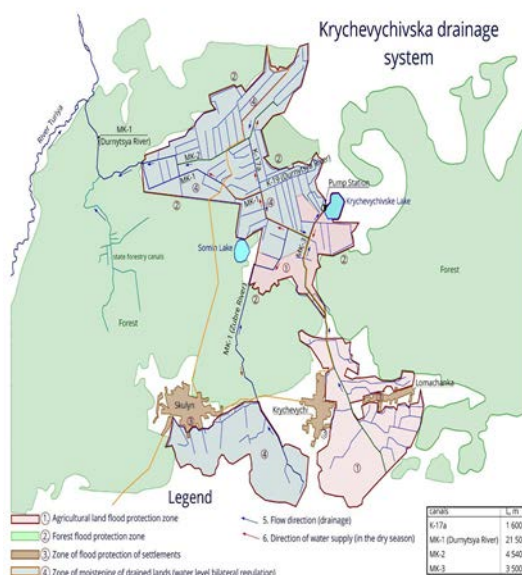
Social problems are: financial losses of tenants of agricultural land (failure to sow agricultural crops); financial losses of the community (non-received revenues to the budget); theft of property of reclamation systems; flooding of houses in villages; lack of specialists.

Organizational problems include: the problematic issue of creating an WUO organization on drainage systems of bilateral regulation is the absence of legislation for its membership, the uncertainty of the financing mechanism of WUO and how to raise the budget of this organization. Currently, the most realistic and likely scenario of the formation of WUO on drainage systems is its creation within the boundaries of operating profitable agricultural enterprises. It is possible in the future to gradually expand the WUO service area to the rest of the territories. At the same time, in a number of European countries, membership in multifunctional WUO systems (local water management systems), in particular in the area of operation of drainage and drainage systems, is mandatory.

General characteristic of the pilot drainage system: Krychevychivska multifunctional drainage system in Volyn Oblast, Kovel District covers 3,549 ha (including 1,117 ha of bilateral (water supply and drainage) regulation, 2,870 ha of pottery drainage, and 1,840 ha of mechanical water lift (polder), which protects the territory of Krychevychi, Skulyn and Lomachanka villages from harmful water impacts. The Krychevychivska drainage system is characterised by an outdated infrastructure and imbalances in water management that adversely impact agricultural lands and result in flood risks. In Volyn region modernization of multifunctional drainage system will support farms by water regulation in the dry periods and also provide water security for the rural population by protection against floods during spring and summer floodings.



Figure 3 Krychevychivska drainage system



The main summarised issues of the Krychevychivska drainage system functioning are:

- ✓ unsatisfactory technical condition of the elements of the drainage system;
- ✓ extremely insufficient financing of operational measures, which led to a significant decrease in the effectiveness of regulating the water regime;
- ✓ emergency condition of bridges and roads;
- ✓ the ownership of individual elements of the system is not determined;
- ✓ inability of the catchment river (Turia River) to receive excess water from the system in critical periods;
- ✓ the need for flushing of the pottery drainage and water regulating and culvert structures;
- ✓ the need to modernize the Pumping Station;
- ✓ the need for land levelling works in the fields to eliminate local depressions and places of accumulation of surface water;
- ✓ lack of a monitoring network (observation wells);
- ✓ non-compliance with the operational regimes of the Krychevychivkyi reservoir

According to the results of the local meeting, the participants agreed to establish a permanent dialogue for the successful implementation of project tasks, close cooperation with a group of stakeholders; conducting further trainings/education on the functioning of WUOs on drainage systems, the tariff system needed, innovations, restoration of monitoring facilities on systems, and the development of a joint strategy regarding the process of creating an WUO in the pilot territory.

3. Analysis of the legislative and economic problems of WUOs establishment on the multifunctional drainage systems

3.1. Lacking issues in the current WUOs Law and perspectives for improvement

Current legislation on WUOs and draft law of Operators should be coordinated on the issue of water governance and transfer of water infrastructure from the state. For the moment both Laws focus more



on the operating and maintenance of the irrigation and drainage systems to manage water only for agriculture.

Based on the analyses of international experiences and results that were obtained on the pilot area via communication with local stakeholders the general weak points of the existing legislation were defined as well as specific missing issues that belong to the conditions of the multifunctional drainage systems.

The common lacking issues that can cause a risk for stable operation and maintenance of all types of the irrigation and drainage systems under current legislation are the following:

1. There is no clear legal regulation on the transfer of the state-owned part of the irrigation and drainage infrastructure (secondary and main canals) to the WUOs or Operator according to the scale of the systems (large scale regional or small scale local) and its typology (multifunctional or only for agriculture purposes).
2. The existing Tax code require to pay a VAT to the state budget to transfer of infrastructure from the state water organizations to the WUOs that make a big complication for functioning of these organizations.
3. There is a need for normative legal acts of the Government on assisting water users in minimizing the risks of the impact of climate change, ensuring guaranteed access to water, optimizing land use on reclaimed land, reducing regulatory pressure when obtaining a permit for special water use.
4. There is a need for developing a clear mandate for the State Agency of Melioration for the state support (training and procedures on transparent subsidies provision) and monitoring of the WUOs functioning.
5. There is lack of normative indicators for assessment of effectiveness and sustainability of the WUOs functioning and efficiency of the water management within the service areas of WUOs, taking into account the needs of local communities and water and land users, which will involve technical re-equipment, improvement of the management system and solving social and territorial development issues.

In the meantime 32 Water user organizations have been established until now. The first organization of water users (WUO "Persha" within the Trushiv irrigation system in Cherkasy region) was registered a year ago, on December 9, 2022. During 2023, the number of water user organizations increased to 32. The largest number of WUO's were created in Cherkasy Oblast - 12 and Odesa - 8. In Poltava and Dnipropetrovsk - 3 each, Zhytomyr - 2, and one each in Vinnytsia, Kyiv, Mykolaiv and Kharkiv Oblasts. These organizations unite more than 100 agro-producers, and the territory covered by WUOs is more than 190,000 hectares. All these organizations have not yet gained practical experience with operation and maintenance of the irrigation and drainage systems because didn't receive the infrastructure in their property yet. There are also not any cases of establishment WUOs on the multifunctional drainage systems.

The process of creation of WUO was very well supported and organized in the South and central regions of Ukraine on irrigation systems. Therefore, at this moment the procedure on establishment of WUOs is checked and explained for irrigation. At the same time it is clear that the legal process of transfer is not yet finalised and additional by-laws and normative documents will need to be developed during first practical experiences of the WUOs functioning. The same holds true for the establishment of WUOs on the pilot for the multifunctional drainage system. These conditions are quite different for pure irrigation or one sided drainage because they deal not only with private interests but also with public interests of flood risks management and nature protection in the rural areas. WUO's for



multifunctional drainage include the following public tasks: regulation of peat soils use, protection and revitalisation of small rivers, protection of nature wetlands resorts and swamps. It seems that legislation on WUOs for the multifunctional drainage couldn't be under private sector legal regulation but WUOs in these conditions should be public organizations that have drainage infrastructure for long term use and not in their property. In this situation territorial communities, regional and national government should have their representation in the governance board of the WUO.

3.2. Key motivations of the stakeholders in Kolodyazhnenska territorial community for WUO development

The following motivations and practical economic reasons for the creation of a WUO were identified during the interactive workshops with stakeholders in the Kolodyazhnenska territorial community.

Technical infrastructure property reason. Cleaning and widening of the canals and modernization of the PS and hydraulic construction is needed. This can be achieved only in combination with an integrated modernization plan that can be developed by WUO (like the current UPF-project proposal) when drainage infrastructure will be transferred to the WUO. To regulate water during flood or dry periods coordination of water regulation around the drainage service area is needed. This can only be done only in frame of one management institutional unit such as a WUO and establishment of the permanent dialogue of the WUO members to agree on flood safety issues and the agriculture practices and strategies. A needed storage capacity should be organized on the drainage system to have enough water accumulation for use during the dry periods. This issue will become more and more important due to the climate change and will need to be included into the modernization investment plan of the drainage system. The following draft calculations of investments need for modernization of Krychevychivska drainage system for different groups of stakeholders are presented:

Table 1 Main components and service areas of the drainage infrastructure that should be included to the investment project of the Krychevychivska drainage system

Name of the drainage system components and equipment	number / area
Main pump station	1
Construction of the additional water accumulation reservoir	1
Service area of the main drainage state infrastructure	3,549 ha
Service area of the drainage infrastructure belongs and serves by territorial community to protect villages form floods	305 ha
Service area of on- farm infrastructure belonged to the famers or leased from community for agriculture production to them	1,117 ha
Drainage allocated in the forest area managed by Forest company	44,5 ha
Equipment for ground water table and water quality monitoring	-

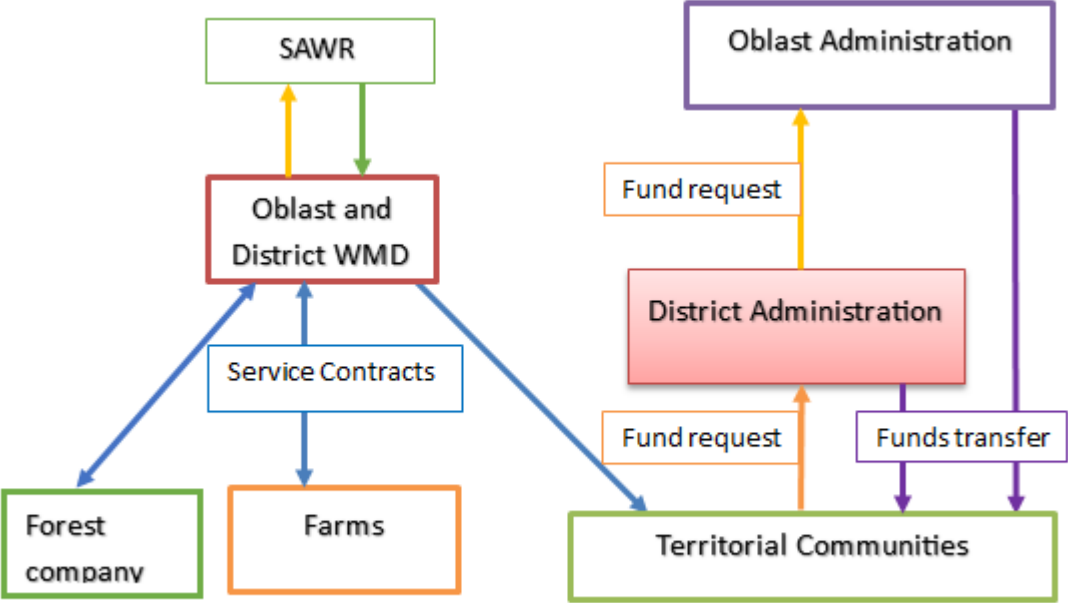
The modernization project should also include introduction of innovations on water management based on the dynamics of meteorological conditions, monitoring of the ground water table during flooding and vegetation periods and also crops water requirements according to the agriculture modernized practice that will fit to climate change and to market challenges. The planning and technical design of such integrated modernization project could be organized and implemented when WUO governance board will initiate and lead this process and then apply for investment business plans to attract investments and share own contributions between WUO members. Nowadays to organize and implement such integrated modernization project is not possible due to the

organizational and property rights issues. Main canals and PS are in the property of the state, on -field farm infrastructure belongs partly to the territorial community partly to the farmers.

Unclear and divided ownership on drainage infrastructure keeps investments away and also couldn't guarantee the quality of water management service for all groups of stakeholders. Nowadays all of them, private water users, territorial community and state regional water management department have insufficient funds to modernize the drainage system and provide its efficient operation and maintenance. The many forms of the infrastructure ownership that exist today cause high risks for the investor in modernization of drainage systems. Transfer whole infrastructure to the WUO will open a new opportunity to attract investors.

Economical and organizational issues. In the figure below the current structure of service provision and funding of operation and maintenance on the pilot Krychevychivska drainage system is presented.

Figure 4 Current situations of the drainage-related services for different users



The quality of the current services is very low due to the bad technical state of infrastructure and lack of financing on operation and maintenance of the drainage infrastructure. This is aggravated by a lack of monitoring and proper water management procedures. Nowadays water is often observed on the surface of agricultural lands and areas in the villages as well as in forests that are flooded. Private water users, working in agriculture, have no initiatives to invest in cleaning of the canals on all their length because infrastructure belongs partly to the state or to territorial community. Both state and TC have not enough funds to realise these tasks.

There is lack of state and private funds on operation and maintenance of the drainage infrastructure. Financing of the state for the regional water management organization covers only small part of needed costs for operation and maintenance of the whole main drainage infrastructure. It looks as a vicious cycle because water users don't like to pay for bad water services. The local stakeholders are not involved to the decision making on tariff setup and planning of the drainage modernization and maintenance issues. Therefore, establishment of the WUO, will open opportunities for attracting



investments, costs recovery for operation and maintenance of the drainage infrastructure and guarantee of the needed quality of the water services. The government support and technical assistant projects and grants can be provided for multifunctional drainage system during the period of the WUO development and also for covering of part of the services costs that have public interest.

Ecological reasons. The low level of water management services called for the environment problems of peat soils drying in summer causing land subsidence and carbon gas emissions to the atmosphere. Also flooding of agricultural lands and villages during heavy rainfall influence water and land quality. Inefficient regulation of water in the forest influences the quality of forest business during wet periods and stop environmental flow via forest to feed small rivers and swamps. Implementation of integrated modernization projects and integrated water management for all type of goals by WUO (water for food: water for people and water for nature) has the potential to limit all negative ecological risks and provide sustainable integrated rural water management.

Social reasons. The bad water management of the drainage system creates problems for living standards of the village population. The excess of water and bad quality of water is a problem that influences the health and household conditions in the villages. People leave the villages and look for the better conditions for their life. Establishment and strengthening of the WUO, awareness raising campaign for all stakeholders and community members will open new social and economic development chances for rural population and local business.

3.3. Analyse of the possible conflicting issues between different water services on the pilot area of Krychevchivska drainage system

In the table below a number of the conflicts in water management due to different interest of different groups of stakeholders are presented, which were observed in the pilot area. Establishment of the WUO will create the opportunity to solve these conflicts.

Table 2 - Possible conflicts in water management on the multifunctional drainage systems

Conflicting sectors	Involved stakeholders	Nature of the conflict	Ways for regulation within WUO
1. Nature and agriculture conflict during the dry periods	River basin department, environment NGOs, Farmers, Territorial Community	To prevent increasing of CO2 emission from peat soils a very accurate water level regulation is needed that sometimes will not favour crop water requirements needing deeper ground water tables	Famer members of WUOs can agree to keep water higher and grow crops that will need less water during the dry season and to compensate some yield losses using carbon exchange market opportunities
2. Agriculture and Territorial community conflict on the excess water drainage	Big famers, private land users, territorial community	It can be case when both agriculture and territorial community need simultaneously very fast evacuate	Construction of an additional water storage reservoir and widening and cleaning of the drainage canals



Conflicting sectors	Involved stakeholders	Nature of the conflict	Ways for regulation within WUO
		excess of water via drainage from the area. The conflict can take place when main drainage infrastructure has not enough capacity to do this or small rivers that received this water could not evacuate it fast and flooding of agriculture areas or village areas can take place.	by WUO will prevent this conflict by increasing the capacity of the drainage system on fast and simultaneously evacuation flooding waters from all area of the territorial community and service area of WUO
3.Forest management and nature protection to provide needed environmental flow to the ecosystem and biodiversity	Forests management company, territorial community, River basin management department	Forest company would like to dry their forest to continue their business in the summer time when minimal environment flow should be provided to fit local small rivers and wetlands	When forest company will become member of WUOs they can optimize their activities to provide permanently needed environmental flow. Based on the data of the ground water monitoring implemented by WUO the plan of such forest business activities can be simulated and planned in ‘win- win’ manner.
4.Nature and territorial community and farmers due to bad agricultural practices on use of fertilizers etc and lack of water treatment after the communal drinking water use	River basin department, territorial community, farmers	In case of the soil pollutions and wastes reaching the ground water, drainage water can have bad quality that will not fit to the norms of water quality according to the WFD and river basin plans	The water quality monitoring conducted by the WUO and river basin management department will help to prevent and solve this conflict

3.4. Perspectives for farmers, local communities and environment

The establishment of the WUO on the Krychevychivska drainage system will provide economical, ecological and social benefits for all involved group of stakeholders and rural development These benefits will be achieved due to the modernization and efficient management of the Krychevychivska drainage system including:



- Enhanced pump station efficiency which is crucial for ensuring that agricultural areas receive the necessary water supply and minimising the energy used for lifting water to the reservoir.
- Optimised water flow through widening and cleaning of canals
- Installed monitoring system for the subsurface water flows to improve water management
- Improved capacity of WUOs on multifunctional water management

For agricultural enterprises, small farmers and land owners the following measurable positive changes due to the creation of WUO will be implemented:

- increasing of crop production;
- introduction of new types of crops and development of agribusiness opportunities;
- reduction of costs on crop growing;
- selling of CO₂ emission rights;
- improvement of soil fertility.

For Kolodyazhnenska territorial community the following direct and indirect positive impacts will be achieved:

- favourable conditions for household agriculture (vegetables gardens) and life conditions;
- improvement of technical and drinking water supply;
- more favourable conditions for all type of businesses within villages and rural areas;
- control on the water quality.

For the forest company:

In summary, the expected result of the project is a transformed drainage system that not only addresses immediate water management issues but also sets the stage for sustainable, collaborative, and community-driven practices. Through enhanced efficiency, optimised water flow, the establishment of WUOs, and a decentralised system, the project aims to contribute to the long-term resilience of the drainage system while serving as a model for replication in other regions.

4. Legal background and normative framework for creation of the WUO in Kolodyazhnenska territorial community

4.1. Current legislation and regulatory document that support establishment of WUOs

In addition to the main Law on establishment of the Water User Organizations on irrigation and drainage systems there is a long list of legal and normative regulatory documents that need to be used during the process of Creation of WUO and its functioning:

1. Water Code of Ukraine of June 6, 1995, No. 213/95-BP: <https://zakon.rada.gov.ua/laws/show/213/95-bp#Text>
2. Land Code of Ukraine dated October 25, 2001 No. 2768-III <https://zakon.rada.gov.ua/laws/show/2768-14#Text>
3. Law of Ukraine "On Land Reclamation" dated January 14, 2000 No. 1389-XIV: <https://zakon.rada.gov.ua/laws/show/1389-14#Text>
4. Verhovna Rada, Law of Ukraine: "On Water User Organizations and Fostering of Hydro-technical Land Reclamation" of February 7, 2022, No. 2079-IX: <https://zakon.rada.gov.ua/laws/show/2079-20#Text>

5. Resolution of the Cabinet of Ministers of Ukraine dated June 5, 2019 No. 476 "On approval of the Procedure for carrying out land inventory and recognition as invalid of certain resolutions of the Cabinet of Ministers of Ukraine"

<https://zakon.rada.gov.ua/laws/show/476-2019-п#n9>

6. Resolution of the Cabinet of Ministers of Ukraine dated August 27, 2022 No. 962 "On approval of the model charter of the water users organizations"

<https://zakon.rada.gov.ua/laws/show/962-2022-%D0%BF#Text>

7. Resolution of the Cabinet of Ministers of Ukraine dated October 11, 2021 No. 1070 "On approval of the Procedure for the use of funds provided for in the state budget for providing state support to agricultural producers who use reclaimed land and water user organizations"

<https://zakon.rada.gov.ua/laws/show/1070-2021-п#n8>

8. Resolution of the Cabinet of Ministers of Ukraine dated February 8, 2017 No. 77 "On approval of the Procedure for the use of funds provided for in the state budget for financial support of agricultural producers"

<https://zakon.rada.gov.ua/laws/show/77-2017-п#Text>

9. Resolution of the Cabinet of Ministers of Ukraine dated August 30, 2022 No. 974 "On determining the levels of performance indicators of the pumping station, which has been transferred to the ownership of the water users organization "

<https://zakon.rada.gov.ua/laws/show/974-2022-%D0%BF#Text>

10. Resolution of the Cabinet of Ministers of Ukraine dated September 27, 2022 No. 1077 "On Amendments to Certain Acts of the Cabinet of Ministers of Ukraine regarding Stimulation of Land Reclamation"

<https://zakon.rada.gov.ua/laws/show/1077-2022-п#Text>

11. Resolution of the Cabinet of Ministers of Ukraine dated October 17, 2012 No. 1051 "On approval of the Procedure for maintaining the State Land Cadastre"

https://zakon.rada.gov.ua/laws/show/1051-2012-п#n19_12

12. Order of the State Agency for Land Reclamation and Fisheries dated September 12, 2022 No. 276 "On some issues of publishing information on the activities of water user organizations on the official website of the State Agency for Land Reclamation and Fisheries"

https://darg.gov.ua/files/21/09_14_mel276.pdf

13. Order of the Ministry of Economy of Ukraine dated November 11, 2022 No. 4552 "On Approval of Amendment No. 9 to the National Classifier DK 002:2004"

https://darg.gov.ua/files/22/11_18_ovk.p02

4.2. Additional legal statements needed for WUO's for multifunctional drainage system

For understanding the specific legal particularities for regulation of water management services under conditions of multifunctional drainage systems we used the following criteria of the sustainable WUOs functioning:

1. Cost recovery on operation and maintenance of the drainage infrastructure via obligatory participation of all groups of the water users;
2. High agreed quality service provision for all groups of the water users during whole year to regulate water according to their needs;
3. Transparent set up of tariffs on water management;
4. Capabilities to attract investments for modernization of the drainage infrastructure;
5. Capacities on organization of the ground water quality and quantity monitoring and implementation of the innovations for water accounting and environmentally friendly water and land management according to the EWFD and Green Deal principles.



The existing WUO Law cannot guarantee the above mentioned criteria because of the following specific reasons:

1. There are no provisions in the law to provide equal membership fixed fee for all water users that have a different benefit from the drainage (village citizens, agricultural and other enterprises, forest company etc) as well as a guarantee on collection of needed service payment for water management.
2. There are a limited number of services that could be provided by WUOs on the drained areas that are related to the water management and Rural Development (see example of the Germany WLMO below).
3. The existing Law on WUOs doesn't regulate the tariffs set up for the different water users that served business or public social interests.
4. There are no arrangements for the states support role for environment protection water services for wetlands and small river protection.
5. There are no regulations to provide needed environment flow from the drainage system for the nature and drainage water quality monitoring needs.
6. Regulations of the drainage management and conditions for the naturalisation of drained lands on peat soils to reduce CO₂ emission.

4.3. Recommendations for improvement of the WUO Law for multifunctional drainage

There are quite a large number of additional articles and regulations, that should be additionally developed in frame of existing WUO Law or within special Law that considers WUO on the multifunctional drainage systems **as a public organization similar to the RIDO model or Water Board model in Netherlands**. Such WUO could have **right on long-term use of public infrastructure** and provide water services for business, local communities and for nature resources protection as a public value.

It was a clear recommendation by the WB experts about the WUOs providing drainage services to function successfully, two critical provisions need to be in the law: (a) to ensure mandatory membership or its equivalent, which provides such WUOs with public status or the transfer of infrastructure for the permanent use; and (b) WUOs should have specific powers that can be quickly implemented to promptly collect fees for the provision of drainage services from all groups of users depending on the benefit they will receive.

The answer is simple: while it is possible to cut off irrigation water for those who do not wish to join the WUO, the same cannot be said for land drainage. If the water level is reduced in the drainage system, all landowners will benefit, regardless of whether they pay for the operation and maintenance service participation or not. A similar observation can be made for flood protection: a dam or dike protects all land regardless of payment.

The following regulations should be mentioned in the Law:

- The WUOs on multifunctional drainage should include the following functions: drainage and water regulation on the lands of rural areas, drainage due to harmful effects on the population, and water regulation to preserve aquatic ecosystems.
- Obligatory mandatory involvement of the all groups of water and land users, TCs, Forestry and environmental protection organizations to become members of WUO is needed to collect fees and have cost recovery for operation and maintenance of the infrastructure.



- To have sustainable function of WUOs on the drained lands the integrated water and land use plans developed by the territorial community should be respected by the WUO.
- Modernization of the drainage systems should be checked on the issue of the balance of economic and ecological requirements for the development of rural areas.
- Renaturalization of part of the territories of drainage systems and introduction of alternative agricultural production on peat soils to reduce CO₂ emissions should be included as a part of WUOs tasks.
- Provision of payment for the water services as a fixed tax per hectare for the maintenance of the drainage infrastructure and additional dynamic tariffs for the flood water drainage from the area and regulation of the ground water table during the dry summer periods for farmers, population and preservation of water ecosystems should be set-up.
- Flood protection management requirements, or more specific management of the ecological flow to the ecosystem should be regulated according to the Nature protection and flood risk management Directives of EU.
- Water quality issue should be taken into account for establishment of the Water and land quality monitoring in WUO.
- Government support of the WUOs on multifunctional systems should be secured.

Additional financial options for the WUOs. In addition to collection of WUO fees special co-financing mechanisms should be introduced to support public social and environment water services on the multifunctional drainage systems.

Costs of water withdrawal from the villages during flooding should be covered by the territorial community and citizens of the villages but contribution to the modernization and innovations and awareness campaign should be covered by local and district budgets. For environment protection cost the regional programs can be used as well as National programs. It can be considered for the following environmental measures implemented by WUO:

- Provision of the needed environmental flow to the nature or small rivers;
- Drainage water quality monitoring;
- Strict regulation of ground water table on the peat soils to reduce CO₂ emissions;
- Soil quality monitoring to avoid acidification, destructing and pollution etc.;
- All of these measures should have their cost according to the amount of services and its duration.

Features of investments and co-financing

The main investment features are the guarantee of cost recovery on long term perspective of the drainage system functioning. Investments can come from private, international and national organizations and banks. Repayment of investments should be combined with the stable government support funds on the regional and local level. The regional and national government should partly cover risks for investors and share them with the private agriculture companies and territorial community.

Creation of an enabling environment for sustainable WUOs on the drainage areas

There are several important preconditions to stimulate establishment of WUOs on the multifunctional drainage systems:



- the technical investments should be organized simultaneously with and parallel to the institutional reorganizational and transfer processes;
- the size of the WUO should be large enough to have funds to employ a professional manager and other specialists on operation and maintenance of the drainage infrastructure;
- the training should be organized for the WUOs managers and members;
- the support of the farmers on introduction of agriculture good practice, new crops and markets should be organized by the regional agriculture support programs;
- the transformation process should be step by step very accurate professional organized process to prevent corrections afterwards;
- long-term political support should be organized by the relative authorities on government level.

4.4. Scenarios and road map

During the interactive seminar on the pilot in the Kolodyazhnenska territorial community of the Volyn region with the local stakeholders several WUO models were discussed.

The participants discussed possible scenarios, models and stages of creating water user organizations within the framework of the functioning of a drainage system that has a multifunctional purpose (water regulation on agricultural lands for growing agricultural products, water supply in dry periods, water drainage to protect settlements during floods and maintaining a favourable water regime on adjacent forest and nature areas), assessment of the need and areas of improvement of the existing WUO-legislation for these drainage areas.

Scenarios: The participants discussed 3 scenarios (developed by NGO Primavera in close communication with local experts) of the possible creation of a "Minimum", "Transitional" or "Maximum" WUO.

Minimum means: WUO is initially formed (only) on the lands of powerful agricultural enterprises with the possibility of later and further expansion.

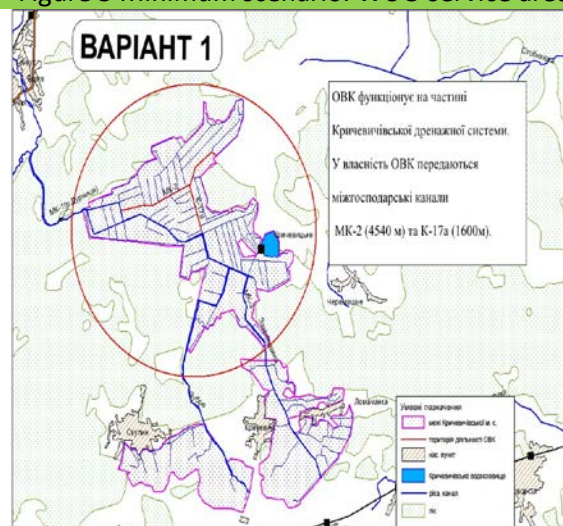
Transitional means: All bigger and smaller farmers in a pilot area become member of a WUO.

Maximum means: Also, other kind of water users (as village, nature, forest, recreation) becomes member of the WUO.

Each of the participants expressed his or her opinion about the future development of the WUO in the pilot territory and assigned evaluation points for each of the criteria for each scenario. Among the three most likely scenarios, by means of interactive voting, the **Minimum scenario was chosen** as the most acceptable under the given conditions in this pilot in this region.



Figure 5 Minimum scenario. WUO service area



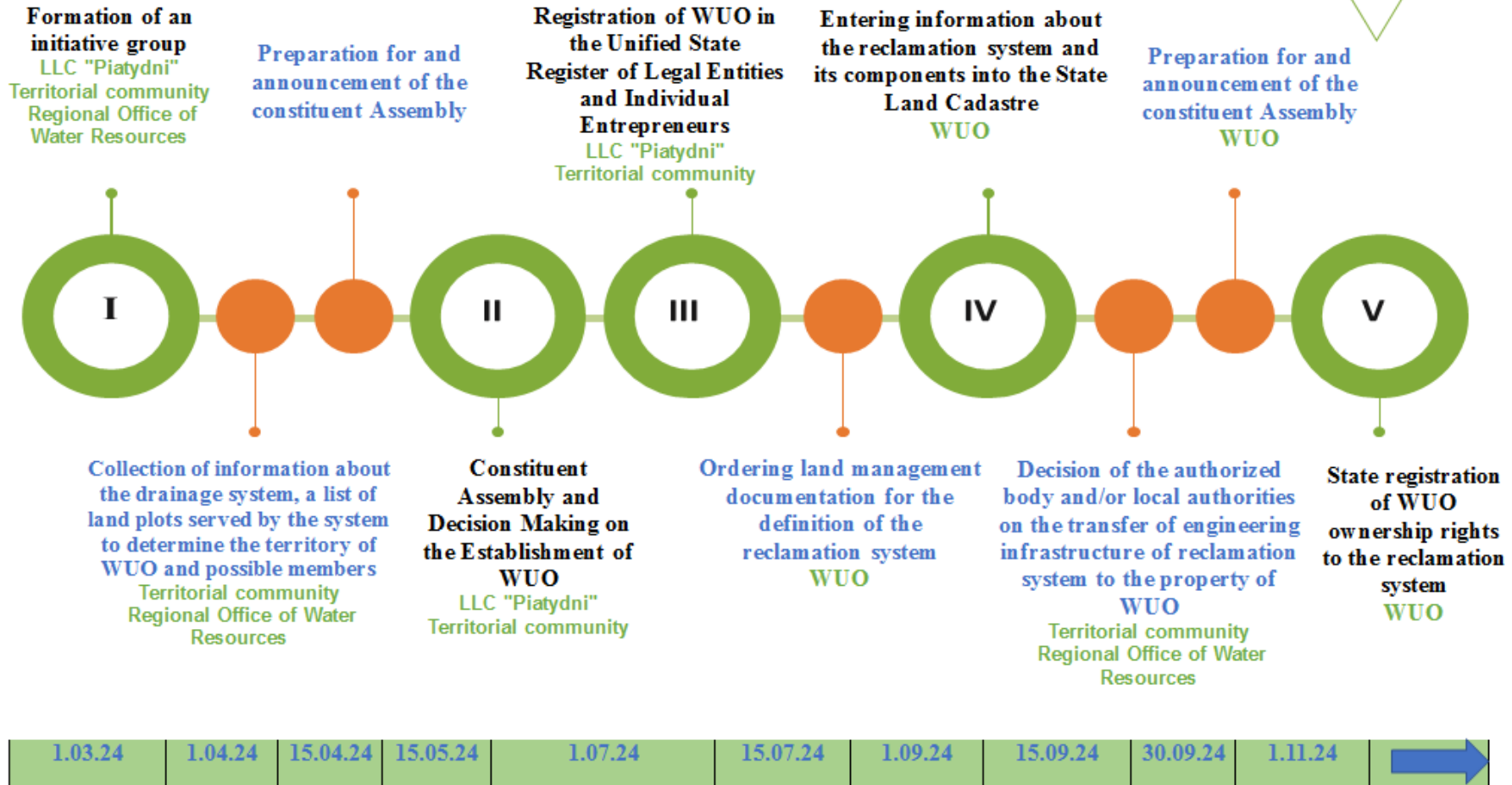
Creation of WUO in accordance with the existing legislation at the on-farm and inter-farm level with option of the transfer of the main canals (MK-2, K-17-a) from the district water management department to control the drainage management for agricultural production. Other main drainage infrastructure and Pump station remain still under management of the district water management department for the provision of drainage services and water supply for the WUO, TC and Forestry.

The establishment of the WUO can be considered as a step-by-step process starting from implementation of the minimum scenario with later the selection of the next step to transfer part of the infrastructure and responsibilities from the government to the WUO after improvement of the legislation and modernization of the main state infrastructure. The final step on scenario development towards the maximum scenario can be enabled if environment protection costs can be guaranteed from the regional and national government. It also needs that the required regulations have been developed, as well as additional special guidelines and normative documents to regulate water for water resources and biodiversity protection. Integration of Ukraine to EU will help on this matter the most. The broad government programs for all types of drainage systems on the government level can speed up the process on further development of the WUOs on the multifunctional drainage systems. But all process will depend on coordination of sectoral policies and finding consensus on the model of water reform and reform in irrigation and drainage on the level of the Ministry of Ecology and the Ministry of Agrarian Policy and Food.

Based on communication with the key local and regional stakeholders the road map on establishment of the WUO for the Krychevychivska drainage system according to the selected minimum scenario was developed. On the figure below the first one-year period of this process is presented.



Roadmap for the establishment of WUO





5. Stakeholder analysis at the national, regional and local level

5.1. Analysis of Stakeholders: roles, interests, responsibilities, relationship

It is important to anticipate the role of stakeholders in the creation of WUO's in the area of drainage systems.

For efficient development and sustainable implementation of the projects the following key *national stakeholders* at national government level should be involved: Ministry of Agrarian Policy and Food (MAPF), Ministry of Environmental Protection and Natural Resources of Ukraine (MEPNR); State Agency of Water Resources of Ukraine (SAWR); State Agency of Melioration and Fishery (recently renamed on Agency of development of melioration, fisheries and food programs SAMF); State Geo Cadaster (SGC); Ministry of Communities and Territories development (MCTD). These main counterparts will guarantee a needed integration of water, land and melioration policies and legislation for the implementation of the projects in rural and urban areas (ANNEX 1).

On the regional and local level the regional departments of the mentioned authorities should be involved for project implementation: Oblast administration, river basin management departments, Irrigation and drainage systems departments on the level of main canals and district and inter-district water resource management departments and environmental inspection branches as well as local water supply and water sanitation companies.

On the local level the Territorial communities, private businesses in agriculture (big agro-holdings and small en medium enterprises (SME's) in agriculture and agribusiness), water and land management should be involved.

5.2. Interaction between different levels and interested parties

The process of creating WUO on multifunctional reclamation systems needs the involvement of stakeholders at various levels. Determining the interests and roles of the participants in this process is important, as it depends on the successful outcome of the creation of the organization and the effectiveness of its further functioning to resolve issues of water resources management in the territory to be served. The table shows the list of stakeholders, to be involved and their interests and roles in solving the problems of the Krychevychivska multifunctional (irrigation and drainage) system management (ANNEX 1).

6. International stakeholders

International projects and organizations - donors involved in land reclamation reform

International organizations that could be involved in land reclamation reform in Ukraine are EIB (European Investment bank), WB (World Bank), EBRD (European Bank for Reconstruction and Development), USAID (U.S. Agency for International Development), IFC (international Finance Corporation), UNECE (The United Nations Economic Commission for Europe), FAO (Food and Agriculture Organization), GIZ (Gesellschaft für Internationale Zusammenarbeit), etc.



Water user organizations have already received access to financial support. During 2023, the USAID AGRO Program allocated more than UAH 70 million in co-financing for the modernization of irrigation systems in 4 WUOs. In 2024, 10 more WUOs will be able to receive financial support from USAID. This will allow irrigation to be restored in areas that have not been irrigated in recent years, if there is a technical possibility to reconstruct or modernize the facilities of the engineering infrastructure of reclamation networks.

7. Prospects for international projects for WUO formation

High awareness and motivation of the governmental representatives on Oblast and local level and of farmers, to investigate the added value and tasks of WUO's is needed. This needs an extended, important longlist of problems to be solved to improve the legislation and an emphasis on a broad training program for all governmental and private stakeholders.

A capacity building program is needed to inform water users on the concept of WUO's, its rules and regulations, the relation between the quality of the service provision and the price. Such a program aims to train representatives of the increasing number of Water User Organizations, plus train regional and national institutions involved in water infrastructure management to acquire the knowledge and skills necessary to provide the required and agreed quality of irrigation water supply services. This capacity training program will be developed and implemented by the Education School of SAMF and needs support to train the trainers. *The program should encompass a) resource-efficient management of water and energy resources in irrigation systems, aligning with b) the principles of a climate-oriented green deal economy.*

The lack of theoretical knowledge and lack of practical experience in carrying out reforms in irrigation management gives rise to many incorrect interpretations and difficulties in the communications of change initiators within society and various groups of water users. A large number of questions we received from local stakeholders on the legislative and management issues of the WUOs. The most controversial provisions of the legislation are in the areas of ecology, issues of land lease and property rights of land and infrastructure. Other important issues relate to ensuring fairness when making management decisions in the interests of all members of newly created water user organizations (WUOs), and guarantees for the protection of private investments.

A significant obstacle for successful institutional transformations is the difficulty of creating a new transparent system for forming and agreeing tariffs for water supply and drainage services. A complicating factor in this respect is that during the past 5 years, tariffs for irrigation and electricity services have been constantly increasing due to the influence of many reasons of a technical, economic, bureaucratic and organizational nature.

Under such conditions, as well as against the background of a decrease in prices for agricultural products and an increase in the cost of energy carriers, there is a danger of losing the expected profitability of irrigated agriculture. Therefore, it is extremely urgent to find ways to reduce operational costs by implementing resource conservation measures, reduction of non-productive water losses, optimization of general production and other costs of water management organizations. In order to increase the efficiency of operation of inter-farm systems, improvement of the quality of services and avoiding conflict situations between water users and water management organizations are important prerequisites for a constructive



dialogue. Introduction of new methodological approaches to the projects of modernization of irrigation systems as given in the previous sections are important to overcome these issues.

A new transparent information system for water users on the basis of transparency is needed, involving them in decision-making of water distribution plans and system operation in the local sections of state systems.

Thus, it becomes increasingly clear that in addition to the modernization of technical infrastructure and the creation of new organizations for the management of the drainage systems, it is urgent to introduce a new culture of communication between interested parties for the formation, implementation and development of state policy in the field of natural resources management. The existing outdated cultural principles and political-economic tools are the main obstacles to the effective implementation of reforms and the implementation of large infrastructure projects. The lack of a proper culture of stakeholder dialogue at the local level, insufficient transparency of reform processes at both the state and local levels and a lack of coordinated intersectoral interaction and stakeholder participation in these transformations prevents effective irrigation modernization.

The government's efforts to accelerate the course of reform and move to attract investments as soon as possible will not work without professional management of institutional changes according to the standards of good governance (transparency, participation of stakeholders, efficiency, reporting, interconnection) and a clear architecture of a multi-sectoral multi-disciplinary system integrated approach.

Unpreparedness for transparent procedures, weak state institutions and lack of adequate experience in involving private water users in the management of water infrastructure are what all countries with transition economies faced at the beginning of reforms.

At the same time, the countries that joined the European Union had some preferences in the possibility of receiving support from EU programs. But, as the example of Bulgaria shows, the comprehensive support from the EU and international organizations did not save the country from numerous mistakes and the negative consequences of the government's desire to preserve the levels of public administration that are not controlled by water users. The creation of a state joint-stock profit-making company in this country resulted in a noticeable decrease of irrigated agriculture for the country because many farmers refused to use artificial irrigation due to the increasing water tariffs.

All these examples are a warning for the government of Ukraine and an argument to avoid repeating the mistakes made in other countries.

In order to prevent the above-mentioned risks, which directly affect the effectiveness of investments to modernize irrigation systems; it is proposed to develop in a special project a training program for interested parties at the national, regional, and local levels. Such a program can have four main training modules.

1. Organizational module

- Insight in the main responsibilities in the Water Sector and the desirability of a high level Water Council, to steer all this;



- Clear division and transparent description of roles and tasks of SAWR and SAMF, and willingness to discuss about that, to inform all Water-stakeholders;
- Organizational and economic planning (development of business plans) for the sustainable functioning of WUO's;
- Analysis of current legislation and participation of water users in the implementation of integrated management of water and land resources;
- Formation of transparent tariffs to cover the costs of operating irrigation systems and providing high-quality irrigation and drainage services;
- Methods of effective communication of WUO with public and private partners and water users who are members of the organization and investors;
- Schemes for attracting and returning internal and external investments.

2. Technical and technological module

- Technical and energy audit;
- Modern methodology to formulate integrated projects of modernization and construction of irrigation systems;
- Technical and technological innovations to achieve resource-efficient irrigation;
- Strategic, annual and operational irrigation planning;
- Creation of an agro-ecological monitoring system and information support for irrigation management.

3. Green economy module

- Application of integrated approaches to the management of water, sustainable energy resources, the structure of cultivated areas and the value chain;
- Use of alternative energy sources;
- Adaptation to climate change and planning of climate-neutral technologies.

4. Module on protection of the natural environment and compliance with social standards

- Awareness about the desirable culture of cooperation and win/win;
- Development of plans for ensuring environmental and social standards when forming irrigation system modernization projects;
- Ensuring awareness of communities and their control over the implementation of modernization projects;
- Water quality and ecology norms and regulations by the Government and implementation by WUO's.

It is important to mention as well, and well-known by the local officials and participants, is that for this pilot-area a UPF project proposal has been developed by a Dutch/Ukrainian consortium and submitted to RVO in December 2023. The purpose is the actual implementation of a new Dutch pumping station, a new Dutch monitoring system for groundwater levels and cleaning and widening of drainage canals by Ukrainian companies, to be implemented in 2024/2025.



8. Dutch added value for Kolodyazhnenska community

8.1 Dutch experience added value

The Netherlands has a unique system of local surface water management called Water Boards. Water Boards are public governance bodies for local surface water management and flood control representing the interests of all stakeholders in the catchment of the board. They are democratic with an elected (every 4 years) governance structure and have the right to raise taxes. Taxes are related to the interest of the stakeholders (the higher the interest the higher the payment) and to the voting power in the assembly (the higher the payment, the higher the influence). In addition to surface water management (flood control and water supply) Water Boards are also entrusted with a legal task: surface water quality management and municipal waste water purification.

The Kolodyazhnenska surface water system has many resemblances with the Dutch surface water systems in the low-lying polder areas in the western part of the country. The problems of flood control in winter and water supply in the summer are similar to the Dutch conditions. The subsidence and oxidation of the peat soils are also similar problems. For these reasons the WUO and RIDO concepts developed in Ukraine for application in the irrigation areas in the south need to be extended with functionalities for flood control and surface water resources protection for the drainage areas in the north. The governance structure of the Dutch Water Board concept could be used as inspiration for the further development of the local water management structures in Ukraine.

By a process of merging of the 3,500 small water boards, to larger ones, the current number has eventually reduced to 21 water boards today. The tasks of water boards remained basically unchanged. They belong to the historically grown structure of governing bodies and are one of the oldest democratic institutions in the Netherlands. Water boards act independently from administrative governing bodies to manage the continuously needed control and improvement of water management in the Netherlands. Water boards levy taxes to finance the work, they have the authority to penalize offenders through means of administrative measures. To control quality of surface water (canals, lakes, ponds and streams), water boards fulfil several tasks: policy making, planning and building of projects, maintenance, innovation, issuing permits (sewage discharge requires a permit) and treatment of sewage and by-products. The various municipalities within the geographic area covered by a water board are responsible for collecting sewage from households and industries, but water boards transport and treat the sewage. The Waterboards have a transparent decision-system about regional / local water policy, climate- and environmental care, investments, maintenance, and water tax. They are organised via a General Assembly with all stakeholders and every 4 years elections, and a professional Board for preparing, communicating and implementing all tasks. Water boards hold elections, levy taxes and function independently from other government bodies.

8.2. Key public and private stakeholders in the Netherlands.

There are a number of public stakeholders in the Netherlands that could be involved in the follow-up of this project:

- The Dutch Water Authorities unite the expertise of the Dutch Water Boards and make this knowledge available for projects abroad. They do this in a program called Blue Deal with a limited number of countries. Depending on external finances other countries such as Ukraine can maybe also be included;



- The Association of Dutch Municipalities, VNG, has an international department making their expertise available for foreign partners, VNG-I. VNG international is already active in Ukraine;
- The Hague Academy for Local Governance has a strong track record in organizing training programs for local water management.

There are a number of Dutch private stakeholders that could contribute to a follow-up project in training and awareness such as:

- Metameta, a small company focusing on integrated water resources management;
- Hydrosat BV, a small company specialised in irrigation advice;
- KnowH₂O, a small company specialised in climate adaptive drainage;
- Others.

Many Dutch companies which are active in the Ukraine Water- and Agri- Platforms, would benefit from a proper institutional arrangement of local water management. These are Consultancy firms, Education and Training Organisations, Dutch hardware- and software- companies in water- and agri-infrastructure, working already in Ukraine, or new Dutch starters on the Ukrainian market. The Ukrainian Government is focussing its economy on winning the war and has no priority for the water infrastructure that is needed for increasing agricultural production and adaptation to the climate change. Farmers are willing to step in and invest, but need a transparent structure through which they can become owner and manage, operate and maintain local water infrastructure.

8.3. Key topics of Netherlands' added value.

Key topics with high added value from the Netherlands are:

Key topic 1: An awareness and training programme with input from the Dutch Water Authorities (DWA) and a Dutch Water Board and the international experience of the Hague Academy for Local Governance to benefit from the lessons learned of the current PSD project in Kolodyzhnenska Territorial Community.

Key topic 2: Organization of workshops to define and expand the roles of WUO's and RIDO's in the southern regions for irrigation water management and for central and northern regions for drainage water management. These workshops should focus on the challenges to come to a uniform institutional set-up that fits both regions and enables investments in the water infrastructure by water users and attract (international) loans for this purpose. It is strongly recommended to involve the World Bank and FAO in these considerations since they were involved in the initial development of the WUO and RIDO concepts.

Key topic 3: A support project with involvement of the DWA on the organization of a federation of WUO's and a federation of RIDO's. Definition of joint interests of these federations and common fact finding.

Key topic 4: Continue piloting WUO organizations both in the drainage and in the irrigation regions of Ukraine to continue the learning by doing process to further develop local water management institutions. The same should be done with the RIDO concepts that operate on a larger scale and a wider mandate than WUO's.



Key topic 5: Dutch UPF- or Invest-international- support to Ukraine / Volyn ++ in composing an ambitious Program with plan-preparation of Irrigation and Drainage Rebuilding projects, and request for implementation money from the IFI's

8.4. Recommendations for bilateral collaboration between Ukraine and the Netherlands

Recommendation 1: It is recommended to develop a broad Dutch-Ukrainian Training program for Ukraine about all aspects of local water management institutions including WUO's, RIDO's and other institutional set ups, taking into account the importance of agricultural water management. Dutch organizations that could be involved in this broad training could be a.o. the Dutch Water Authorities, the VNG-I organisation (International branch of the umbrella organisation of the Dutch Municipalities) and the Hague Academy.

Recommendation 2: It is recommended to create a support Dutch-Ukrainian support project for establishing WUO's and RIDO's in different regions in Ukraine. The project would support learning by doing and provide suggestions for improving and broadening the local water management legislation and support establishment of a Union or Federation WUO's in Ukraine.

Recommendation 3: It is recommended that the Netherlands Embassy continues to support Dutch water and agriculture companies to cooperate with Ukrainian companies.

Recommendation 4: It is recommended that The Netherlands avails its knowledge and experience in local water management to start and participate in a Government to Government dialogue on local water management and water policy.

ANNEX 1 Analysis of Stakeholders

Table A1 The main groups of stakeholders and their roles in the Krychevychivska multifunctional drainage system management

	<i>Stakeholders</i>	<i>Interest and tasks</i>
Public administration bodies, local-authorities on oblast and regional levels	Oblast State Administration	-Implementation of regional development programs
	Regional Councils	- Rural development
	District councils	- Ensuring the environmental safety of reclaimed lands
	Deputies of the Regional Council	- Economic development and social sustainability of agriculture
	Members of the District Council	-Creation of a pilot WUO, dissemination this practice within the region
	Non-governmental organizations, agencies of development, local educational institutions, etc.	- Maintaining the well-being of peasants at appropriate level
Representatives of local self-government	Head of the territorial community	- Protection against harmful effects of agricultural drainage water of the Kolodyazhnenska community and the adjacent village territories of Krychevychi, Skulin, Lomachanka
	Specialists of the village council	- Rural development
	Deputies of the district council from the community	- Socio-economic development of TC through the restoration of the reclamation system (receipt of funds from taxes, deductions from the profits of enterprises)
	Deputies of the village council	- Economic development and social stability of TC - Maintaining the well-being of peasants at an appropriate level; - Providing the population with jobs, creating cooperatives, processing facilities
Agricultural enterprises / farms	LLC "Piatydni"	-making profit by cultivating the lands in the Krychevichi I&D system
	Farms "Kawasaki" and others	- Cost-effective and sustainable operation of the drainage system; - Covering the costs of O&M of the Krychevychivska I&D system
		- Reconstruction of the Krychevychivska I&D system, if needed - Economic sustainability of management - Possibility of improving the management practice to a new economic level
Population	Owners of agricultural Lands	- Profit from the land leasing and land ownership - Sustainable cultivation of agricultural crops - Economic sustainability of production - Protection of the interests of agricultural



Stakeholders		Interest and tasks
	Population of villages	<p>producers</p> <ul style="list-style-type: none"> - Protection from the harmful effects of waters of drained agricultural lands of the Kolodyazhnenska community, adjacent territories of the villages of Krychevychi, Skulin, Lomachanka and households
Regional Office of Water Resources in Volyn region	<p>Regional Office of Water Resources in Volyn region</p> <hr/> <p>Kovel Operational Section of ROVR in Volyn Oblast</p>	<ul style="list-style-type: none"> - Maintaining the proper technical condition and regulation of the water regime with the help of reclamation systems, which will ensure more efficient management of water resources in the region - Receipt of funds for the maintenance of the Krychevychivska I&D system
Forest management company	Kovel district forestry	<ul style="list-style-type: none"> - Maintaining the proper technical condition and regulation of the water regime with the help of forest reclamation systems and the Krychevychivska I&D, which will ensure more effective forestry management within the Kolodyazhnenska community
Tenant Krychevychivskiy Reservoir	LLC "Karpus"	<ul style="list-style-type: none"> - Maintaining the proper technical condition of the Krychevychivska I&D system - Comprehensive regulation of the operating mode of the Krychevychivskiy reservoir, based on the needs of all stakeholders, taking into account the needs of fish farming and recreation - Reconstruction of the Krychevychivska I&D system, taking into account the mode of operation of the Krychevychivskiy reservoir for the purposes of fish farming and recreation
Experts, research institutions	NGO "Primavera", Institute of Land Management of NAAS Institute of Water Problems and Land Reclamation of NAAS and others	<ul style="list-style-type: none"> - Implementation of technical and technological, environmental, socio-economic measures to ensure the technological integrity of land resources use, the effective O&M of reclamation systems and other measures as part of integrated plans for the consolidation of water and land resources - Organization of investment projects for the restoration of I&D systems, the creation of cooperatives, the management of water bodies, etc. - Raising of public awareness - Training - Providing consulting services - Holding meetings and seminars at the national and local levels



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