

WEBINAR

TAMING THE RAIN: NATURE BASED SOLUTIONS FOR STORMWATER MANAGEMENT

14 November saw the latest edition of the Danube Water Program's popular "KnowNow" webinar series. The Danube Water Program had teamed up with Aqua Publica Europea (APE) to organize a webinar on latest trends in stormwater management, with a strong focus on nature-based solutions.

"Blue-green" Solutions

The introductory presentation on stormwater management came from Dr. Florian Kretschmer, Senior Scientist at the Institute for Sanitary Engineering and Water Pollution Control at BOKU University in Vienna.

Stressing the importance of considering the complete urban water cycle from source via delivery and consumption to wastewater treatment and discharge, Mr. Kretschmer walked the audience through the differences between conventional and innovative storm water management approaches, with the conventional, or "grey" approach increasingly challenged by surface sealing and increasing occurrence of heavy rainfall events leading to sewer overloads that impact the small water cycle and the receiving water.

Innovative "blue-green" solutions work mainly with structures above ground and include vegetation, infiltration into soil, and storage/retention basins to cut discharge peaks and provide hydraulic relief for existing sewer systems that cannot keep up with the pace of the urban development and surface sealing. Their beneficial side effects include heat island mitigation, extended living spaces for flora and fauna, and human recreation. The downside is that such innovative solutions require space that is usually scarce in built environments. Other obstacles for nature-based solutions include a lack of an appropriate institutional framework, regulations and responsibilities – and of course the cost for investments, operation and maintenance.

At this point, Mr. Kretschmer reminded the audience that urban water management is usually a very fragmented affair, involving water supply utilities, wastewater treatment plants, and municipal sewer operators. Introducing innovative stormwater management concepts exacerbates this fragmentation, touching urban planning, urban green space management and a host of others.

The antidotes are integrated thinking, an appropriate institutional framework, and feasible lifecycle concepts for the management of innovative assets. In the face of the revised EU Urban Wastewater Treatment Directive and growing climate change-related challenges for urban stormwater management, Mr. Kretschmer sees no need to reinvent the wheel and states:

“A combination of existing conventional “grey” and innovative “blue-green” nature-based solutions can be the most promising way forward.”

Next, Ms. Cemre Erbil of the Research and Development Branch at the Istanbul Water and Sewerage Administration ISKI, gave a presentation on the Istanbul's Early Flood Warning System, currently in the testing and rollout phase in parts of the city.

Early Flood Warning System

Turkey as a whole and especially the capital Istanbul have a long history of flooding disasters. Between 1950 and 2018, 38 flooding events occurred in Istanbul.

Until recently, ISKI's flood prevention strategies were focused on hard engineering solutions like dams, reservoirs, river straightening, dredging, and flood relief channels. “That is changing now”, stated Ms. Erbil. The new Early Warning System is based on a software solution that combines hydrodynamic modelling, weather forecasts, sensors and video camera input to create a highly accurate flood risk forecast. Istanbul's wastewater and stormwater networks can be simulated in a single environment, including topological and hydraulic flows and regulating structures.

The system is now up and running and set to send out e-mail alerts in case of impending flood events. “It will soon support disaster management from the preparation stage throughout the emergency situation monitoring and the subsequent recovery efforts” states Ms. Erbil.

Rain Gardens

Subsequently, engineering consultant Tatjana Uzelac invited the audience for a walk through the Rain Gardens of Pula, Croatia, a best practice example of nature-based stormwater management. Pula suffers from recurring flooding problems caused by a difficult topography, an outdated sewer infrastructure overwhelmed by rapid urbanization, and faulty spatial planning.

Starting in 2007, the city turned to nature-based solutions, installing rain gardens, infiltration trenches, underground retention facilities and lagoons in critical spots all over the city. While the nature-based approach still has to overcome hurdles, especially a lack of proper regulation and some skepticism on the side of stakeholders, Pula's nature-based solutions turned out to be three to ten times cheaper than grey infrastructure.

“The holistic approach is the only solution”,

states Ms. Uzelac. “Future urban space planning needs to focus on interactive, publicly visible, technically simple and esthetically pleasing ecological infrastructures.”

Teamwork for water safety

The next speaker, Franck Perru of SDEA, has rich experience with overcoming obstacles in nature-based water management projects. French water companies are in a quite unique situation, being in charge of river and flood management, and water services. SDEA, a utility company delivering water for 420, and wastewater treatment für 533 municipalities, is charged with river basin management for 6500 km river kilometers in a mostly rural Eastern French region with almost 1,1 million inhabitants.

Legally obliged to reduce flooding and keep combined sewer overflows under 5%, with the future European standard down to 2%, SDEA faces quite a challenge. To solve this, the company has successfully engaged in teamwork with all stakeholders involved, and especially the regional and local farmers' associations.

His company has not only rerouted rivers, redesigned sewer networks, planted some 60.000 trees, motivated farmers to dedicate parts of their fields as flooding zones, and introduced programs for disconnecting homes and schoolyards from sewer networks. SDEA also engages in educating farmers about flood prevention through modified farming practices like plowless farming. In urban areas, the company routinely coordinates with planning authorities and city councils.

“You have to take into account a great variety of partners, and without those you will not go far”,

comments Mr. Perru, setting the mood for the ensuing Q&A session, moderated by Milo Fiasconaro of Aqua Publica Europea. Unsurprisingly, most of the questions from the audience touched the financial dimension of Nature Based Solutions, ranging from “Who picks up the bill?” to the possibility, and sometimes necessity to financially incentivize stakeholders.

Asked at the close of the webinar if she thinks the current measures will prove sufficient in the face of ongoing climate change, Tatjana Uzelac, while acknowledging the merits of latest prediction and simulation software, still quotes a German landscape architect: “Please use your common sense.”

Further information, including the presentations and recording of the webinar, can be found on our [website](#)!