



# **LIFE-CLIMCOOP**

## **Layman's report**

### **2020-2024**

**Cooperation of cities and local companies for  
climate change adaptation**

**LIFE19 CCA/HU/001320 – LIFE-CLIMCOOP**



## Members of the consortium



**MISKOLCI**  
EGYETEM  
UNIVERSITY OF MISKOLC



## Our supporters



ENERGIAÜGYI MINISZTERIUM



Project budget: €2,95 million  
EU co-financing rate: 55%

## Main implementation site – Kazincbarcika, BorsodChem Zrt.



## **Extreme rainfall distribution**

Damage to local infrastructure caused by flash floods

## **Ecological problems of industrial and urban environments**

Drainage and flood management problems

Habitat quality to be improved and low urban green space coverage

## **Extreme weather conditions**

Critically low water levels in the River Sajó - water shortage conditions

Lower groundwater levels - disrupted local water balances

# **INTERVENTION LOGIC**

**Causes and effects**

## **Inelastic use of water resources**

Contrasting measures in rainwater management

## **Lack of cooperation between vulnerable groups**

Increasing social inequalities

Climate adaptation of communities  
climate resilience

## **Growing domestic and economic water demand**

Periods of water scarcity  
Waste of drinking water, use for irrigation

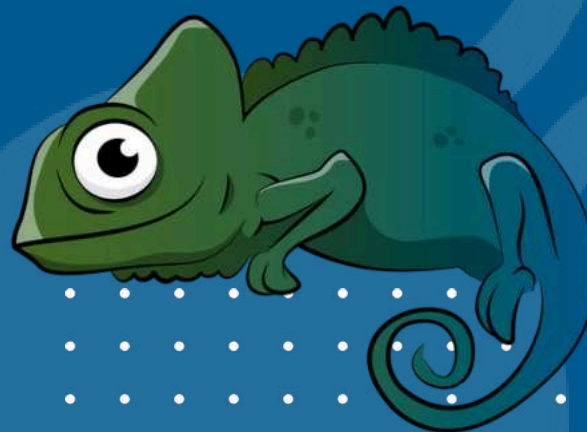
**Cooperation  
mechanisms  
between cities and  
companies**

**Exploring water saving  
and recycling options**

**Nature-based urban  
climate adaptation  
measures**

**Diversified and  
adaptive water  
management**

# **MAIN OBJECTIVES OF THE PROJECT**



**Smart and innovative  
awareness-raising**

**Integrating climate  
adaptation into urban  
and corporate policies  
and practices**

**Dissemination and  
replication**

**Capacity building  
and increasing the  
knowledge base**

**Sajó-valley  
basin level  
partnership**

## OUR MAIN RESULTS

### Strengthening climate adaptation capacities and developing a climate knowledge base

Strengthening the climate adaptation capacities of local government and industry  
Creating a joint

Climate Adaptation Strategy based on a climate vulnerability assessment

Creating a common climate knowledge base  
Broad social cooperation

### Climate change adaptation guide and best practices handbook

Development of a replicable climate change guide for municipalities, businesses and individuals

Creation of a Climate Adaptation Best Practice Handbook

### Establishing cooperation mechanisms

Establishing joint business-municipal climate adaptation cooperation mechanisms

Establishing a Climate Platform to coordinate climate adaptation plans

Establishing a Future Research Group for scientific research on climate change

Establishing a Climate Fund to support small-scale, low-cost climate adaptation measures

### Implementation of nature-based adaptation measures

Installation of climate adaptation devices in Kazincbarcika and BorsodChem Zrt. areas

Improvement of stormwater drainage

Expansion of urban green areas

Nature-based recultivation of former industrial sites

Creation of new ecological areas

Upgrading of urban irrigation plan

## OUR MAIN RESULTS

### Developing smart adaptation tools for climate awareness

Creation of an urban tree inventory projected on an interactive mobile app map, also based on the climate awareness of the local population

### Integrating climate action into strategic documents and policies

Introduction and integration of climate adaptation measures into the strategic documents, regulations and practices of Kazincbarcika City Municipality and BorsodChem Zrt.

Kazincbarcika Sustainable Energy and Climate Action Plan supplemented with a climate adaptation concept

Kazincbarcika spatial planning plans modernisation

### Operation of a chemical water treatment prototype for process water recycling

Mapping of the water footprint of BorsodChem Zrt. and study of water saving and recycling options

Design, installation and operation of multi-stage, up-scalable water treatment pilot for purification of different grey water qualities

### Replication and dissemination of results

Demonstration and dissemination of municipal-company climate adaptation mechanisms based on the Water Stewardship - Watershed Level Management Model

Identification and promotion of ten follow-up partners to implement climate adaptation mechanisms

Mapping of project results

# INSTALLATION OF LOG DAMS

Kazincbarcika and its surroundings are particularly exposed to river flooding and flash floods, which are becoming a growing problem as extreme weather events become more frequent. In 2010, the flash flooding of the Tardona stream caused serious damage in Kazincbarcika and Tardona. For this reason, GeoGold Carpathia Ltd. carried out a geomorphological survey of the stream catchment area and proposed natural water retention solutions. The study focused on the identification of log dams suitable for reducing flood peaks in Tardona and Kazincbarcika and the location of a potential lateral reservoir connected to the Tardona stream. Finally, two sites suitable for the construction of log dams were identified, one in Mályinka and one in Kazincbarcika. Following the survey, the water rights for the construction and operation of the Kazincbarcika log dam were opened. The delivery of the log dam took place on 10 September 2024. The contractor Forest Group Ltd. placed the one and a half metre high structures in the upper third of the upper reaches of the Tardona stream, thus protecting the lower parts of the valley and the settlements. The dams are not hermetically sealed, the water seeps under and between the logs, so they do not completely dam the upper section of the stream, but slow down and spread the incoming water sufficiently to increase its residence time, thus helping to reduce the flooding and infiltration. In addition, the dams retain larger debris, reducing the damage from sudden rainfall events.



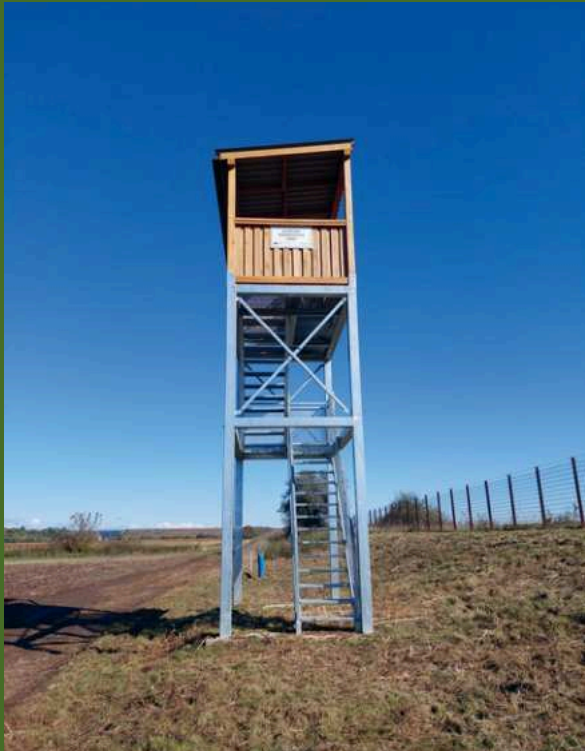


**Installed logs at Tardona creek**

# RECOLTIVATION AND BIRD OBSERVATION

BorsodChem Zrt. has recently completed one of the largest recultivation projects in its history, covering 258 thousand m<sup>2</sup> of land. As part of this, a wetland of more than 34,000 m<sup>2</sup> was created, which supports biodiversity and serves the local ecosystem in an environmentally friendly way. Two artificial pools have been created in the Salt Lake area, in collaboration with the Aggtelek National Park Directorate, providing an ideal habitat for more than 100 bird species. The new habitat is important for local nesting birds and migratory species, as there are few similar natural wetlands in the vicinity of the Carpathians.

The project also included a bird observation tower and a nature trail, which provide information about the area's wildlife through information panels. This initiative not only contributes to biodiversity conservation, but also provides the community with an opportunity to experience and learn about nature. The company's long-term plans include the conservation of wetlands and the development of a solar park in the area. The project will offer exemplary solutions for other similar industrial sites and provide a unique model for sustainable and responsible environmental management.



**Birdwatching tower**



**Recultivation area**



**Walking tour and opening of CCA educational path**

## MULTI-STAGE WATER TREATMENT PROTOTYPE

The aim of BorsodChem Zrt. is to meet its growing water demand without further burdening the Sajó River and to find ways to optimise its water footprint. The company is focusing on finding ways to save water and reuse water. To this end, as part of the LIFE project, a prototype water purifier with a capacity of 1 cubic metre per hour, installed in a container, was commissioned at the Kazincbarcika site in January 2023. The aim of the plant is to be able to treat not only biologically treated water, but also other process waters and municipal wastewater, allowing their reuse in production processes. In the prototype's operation, the water is first filtered in two stages and then its conductivity is reduced by fine desalination. At the end of the process, the required water quality is achieved using special ion exchange technology steps. During testing, the prototype has successfully demonstrated its efficiency at several different installation sites and water quality. The aim is that the system should be able to reduce the use of raw water while providing the necessary amount of water for the technological processes or to offer an alternative water supply, for example for irrigation. In line with BorsodChem Zrt.'s sustainability objectives, the project will contribute to reducing water use and helping to adapt to future climate change in the Sajó catchment area. The successful testing and the results of the project may also offer exemplary solutions for other companies.



**Prototype II. installation site**

# CLIMATE FUND APPLICATIONS

In 2022, the Barcika Art Nonprofit Kft. Kazincbarcika City Municipality and the Climate Fund operated by BorsodChem Zrt. The jury awarded three prizes and the imaginative designs were painted on the giant grey side walls of the five-storey buildings. This added three to the more than forty colourful walls in the city.

Each work presents the issues of climate change in a unique way, drawing attention to the consequences of global warming, the impact on wildlife and the importance of protecting nature. Such creative initiatives aim to shape the mindsets of city dwellers and raise their environmental awareness.

As part of the programme supported by the Climate Fund, Kazincbarcika and BorsodChem Zrt. also provided another opportunity for the local community to apply for a grant, under which 30 IBC tanks were distributed to the residents of the city every year. These large-capacity devices are ideal for collecting rainwater, which residents can use for irrigation purposes. The aim of the project was to highlight the importance of water conservation, which is particularly relevant in a world where the effects of climate change are being felt in all areas. Rainwater harvesting in urban environments thus not only offers a sustainable alternative, but also encourages people to live more consciously.



**Alex Szabó - Polar Bears**



**Eszter Masir - Survivors**



**Erika Szentgyörgyi - The situation has turned around**

### Winner wall painting tenders



**IBC distribution**

# TREE INVENTORY AND TREE PLANTING IN KAZINCBARCIKA

Urban trees play an important role in urban climate adaptation and mitigation, and their preservation and enhancement is therefore an inevitable task. The project has created one of Hungary's first urban tree inventories in the central area of Kazincbarcika, covering almost 2 km<sup>2</sup>. The tree register and its associated map provide information on the growth and health of trees, which helps to ensure that tree maintenance and care tasks are properly carried out. During the data collection process, drones were used to measure the position of around 8,000 trees, major shrubs and shrub groups, as well as the parameters of the plants (species, trunk and canopy diameter, height and health). The tree register will help the Kazincbarcika Municipality to take rapid action to protect trees when necessary. BorsodChem Zrt. has established ecological areas on nearly 3.85 hectares to promote the protection of trees and shrubs. In two phases of the programme, a total of 1,540 native tree seedlings, including narrow-leaved and tall ash trees, silver limes and common arbutus, were planted by the company's employees in cooperation with local residents. The project was aimed at reducing invasive plant species, cleaning the air by dusting, providing shaded areas and noise insulation.





**Tree map and tree planting**  
**[www.life-barcika.hu](http://www.life-barcika.hu)**

# BUS SHELTER WITH GREEN ROOF



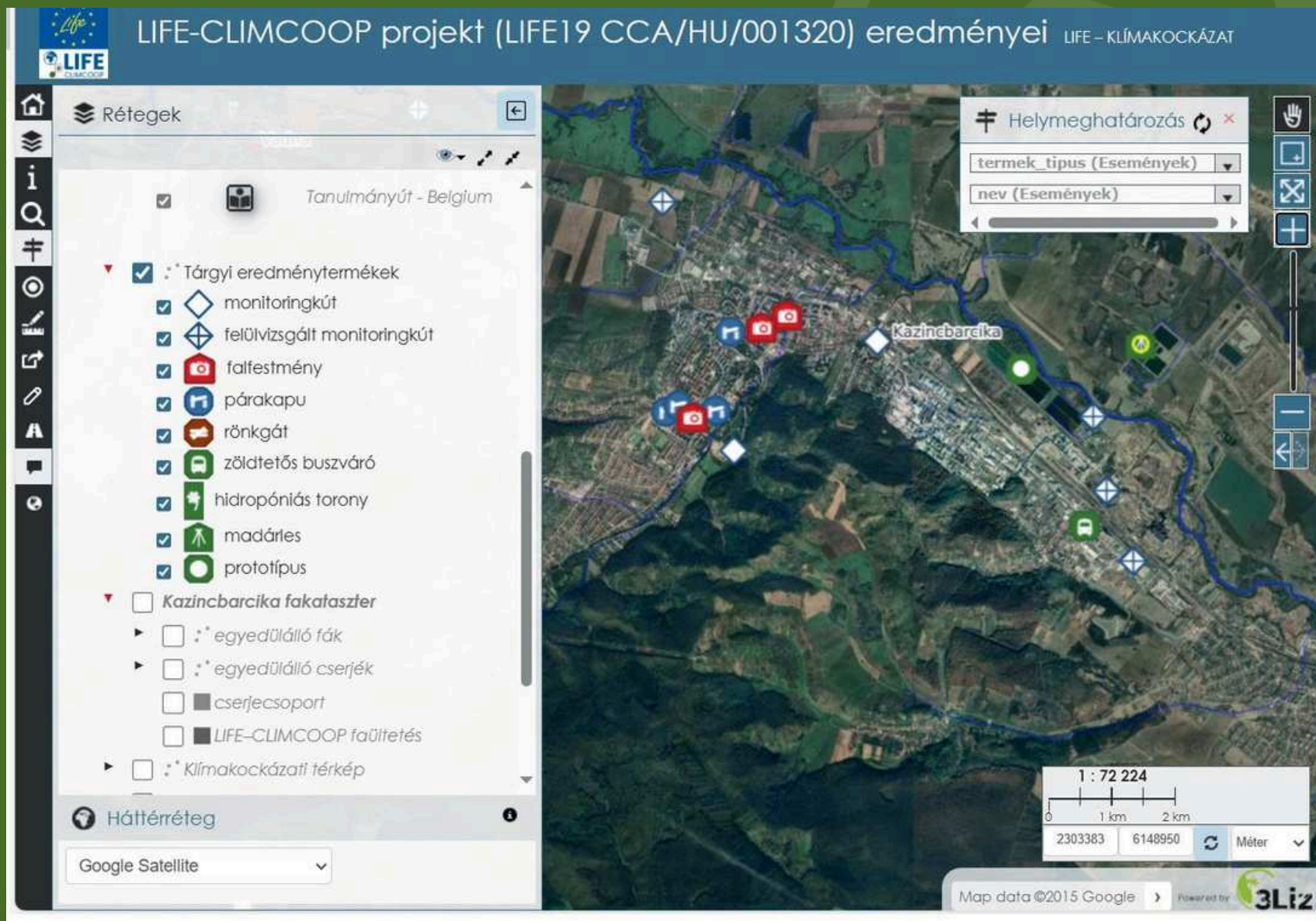
The project also included the prototype of an innovative green-roofed bus shelter at BorsodChem Zrt., which has a number of environmental and sustainability benefits. The green roof improves the microclimate, reduces environmental pollution through its dust-binding and temperature-balancing effects. It also stores rainwater, reducing the load on the sewerage system, and protects against noise, UV radiation and thermal fluctuations, thus increasing the life of the bus shelter. The Sedum carpet provides rapid plant establishment and immediate full plant coverage, making the bus shelter a green and sustainable element immediately after handover.

# MONITORING WELLS

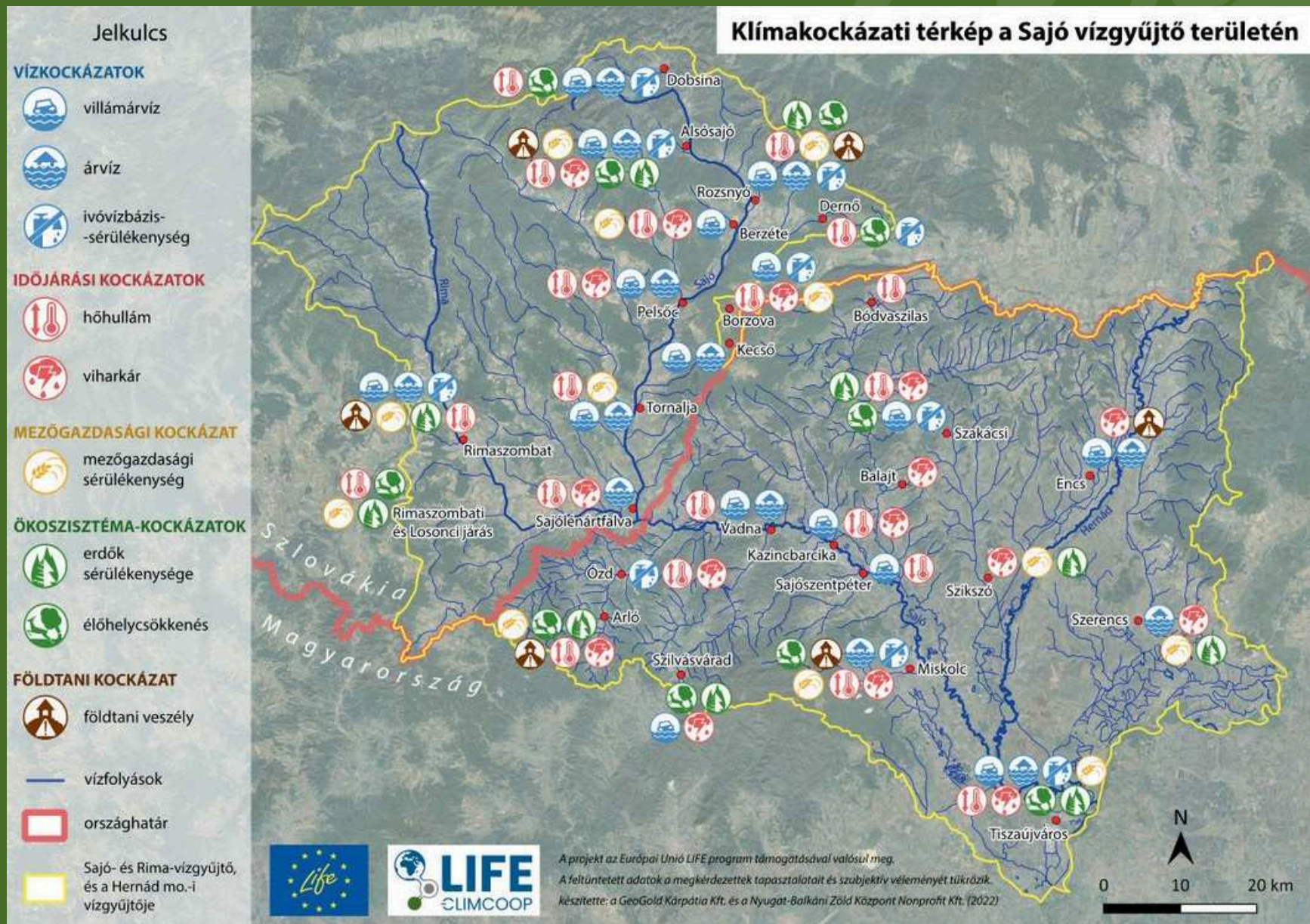
The installation of monitoring wells plays a crucial role in monitoring groundwater levels, which is essential for an accurate assessment of the climatic vulnerability and environmental status of the area, directly supporting the development of green infrastructure and the design of natural water retention measures.

The monitoring wells provide continuous groundwater level measurements, which are important because automatic level gauges can be used to collect accurate data on groundwater movements and changes. This data is key to optimising irrigation practices.





Map showing the results of the project



Map showing the results of the project

## THE RESULTS IN FIGURES

### Water recycling

**1** The result is a state-of-the-art, scalable process that is ideal for water treatment and can be flexibly adapted to different water quality requirements.

### Increasing green space

Development of an ecological area of 38,500 square metres

**3,85 hectares**

planted in two phases by BorsodChem Zrt. with the participation of employees and the general public

**1 540 tree**

### Natural water retention systems

**2 log dams**

2 nature-based water retention systems established in the Tardona stream area

### Development of interactive tools

**Urban tree cadastre map**

Digital map, real-time water data - website

### Wide-ranging communication actions

**27 000**

resident access to Kazincbarcika and BorsodChem

**16 BC Click appearance**

**5** Educational school presentation

**kkv workshop**

Distribution of Green Newspaper and Sustainability Newsletter

**12 green publications** The project website:

**3 murals**

life-climcoop.hu

### Propagation and replication

Climate action Guide and Manual of Good Practice Climate Risk Assessment Based on questionnaire surveys impact assessment

**10**

involvement of urban-industrial followers

**3**

conference on the subject

Regular media activity

**10** workshop for followers, companies, municipalities

# LIFE-CLIMCOOP CONSORTIUM



<https://life-climcoop.hu>



## COOPERATION OF CITIES AND LOCAL COMPANIES FOR CLIMATE CHANGE ADAPTATION

The project is funded by the European Union LIFE programme.

### For more information, please contact:

#### **Prof. Dr. Béla Viskolcz, Head of Unit**



+36 46 565-111/1244



bela.viskolcz@uni-miskolc.hu

#### **Orsolya Kolyvek, Project Manager**



+36 46 565-111/1770



orsolya.kolyvek@uni-miskolc.hu

#### **István Nagy, Chief Financial Officer**



+36 46 565-111/1770



istvan.nagy@uni-miskolc.hu

*"Always evolving and changing...  
Always waiting for the storm and the  
firestorm. And when the storm and  
the fire come, not to wonder and not  
to complain. Calmly say: Here it is.  
And extinguish and protect."  
(SándorMárai)*

