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INTEGRATED HEAVY RAIN RISK MANAGEMENT

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Dear readers,

if you would not like to receive the newsletter any longer you can unsubscribe at any time: in that case, please send an e-mail to rainman@iu-info.de. If you are still happy to hear from us, we are looking forward to providing you with news of our project!

Your RAINMAN Team

NEWSFLASH

04/06 –
05/06/2019

6th transnational partner meeting in Wroclaw

The next partner meeting will take place in Wroclaw on 4th and 5th June 2019. The focus will be laid on the further development of the RAINMAN tools and RAINMAN-Toolbox. A major goal is the coordination of the ongoing workflow in the pilot actions and thematic activities to ensure the transferability and practicability of the developed tools and the toolbox itself.



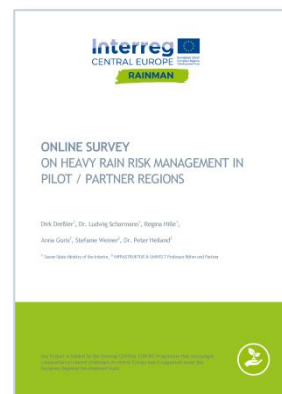
17/04/2019

Results of the Online Survey on Heavy Rain Risk management published

The analysis of the online survey on the subject of heavy rain risk management is now published on the RAINMAN website (see “Publications”) and is available for download on the RAINMAN website ([link](#)).

The online survey was conducted as a basis for the toolbox design to assess experiences with heavy rain events and to define the requirements of the relevant actors for the improvement of heavy rain risk management.

We would like to thank all respondents of the survey for supporting the development of the RAINMAN project by participating in the online survey!



02/04/2019

RAINMAN was presented at workshop of the ICPO

On 2nd and 3rd April, the “International Commission for the Protection of the Oder against Pollution” (ICPO) organized a workshop of its G2 Working Group “Flood”. Representatives from Germany, Czech Republic and Poland attended the meeting. Two RAINMAN project partners, VUV (T. G. Masaryk Water research institute, Czech Republic) and IMGW (Institute of Meteorology and Water Management, Poland), participated in the meeting.

Both project partners distributed information about the project and the pilot activities. During the meeting VUV gave a presentation on the main objectives and intermediate results of the RAINMAN project. The project met with great interest among the water managers. Especially the catalogue of measures, the role of the pilot actions and the toolbox aroused the interest of the participants.



RAINMAN mid-term conference: transnational project exchange to make a difference locally

The RAINMAN project's mid-term conference was held on 20th March 2019 in the beautiful town of Tiszakécske, Hungary. The conference was organized by the Middle Tisza District Water Directorate (MTDWD) and moderated by Melinda Váci and Gábor Harsányi (MTDWD). The host MTDWD organised a memorable event and welcomed not only the RAINMAN partners but also several local high-level political representatives.



© Ötvös Sándor 2018

The conference's main aim was to have an overview about the project implementation, about the main outcomes and results in front of a wider scale of public participants at the level of decision makers and involved interest groups. Stakeholders from various fields of expertise attended the conference, for example water management, public administration and nature conservation.

External experts and RAINMAN partners presented different aspects of heavy rain risk management with the aim to reduce negative impacts of heavy rain events. One focus of the presentations was on Hungarian approaches and experiences that consider areas characterized by low land.

János Tóth, Mayor of Tiszakécske, and Attila Lovas, Director of MTDWD, warmly welcomed the participants to the mid-term conference and invited everyone to enjoy the splendid surroundings. The town of Tiszakécske is very popular for tourists and weekend excursionists. János Tóth emphasized the importance of integrated heavy rain risk management and water management in his welcoming speech. "In the district of Middle Tisza we have to solve the problem of fluvial and pluvial flood and drought as well."



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Ernö Kovács, Government Commissioner of Bács-Kiskun County, and István Láng, Head of General Directorate of Water Management of Hungary, opened the conference and listened with great interest to the presentations of MTDWD's relevant outcomes of the RAIMAN project.



Setting the Scene - relevant outcomes of the RAINMAN project in Hungary

In the first session Hungarian experts, including experts from MTDWD, presented aspects of heavy rain risk management in Hungary and relevant outcomes of the RAINMAN project.

- József Gutman focused in his presentation on the correlation between damages caused by pluvial floods and the quality of spatial planning.
- Csaba Bozán, Director of Research Institute for Irrigation and Water Management, described methods of risk assessment and mapping of pluvial floods in Hungary.
- Mátyás Dén, Technokrats Kft., introduced the smart phone application 'VÍZ24', which will support the organisation of the defence works of municipalities against pluvial floods.

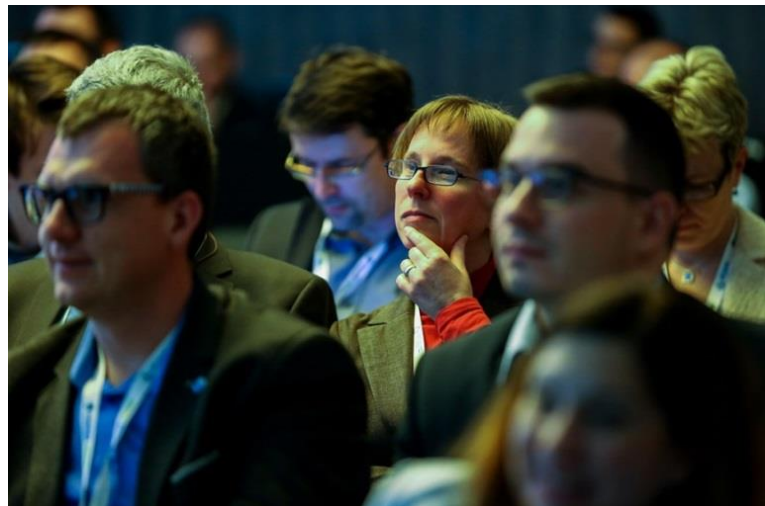


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- Gábor Harsányi, RAINMAN project manager at MTDWD, presented the current status of a concept for retention measures and the optimization of storage management.
- Imre Nagy, RAINMAN project engineer at MTDWD, introduced steps to create a heavy rain risk management plan for Tiszakécske.

Taking action: Ways to reduce risks and possible damages of heavy rain events

In the second session of the mid-term conference RAINMAN partners presented tasks in heavy rain risk management for which RAINMAN develops tools and methods. Despite different legal and organisational background in the different countries, the project aims at a transnational risk reduction approach. Pavel Balvin (VUV) presented a first glimpse into the RAINMAN measures catalogue for prevention and protection of heavy rain risks that is currently being developed. RAINMAN partners from Croatia, Poland, Austria and Germany reported on their experiences in applying non-structural measures and gave insights from the RAINMAN pilot actions.



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Gathering the basis: Ways to assess and map risks of heavy rain

The third session of the conference was introduced by Yvonne Spira, (UBA, Austria) presented the state of practice in heavy rain risk assessment and mapping and RAINMAN's approach to support public authorities in assessing and mapping risks of heavy rain.

This was followed by RAINMAN's 2nd Practitioner Workshop. Interactively, under guidance of the Leibniz Institute of Ecological Urban and Regional Development (Dresden, Germany) in close cooperation with MTDWD (Hungary) and with contributions by INFRASTRUKTUR & UMWELT, the conference participants delved deeper into the topic of how to document and map heavy rain hazards and vulnerabilities. The potentials and limitations of different assessment and mapping methods as well as the needs and demands of potential users in Hungary were considered. More information on the practitioner workshop is included in the article "2nd Practitioner Workshop in Tiszakécske, Hungary" in this newsletter.

Putting solutions into practice

The RAINMAN partnership used the conference also to prompt a broad project exchange of the Interreg CE and DTP projects **FramWat**, **PROLINE-CE** and **JOINTISZA** (please find more information about the projects on page 6).

Synergies between the projects were identified and the benefits to the local stakeholders in Hungary were highlighted. The projects shared their experiences, challenges and solutions for the enhancement of management and planning processes. RAINMAN will integrate this new knowhow into the project's approach to support and guide the local level towards an effective heavy rain risk management.



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"It was a pleasure to be here and to learn about the many project results which are being developed at the moment. I am looking forward to seeing the final outcome implemented here, in my home town..." was the conclusion of a local stakeholder.



Information about the projects

“FramWat aims to strengthen the regional common framework for floods, droughts and pollution mitigation by increasing the buffer capacity of the landscape. It will do so by using the natural (small) water retention measures (N(S)WRM) approach in a systematic way. So far, the majority of water management and flood protection measures lack innovation and follow more traditional approaches without taking into account valuable ecosystem services provided by nature in the landscape settings.”



source and more information: <https://www.interreg-central.eu/Content.Node/FramWat.html>

“PROLINE-CE is going to improve the protection of drinking water resources as well as protection measures against floods and droughts in an integrated land use management approach. PROLINE-CE will encompass efficient implementation of innovative best practices of land use and water protection in pilot actions.”



Source and more information: <https://www.interreg-central.eu/Content.Node/PROLINE-CE.html>

“The JOINTISZA project will enhance the status of waters of the Tisza River Basin. It will focus on the interactions of two key aspects of water management – river basin management (RBM) and flood protection – while taking into account the relevant stakeholders who play a pivotal role in the Tisza RBM planning process. The main aim of the project is to further improve the integration of water management and flood risk prevention planning and actions for the next RBM planning cycle, in line with the relevant EU legislation.”



source and more information: <http://www.interreg-danube.eu/approved-projects/jointisza>

More information:	Middle Tisza District Water Directorate, Hungary Attila Lovas, Gábor Harsányi, Péter Gergő Katona, Melinda Váci tiszaoffice@kotivizig.hu
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Pilot action in Zagreb and Istria

Heavy rain risks are increasing every year, with the number of people affected by such events constantly on the rise as well as material and non-material damages. Also Croatia has been affected by several occurrences of intense rainfall. For example in September 2017, Southern Croatia was hit by heavy rain that caused flooding in the tourist destinations Dubrovnik, Zadar and other locations.

The main purpose of RAINMAN is to improve the capacities for integrated heavy rain risk management in order to reduce these heavy rain risks and losses in the natural and built environment. For doing so, the tools and methods are developed and tested in seven pilot actions with different natural and geographical characteristics.

In the Croatian pilot action RAINMAN partner Hrvatske Vode (Croatian Waters) focuses on parts of the urban area and parts of coastal Croatia. The pilot action covers the City of Zagreb and the region of Istria. The areas show large differences in the amount of precipitation and their natural setting.

The City of Zagreb: description and identification of main problems

Zagreb is the capital of the Republic of Croatia and its largest city in terms of population (census in 2011: 790,017 inhabitants). The city is Croatia's cultural, scientific, economic and administrative center.

The territory of Zagreb has a complex geological composition. The area covers a long and wide alluvial plain along the Sava which is covered by the youngest river alluvia, with gravel, pebbles, sand and mud in the upper layers. In the eastern part, the alluvial Sava plain gradually raises northward, turning into plateaus and into the Medvednica foothill region.

The city of Zagreb is threatened by high waters of the Sava river and by flash floods of Medvednica. Throughout the city's history, streams on the southern Medvednica slopes have relatively frequently affected downstream settlements, causing heavy damages and human casualties.



© Study "Analysis of rainfall in the Zagreb and Istria pilot regions", Faculty of Civil Engineering in Rijeka and Croatian Meteorological and Hydrological Service, 2019



Istria peninsula: description of pilot areas and identification of main problems

In the area of Istria there are significant karstic areas where heavy precipitation amounts have specific characteristics of surface and underground runoff. Umaški potok region has been selected as pilot area.

As the Umaški potok stream drains into the sea, a special characteristic of the pilot area is that it is also threatened by the backwater effect of the sea so the protection against heavy rain risks has also to be looked at in the context of climate change and seawater level rise. In Umaški potok the frequency of high water events is rare but the consequences of floods are usually even stronger.

The devastating impacts of extreme rainfall in Istria became for example visible in 2010 in the Umaški potok, when the heaviest flood so far was recorded. It was the result of the heavy rainfall recorded in the night on 18th-19th September 2010 in the area of the town of Umag with a daily rainfall of approx. 140 mm in the town centre and even more rainfall in upstream parts of the basin (e.g. 210 mm recorded at the Buje station). This rainfall volume couldn't be received either by the Umaški potok or by the town's existing storm water drainage system. During the high water event, the most downstream part of the watercourse was under the backwater effect of the sea. More than 60 housing units as well as a sports hall and the Stella Maris tourist settlement were flooded and several roads were closed. The total flooded area in the immediate town area was 161.42 ha.

Activities in the pilot action

While for river (fluvial) flooding risk maps are available, a "heavy rain risk assessment" or adequate pluvial flood maps do not exist. Therefore, the Croatian Pilot action focuses on the assessment of heavy rain risks, the development of heavy rain risk maps and heavy rain hazard maps as well as the mitigation of heavy rain risks by risk reduction measures.

The following steps are planned in the pilot action:

- analysis of trends and probability of occurrence of short-term heavy rain,
- development of maps showing spatial distribution of heavy rain with selected probabilities of occurrence,
- development of flood hazard and flood risk maps for local, short-term heavy rain in torrential basins and urban areas,
- analysis of potentials for risk reduction from flood events caused by heavy short-term rain using retentions, infiltration systems and similar measures,
- improvement of flood forecasting and warning systems.

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Public event in Oderwitz: dealing with heavy rainfall, flooding, soil erosion

(Author: Gérard Hutter*)

On 10th April 2019, representatives of the RAINMAN project and public authorities conducted a workshop “Dealing with heavy rainfall, flooding, and soil erosion” in Oderwitz, Germany. Approximately 60 citizens, especially representatives of the city council, of the state and local administration, of the fire brigades as well as external experts, attended the workshop. The RAINMAN project partner Saxon State Office for Environment, Agriculture and Geology (LfULG), representatives of state authorities and external experts (e.g. civil engineers and a geologist) provided important information on heavy rain risk management during the workshop and actively involved the participants in the discussions.



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Adelheid Engel, the mayor of Oderwitz, opened the workshop. She underlined the importance of a pro-active approach towards dealing with heavy rain, flooding, and soil erosion. Dr. Sabine Scharfe and Florian Kerl (LfULG) introduced the RAINMAN approach for an integrated heavy rain risk management and the aims of the workshop to the participants. They underlined that public authorities cannot provide “absolute safety” with regard to heavy rain risk but need to be prepared to reduce fatalities and damages in case of a heavy rain event that can hit any location with only very short warning time.

Alina Schellig (lower water authority) introduced the manifold measures implemented by the Free State of Saxony and by local authorities. The measures aim on the one hand at repairing the damages from the latest heavy rain events and on the other hand at reducing the risk of pluvial floods.

Dr. Axel Sauer (RAINMAN project partner, Leibniz Institute of Ecological Urban and Regional Development) and Prof. Thomas Naumann (external expert) explained approaches of identifying and assessing high risk areas as well as ways and measures to reduce heavy rain risks as far as possible, for example by structural mitigation measures.



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In the second part of the event the participants were actively involved in intensive discussion rounds. As a result of the discussions the participants agreed on the following important points:

- Research, especially on built structures and materials of buildings, provides fertile ground for tailor-made solutions for heavy rain risk reduction. External experts demonstrated how technical measures could enhance the resilience of typical buildings in Oderwitz and Leutersdorf. Participants showed great interest in this approach and agreed that further demonstration activities with regard to typical local buildings are required. However, participants also agreed that measures for improving built structures are just one important component of an overall integrated approach.
- Participants discussed intensively the possibilities and limits of measures that aim at preparing for heavy rainfall to prevent serious harm on people and properties by emergency response strategies (“Gefahrenabwehr”). Guidance in preparing and using emergency response plans through collective action is required with a special focus on the interpretation of early warning information. The RAINMAN-Toolbox will respond to this need by giving guidance for preparing emergency response plans.
- Land-use changes are a possibility to reduce risks of heavy rain. The discussion focused on issues of agricultural land use. The workshop showed that farmers in Oderwitz and Leutersdorf already consider a wide spectrum of measures of land-use change and that they are willing to apply new ways of heavy rain risk reduction. Participants pointed out that further activities and actors need to be considered (e.g. activities in built-up areas that lead to further soil sealing and, thereby, increase the tendency towards negative consequences of heavy rainfall in river catchments).



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Based on the rich results of workshop discussions, Dr. Sabine Scharfe, LfULG Saxony, concluded that integrated heavy rain risk management requires contributions from a wide spectrum of public, private and intermediate actors. Heavy rain risk management needs to integrate not only technical and professional knowledge, but also the different actors into a co-operative approach.

*This event was accompanied by two members of the PIVO project (<https://bit.ly/2UCdTJY>) from the Leibniz Institute of Ecological Urban and Regional Development. Their summary and feedback with respect to risk communication is greatly acknowledged.

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2nd Practitioner Workshop in Tiszakécske, Hungary

The 2nd RAINMAN Practitioner Workshop was embedded in the RAINMAN mid-term conference in Tiszakécske, Hungary. It was organised by the Leibniz Institute of Ecological Urban and Regional Development (IOER), Germany, in close cooperation with the Middle Tisza Water District, Hungary, and with contributions from INFRASTRUKTUR & UMWELT, Germany.

The main aims of the workshop were

- to show how to document and map heavy rain hazards and vulnerabilities under Hungarian low-land conditions,
- to discuss the potentials and limitations of different assessment and mapping methods, and
- to discuss the needs and demands of potential users in Hungary.

Therefore, the workshop covered different topics regarding the documentation of heavy rainfall events and the compilation of hazard and risk maps.

Axel Sauer (IOER) started the workshop by introducing the current status of the RAINMAN tool “assessment and mapping” and its integration into the RAINMAN-Toolbox. The tool will follow the structure of an analytical framework that provides a comprehensive system to categorise and organise the methods and applications developed by the RAINMAN partners. Demands and needs of the toolbox-users were considered in the framework by conducting an online survey in the pilot regions. The main findings regarding the current status of documenting and mapping heavy rain hazards and risks in Hungary were presented to the participants.

The tool “assessment and mapping” provides a system to organise and compare methods and applications on different complexity levels. The participants learned about different levels of hazard analysis approaches including pros and cons.



Representations of the contents of the three hazard mapping levels: from left to right: Observation with UAVs (level 1), flow pathway analysis (level 2) and hydrodynamic analysis (level 3); © Axel Sauer, IOER

Different approaches to map hazards were exemplary applied and tested for the Hungarian pilot sites. The results were presented and discussed during the workshop (see figure on the right).

The workshop also provided first insight to map designs as well as the challenges of assumptions and uncertainties in the mapping process.



Hazard map based on a hydrodynamic simulation (level 3) for Kunhegyes, Hungary, and comparison with observed (satellite data) flooded areas.

© Axel Sauer, IOER

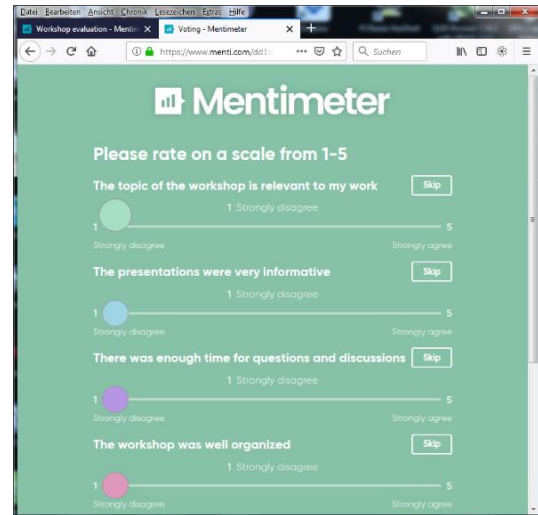


In addition to the presentation-oriented format of the workshop, an interactive component was integrated to give the participants the opportunity to provide anonymous real-time feedback during the workshop. This was realised with an online survey tool (www.mentimeter.com) that could be accessed via smart phone or other devices with internet connection. The real-time survey helped to tailor the workshop to specific expectations of the participants. The following general conclusions can be drawn from the real-time online survey:

- There is a strong need for hazard assessment and maps in the regions of the participants.
- There is limited knowledge about heavy rain risk assessment methods.
- Analysis and mapping is mainly carried out by public authorities.
- The application of process based hydrodynamic and damage models vs. observations and statistic/GIS-based approaches is not very frequent.
- Major needs to carry out hazard and risk analysis are methodological knowledge, Step-by-Step “recipes”, high-resolution terrain data and standards regarding event magnitudes/return periods as well as receptors to assess.
- The collection of event data/observations is seen as very relevant.
- People are the most important receptors followed by private/public buildings and water/electricity infrastructure.
- Most common map scales are between 1:10.000 and 1:1.000.
- Maps should mainly be presented interactively or as digital print layouts.
- Maps should be publicly available.
- Communicating uncertainties is relevant and multiple scenarios/variants as well as methods/tools can help in assessing uncertainties.
- There is no clear opinion on the type/magnitude/return period of the event to be analysed.

In conclusion, the content and organisation of the workshop was evaluated by the participants as good to very good.

The answers of the real-time survey were saved anonymously allowing an additional post-workshop analysis of the responses. A detailed quantitative analysis of the responses will be given in the next newsletter.



Example of the user interface of the online survey tool; © Axel Sauer, IÖER; Mentimeter Web platform

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5th RAINMAN Partner meeting in Tizsakécske, Hungary

After the mid-term conference the RAINMAN team met for a partner meeting in Tizsakécske on the 21st March 2019 to discuss the current workflow and agree on next steps for the toolbox development.

Development of the RAINMAN-Toolbox

One focus of the working group meeting laid on the further development of the RAINMAN tools and RAINMAN-Toolbox. Stefanie Weiner (INFRASTRUKTUR & UMWELT) on behalf of the Saxon State Office for Environment, Agriculture and Geology (LfULG) presented a dummy of the RAINMAN-Toolbox.



The integration of experiences of the pilot actions will have a high priority in the toolbox. The RAINMAN partners agreed to insert these good practice examples including descriptions of lessons learned in the form of factsheets in the toolbox.

Furthermore, the RAINMAN partners highlighted that it would be very valuable to translate parts of the toolbox into the national languages. Furthermore, texts of the toolbox will be kept short and supported by pictures.

Current status of pilot actions and thematic work packages

The RAINMAN partners presented the current status of the ongoing activities in the pilot actions and thematic work packages. Two of the thematic activities are highlighted in the following.

- Dr. Axel Sauer, Leibniz Institute of Ecological Urban and Regional Development, presented the status of the activities for the tool “Assessment and mapping”. The toolbox will contain different methods for assessment and mapping including a qualitative evaluation of the methods. A differentiation between the methods will enable the users to select a method according to their specific needs (for example quick and low-effort methods).
- The current draft of the “Catalogue of measures” was presented by Pavel Balvin, T. G. Masaryk Water Research Institute. All RAINMAN partners provided input to the catalogue. Now the contributions have to be reviewed and evaluated in order to create a holistic catalogue for the RAINMAN-Toolbox.

The partners will continue to coordinate their activities and ensure the transferability and practicality of the developed contents to the toolbox. Further steps for all ongoing activities were agreed on.

Awareness-raising and stakeholder involvement

A focus of the second half of the RAINMAN project is to involve stakeholders more actively in the project and toolbox development process. Therefore, the project partners already started to schedule planned activities in the pilot actions and exchange information about the various activities.



Study Tour

In the afternoon a lovely excursion led by the mayor, went to the oxbow in Tizsakécske and the Tisza River.

The oxbow next to the city has four sections. The RAINMAN partnership visited two of them during the tour. They play a significant role in rainwater drainage. Due to the “Wetland rehabilitation and conservation management along the Middle Tisza” project, the whole area will be rehabilitated. The project includes dredging, creation of a study tour path and a bird gazing tower, improvement of water quality, planting of trees as well as the rehabilitation of flora and fauna. The aim is to create a recreational centre while rehabilitating the whole area.



Within the study tour the RAINMAN team also visited the Tisza river (longest tributary of the Danube river), more precisely the section of the river in Tizsakécske. Hungarian experts presented the Hungarian flood protection system, flood conveyance capacity regarding to the condition of floodplains.



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RAINMAN Key Facts

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newsletter registration: www.interreg-central.eu/rainman



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