With 80% of wastewater being released untreated into the environment and 892 million people still practicing open defecation, our communities and environment are at risk. Thus, it is no surprise that clean water and sanitation are prioritized in the UN SDGs. Committed to safeguarding a sustainable future, the SDGs aim to address global challenges by 2030. Linked to social and economic development, wastewater management is a vital component in achieving SDG 6, most notably in developing countries (Target 6A).

Annually, the lives of 361,000 children under the age of 5 are lost due to diarrhea; public health is threatened by poor sanitation and contaminated water. Untreated wastewater increases the risk of the transmission of water-borne diseases such as cholera, dysentery, hepatitis A, and typhoid. In our pursuit of vitality and sustainability, the provision of functioning sanitation systems
not only offsets these consequences, it could also act as a channel to convert our waste into resources – a procedure otherwise known as resource recovery.

The World Health Organization (WHO) reports that three quarters of those practicing open defecation are concentrated in five countries: India, Indonesia, Nigeria, Ethiopia, and Pakistan. While municipal treatment plants are an established, effective solution to waste management, they are costly and often complex, and demand large amounts of energy and trained personnel (Avellán and Gremillion 2018). The prerequisites to support such an infrastructure can be a burden for developing countries.

Adaptable, pragmatic solutions that are cheaper exist, and should be used.

**Hiding in Plain Sight**

A study by the UN University Institute for Integrated Management of Material Fluxes and of Resources (UNU-FLORES) explores how constructed wetlands address these challenges through the Nexus Approach. Constructed wetlands are a prime example of a low-tech, cost-effective solution whose value has yet to be fully realized. As the collecting point for wastewater, this biologically diverse ecosystem unlocks its potential by recycling the waste component into resources. Additionally, the low-cost and low-tech features of constructed wetlands make them highly adaptable to various contexts such as rural and peri-urban areas in both developed and developing countries.

**World Toilet Day** is observed on 19 November, and the UN is committed to implementing sanitation solutions that are embedded in our environment. This year’s theme, centering on Nature-based Solutions (NbS), promotes actions that protect, manage, and restore ecosystems while simultaneously addressing societal challenges. Mending the environmental costs of open defecation and providing ecosystem services such as aesthetic value and biodiversity, wetlands are a leading example of NbS. By installing toilets and subsequent locally suitable sanitation systems, wastewater is treated and can then be repurposed for irrigation, with the remaining nutrients being used as fertilizer (see infographic). With the capacity to provide effluent for irrigation and create biomass, constructed wetlands can, in addition to the ability to offset irrigation needs, provide a sustainable bioenergy source. Securing energy needs through using renewables made of land crops does not go without compromise. Water resources are used to nurture these crops, and instead of being used for food, they are used as a substitute for unsustainable fuel sources. This puts both energy and food security at risk. However, the return of energy supplied by wetland biomass has the capacity to provide a part of the energy needed in small communities or neighborhoods. Furthermore, if mixed with household and livestock organic waste, wetland biomass can generate biogas. The result is a rise in the yield of biofuel used for household cooking – an attractive alternative to energy conversion.
It Takes a Village

With the ability to supply energy to communities both large and small, it is necessary to filter wastewater through constructed wetlands. Calling upon community efforts to achieve sustainable water management is hence an ideal approach, particularly in developing countries (Target 6B). Favorably, toilets mitigate the impact of open defecation and support wastewater treatment. Combined, these effects can lead to the increased availability of water, nutrient, and energy resources.

Looking forward, an emphasis on educating people on good sanitation and the collective effort of communities are necessary to implement these measures. The low-tech, cost-effective features of constructed wetlands and their potential for revenue generation are great incentives. We must, hence, continuously advocate to advance constructed wetlands as a sustainable solution that secures food and energy production without compromising our limited resources.

References


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