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SUSTAINABILITY ASSESSMENT OF THE WASTEWATER TREATMENT PLANT IN THE BALTIC SEA REGION: A CASE STUDY IN LITHUANIA

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Abstract

According to EU Strategy for the Baltic Sea Region Lithuania obligates to ensure sustainable growth, gain and maintain good condition of marine environment till 2020. In accordance with sustainability approach every potential cost and energy cutting as well as social sustainability measure for wastewater treatment should be explored. Nonetheless, Lithuania wastewater treatment plants (WWTP) in the sustainability context have never been evaluated before. A comprehensive set of 30 sustainable development indicators (SDI) (9 functional, 11 environmental, 5 economical and 6 socio-cultural) in connection with functional unit were applied to medium-sized Jurbarkas WWTP (with capacity 2,540 m³/d). Sustainability evaluation involved life cycle of WWTP maintenance phase as well as water inlet, outlet and manufacturing. Results revealed that in the general context of sustainability the stability of plant varied greatly. Nine SDI haven't reached the sustainability approach. Graphically systemized results in the four sustainability categories have shown that relatively highest environmental impact regarding the maximum covered plot is caused due to an economical unsustainability. Operational and maintenance costs per volume of wastewater treated were approximately 2.23 higher than the cost to consumers per one cubic meter of wastewater treated, therefore depreciation, repairs, material costs and wastewater treatment costs accounted to 87 %.

Methodology by using SDI for estimating sustainability of WWTP is adaptable to different capacity or technology of WWTP, comparable, simple to develop and improve. Thus highly advisable and wherefore significant management tool for wastewater treatment processes optimization and improvement.

Key words: sustainable development, sustainability indicators, wastewater treatment plant

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