

## **WP2. Implementation and investment plans in case areas**

### **Kutno County Case Area, Poland**

#### **Part. I.**

**Action Plan for improvement of water retention  
for the Bedlno commune  
with suggested investments, and funding sources**

**(Draft version)**

European Regional Centre for Ecohydrology  
of Polish Academy of Sciences

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## 1. Goal

To develop an Action Plan to improve water retention for Bedlno commune together with suggested investments, and funding sources. The action plan will include 3 groups of actions:

- (1) joint creation of a controlled drainage system,
- (2) promotion of selected good agricultural practices, and
- (3) optimization of landscape structure.

The Action Plan will be developed in collaboration between the main actors: water authority, farmers associated in water company, local and regional authority.

## 2. Description of Bedlno Commune

Bedlno Commune is one of 10 communes in the Kutno county (Polish Waterdrive Case Area) district which has been selected for testing Waterdrive approach in the catchment scale. The commune area is ab. 126 km<sup>2</sup>.

The choice was determined by 3 factors: (1) there is one main stream and the river catchment is almost the whole area of the commune; (2) 90% of the land is agricultural land, mainly drained, and finally (3) Bedlno Water Company (association of farmers) is the most effective water company in the Lodzkie Province.

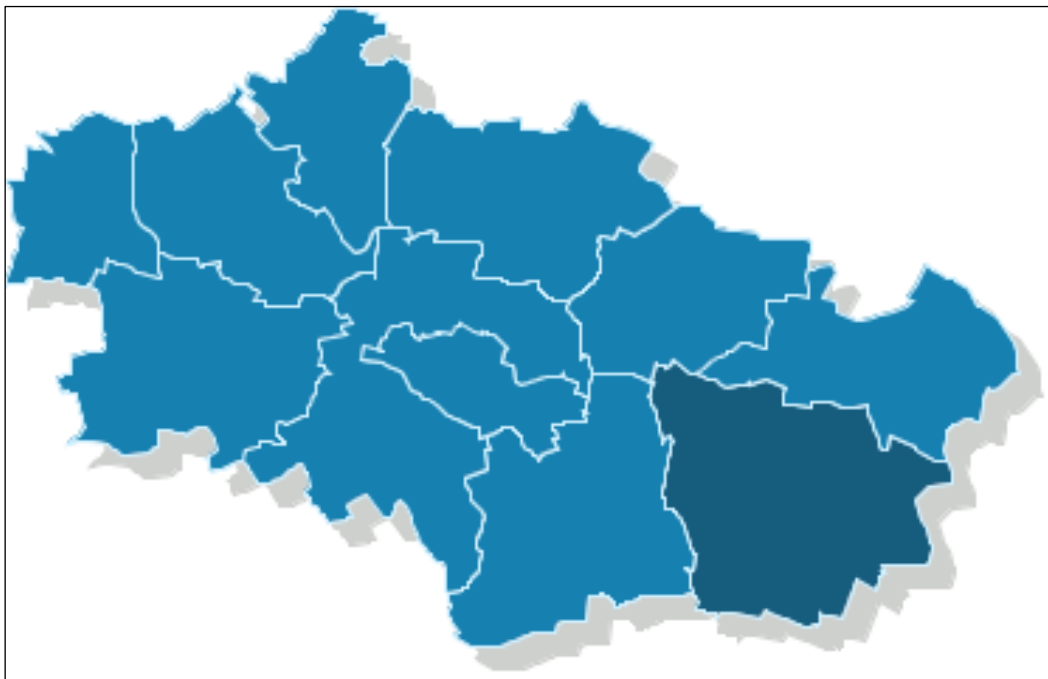


Fig. Location of Bedlno commune (dark blue) in Kutno county



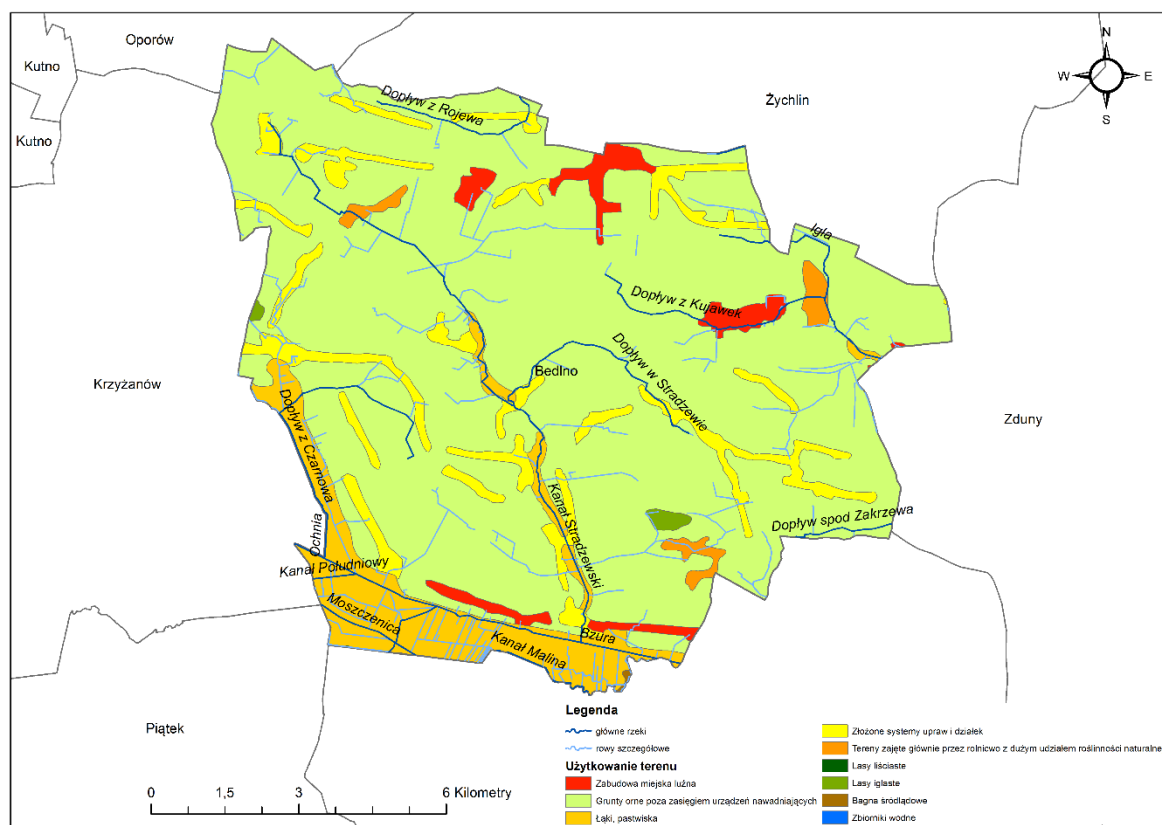


Fig. Land use in Bedno commune

*Detailed description including maps will be completed, Deadline April 2021/connected with point 7*

- 2.1. Climate
- 2.2. Terrain topography
- 2.3. Soil and geology
- 2.4. Drainage system
- 2.5. Groundwater
- 2.6. Land cover and land use
- 2.7. Wetlands, lakes, ponds, marshes
- 2.8. Environmental/ecology
- 2.9. Socio-economic characteristic
- 2.10. Current risks and hazard types

### 3. Mapping of stakeholders

The stakeholder mapping process carried out in 2018 corresponded with the reorganisation of the water management system in Poland. National Water Holding Polish Waters was set up, which involved transferring responsibilities and competences from a number of entities into one hand. The conclusion of the regional meetings and informal discussion was that the main problem was the lack of communication between the two main actors: the water

authority and water companies. They did not cooperate in planning and implantation of work, especially in the drainage area. Facilitating communication between them by implementing a pilot program “Multi-stakeholder cooperation to increase water retention in an agricultural catchment area in the Bedlno commune” was one of the objectives of the Waterdrive project activities.

Main actors:

- Water companies (*in Polish: Spółki wodne*), - voluntary association of farmers, who are owners of land through which a drainage system passes. Voluntary contributions paid by farmers set up their budget. A municipality may also be a member (a public-private structure). They can raise funds for investment.
- Catchment and Regional Water Management Authorities (*in Polish. Zarząd Zlewni and, Regionalny Zarząd Gospodarki Wodnej*) - parts of National Water Holding Polish Waters). Responsible for water resources management (surface water and underground water), e.g.: flood and drought protection, coordination of the implementation of investments in water regions,
- Local authorities in case area (communes and county)
- Regional authorities (lodzkie province)
- Network of agricultural advisors
- Financing agencies
- Experts

#### 4. Joint identification of problems and solutions with farmers and water authority

The 1st Local WATERDRIVE Meeting (6th Feb. 2020, Bedlno) focused on identifying local problems and solutions. Farmers and water authority had an open space for discussion.

The meeting was organized by the Department of Agriculture and Environmental Protection of the Marshal's Office of Lodz Voivodship and the European Regional Centre of Ecohydrology of the Polish Academy of Sciences in cooperation with the Head of Bedlno Commune

45 participants: ab. 20 farmers from Bedlno Commune area (water company, farmers, community council), 5 representatives of National Water Holding ‘Polish Waters’ (local, catchment, regional and national level), water companies and local authorities from Kutno County, regional authorities, agricultural advisors, experts.





Photos: The 1st Local WATERDRIVE Meeting (6th Feb. 2020, Bedlno), opening by Andrzej Górczyński, Member of the Board of the Łódź Voivodeship.

#### Goals of interactive workshops:

- the selection of the area to demonstrate water retention increase through controlling the outflow from drainage system (the so-called river channel retention)
- the possibilities and limitations of the implementation of targeted agricultural practices (catch crops, deepening, selection of the sowing direction) and landscape shaping measures (buffer zones, afforestation, mid-field bushes and trees, wetlands).



Photos: The 1st Local WATERDRIVE Meeting (6th Feb. 2020, Bedlno), interactive workshops

During the workshop, the selection of the area to be piloted was discussed together. The planned pilot actions are to cover both watercourses owned by Polish Water and Bedlno Water Company. The local knowledge about the catchment area, existing drainage facilities, as well as places where these facilities existed in the past was gathered. Stakeholders showed the hot spots in the river basin, as well as the area with the potential to increase water retention. It was pointed out that it is necessary to develop guidelines for joint actions including water retention in the catchment scale as well as to make an inventory and assessment of the condition of existing water melioration facilities or to indicate the location of new damming up places including private land. It was stressed that effective management



of the drainage system requires cooperation and coordination of activities but first of all understanding and acceptance of adjacent land owners.

The possibilities and limitations in the implementation of appropriate agricultural practices (catch crops, deep loosening, choice of sowing direction) and landscape management measures (buffer strips, mid-field woodlots and shrubs, wetlands) were also discussed from the point of view of farmers. Among the conclusions reached was the need to raise awareness among farmers, as well as to develop financial instruments to encourage farmers to cooperate within catchment areas.

Follow-up of the Bedlno meeting :

1. The joint operation on existing hydrotechnical infrastructures by the Bedlno water company and the Polish Waters – about 10 weirs on the Bzura river tributaries, located in the Bedlno Commune, were dammed between 30 April 2020 and 14 May 2020 storing the water on the commune meadows.
2. The Water Partnership signed by the Marshal's Office of the Łódzkie Voivodeship and National Water Holding Polish Waters. The river basins selected for the pilot area: Stradzewski Channel, Igła, Słudwia, located within the communes of Bedlno and Zduny.
3. Contribution of the Bedlno meeting outcomes to newly run national program of “River Channel Retention”.

## 5. Recognising the acceptability of environmental measures by farmers

Acceptance of inhabitants for particular measures, hierarchy of measures for increasing retention and administrative capacities of local authorities (commune office) were the subject of the 2nd Local WATERDRIVE Meeting on 21 May 2020 organised by the Department of Agriculture and Environmental Protection of the Marshal's Office of Lodz Voivodeship and the European Regional Centre for Ecohydrology of the Polish Academy of Sciences within the framework of the WATERDRIVE project.

8 participants: 5 farmers (water company, community council, local authority) and regional authority, experts. Limited number of people due to covid.



Photo. The 2nd Local WATERDRIVE Meeting (21 May 2020, Bedlno)

The selected measures that took place in case area were discussed:

- the effective use of channel retention in drainage areas is most widely accepted by the residents of In the Bedlno commune and is crucial for the retention of water in the landscape. However, investments in this field are necessary both on the side of Polish Water Authorities and farmers/water companies: to renovate the drainage system and switch to a controlled drainage system and to enable water collection in open ditches and underground pipes by water damming facilities.
- There are many small mid-field ponds, farm ponds and small retention reservoirs in the municipality. Due to water shortages, some of them are not filled up; some of them functioned as flow-through. It is necessary to invest in their reconstruction, repair/construction e.g. of damming devices
- Bushes/shrubs in fields, along ditches, along roads: unwillingness to obstruct agricultural machinery; also in the case of maintenance work on watercourses; in the case of mid-field/municipal roads, it must be taken into account that in the case of their modernisation/reconstruction, their widening is necessary and part of the currently existing trees may be removed. Farmers expressed their interest in planting old species of fruit trees, which are now being carried out by the Complex of Landscape Parks of the Lodz Voivodeship. They are open for protection/ renovation of wetlands, meadows;
- More knowledge is needed on optimising /adapting cultivation techniques to local soil and water conditions, e.g. is the effect of catch crops on the water cycle beneficial for a given soil type and hydrological conditions? Awareness of the possibility of using the experience/results of the Experimental Station of Variety Evaluation in Sulejów should be increased

Measures	Farmers's acceptability
Establishing shelterbelts	-/+
Afforestation of selected, unproductive lands	--
Establishing and protection of ecotone meadows and wetlands	+
Cultivation of catch crops and soil embedding crops (intercropping)	++
Protection / establishing small water bodies	++
Reconstruction of drainage systems towards amelioration of soils - controled drainage system	+++

## 6. Co-design of new water damming system both on state and private lands

In the past, the main task of the drainage system was to increase the outflow. There are damming facilities on the main stream (Kanal Stardzewski), however they are often destroyed. There are no damming systems in the tributaries of Kanal Stradzewski.

The water damming facilities are manually operated wooden gates. The damming water is accumulated in open ditches and also influences the increase of ground water level in the fields.

However, the location, level and time of water accumulation in basin scale is crucial for agricultural practices and yields. Therefore, first of all, the analysis of the possibility of regulating drainage water outflow should be developed by an design office related to drainage in cooperation with a water authority, water company and local authority.



*PHOTOS: Joint operation on existing hydrotechnical infrastructures by Polish Waters and Bedno water company facilitated by the Lodzkie Marshal Office, April/May 2020*

### 6.1. Determining details of cooperation

Determining the details of cooperation within the of the pilot program was the main subject of the working meeting, which took place on 23 July 2020 in the headquarters of the Catchment Water Management Authority in Łowicz.

The meeting was organised in cooperation with the Department of Agriculture and Environmental Protection of the Marshal's Office of Łódzkie Voivodeship, the Regional Water Management Authority in Warsaw and the Catchment Water Management Authority in Łowicz.

12 participants: regional water management authority, local water management authority, farmer from water company, local authority, regional authority, experts

During the meeting there was a discussion on the joint design of a new water damming system both for ditches and rivers managed by water authority and for ditches managed by farmers.



Photos. The 3rd Local WATERDRIVE Meeting (23 July 2020, the Catchment Water Management Authority in Łowicz)



## Remarks/problems:

- Data collection: Widely available maps are not sufficient for drainage-related technical documents. Paper maps, which are included in the old documentation (1: 2 000) are needed. They are spread out in different places.
- Now the legal issues connected with damming facilities and water damming are changing. The point is to simplify them, but at the moment it requires individual analysis what technical documentation is needed.
- The analysis and technical documentation will be developed by an external design office. The number of persons with skills to perform technical documentation related to drainage is decreasing.
- Generally there are no financial programs to support the stage of preparation of technical documentation at the moment.

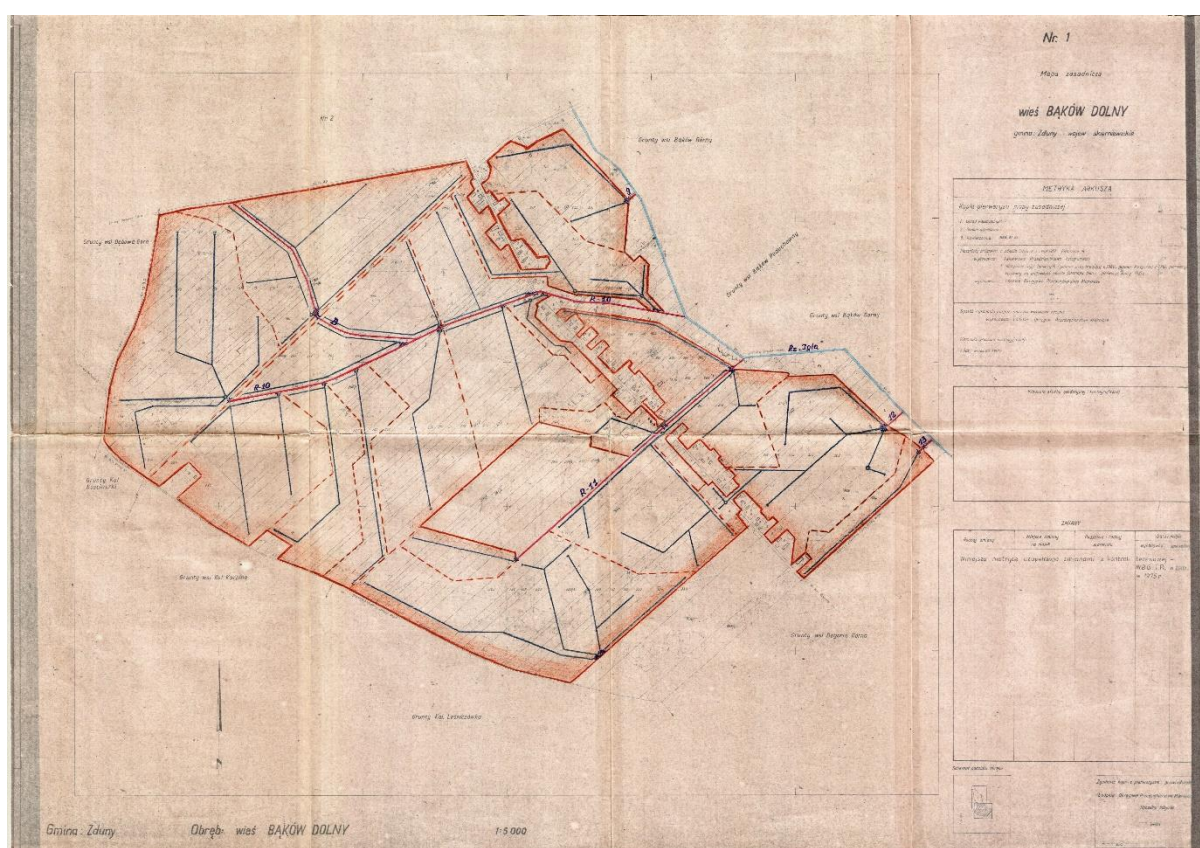


Fig. Old map (1:5 000) of drainage facilities in Igla Stream provided by the Zduny Water Company

## Arrangements:

1. Maintenance and investment plans for the following years for activities within the pilot catchments will be agreed so that the Polish Waters and the Water Companies can plan complementary activities.



2. Within the framework of the Waterdrive project ERCE PAN in cooperation with the stakeholders will undertake activities to develop an analysis of the possibility of regulating the outflow of water from drainage facilities for the Stradzewski Canal and the Igla River in order to increase water retention in the landscape and to restore gritty waters. Developed concepts and necessary documentation will be handed over to PGW WP and water companies in Bedlno and Zduny. For the purpose of carrying out the above mentioned analysis an agreement will be signed on the use of the developed documentation by the interested entities.
3. The Polish waters will provide access to documentation (including as-built reports) for hydrotechnical facilities. Water Company Zduny provided paper maps of water devices (collectors) under their management (1:5000) for scanning. The Bedlno Water Company also has documentation which it will make available for scanning.

## 6.2. Notification investments to Drought Effects Counteracting Plan during public consultation

The key planning document in Poland for increasing water retention and counteracting the effects of drought is Drought Effects Counteracting Plan (DECP) (*in Polish: Plany przeciwdziałania skutkom suszy, PPSS*) (<https://stopsuszy.pl/en>).

The main goal of the DPP is clarified by four specific objectives: (1) effective water resources management to increase available water resources, (2) increasing water retention (storage), (3) drought education and coordination of drought related activities, (4) creation of implementation and funding mechanisms for actions counteracting drought effects. DECP is developed for a period of 6 years (2021–2027). The legislative process is currently underway (<https://legislacja.rcl.gov.pl/projekt/12342551/katalog/12757857#12757857>).

During the public consultation, the investments /proposal “Restoring water damming facilities on the Stradzewski Canal” was submitted. Additional the proposal of “Increasing the possibility of water retention in the basin of the Bzura River in the Kutno, Łowicz and Łęczyca Counts”, which is more general was submitted. It include (1) development of the water retention concept for the area of particular communes in the Kutno, Łowicz and Łęczyca Counts taking into account channel retention, using green infrastructure and optimising landscape structure. (2) preparation of an inventory of the technical condition of hydrotechnical facilities together with a conception for repair and an alternative analysis of the environmental impact (3) preparation of project documentation for new hydrotechnical facilities (weirs, barrages) and modernisation of the existing ones indicated in the concept of water retention (developed under point 1); (4) construction works, including construction of weirs and gates, repair of existing damming facilities, reconstruction of drainage facilities in the scope of changing their function from drainage to retention (slowing down the outflow).

The investments are included in Annex 1 of the draft DECP containing proposals for the construction and reconstruction of water facilities. It is included in Table 1C - investments of external entities submitted during the public consultation, which passed the preliminary assessment (multi-criteria assessment taking into account, inter alia, compliance with the

provisions of the DECP and preliminary cost-benefit analysis of a given investment). Inclusion in DECP allows for investment and fundraising. However, the list of investments is an open set, which makes it possible to implement investments that are not included in the document.

### 6.3. Analysis of available funding sources (cost of documentation and investment)

Investments in water management are mainly the responsibility of the Polish Waters and are financed either from their own budget (state budget) or from external sources (European and national funds).

In the case of maintenance works in agricultural areas, these are covered by the Polish Waters and/or funds acquired by water companies and/or local authorities. In 2020, Polish Waters allocated PLN 4 million (890 000 euro) for maintenance works in area of the Catchment Water Management Board in Łowicz.

Water companies are beneficiaries of regional (marshal's office, provincial office) and European (*RDP???*) programmes financing maintenance works. The Marshal's Office of Łódzkie Voivodeship supports the activities of water companies in maintenance works of drainage systems in agricultural areas. In 2020 it allocated the amount of approx. PLN 2 million (440 000 euro).

However, the resources allocated to investment and maintenance work are insufficient.

There are no financial programs to support the stage of preparation of technical documentation at the moment.

*To be completed after agreement with the European Commission of the Rural Development Programme*

### 6.3 „Analysis of the possibility of regulating the drainage outflows for the Stradzewski Channel in order to increase water retention in the landscape and groundwater restoration” – preparatory work for submitting a grant application

Collection of the maps of drained infrastructure in Kanal Strudzewski basin, which are crucial for targeted location of measures in drainage area was finished. Paper maps (1: 2 000) being part of 1960-1970 documentation, they were spread among archives of water authorities and farmers.

On the basis of the materials obtained, a preliminary estimate of the costs associated with the preparation of „Analysis of the possibility of regulating the drainage outflows for the Stradzewski Channel in order to increase water retention in the landscape and groundwater restoration” was made.

The cost of the analysis includes e.g. preparation of maps for design purposes, hydrological and hydraulic calculations and programme and spatial concept development. Preliminary estimated cost is ab. 45 000 euros.

ERCE PAN with cooperation with Bedlno local authority, Bedlno Water Company and Polish Water is preparing an application to be submitted to the Voivodship Fund for Environmental Protection and Water Management in Łódź as part of scientific research. As part of the application, 'Analysis of the possibility of regulating the drainage outflows for the Stradzewski Channel' will be carried out by the project office.

*Next steps - To be completed*

## 7. Participatory mapping of potential areas increasing landscape water retention in Bedlno Commune

*In progress; deadline April 2021*



Photos: Landscape elements (wetland, mid-field bushes and trees, buffer zones, small pond), Bedlno Commune

8. Selection of good agricultural practices

*In progress; deadline April 2021*

9. Action Plan with suggested investments, and funding sources

*Based on result from points 6.3/7/8, deadline Sept 2021*