

# Kutno County: WATERDRIVE Case Area in Poland



**Katarzyna Izydorczyk, Wojciech Frątczak, Kinga Krauze**

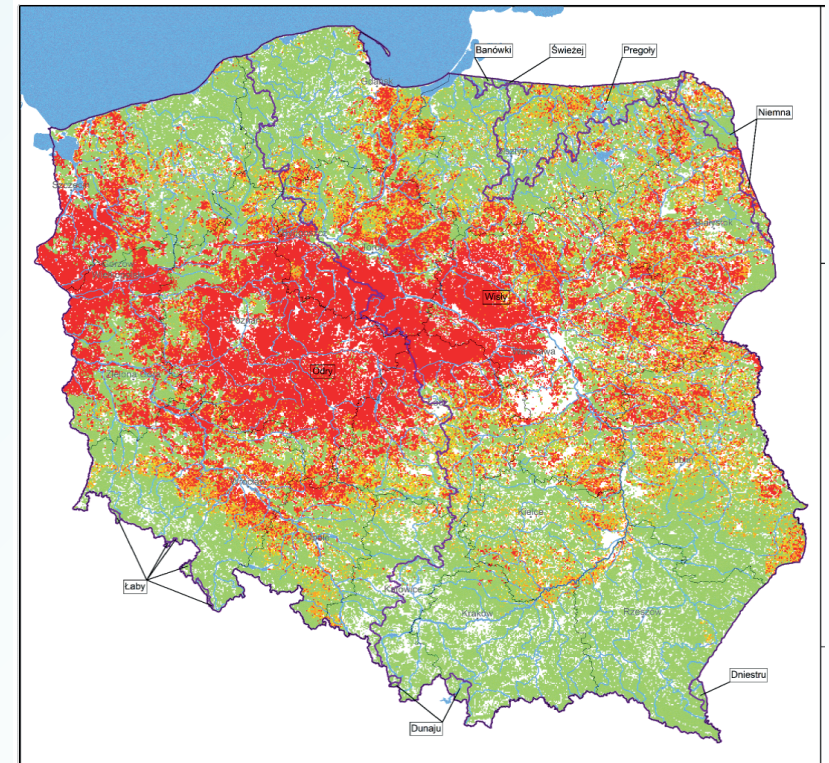
European Regional Centre for Ecohydrology PAS  
in cooperation with Marshal's Office of Łódzkie Voivodship

# Increased drought risk

Poland is one of the countries with very limited water resources. Renewable fresh water resources per capita amount to 1600 m<sup>3</sup>, while already the level of 1700 m<sup>3</sup> per capita is considered as a critical one.

Drought frequency has increased significantly in Poland in the last decade (2010-2019). In the last decade, they occurred on average every 2.5 years.

Analyses indicated that 37.8% of agricultural and forest areas are endangered by extreme and strong agricultural drought which, together with areas endangered to a moderate degree, qualifies as much as 45.5% of agricultural and forest areas as significantly endangered by agricultural drought.



Agricultural drought risk classes: Class I (green) - areas threatened to a weak degree; Class II (yellow) - areas threatened to a moderate degree; Class III (orange) - areas endangered to a strong degree; Class IV (red) - areas endangered to an extreme degree.

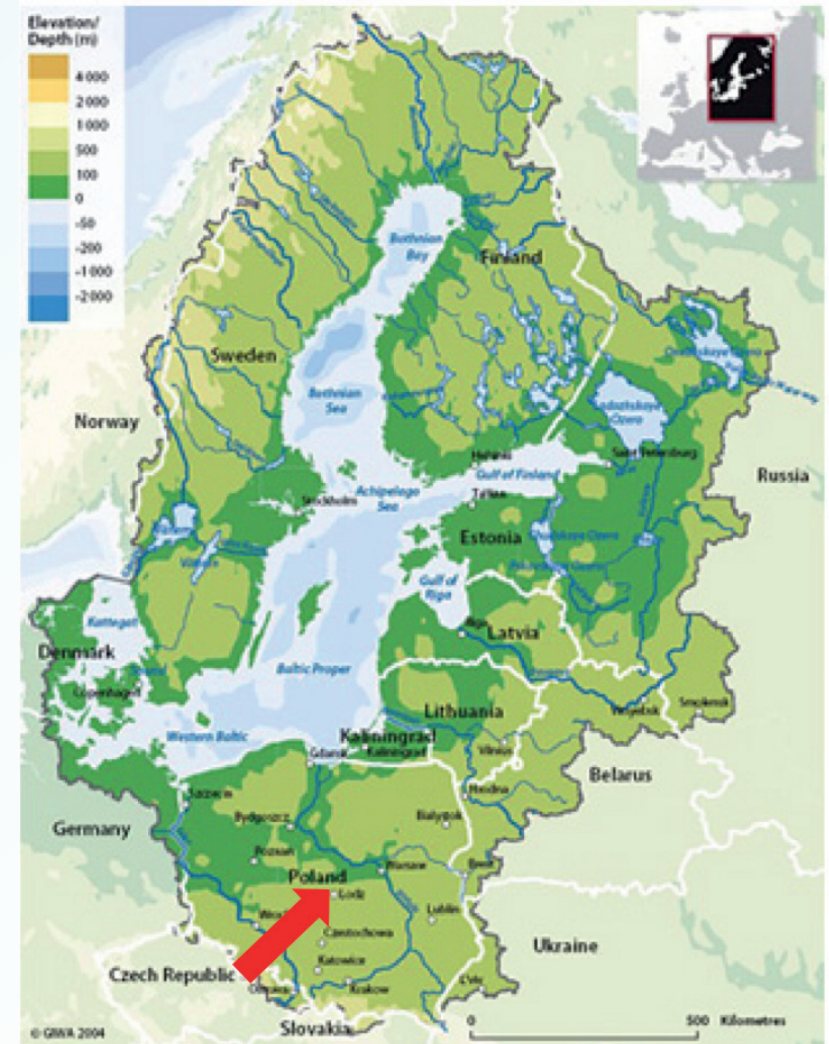
SOURCE | Plans to prevent effects of drought. 2021

# Kutno County in The Baltic Sea Region

The area of the Kutno County is an important agricultural production area in the Lodzkie province in central Poland.

The high quality of soil had contributed to the development of intense agriculture. Land acquisition was based on the drainage of the area and regulation of rivers, followed but changes in the dynamics of water flow in the landscape.

In the Waterdrive project, Bedlno Commune, one of 10 communes in the Kutno County, has been selected for testing Waterdrive approach in the small agricultural catchment scale.

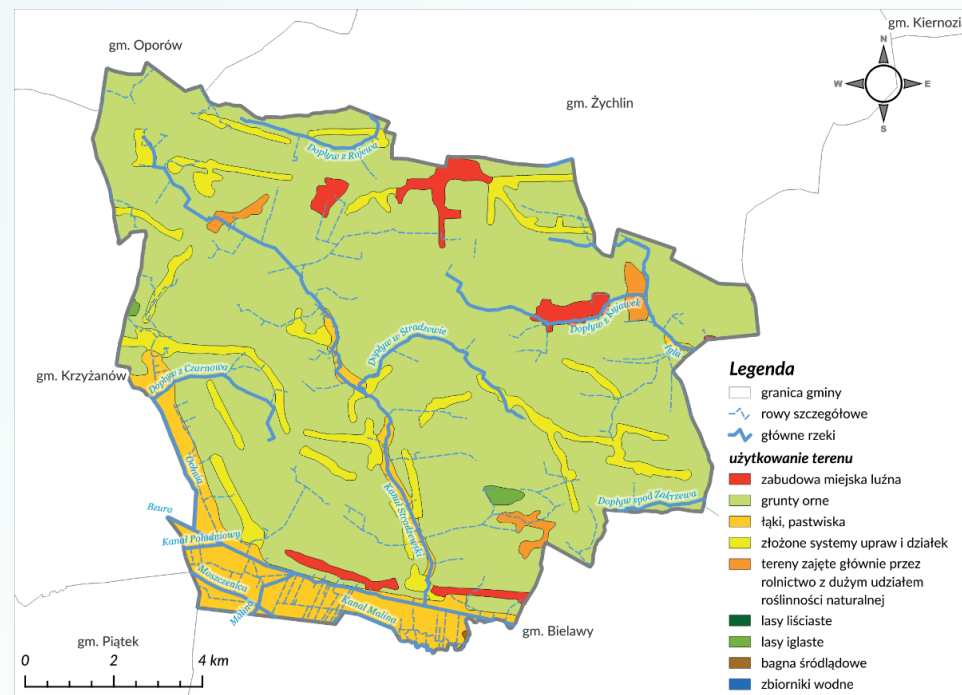


# Bedlno Commune

The Bedlno commune is a rural commune with an total area of 12,596 ha.

The dominant type of land cover is arable land (94%, green colour in the map), the largest share of which is used for the cultivation of cereals. Pastures and heterogeneous agricultural areas with a high proportion of natural vegetation (yellow and orange) constitute 3.4% of the area.

The Stradzewski Channel basin, which lies entirely within the commune and is a system linked to the drainage system. The Stradzewski Channel is 14 km long and its catchment area is 5 331 ha.



# Controlled drainage system for water retention

**The use of the drainage system is a basic tool in the fight against drought. Renovating the drainage system and switching to a controlled drainage system allows water to be collected in open ditches and underground pipes through damming facilities. This will help to increase water retention in the soil.**

In the past, the main task of the drainage system was to increase the outflow. In Bedlno Commune, there is a drainage network covering almost the majority of the commune's area. Underground drainage system together with open ditches is a connected system with natural rivers. There are damming facilities on the main stream (Kanal Stardzewski and Iгла River), however they are often destroyed.

It should be 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.

It is necessary to develop guidelines for joint actions 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.

## Controlled drainage system for water retention

The small water damming facilities (gates) are manually operated wooden gates. The damming water is accumulated in open ditches and influences on water level in underground drains. It raises the groundwater level in arable lands and increases the water retention in the soil.



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

# Controlled drainage system for water retention

The second group of damming facilities are larger construction with damming water in main riverbed, and then the water is redirected to drainage ditches. In this way, the neighbouring meadows are irrigated.



<https://www.wody.gov.pl/mala-retencja/retencja-korytowa>

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# Main Actors

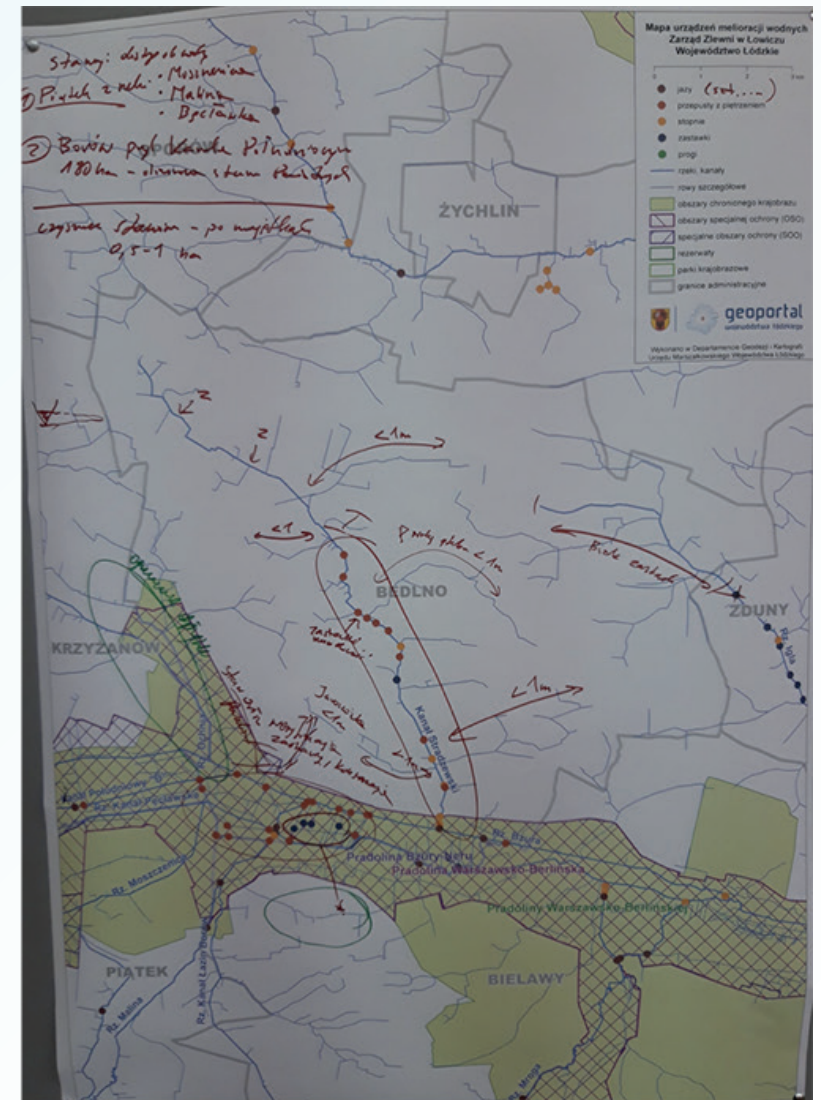
- **Bedno and Zduny Water Companies** (in Polish: Spółka wodna w Bednie i Zdunach): voluntary association of farmers, who are owners of land through which a drainage system passes. Voluntary contributions paid by farmers set up their budget
- **National Water Holding Wody Polskie** (in Polish: Państwowe Gospodarstwo Wodne Wody Polskie): water management authority responsible for water resources management, e.g.: flood and drought protection, coordination of the implementation of investments
- Local authorities - **Commune Office in Bedno and Zduny**
- Regional authority - **Marshal's Office of Łódzkie Voivodship**
- Network of public **agricultural advisors**





# Local Meetings

- Joint identification of problems and solutions with farmers and water authority
- Co-design of new water damming system both on state and private lands



# Local Meetings

- Recognising the acceptability of environmental measures by farmers

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 ponds	++
Reconstruction of drainage systems towards amelioration of soils - controlled drainage system	+++



# Regional Meetings and Initiatives

Support by regional authority is a key element mobilizing local initiatives

- Organization of regional meetings of water companies with Wody Polskie, including public consultations;
- Signing of the Water Partnership Agreement between the Marshal of the Łódź Province and the President of the Wody Polskie,
- Grants for water companies for maintenance works from regional funds (from 2019)



## Local Water Partnerships – national initiative

Multi-stakeholder cooperation started during the WATERDRIVE project found its continuation in official structures as a part of Local Water Partnerships in Kutno County.

The initiative to create Local Water Partnerships was taken by the Ministry of Agriculture and Rural Development and the Agricultural Advisory Centre in Brwinów in cooperation with the Regional Agricultural Advisory Centres in 2020.

The aim of the Partnership is to diagnose the condition and principles of rational water management and drought prevention in the county.

In the future, it will probably also be able to obtain funds for studies and expert opinions on water retention in agricultural areas and give opinions on planned investments.



Local Water Partnership meeting in Kutno County (26.11.2021) to discuss the development of the Rural Water Management Development Plan for the Kutno County Local Water Partnership for 2022 - 2030

## The subsidies for renovating the drainage system, transitional RDP for the years 2021-2023

<b>Activities</b>	<b>Lump sum price [PLN, 1 € = 4.5 PLN]</b>
Reconstruction or repair of the drainage ditch, including: a) mowing the slopes and bottom; b) removal of bushes and trees, c) de-silting of the bottom together with scattering the excavated material, d) sloping, e) cleaning of culverts, f) cleaning of drainage outlets	19-37 PLN/ running meter*
Construction, reconstruction or repair of the culvert	1 100 -3 300 PLN**
Construction, reconstruction or repair of hydrotechnical facilities for water damming (gates)	Construction new: 9 000-30 000 PLN** Reconstruction: 5 000 -14 400 PLN**

\*Price depends on width and depth of ditches; \*\* Price depends on the diameter/width/size  
sources: <https://www.gov.pl/web/rolnictwo/xiii-posiedzenie-km-prow-2014-2020-z-16-17022021-r>

## The subsidies for renovating the drainage system, transitional RDP for the years 2021-2023

Activities	Estimated cost
1. Developing programmatic and spatial concept for the Stradzewski Canal basin (including preparing a map for design purposes and hydrological calculations)	200 000 PLN
2. Development of the required technical documentation by the design office for the Stradzewski Canal basin	200 000 PLN
3. Modernization of the existing drainage systems (e.g., repair of facilities: gates, culverts) in the Stradzewski Canal basin (modernization works: 10 items).	102 500 PLN
4. Construction of damming facilities on drainage ditches in the Stradzewski Canal basin (investment works: 10 items)	230 000 PLN
5.-8. The same stages for the Igla river basin - in cooperation with the Zduny Commune (half of the Igla river basin area lies in the Bedlno commune; therefore half of the costs were assumed)	366 250 PLN
<b>Total</b>	<b>1 098 750 PLN</b> <b>240 000 euro</b>

## Barriers:

- Broadly available maps are not sufficient for drainage-related technical documents
- Availability of paper maps (1: 2 000) being part of 1960-1970 documentation, they are spread among archives, water companies and farmers
- Lack of financial programs to support the stage of preparation of technical documentation
- No successors of designers/persons with the mandate and skills to carry out drainage-related technical documents
- Legal issues of damming facilities and water damming are changing and require individual analysis



## Suggestions to the future:

- Improved access to data: the common database is needed, covering an inventory of land drainage facilities, as well as water, soil, climate, geology and biodiversity data that allows for enhanced local analyses and development of local solutions harmonized at catchment scale;
- Making the sub-catchment/area scenarios (e.g. Action Plans) of restoration and management of water resources a widely used, common basis for any investments/implementations.
- Those should be elaborated by the experts in cooperation with water managers and farmers, landowners and other interested parties according to the following rules: (1) The proposed measures (their type/location) should be analysed in catchment scale; (2) The expert group should be able to generate a holistic approach, therefore should cover a number of disciplines in agriculture, water, biodiversity, forestry, climate, and economy; (3) The expert team should act as a support to Local Water Partnerships.
- Advancing the concept of Local Water Partnerships to provide a new, effective communication and managerial instruments allowing participatory approach to planning processes at county level (engaging farmers and their organisations, other rural actors, agricultural advisors).
- To continue activities aimed at introduction of a new type of agricultural advisory service (water advisor) into the Ministry of Agriculture and Rural Development's national advisory system.



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