LIFE-MICACC project

Layman's Report

1. **Project details:**

Project title: Municipalities as integrators and coordinators in adaptation to climate change

Project acronym: LIFE-MICACC

Project reference: LIFE16 CCA/HU/000115

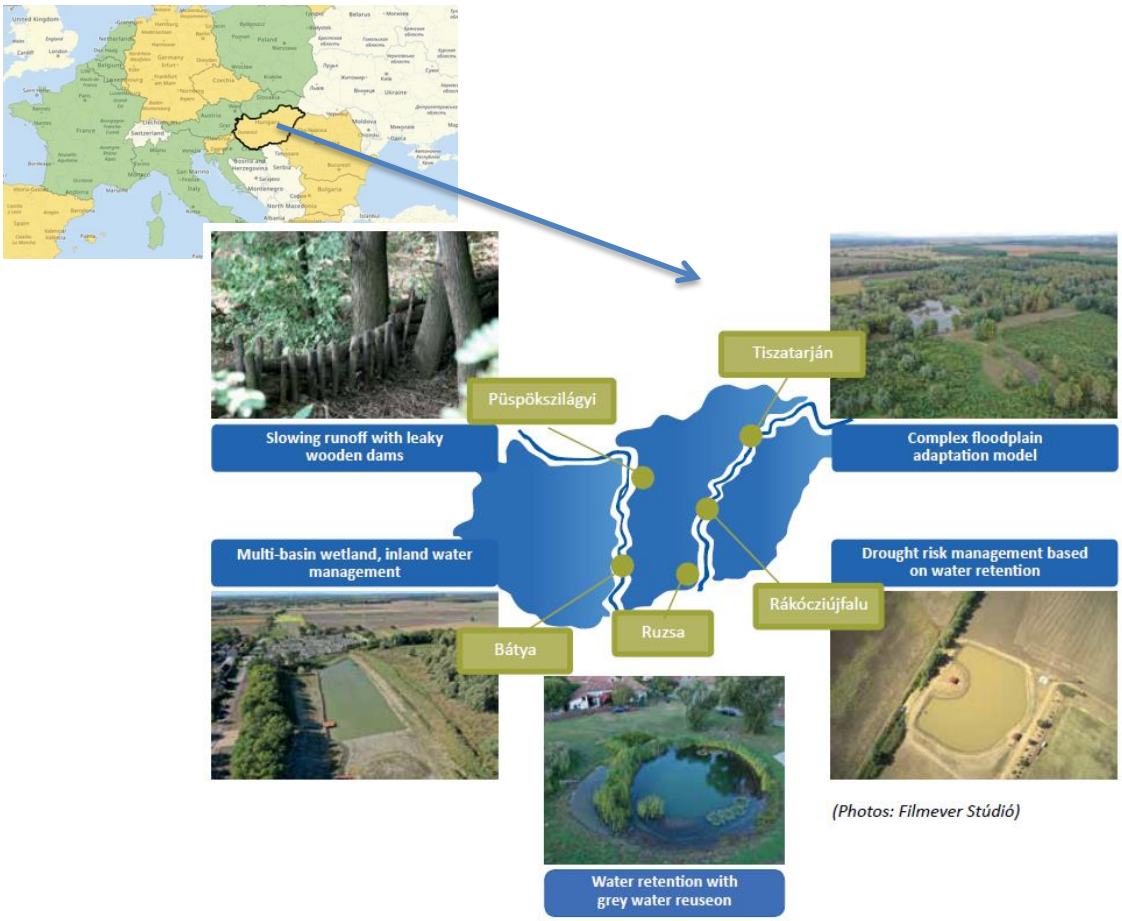
Project implementation period: 1 September 2017- 31 August 2021 (Extended due to COVID19 epidemic until 30 November 2021)

Total project budget: 2 564 783 Euro

EU financial contribution requested: 1 528 069 Euro

The LIFE-MICACC project is **national coverage**.

The pilot project aimed at natural water retention was implemented at five partner municipalities, however, many of the activities and results of the project is national in scope: awareness-raising trainings, smart tools, study trips in EU, field trips, publications etc.



(Photos: Filmever Stúdió)

2. Focus of the project

The LIFE-MICACC project - coordinated by the Ministry of the Interior of Hungary and involving nine associated beneficiaries - focuses on local governments, climate change, adaptation and efficient local water management. In the centre of project are the municipalities and so-called "natural water retention measures".

Starting point: Hungary is expected to be impacted by climate change more severely than the global average. The increase in average temperature will be over 3-5 °C. This is expected to be accompanied by a decrease in precipitation with a more hectic distribution and increase of extremities. Increasing water shortages, more frequent heat waves, prolonged drought, more intensive and unpredictable precipitation, and worsening flood and inland water problems are expected. Hungary is in a water-losing position.

Solution provided in the project: Restoration and improvement of the water-retaining capacity of the environment, soil and aquatic ecosystems can be a solution to mitigate extremes and contribute to strengthening the resilience of the local communities and the economy to climate change and developing their adaptability.

In the project, we assumed (which was finally confirmed) that:

- the local municipalities have a key role of also this area, they are able and necessary to integrate this approach into local plans, strategies. Furthermore they are also able to coordinating adaptation at local level, involving all stakeholders.
- the natural water retention measures are working well at local level. They are small-scale and cost-effective solutions with many benefits. Therefore it is worth in more information of them. They could be a relevant solution for reducing the water problems of the climate change next to traditional water management solutions.

3. The objectives of the project

The overall goal of the project is to improve climate resilience of vulnerable municipalities in Hungary by reducing their risks stemming from climate change.

Among the **goals of the project** we formulated the following activities:

<u>1. Awareness-raising, knowledge expansion</u>

To raise awareness and increase knowledge of decision makers at Hungarian local governments, relevant public administration bodies and economic actors **about the impacts of climate change and about ecosystem-based natural water retention measures (NWRM)** as a powerful tool to improve climate resilience. To adapt and disseminate to Hungarian municipalities and stakeholders the relevant knowledge from implemented NWRM pilot cases in Europe.

<u>2. Development and testing of natural water retention measures in pilot municipalities</u>

To test and demonstrate the practical applicability and viability of selected NWRMs in climate

adaptation within the Hungarian natural, socio-economic and administrative context through developing and implementing prototypes of these measures on 5 pilot sites.

3. Sharing the gained knowledge and experience

To disseminate the practical knowledge gained from the 5 test cases, and to foster the replication of the tested NWRM solutions for improved climate resilience in different locations within Hungary, both at local and regional scales. To build locally coordinated catchment partnerships around a joint vision and prepare plans for the upscaling of NWRM solutions to catchment level, involving stakeholders.

4. Strengthening the coordinating and integrating role of the local governments

To build local capacity at the most vulnerable Hungarian municipalities in order **to strengthen the coordinating and integrating role of local governments** in mainstreaming ecosystem-based climate change adaptation measures into natural resources management strategies and spatial planning, and to enhance an enabling environment for them.

5. Knowledge sharing with innovative tools

To create **innovative and user-friendly smart IT tools** for all Hungarian municipalities and other stakeholders that help them **understanding and managing climate risks, support knowledge sharing** and facilitate stakeholder mobilization.

6. Strengthening cooperation between local governments

To involve Hungarian local governments **in national and European networks** of mutual support and cooperation for climate change adaptation and mitigation.

With the project (and this will remain the goal set after the official closure of the project), we would like that Hungarian municipalities to be able to respond effectively and naturally to the effects of the climate change by learning about well-functioning natural water retention measures. The acquisition of knowledge, experience and the necessary tools will significantly increase the adaptive capacity of local governments and it results in the development of balanced natural areas. The natural water retention measures improve the resilience and the well-being of local communities to climate change and contribute to mitigating local socio-economic risks. The restoration of wetlands also contributes to reducing the effects of climate change.

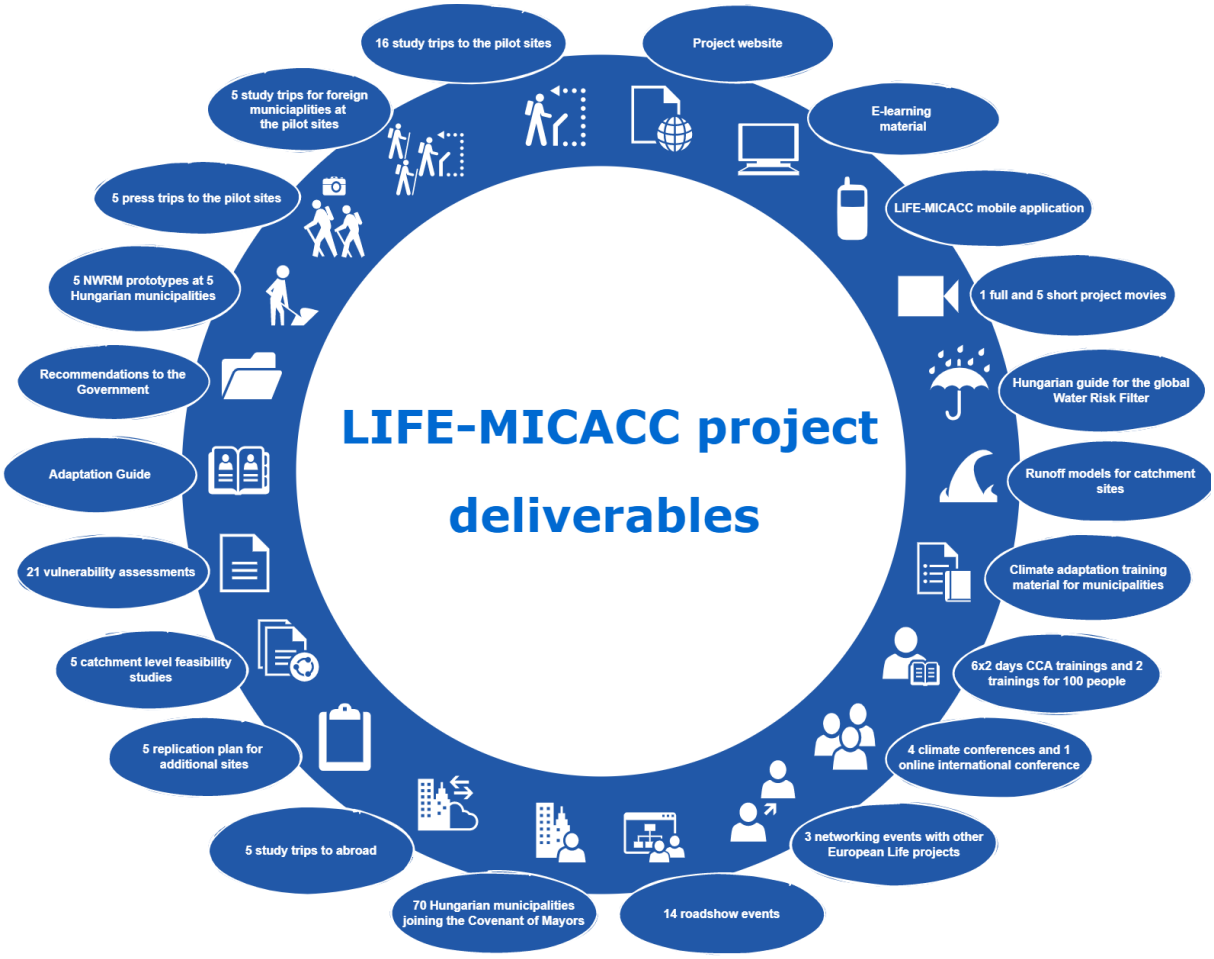
4. Achieved results in the project

The LIFE-MICACC project has achieved a number of results which:

- directly affect local governments, the population and the surrounding settlements;
- support awareness-raising, knowledge sharing and exchange of experience;
- dissemination[1] and communication events;
- publications, guides.

[1] Dissemination: publishing and sharing the results of the project

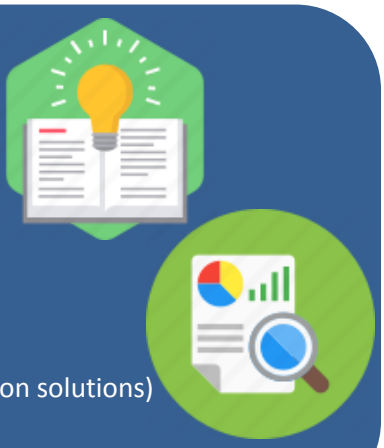
In summary, the figure below shows the results achieved:



Project results directly affecting local governments,

- **5 natural water retention measures** (prototypes) in the partner municipalities
  5 feasibility studies (on the small catchment level of the 5 partner municipalities)
- **5** replication plans (for 5 more municipalities, ready for implementation)

Publications produced within the project:



- **1 leaflet** (introduction of the project)
- **1 brochure** (comprehensive results of the project)
- **1 case study** (professional-technical description of the pilots)
- **4 themed climate-friendly booklets**
- **1 special issue of WWF magazine**
- **1 training material**
- **1 Adaptation Guide** (guide to implementing natural water retention solutions)
- **1 Recommendations package to the Hungarian Government**

Knowledge sharing tools:

- **1 e-learning material**
- **1 Water Risk Filter**
- **1 application**
- **5 + 1 video films**
- **5 runoff model to the five affected catchments**
- **2 infographics**

Implemented events:

- **5 study trips to abroad**
- **3 networking events**
- **4 climate conferences**
- **14 roadshows**
- **10 field visits** for domestic interested parties
- **5 field visits** for foreign visitors

Results in terms of number of participants:

400 people in trainings

400 e-learning users

400 people in roadshow

56 000 website visitor

5. Highlighted project results

The 5 pilot areas - 5 model solutions for dealing with water and water shortages

Bátya

Problem/challange: Annual rainfall is unevenly distributed. It does not rain as much as it should and not when it is needed. Periods of high and low water levels alternate, with frequent flooding of basements and streets, while the risk of drought is also making life very difficult for local people.

Pilot solution: On the site of an old abandoned clay pit (cubic pit), a multi-basin open water pond of about one hectare has been created, which also functions as a wetland. The lake can absorb and retain excess water, mitigate the effects of heat waves and droughts by recharging groundwater, improve the microclimate through evaporation, and provide recreational opportunities for local people.

„What God has given to Bátya, we are obliged to keep here." (Csaba Fekete, Mayor of Bátya)

What do we expect from this solution?

The revitalisation of the lake aims to preserve Bátya's valuable water resources for drier times, thereby recharging groundwater and mitigating droughts that are increasing with climate change. But there are many other benefits: the open water lake evaporates in summer, cooling the air and protecting residents from the heat. It also provides an exciting space for animals and people alike. The lake is designed so that the northern side, with its reedbeds and irregular shoreline, is more for wildlife and nature, while the southern side, with its straight shoreline, is for recreation.

Costs (geodetic survey, design, licensing, construction): cca. 45.1 million HUF

Short movie about the pilot: https://youtu.be/_kB_B1VsNLQ

Püspökszilágy

Problem/challange: The Szilágyi stream often causes flash floods in the municipality, at least once or twice a year. The sudden heavy rainfall and sedimentation caused serious damage to the built infrastructure and residential properties of the municipality, amounting to tens of millions of HUF. For properties owned by the municipality (and the state), the municipality has had to apply for vis maior aid every year so far.

Pilot solution: Rather than drainage, the focus is on slowing down run-off and conserving and retaining water in the landscape. On the side branch of the Szilágyi stream, seven sediment control wooden dams were constructed from local timber and four boulder bunds were also renovated. These natural barriers slow the flow of water, flatten the flood peak and prevent flooding. In addition, a lateral reservoir has been constructed at the lower catchment, which can absorb excess water and also serve as a wetland.

„The complex drainage and water retention system tested well during the flash flood of early June 2020 and I can say that it protected the municipality 100% from flooding." (Sándor Tordai, Mayor of Püspökszilágy)

What do we expect from this solution?

The aim of the complex solution is to reduce the risk of flash floods in Püspökszilágy, while preserving the valuable water resources of the settlement for drier times in the created wetland, and thus mitigating the expected adverse effects of climate change. Not only will this make the settlement more liveable during droughts, but it will also provide a habitat for many species and a recreational park for those who want to relax.

Costs (geodetic survey, design, licensing, construction): cca. 44.9 million HUF

Short movie about the pilot: https://youtu.be/1TnzpVUoDUc

Rákócziújfalu

Problem/challange: It is located in the drier region of the country, with a high number of heat-wave days and increasing water demand due to intensive agriculture (rapeseed, sunflower). However, inland flooding is also common. This mainly results from snow melting in spring and makes life difficult for farmers as it stops in the fields.

Pilot solution: The solution developed in this project addresses this dual problem. The excess water caused by flooding and heavy rainfall will be held in place by modifying the existing sewer network and building structures and a dam. Next to the canal, a deeper area has been created to which excess water (stormwater, rainwater) can be diverted from the canal. A wetland will be created in this area to help recharge groundwater during periods of drought.

What do we expect from this solution?

The aim of the intervention is to preserve the valuable water resources of Rákócziújfalu for drier times, as the lake cools the local climate by evaporation, making the settlement more livable in times of increasingly frequent droughts. This will mitigate the likely adverse effects of climate change and provide habitat for many water-dependent species. We also want the lakeside to serve as a recreational park for local residents.

„Almost 100 entries were received by the municipality to the drawing contest prior to the construction of the pond, in which the pupils dreamt up their own lake design." (József Varga, Mayor of Rákócziújfalu)

Costs (geodetic survey, design, licensing, construction): cca. 45.6 million HUF

Short movie about the pilot: https://youtu.be/K7EBtMsGpvQ

Ruzsa

Problem/challange: The Sandhills are becoming drier and drier, with average rainfall decreasing and groundwater levels falling. The sandy soil makes it difficult to retain water, with increased water filtration in the area. Every drop of water has value - and this is even more true here.

Pilot solution: The project will test the recycling and reuse of greywater, including both treated wastewater and process water. An internal pond of about 700 m2 has been created, where groundwater recharge based on the retention of decanted water as a by-product of drinking water treatment will be implemented. On the positive side, the environment is also greener and the microclimate is improved, making the area suitable for recreation. A reservoir of about one hectare has been built behind the wastewater treatment plant, which discharges about 150 m3 of treated wastewater per day, in order to store the treated wastewater. On the other hand, the external drainage system has been renovated and wooden barriers have been installed to prevent water from running off the site during wet periods and spreading to the adjacent pasture. This also helps to replenish soil water reserves and reduce drought risks.

„We have created a pond from drops, a real treasure here in the Sandhills. Meanwhile, my personal attitude has changed a lot." (Gizella Sánta, Mayor of Ruzsa)

What do we expect from this solution?

In the Homokhátság, every drop of water has value. Nevertheless, the little water that sometimes appears here has run off from Ruzsa through the canal. The aim of the project is to preserve the precious water resources of Ruzsa in the canal and small lakes for drier times, to recharge groundwater and thus mitigate heat waves and the expected adverse effects of climate change.

Costs (geodetic survey, design, licensing, construction): cca. 46 million HUF
Short movie about the pilot: https://youtu.be/rzagkJVhYK4

Tiszatarján

Problem/challange: The floodplain is extremely exposed to unpredictable, intense flooding, persistent and increasingly frequent droughts, and inland water. The lakes formed from the floodplain pits have almost completely dried up in Tiszatarján.

Pilot solution: In order to increase the retained water resources, the existing cubic basin system has been extended with a new basin, and natural gullies have been created on the banks. In addition, the Municipality of Tiszatarján has for years used its floodplain areas for grazing and energy plantations, which also helps to control the invasive pedestrian caterpillar. This is a unique floodplain management model, which we are now making accessible and demonstratable by building a nature trail.

„The completed investment (with the developed nature trail) contributes to the development of ecotourism. People here are very proud of that." (Lajosné Bögre, Mayor of Tiszatarján)

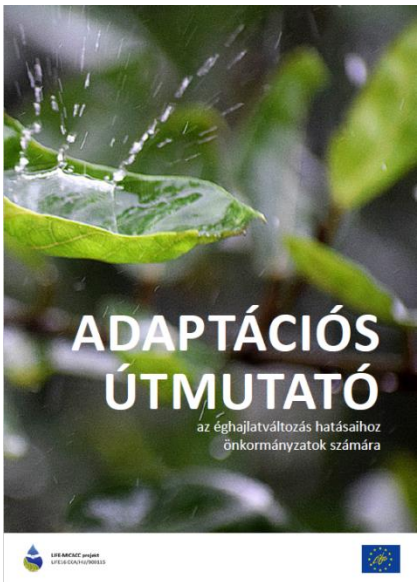
What do we expect from this solution?

The aim of the project is to increase local flood safety, prevent invasive species (horseshoe crabs) from infesting the floodplain and increase the amount of water that can be retained in the landscape. The small pond system will store valuable water resources and inland water from the Tisza flooding, thus mitigating the adverse effects of climate change. The biomass from the plantation can be used to replace the use of natural gas in public buildings, which will also contribute to slowing climate change. In addition, the water buffalo and grey cattle grazing on the restored floodplain will also help to develop the local economy as a visitable ecotourism programme

Costs (geodetic survey, design, licensing, construction): cca. 44.4 million HUF
Short movie about the pilot: https://youtu.be/eOYn5FOk5rU

Adaptation Guide

Based on the experience of the LIFE-MICACC project, the Adaptation Guide is a toolkit for municipalities, which describes:



- the role and options for actions of local authorities in adapting to climate change;
- possible ways of conserving water (near water courses, in forestry, agriculture);
- the additional benefits of natural water retention measures
- the process and steps (from design to permitting and operation) of creating close-tonature solutions;
- national and international good examples, best practices, case studies;
- effective methods and tools for involving stakeholders, recommendations for communication;
- useful links, further reading on the subject.

Goal: Encourage and inspire local authorities to think about and implement similar solutions in their own municipalities (adapted to local climatic challenges and conditions). The Guide is intended to provide a practical, useful tool and methodology for this purpose.

Target group: Mainly local authorities, municipal leaders, experts.

E-learning material

Another important tool for knowledge transfer is the e-learning material prepared in the project, which will be **available free of charge** on the project website for all interested parties after the project is completed (in Hungarian). In November 2020, the user rights were sent to all national municipalities. The e-learning covers the topics of **local adaptation to climate change and water conservation** through 6 modules and interactive exercises. Users can find useful information on the following topics:

- What are the basic concepts and processes of climate change?
- How to adapt to water-related risks?
- How to prepare a vulnerability assessment for a municipality?
- How to adapt to the identified vulnerabilities?

Application to support natural water retention measures

The project has developed an app that aims to **provide community-based information** on natural water retention measures and provide an opportunity for stakeholders **to learn and share good**

practices. The mobile app is mainly designed for municipal staff, but it can also be useful for water management, environmental experts and farmers, as well as for the laymen, as it brings together all relevant information on natural water retention in one place in an easy-to-understand way. Through the app, people can find out what solutions exist, what projects (good practices) have been successfully implemented in Hungary and abroad, and get information about related events and news that may be of interest to them.

Water Risk Filter for companies and municipalities

Water is associated with many risks that can have a profound impact on the development of a municipality or company. Moreover, these risks are increasing as a result of climate change. WWF's Water Risk Filter, launched in 2012, is a practical online tool (https://waterriskfilter.panda.org/) designed to help local governments, businesses and water users to easily **assess and evaluate where water risks lie**.

In the LIFE-MICACC project, the Water Risk Filter was populated with Hungarian data in addition to the global databases, to help local authorities **find the water risks in thecatchment areas of their interest.**

The high-resolution Hungarian databases also show spatial differences, such as the differences between the Transdanubian and the Great Plain regions, which the global map cannot show.

The Water Risk Filter will also help to start a dialogue between municipalities and companies operating in their areas with higher water risks on common environmental challenges and possible adaptation measures on the ground. An online guide to the Water Risk filter has been produced in Hungarian and is available at https://vizkockazat.wwf.hu/.

Making recommendations to the Government

The primary objective, is to create a supportive legal environment for the application of close to-nature solutions through regulatory recommendations, and to expand and develop the powers and tools of local authorities in the field of climate change adaptation.

We also aim to contribute to the integration of climate resilience into local strategies. This will support the strengthening of the integrating and coordinating role of municipalities in integrating ecosystem-based climate adaptation measures into natural resource management strategies and spatial planning practices by creating an enabling and supportive environment.

6. Evaluate benefits and impacts

Features and co-benefits of natural water retention solutions:

Small-scale

Typically, it is not a single large investment, but rather a series of smaller, interdependent developments that can work well as a complex system.

Cost-effective

More small interventions cost less, so the cost of these improvements is lower compared to traditional grey infrastructure solutions (depending on the solution, but typically below 50 million HUF).

Close-to-nature solution

Ecological considerations are taken into account from the planning stage onwards, in order to preserve biodiversity and maintain harmony between human and nature. In addition to concrete, construction with natural – even local - materials (e.g. stone, gravel, wood) is common.

Greener environment

A "greener" solution will allow nature to quickly reclaim the affected area, making the flora and fauna even more diverse. Evaporation of a water reservoir e.g. improves the microclimate, nourishes the vegetation, provides a fresh green environment.

Protection for the settlement

In a number of cases, it contributes to the protection of a settlement. For example, a runoff slowing woody dam system for a hilly municipality can provide strong support for local level protection.

Recreational opportunities

With the addition of some elements (e.g. benches, covered tables and seats, pier) the solutions are suitable for relaxation, active recreaction and even sports for local residents and visitors. Such developments also have a community-building effect.

Attractive townscape

In many cases, they can give new meaning and a new useful function to municipal land that was previously disused and neglected. In this way, such an investment can also make a significant contribution to improving the townscape.

Source of pictures: www.iconfinder.com

Based on our experience and the feedback (questionnaires and surveys), we can say that the residents affected, feel and experience the negative effects and problems caused by climate change on their own skin and in their own settlement. They are aware of it, they see and understand the importance of adaptation. They also realized that something needs to be done, and that it can be started at the level of the individual, in their own garden or in the household. At the same time, they recognize and even expect the municipality (the mayor) to show direction and set a good example.

Among other things, the LIFE-MICACC project significantly contributed to shape the attitude of and show direction to the settlement leaders and those working at the municipalities. Most of the majority of residents, local stakeholders know and acknowledge the results of the project, evaluate the local developments and are very proud of the measures implemented.

In general, it can be said that the project had several positive outcomes and impacts on the local society and economy on the pilot sites. The local microclimate has improved everywhere, the flora and fauna have become more colourful, the image of the settlement has improved, and the local community has strengthened. The implemented solutions have greatly contributed to the improvement of knowledge, the shaping of local/regional attitudes, the restoration of the relationship between human and water, and the sustainable management of water in all settlements.

Through the introduction of the pilot water retention solution projects (at trainings, national events in all Hungarian regions, on-site field trips), the project also had a significant impact at the national level. Many interested settlement leaders, water experts, farmers, schoolchildren and children have been able to learn about these developments directly from here and beyond the borders.

In addition, we feel that discussion and common reflection on water retention has also begun at government level, between co-ministries and relevant background institutions. This is also well shown by the fact that water retention is one of the priorities of the Hungarian operational programs for the financial period 2021-2027 (TOP Plus, KEHOP Plus).

The main goal was successfully achieved: more and more people are talking about water retention and adaptation, and local governments are taking it more seriously and even they taking concrete steps to retain water locally.

Work will continue after the project is completed.

Project details:

"Municipalities as integrators and coordinators in adaptation to climate change"

Reference: LIFE16 CCA/HU/000115 | Acronym: LIFE-MICACC

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Ministry of Interior, Municipality of Bátya, Pannon Pro Innovations Ltd., Municipality of Püspökszilágy, Municipality of Rákócziújfalu, Municipality of Ruzsa, Municipality of Tiszatarján, Association of Climate-Friendly Municipalities, General Directorate of Water Management, WWF World Wide Fund for Nature Hungary Foundation

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