**EU Integrated Nutrient Management Action Plan**

**Feedback by GWP CEE Sustainable Sanitation Task Force**

*Sustainable sanitation task force is a group of experts from Central and Eastern Europe addressing the lacking and improper wastewater collection and treatment in rural areas of the region. The task force is working in the framework of Global Water Partnership in Central and Eastern Europe since 2011.*

Under the currently valid EU legislation, wastewater collection and treatment in small settlements (<2000 PE) is not clearly regulated. Revision of the Urban Waste Water Directive (91/271/EEC) considers policy changes for remaining pollution, which comes also from small villages and towns and individual collection systems not falling within the scope of the Directive. **The number of small settlements in Central and Eastern Europe is significant**, inhabiting 30% of total population, and inappropriate treatment of wastewater from these settlements causes pollution of surface and groundwaters. the region (Istenič et al., 2021).

Determination of a feasible wastewater collection and treatment system in rural and peri-urban areas is a complex process that should consider not only geographical features, water supply systems, financing, and regulations but also potential for reuse of reclaimed water and coupling with other sectors like agriculture and energy, especially when they are present in local environment and thus providing short circuits. Wastewater reuse is addressing global environmental problems such as (i) water deficitin dry (e.g., Mediterranean) and/or agricultural areas (agriculture uses 70% of fresh water); (ii) nutrient depletion(mineral phosphorous fertilizers are obtained from mineral ores and present unrenewable resource); and high energy needsfor production of nitrogen mineral fertilizers and wastewater treatment.

Simple and robust technologies such as nature-based solutions (NBS) that have low operation and maintenance requirements and costs, are recognised as most suitable for rural areas. In addition, **NBS are important building blocks for resource recovery** (van Hullenbusch et al., 2021) thus their implementation needs to be promoted and the reuse of wastewater treatment products (i.e., water, nutrients, biomass) must be integrated in water and nutrient management in rural areas.

The shift of existing water management toward circularity can be achieved by a variety of approaches and technologies. **Decentralized water reuse systems** can provide reclaimed water close to where wastewater is generated (Masi et al., 2021) and provide a sustainable solution for wastewater collection and treatment as well as water and nutrient reuse. European research and innovation projects show that NBS are one of the most suitable options for this purpose (e.g., HYDROUSA). However, technologies such as treatment wetlands, lagoons, high-rate algae ponds, willow systems, and similar are currently not recognized sufficiently by local authorities, water utilities, and the public and that needs to be changed in the future.

Decentralized wastewater treatment and reuse systems provide reclaimed water in their vicinity, meaning **locations where wastewater is generated and where reclaimed water is reused are close together**, reducing the cost of building new transportation systems to bring reclaimed water from the central treatment plant to the reuse locations. Decentralized systems allow for better **source control** because they are smaller and contain mainly pure domestic wastewater that is not mixed with industrial wastewater. Consequently, the potential for safe reuse of water and nutrients is higher. Furthermore, NBS can be implemented as green infrastructure and their use provides numerous **co-benefits** besides water treatment, such as microclimate mitigation, water retention, carbon sequestration, biodiversity, and wellbeing.

Decentralized solutions can be coupled with **source separation**, making the recovery of nutrients, organics, energy, and water more efficient compared to centralized systems. Domestic wastewater can be separated by collecting greywater, blackwater, and urine. Greywater can be treated with NBS. In domestic wastewater, urine accounts for 80% of the nitrogen, 55% of the phosphorous and 60% of the potassium, but only 1% of the total wastewater volume. Therefore, if urine is separated at the source, the NPK recovery is easier.

***GWP CEE asserts that nature-based solutions should be integrated into nutrient management and that it is paramount that the current inadequate wastewater collection and treatment in rural areas is bind with the lack of water and nutrients in agriculture in the immediate vicinity.***

Cited sources:

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