



INTEGRATED ASSESSMENT OF WASTEWATER TREATMENT PLANTS FOR SUSTAINABLE RIVER BASIN MANAGEMENT

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Abstract

Sustainable water management is based onto an integrated approach that considers, among the others aspects, strategic planning, operational practices and infrastructure development, the last one being the most important challenge in this field for Romania because of the severe problems related to the outdated treatment infrastructure. Wastewater treatment plants (WWTPs) represent a critical point in ensuring the sustainable use of water resources, as they directly affect the quality of aquatic environment and from this point of view, there is an urgent need to develop simple and reliable instruments for performance evaluation and prioritization of actions.

This paper presents the assessment of seven WWTPs from Iasi County, Romania by applying an integrated methodology that considers the environmental risk as a function of the environmental impacts and their respective probabilities. This method allows the quantification of environmental impacts and associated risks based on multiple water quality indicators and it allows an in depth analysis of the impacts and risks components, proving thus, a valuable instrument for supporting the analysis and decision making processes within integrated river basin management. In this way, the identification and prioritization of the impact and risk hotspots of wastewater infrastructure in a river basin have been realized. The results have showed that the highest impacts and risks are caused by the rural WWTPs, while the lowest impacts and risks are induced by the urban centers, although they produce the highest outlet effluent flows. Furthermore, the assessment has revealed that the main risks induced by the WWTPs are given by the very high ammonia concentrations in the discharge flows.

The study concludes that unless the efficiency of the WWTPs increases, the risks remain very high and the magnitude of the polluting events may also cause irreversible damages to the receiving water bodies.

Key words: environmental impact assessment, risk assessment, water resources management, wastewater treatment plants

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