Waterdrive project #R094, Interreg Baltic Sea Region Programme 2014-2020

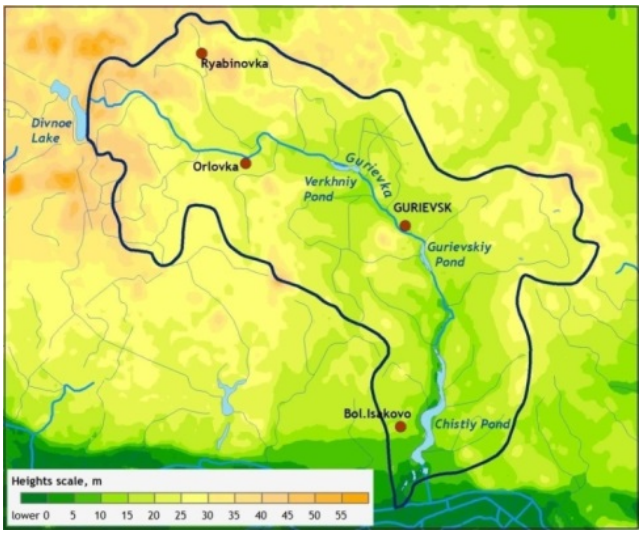
Case study area. New implementation and investment plan, 2021
Guryevsk, Kaliningrad region, Russia

Summary report 2021

According to the original Waterdrive project plan, the case area selected as the study area was the catchment area of the Upper Guryevka River pond, which is part of the main catchment area of the Guryevka River.

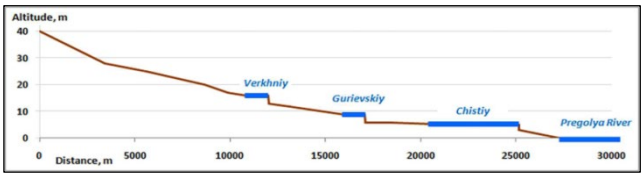
The total catchment area of the drainage channels is 1,030 ha, of which 490 ha are agricultural areas.

The choice of the project area was determined by the fact that earlier in the WaterNets-RU project, under the ICLD programme (cooperation between Guryevka municipality, Russia and the municipality of Västervik, Sweden), data had been collected on studies of the physical and chemical parameters of the Guryevka River water. And within the Waterdrive project we wanted to use the results of the WaterNets-RU project



The Guryevka River (Mühlen Fluss) is a small river in Kaliningrad Oblast, the right tributary of the Pregolya River. The Guryevka River runs in an arc around the city of Kaliningrad, through the Guryevsk urban district.

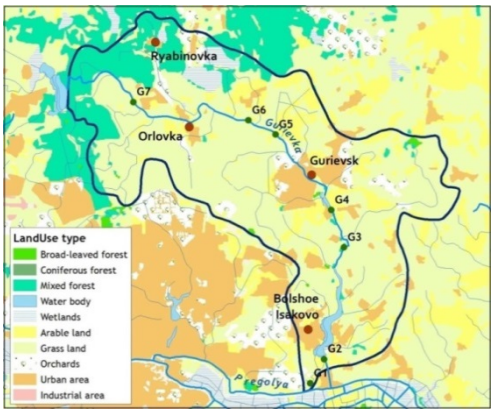
- The length of the river is 27 km.
- The catchment area is 85.2 km².
- River width: from 2 m to 6 m

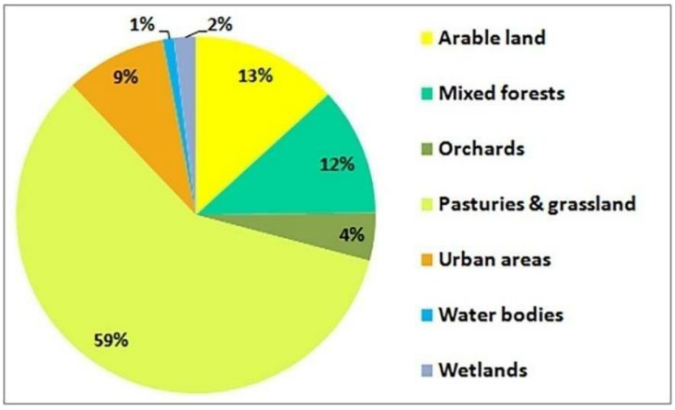


The height difference of the river bed - from 40

The river flows through ponds:
Upper/Dambus (below settlement Orlovka)
Guryevsky (city Guryevsk),
Chistyi (sett.Bolshoy Isakovo)

Land use





Approximately 60% of the Guryevka River Basin is occupied by agricultural land, but only 13% of them are arable land.
An extensive drainage network is used to combat the waterlogging of the soil.

- The main sources of negative impact in the Guryevka River basin are settlements, industrial facilities, and agriculture.
- Of the 19 settlements located in the Guryevka River basin, 7 have a centralized system of collection and disposal of wastewater, and only three of them have treatment facilities: two treatment facilities of biological wastewater treatment, one - mechanical.
- All domestic wastewater is discharged into surface watercourses either directly or through the sewerage system and treatment plants.
- Field studies have shown that concentrations of nutrients (nitrogen and phosphorus) increase as the river flows from source to mouth, which correlates with the degree of anthropogenic impact and the population.
- The once artificially created ponds (3 ponds) on the Guryevka River now act as natural sedimentation ponds, thus contributing to the self-purification process of the river. However, this is not enough to ensure that the ecosystem does not degrade.

Field studies for the design of a wetland with surface runoff were conducted in 2020, but during the project implementation phase, there were difficulties related to legislation and the procedure of obtaining permits from several landowners at the selected site, and it is taking much longer than originally envisaged. In addition, the estimated cost of building the wetland was significantly higher than the budget of the project as a whole.
Therefore, it was not possible to realize the investment in the project by the end of 2021.

Due to the fact that it was not possible to make investments in the construction of the Guryevsk wetland, the Waterdrive project management decided to change the plan: to exclude the investment component and to move to a more systematic approach for further investments in wetland construction after project completion. At the same time, the objective to increase natural water treatment, e.g. by constructing wetlands in agricultural areas of Kaliningrad Region, remains the same.

New case area - new implementation and investment plan, 2021

The updated work plan foresees closer cooperation between the Waterdrive project teams from Leningrad and Kaliningrad oblasts and develops the already established cooperation with regional and federal authorities in Kaliningrad, in this case with the representative in Kaliningrad oblast Federal State Budgetary Institution "Department of Land Amelioration and Agricultural Water Supply in Kaliningrad oblast, FSBI "Kaliningradmeliovodkhoz".

Main objective:

- To select locations of agro-ecological measures: constructed wetlands, two-level channels;
- To study the effectiveness of selected agro-ecological measures;
- To consider the possibility of incorporating the selected measures into the existing drainage system;

The new project implementation plan includes the following components:

1. The educational component

Implementation of activities aimed at raising the awareness of representatives of municipal departments of agriculture about agroecological measures.

For this purpose, the Administration of the Guryevsk Urban District, the state autonomous institution of the Kaliningrad Region "Ecological Centre "EKAT-Kaliningrad" organized a series of information workshops "Increasing ecological efficiency in agriculture in the framework of the implementation of the international project WATERDRIVE" under the "Interreg Region of the Baltic Sea" program.

The purpose of the workshops was to present good practices and modern methods used in Northwest Russia and internationally in the Baltic Sea Region to reduce pressures on the aquatic environment.
The main focus was on the peculiarities of the land reclamation system of the Kaliningrad region. The territory of the Kaliningrad region is located in the zone of excessive moisture, it accounts for 23% of all drained and 70% of polder land in Russia.

Polders have a high agricultural potential, as evidenced by high crop yields.
However, special attention should be paid to the restoration of the ameliorative system of the Kaliningrad Region.

The first systematic reclamation works on the territory of the present Kaliningrad Oblast were carried out in 1613-1616 in the Gilge-Tave-Sköpen area. Mass reclamation works started in the 17th century. Closed drainage was applied at the beginning of the 19th century. The most intensive reclamation works were carried out at the end of the 19th century and the beginning of the 20th century.

At present, the ameliorative economy of the region includes:

- 114 pumping stations;
- 713.5 km - water protection dams;
- 13,565 km - open drainage/regulation network;
- 11,909 km - main canals;
- 362,500 km - closed drainage.

In the 1990s the ameliorative system of the region fell into disrepair, which resulted not only in a reduction of crop yields but also in the threat of flooding of both agricultural areas and settlements. There are more than 90 settlements on the polder lands, where about 80 thousand people live.

The development of agricultural production is directly dependent on the functioning and technical condition of the land reclamation system. Land reclamation systems of polders must:

- provide protection of the territory from flooding by flood and surge waters;
- maintain normal living conditions on the territory of settlements.

Since 2018, the Kaliningrad Oblast has been actively restoring and developing its amelioration system, hydraulic engineering and drainage facilities are being restored to a workable condition.

To this end, the amelioration sector is being financed from the federal and regional budgets to carry out anti-flooding and operational works at federal and regional facilities.

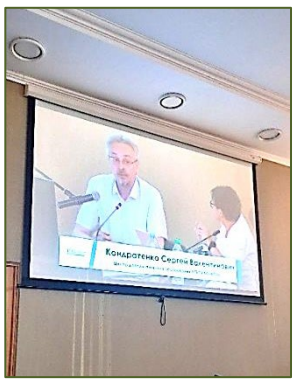
The list of facilities to be reconstructed includes the construction of additional pumping stations and water protection dams and the cadastral registration of amelioration canals, works related to fishery-economic reclamation, cleaning of canals within the boundaries of the State Forestry Fund.

Funding from the federal budget is provided under:

- State Programme for the Development of Agriculture and Regulation of Markets of Agricultural Products, Raw Materials and Foodstuffs (2013-2025). Subprogram - "Development of land reclamation for agricultural purposes in Russia".
- State Programme for the Effective Involvement of Agricultural Land in the Turnover and Development of the Land Reclamation Complex in the Russian Federation (2022-2031).
- The Federal Target Programme "Development of the Water Sector of the Russian Federation in 2012-2020" / FTP "Voda Rossii".
  The Programme is implemented under the auspices of the Ministry of Natural Resources and Environment of the Russian Federation and is one of the main practical tools for implementing the "Water Strategy of the Russian Federation".

The state programmes include practically all ameliorative facilities of capital construction that require reconstruction. Under the relevant Programmes, subsidies are planned from 2022 for crop works, hydro-ameliorative works for the construction and reconstruction of ameliorative systems, and lime treatment of acidic soils on arable land.

Our workshops focus on state support measures and the procedure for granting subsidies aimed at agricultural land reclamation and restoration in the Kaliningrad region. Among the speakers of the event are representatives of scientific institutes from Russia, Finland, Sweden and Denmark.



Two conferences and 4 information workshops are planned.
The participants of the workshops are specialists from municipal agriculture departments, farmers, and students from Kaliningrad State Technical University.

The first conference "Water Sector in Agriculture: Current Trends in the Baltic Sea Region and the Russian Waterdrive Project Experience", was held on 03 June 2021 in a mixed online/offline format. Due to the limitations related to Covid-19, the workshops had to be held in the online format. But the interest of 13 municipal agricultural authorities was nevertheless noted.

2. The Information component

Also, in order to disseminate knowledge about agri-environmental measures and raise the awareness of stakeholders, farmers, agricultural specialists, it is planned to develop an information block, which will be placed on the platform of the official website of the Guryevsk Urban District Administration. Preparation of text and visual materials for the website includes an overview of materials on agroecological measures in Kaliningrad Oblast and the Catalogue of Measures developed within the Waterdrive project.

3. The research component

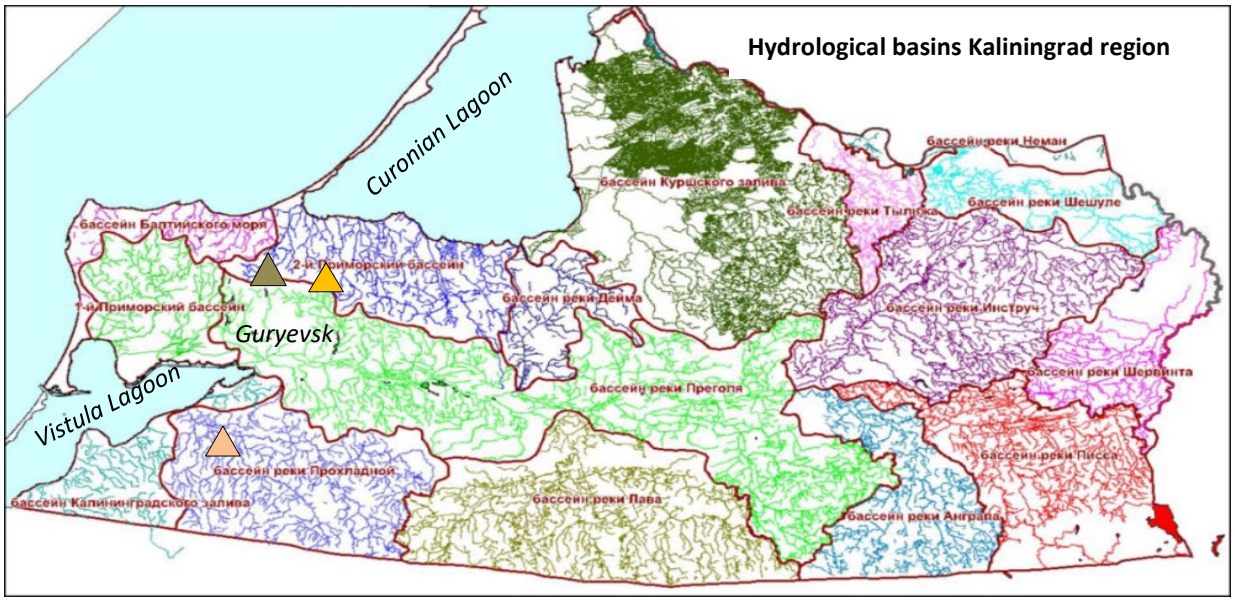
As research has shown, the main sources of negative impacts on the aquatic environment are human settlements, industrial development, and agriculture.

A significant source of nutrient compounds is diffuse runoff from agricultural land, so the Waterdrive project focuses on agroecological measures aimed at reducing the eutrophication of water bodies.

One of these measures, which was supposed to be implemented in the Guryevskiy district, is, in particular, the use of "constructed wetlands" technology.

Experience from the use of wetlands in the Nordic countries shows that artificially constructed wetlands as treatment facilities for agricultural run-off are effective measures for reducing nutrient loads.

A new phase of Waterdrive project focused on the study of the Guryevsk urban district in Kaliningrad region for the selection of agroecological measures, such as constructed wetlands and two-stage ditches. The works were carried out jointly with the FSBI "Kaliningradmeliovodkhoz Directorate". Initially, a review of the catchment area of all reclamation canals under the jurisdiction of FSBI "Kaliningradmeliovodkhoz" was carried out.



The catchments of three drainage ditches were selected, two of which (No. **1**, **2** ▲▲) belong to the Primorsky hydrological basin (Guryevka river catchment) with the Curonian lagoon as its

recipient, and one more (No. 3▲) belong to the catchment of Prokhladnaya River, with the Vistula Lagoon as its water recipient.

The presence of the Curonian and Kaliningrad lagoons is a characteristic feature of the formation of biogenic load to the Baltic Sea from the territory of the Kaliningrad region, which is separated from the seawater area by narrow strips of land - Curonian and Baltic Spits.

The main part of freshwater runoff from the territory of the Kaliningrad region is directed not to the Baltic Sea, but to the transboundary coastal lagoons, which are geochemical barriers, preventing the removal of chemical substances and nutrients from the catchment area to the marine ecosystem.

The next step is to study and analyze the use of the catchment area of the selected reclamation canals, indicating catchment boundaries, and to select several effective agroecological measures.

In the work process, the proposed zone of mini-wetlands location and the zone for the arrangement of two-level canals as part of the ameliorative system or by reconstruction of ameliorative canal beds in accordance with their cross-sections have been established.

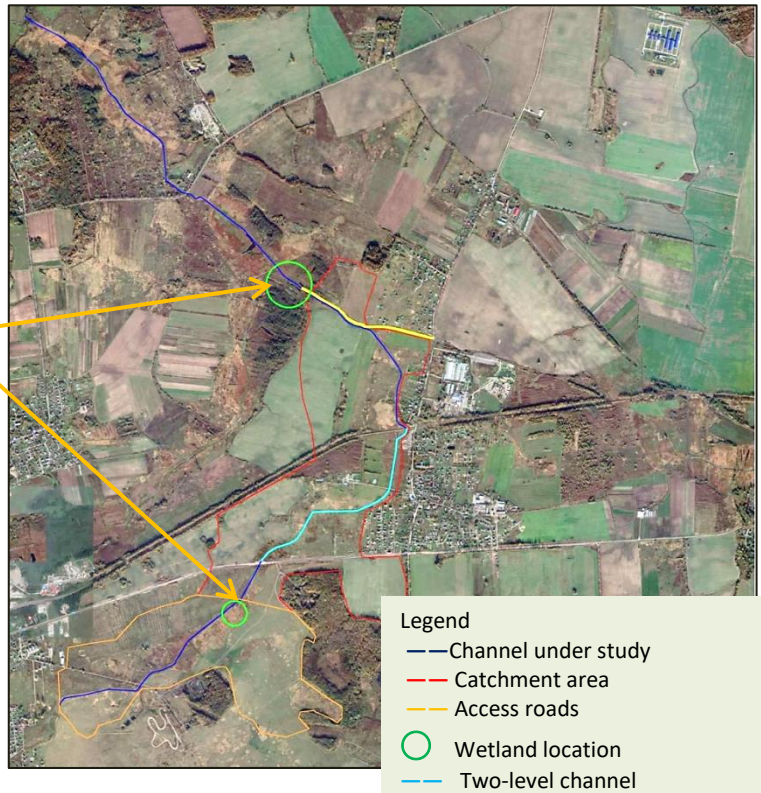
The analysis of options of investment implementation with the technology "two-stage drainage canal" has been carried out and the map-scheme of potential agro-ecological measures in Guryevsk city district of Kaliningrad region for investments in wetland construction has been drawn up..

Research area and results

The Bolshaya Moryanka river basin (Guryevka river catchment)

Drained channel 1 (ШБ8)

Length - **9.2 km,**
Channel width **6-10 m**
Water discharge - **1 m3/s**
Catchment area - **424.37 ha**
Farmland area - **124 ha**
Farming enterprise - PSP Ltd.



Legend
- Channel under study
- Catchment area
- Access roads
- Wetland location
- Two-level channel

Area opportunities:

1. Location 2 or 3 mini-Wetlands with surface runoff (area of the wetland up to 1 ha);

The location of the wetland has been chosen in view of the location of the estuary, in the area of natural lowering of the relief.

2. Reconstruction of the existing drainage channel into a two-level one, up to 1 km long.

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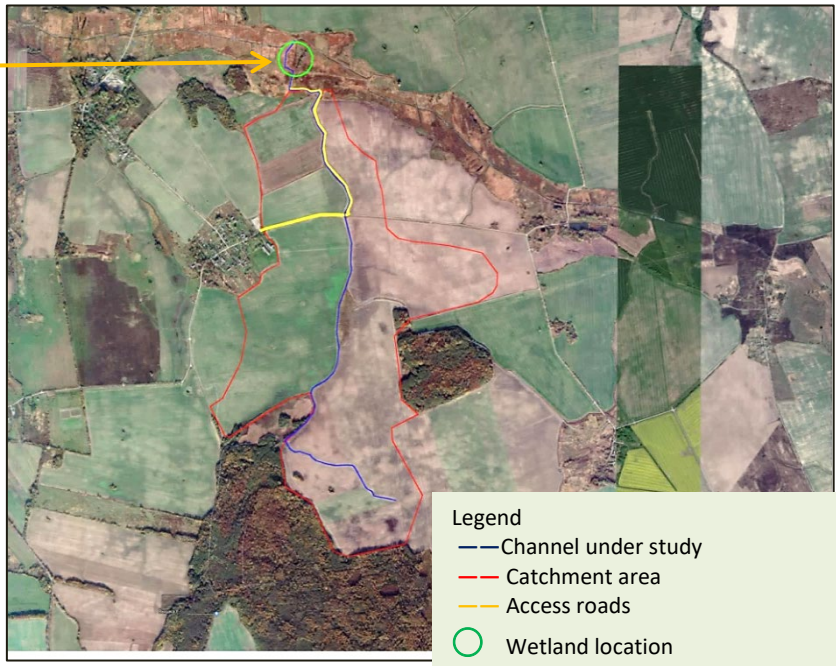
Drainage channel 2 (B-4-7)

Channel length **7.8 km**
Channel width **4-6 m**
Catchment area - **359.54 ha**
Farmland area - **340 ha**
Farm - LLC Guryevsk-Agro

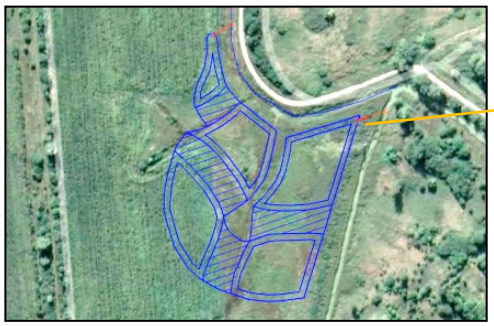


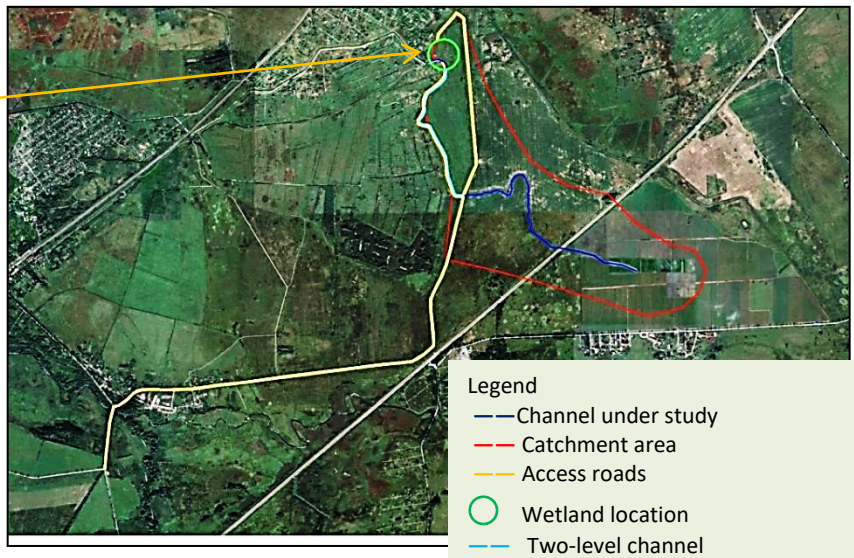
Area opportunities:
Location mini-wetland with surface runoff (area of the wetland up to 1 ha); The location of the wetland has been chosen in view of the location of the estuary, in the area of natural lowering of the relief.

The Prochladnaya River basin

Drainage channel 3 (ФР-6-1)

Channel length **3.0 km**
Channel width **4-6 m**
Catchment area - **163.36 ha**
Farmland area - **114 ha**
Farming facility - LLC LPG AGRO, LLC Biodor





Area opportunities:

1. Location 2 or 3 mini-Wetlands with surface runoff (area of the wetland up to 1 ha);

The location of the wetland has been chosen in view of the location of the estuary, in the area of natural lowering of the relief.

2. Reconstruction of the existing drainage channel into a two-level one, up to 1 km long.

The Kaliningrad Region is located in a zone of excessive moisture. The technical condition of the land ameliorative system affects not only the development of agricultural production, but also ensures safe livelihoods in the polder areas.

At present, there is state support and subsidy system aimed at rehabilitation of the land ameliorative system of the Kaliningrad region.
State programs include practically all ameliorative facilities of capital construction that require reconstruction.
On the territory of the Gurievsk district in 2020, state subsidies were used to renovate:

- 13. 3 km of closed drainage channels ;
- 107.27 km of open melioration channels;
- 7.97 km of dams;

☞ This returned 454 ha of farmland to use.

However, of all the agri-environmental measures recommended by Waterdrive, only structural liming and afforestation are subsidized in Kaliningrad Region

Subsidies for measures such as the construction of artificial wetlands, two-level channels as well as the use of other nature-based solutions have not yet been applied.

To use agro-ecological solutions such as buffer strips, two-level channels, wetland restoration, or construction of artificial wetlands, a strong education campaign is needed, not only for farmers but also for specialists in regional and municipal agricultural administrations.

One of the positive results of the Waterdrive project is the cooperation with federal and regional structures and scientific specialists from Kaliningrad Technical University.
We hope that cooperation with the federal structure FGBU Kaliningradmeliovodkhoz will have positive results.
Implementing agro-ecological measures and incorporating mini-wetlands as part of the integrated amelioration system:

- On the one hand, it will significantly improve the state of the farmland returned to use, which will lead to higher crop yields,
- On the other hand, it will reduce nutrient inputs to the region's water bodies.

Waterdrive PP22
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