



water

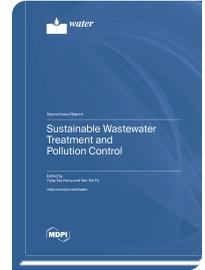


*Special Issue Reprint*

## Sustainable Wastewater Treatment and Pollution Control

[www.mdpi.com/books/reprint/10714](http://www.mdpi.com/books/reprint/10714)

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ISBN 978-3-7258-3427-3 (Hardback)  
ISBN 978-3-7258-3428-0 (PDF)

Wastewater treatment has evolved over the past thirty years, shifting from merely designing systems for discharging into natural water bodies, such as activated sludge and trickling filters, to addressing broader human health concerns such as recycling wastewater, tackling poor waste treatment, and implementing pollution prevention. This reprint, encompassing 13 papers, delves into challenges and innovations in wastewater treatment, sustainability, and contamination management. Research highlights include *E. coli* dynamics in septic tank storage and fecal coliform concerns in effluent-dominated streams, emphasizing public health. Source-separation sanitation concepts offer ecological and economic benefits. Studies reveal microbial community shifts due to aeration and tetracycline, while CO<sub>2</sub> emissions from rainwater and reclaimed water use are examined for carbon-conscious planning. Flocculation advances enhance pollutant removal efficiency, and unconventional technologies target pharmaceuticals such as lidocaine. Innovations extend to biosorbents such as fungal biomass for dye removal, TiO<sub>2</sub>-modified filters, and high-rate anaerobic processes for agro-food wastewater. The synthesis underscores the need for sustainable, tailored wastewater strategies amid rising contamination, addressing economic and efficiency challenges. Each paper prioritizes advancing water quality and reducing environmental impact while ensuring practical applications through interdisciplinary methods.



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