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Practicing Environmental Protection "with Head, Heart and Hands"

2018 German Environmental Prize: Individual Recognition of Interdisciplinary Wastewater Expert Team from Leipzig

Leipzig. "In regions with little water, wastewater usually pollutes already scarce drinking water resources and makes people ill. In Jordan, water protection is a matter of survival. With their conviction that effective water protection is achieved through decentralized wastewater treatment, this interdisciplinary team of experts has developed innovative system solutions in a difficult political environment, has made them consensual, and put them into practice: Environmental protection with head, heart and hands!" - With these words Alexander Bonde, Secretary General of the German Federal Environmental Foundation (Deutsche Bundesstiftung Umwelt, DBU), recognized today the presentation of the 2018 German Environmental Award to the Leipzig team of experts Prof. Dr. Roland A. Müller (55), Dr. Manfred van Afferden (57), Dr. Mi-Yong Lee (47) – all of the Helmholtz Center for Environmental Research, Department "Environmental and Biotechnology Center" – and Wolf-Michael Hirschfeld (70), initiator of the Education and Demonstration Center for Decentralized Wastewater Treatment (BDZ). German President Frank-Walter Steinmeier will present the award on 28 October in Erfurt. Prize money to be awarded to the team: EUR 250,000.

Two billion people worldwide use polluted water

According to Bonde, at least two billion people worldwide use drinking water contaminated with feces. Bonde: "It is intolerable to know that more than 1,500 children under the age of five die every day as a result of contaminated water." In addition to poverty, the lack of economic prospects, a lack of political participation, and difficult living conditions including the lack of water play decisive roles as central causes of flight.

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Key problems: Knowledge gaps and uncertainties among decision-makers

At present, only 20 percent of the world's wastewater is being properly treated. The United Nations Sustainable Development Goals, including ensuring the availability and sustainable management of water and sanitation for all by 2030, will become increasingly distant unless decisive countermeasures are taken, Bonde said: In Jordan – one of the three countries most affected by water scarcity worldwide and a country whose population has increased by almost 70 percent from 5.6 million (2006) to 9.5 million (2016), not least due to the influx of refugees from Syria -- 45 million cubic meters of wastewater flow directly into groundwater and pollute it every year in rural areas alone. Canal networks, such as those customary in Germany, exist in Jordan only in the larger cities. Even when the disadvantages of long sewer networks in urban peripheral areas and in rural areas, which include high investment, susceptibility to failure, and a lack of adaptability to settlement dynamics, are known: internationally, it is still the case that hardly any decentralized alternatives are finding access to the market, Bonde stated. This is often due to knowledge gaps and uncertainties among decision-makers and end users.

"Pioneering" for better livelihoods for local people

This is where the Leipzig team started with innovative ideas: "The winning team has done great pioneering work in developing and advancing sustainable wastewater treatment – first in Germany and later in the Middle East," according to the words of praise from the Secretary General of the DBU. With their solution of decentralized wastewater systems, which can be flexibly adapted and can supplement existing central systems, the wastewater is treated locally at the point of origin and can be used directly for irrigating agricultural land, he continued; this significantly reduces the consumption of fresh water and the introduction of pollutants and germs into groundwater. The linking of old and new structures and the creation of a functioning, manageable, low-maintenance, cost- and energy-saving wastewater sector is a crucial "groundbreaking step for improving the livelihoods of local people and their children and grandchildren," Bonde went on to say.

"Helping people to help themselves" as the key to success

As a "neutral advocate for water resources protection", the team was said to have recognized early on that "helping people to help themselves" is the key to success. The team has developed a holistic approach beyond disciplinary boundaries and in open dialogue with the key actors, and has given equal consideration to technologies, planning and decision-making tools, and institutional framework conditions as well as training and further education. For example, the boundaries between the natural, engineering, and social sciences, but above all between research and practice, have been overcome, Bonde asserted. The opening of the research and demonstration center in Fuheis, Jordan, is considered to have been one of

the first building blocks; eleven different decentralized wastewater treatment processes with real wastewater were operated, further developed and adapted to Jordanian requirements. The facilities have served as a platform for direct exchange between interested citizens of all ages, local and regional decision-makers, students and scientists in Jordan, according to the DBU. In addition, a special series of classes for primary schools was offered, reaching almost 5,000 children.

As local contact persons, enabled to initiate a paradigm shift

In order to ensure the presence in Jordan necessary for the acceptance of the technologies, the team has set up an implementation office in the Ministry of Water, said Bonde, moderating working group meetings onsite, providing technical support to decision-makers, and contributing to the solution of the structural water management problem in feedback with the experts at home. "The political framework for decentralized wastewater management, in which the German team played an active role and which was decided by the Jordanian cabinet, was a great success," Bonde continued. To help local decision makers choose the right wastewater management system, the team developed a practical planning tool that takes geographical, technical and socio-economic data into account and helps to avoid flawed planning and investment risks, he went on.

"Jordan Model": Engine for the Middle East?

The political anchoring and long-term realignment of Jordan's wastewater sector offers a realistic prospect for achieving the Jordanian Ministry of Water's goal of increasing the annual volume of treated wastewater from the current 140 million to 235 million cubic meters by 2025, and of reaching a connection rate of around 80 percent, according to the Secretary General – a perspective that has aroused noticeable interest in the Middle East as a whole. Already during the Jordan project, cooperation with the Sultanate of Oman has been established in order to introduce the German-Jordanian concept there as well. This could, said Bonde, "open up new markets internationally as an additional collateral benefit for German manufacturers".

Effective, flexible combined solutions for rural and urban populations

In any case, the new decentralized wastewater sector in Jordan marks "a paradigm shift away from exclusively centralized systems connected to long sewer networks and towards effective, flexible combination solutions for rural and urban populations," said Bonde. The team developed a holistic process "and was active at all levels: interdisciplinary in science, consulting in business, mediating in politics, informative in society and hands-on in practical implementation" – unfortunately, this represents "a stroke of luck which is all too rare in German research."

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