INTERSESSIONAL PANEL OF THE UNITED NATIONS COMMISSION ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)

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Contribution by Hungary

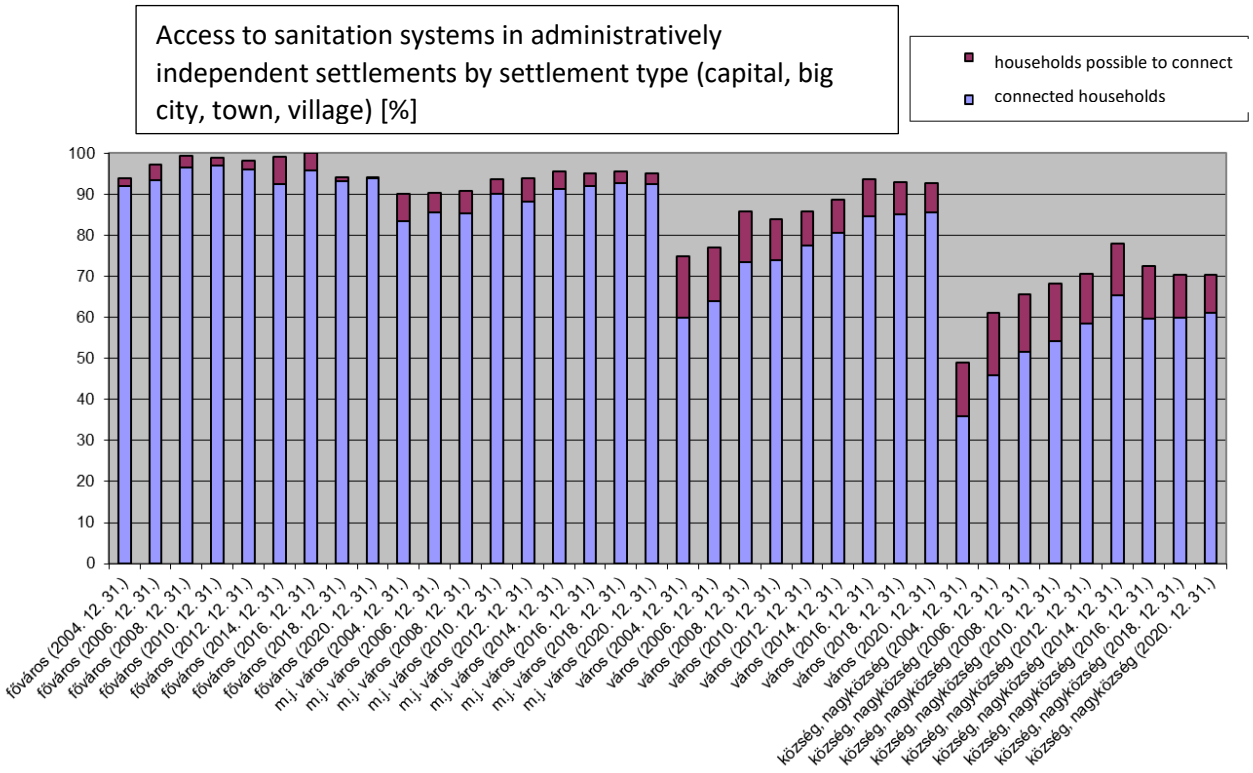
to the CSTD 2022-2023 priority theme on "Ensuring safe water and sanitation for all: a solution by science, technology and innovation"

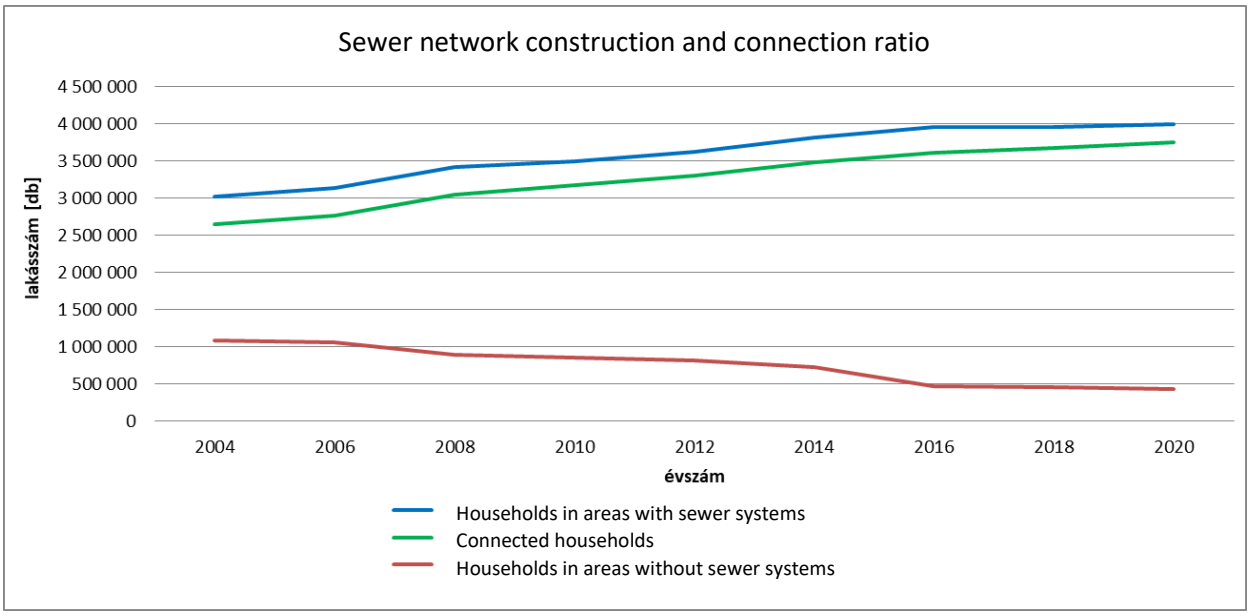
1. **What are the concrete challenges that your country has encountered in managing water and sanitation and providing access for all to these services?**

The most significant issues originate from financial problems of the state authorities responsible for inspecting environmental impacts and the utility companies commissioned for drinking water supply and wastewater treatment.

Rapid growth in the population without adequate development of urban infrastructure is a consequence of mistaken urban planning leading to capacity problems. Utility companies cannot maintain their systems properly, nor increase capacity.

In case of sanitation, access to the services reached a plateau in the last years. While EU funds made it possible to grow the length of the wastewater collection network, access to sanitation services still falls behind. More effective official control and collection of penalties would be necessary to make a bigger percentage of citizens connect to the already built systems instead of sticking to their formerly used questionably working individual wastewater management solutions.





2. **What projects/policies has your country implemented to use the above-mentioned range of technologies and innovations or other STI, including frontier technologies (e.g., AI and drones) to address these challenges? What are the main outcomes? What are the main difficulties confronted while trying to implement these projects/policies? Pls. include the gender dimension.**

   A lack of resources can motivate utility companies to discover and implement new and efficient technologies and solutions.

   Energy efficiency is of paramount interest for the utilities as energy prices are growing. Bigger wastewater treatment plants step toward biogas production from sewage sludge.

   The gender dimension is rarely investigated in the water sector.

3. **Can your country provide examples of policies/projects/initiatives aimed at strengthening national STI capabilities in managing water and sanitation for ensuring their access by all population in your country? One example is what institutional and regulatory arrangements are in place to stimulate R & D and innovation in managing water and sanitation for access by all.**

   a) Water Science and Water Security National Laboratory: One of the Sustainable Development Goals aims to ensure sustainable water management, which calls for interdisciplinary and holistic approaches. The primary goal of the present National Laboratory is, therefore, to substantially broaden the knowledge base on fluvial and lacustrine systems (e.g. River Danube, or Lake Balaton and Lake Neusiedl), considering inherent complexity and interactions in their hydrology, hydrodynamics, morphology, water quality and ecology for a smarter and more secure subsurface, agricultural, rural and urban water management and for more advanced waste water treatment technologies. Cooperation of the most acknowledged Hungarian research institutions in water management, covering all relevant fields, including the above mentioned topics, ensures interdisciplinarity.
   b) Area V. Urban water management and sanitation: We will develop a high-resolution precipitation monitoring system based on 5G for urban environment, a water quality tracing system covering the drinking water supply network, hydrodynamic models to control biological wastewater treatment (WWT) processes, and will further improve selected technological units of WWT plants.
   c) The "Clean Drinking Water: multidisciplinary assessment of secure supply from the source to the consumers" project aims to investigate the fate of emerging pollutants (including

pharmaceuticals and other micropollutants, and antimicrobial resistance) and the microbial communities in the bank filtration based drinking water supply system in Budapest.
The multidisciplinary team is lead by the Ecological Research Centre of the Eötvös Loránd Research Network and the members are Budapest University Technology and Economy, University of Miskolc, National Public Health Centre and Budapest Waterworks.
One year sampling campaign was carried out at the drinking water abstraction sites upstream and downstream from Budapest from the Danube, the wells, different technological points (e.g. chlorination) and points of consumption. The generated data (over 50 thousand measurements) are being used to model future drinking water quality under different hydrological and climate scenarios and to identify potential control points to ensure long-term drinking water safety.
The project is funded by the National Research, Development and Innovation Office under grant No. 2018-1.2.1-NKP-2018-00011. Further information is available on the project home page: https://tisztaivovizprogram.hu/?lang=en

4. Could you share case studies of regional and international cooperation that have helped your country in strengthening STI capacities? Can you provide success stories in this regard?

a) Danube River Region Resilience Exchange Network (DAREnet) :
DAREnet supports flood management practitioners across the EU Danube River region to deepen and broaden their Research, Development, and Innovation (RDI) related collaboration. The project is financed by the EU Horizon2020 program. DAREnet builds a multi-disciplinary community of practitioners, operating in a network of civil protection organizations, and supported by a broad range of stakeholders to foster synergies, innovation, and its uptake. DAREnet presents a regularly updated RDI Roadmap highlighting promising innovation opportunities to cope with the main challenges in the region. It provides concrete perspectives for further development, industrialization, and uptake of innovations of highest relevance for practitioners, and lays the basis for concrete innovation initiatives, practitioner-driven and "bottom-up". DAREnet draws upon synergies with the modules and facilities of the EUCPM and the regional strategies for flood prevention and risk management of the ICPDR and EUSDR.