

University of Ljubljana





Experience and challenges with sustainable wastewater treatment in the Danube region

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Nature-based Wastewater Treatment in Southeastern Europe and Turkey 3 November 2020

GWP vision is for a water-secure world

a diverse, inclusive, multi-stakeholder partnership with 21 years of experience, pioneering and practicing an integrated approach to water resources management (IWRM)

Network + Knowledge => influence **policies**, **practices & investments** for a water secure world

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Global Water Partnership

2020

November

Global Water Partnership Central and Eastern Europe

GWP CEE currently joins 160 partners (NGOs, water utilities, governance, companies, academia, etc.)



OUR MISSION

Global Water Partnership Central and Eastern Europe

To advance governance and management of water resources for sustainable and equitable development

OUR VALUES

Inclusiveness	Openness			
Transparency	Accountability			
✓ Respect	✓Gender sensitivity			
✓ Soli	idarity			

Wastewater treatment in the Danube region





<u>Water and wastewater services in the Danube region,</u> <u>A state of the cector, Regional report 2015</u>

- **55%** (74 million) of the total population in the Danube region is **not connected to wastewater treatment plants**
 - Major differences between the countries: (97% in Austria, 2% in Kosovo)



Wastewater treatment in the Danube River Baisn

- According to the UWWD, the focus of wastewater treatment has been on aggromerations above 2000 PE
 - Significant wastewater load
 - Remaining gaps

Source: https://www.icpdr.org/main/publications/danube-watch-3-2017-wastewater-treatment-overview

- Settlements < 2000 PE
 - Approximately 40% of population (55 million people)

WW treatment: cross-section between CEE and the Danube region

GWP CEE study on the status on NBS for wastewater treatment, 2011: Lack of sanitation in small settlements

- In CEE 30% of population lives in settlements with less than 2000 inhabitants
- 9% of these are so far connected to WWTP (GWP, 2011)

Pollution of surface and groundwater

\rightarrow Sustainable sanitation task force

Country	Population connected to municipal WWTP (%)	Total number of WWTPs	Small municipal WWTPs (50-2000 PE)	Population in samll settlements (%)	Percentage of small WWTPs
Bulgaria	47.6	89	57	27	64
Czech Republic	78.8	2188	1550	27	71
Hungary	72.5	660	270	17	41
Romania	30.7	427	82	5	19
Slovakia	58.9	607	382	31	63
Slovenia	30	269	190	51	71

Istenič, D., Bodik, I., Bulc T. 2015. Status of decentralized wastewater treatment systems and barriers for implementation of nature-based systems in central and eastern Europe. Enviorn Sci Pollut Res, 22, 12879–12884

Sustainable sanitation Task Force of the GWP CEE

2007-2014	 Book: Sustainable sanitation in small and medium settlements Study: Actual status on natural wastewater treatment <u>Guidebook: Natural technologies of wastewater treatment</u>
2016	 Project: SANDANUBE Sustainable sanitation in small settlements of the Danube Region
2017	 Project: Synthesis centres on innovative wastewater treatment: feasibility studies in the Lower Danube
2018	 COST action: Implementing nature based solutions for creating a resourceful circular city CA17133
2019-2020	 Preparation of new projects and connection with partners outside of CEE region: Decentralised regenerative wastewater and nutrient management in the Danube Region / Enhancing capacity and engagement in supporting and influencing local governments in Armenia to introduce nature based solutions for wastewater treatment (WWT) and reuse of treatment

Synthesis centres on innovative wastewater treatment

feasibility studies in the Lower Danube

JRC SCIENCE FOR POLICY REPORT

Wastewater treatment in the Danube region: opportunities and challenges

SMALL DECENTRALIZED TREATMENT PLANTS in Slovenia

WASTEWATER TREATMENT

IN THE DANUBE REGION:

opportunities and

challenges

Feasibility study 1

A LARGE CENTRALIZED TREATMENT PLANT in Serbia

Feasibility study 2

Available at JRC website

9 November 2020

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- Comparison of different scenarios for collection and treatment of wastewater in small settlements
- Study area: 3 small settlements in the catchment of Kamniška Bistrica, Slovenia

Feasibility study

- Technology
 - High-tech
 - Sequencing batch reactor (SBR)
 - Membrane bioreactor (MBR)
 - Nature based
 - Forced bed aeration treatment wetland
 - French treatment wetland
 - Hybrid treatment wetland
 - Horizontal flow treatment wetland
 - Vertical flow treatment wetland
 - Resource-oriented
 - Algae bioreactor
 - Zero discharge willow system

Feasibility study

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Feasibility study – Results

Decentralized approach enables numerous advantages (economic, social and environmental), **but only if robust technologies are applied** that do not need a lot of maintenance.

- French treatment wetland for agglomerations
- Horizontal flow treatment wetlands for individual settings
- SBR for individual settings where space for HF TW is not available

This needs to be taken into account in decision making

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CHALLANGES FOR IMPLEMENTATION

15 November 2020

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Challanges for implementation

Legislation gap

- Urban WW Directive: WWTP for settlements <2000 PE are not obligatory
- Countries are obliged to meet the goals of WFD (to achieve good water status)
- Different policy approaches in different countries; different financial support

Lack of awareness and knowledge

- Lack of sufficient knowledge on wastewater treatment and reuse; nature based solutions are present but the knowledge about them is still low
- Lack of skilled technology providers
- Different performance efficiencies

Low community engagement

- Public participation and involvement of citizens and stakeholders in slow
- Limited transboundary cooperation

Wastewater not recognized as a resource

Wastewater as a resource

- Opportunities for wastewater reuse in decentralized systems
 - Proximity of agricultural land
 - Source control
- To adjust wastewater treatment level according to the reuse
 - Keeping nutrients in treated water when used in agriculture (fertigation)

Sustainable sanitation Task Force mindset

18 November 2020

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Conclusion

- 1. GWP CEE promotes NBS as robust technologies that can offer integrated water management including water and nutrient reuse, draught protection and flood mitigation
- 2. There is a need to continue activities to raise awareness at "policy level" and attract governmental institutions
- 3. There is a need to bridge the knowledge gap and to support better dialog between scientific community and practitioners/policy level
 - Many good practices already exist in CEE and Danube region which offer good opportunities for knowledge transfer and further dissemination
- 4. GWP CEE multi stakeholder platform; can further support regional activities through our diverse partner network

Thank you for your attention!

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