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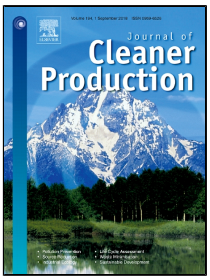

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Eva Gómez-Llanos, Pablo Durán-Barroso, Agustín Matías-Sánchez

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Management effectiveness assessment in wastewater treatment plants through a new water footprint indicator

Eva Gómez-Llanos[1], Pablo Durán-Barroso[1*], Agustín Matías-Sánchez[1]

[1]Department of Construction, School of Technology, University of Extremadura, Avda. de la Universidad s/n, Cáceres, Spain

(Email: egomezl@unex.es; pduranbarroso@unex.es; amatias@unex.es)

Abstract

From ecological and economic perspectives, current demands on freshwater management require the assessment of human water resource activities and urban water cycle impacts. The need to measure and control the quality of water returned to the environment is critical to evaluations of the efficiencies and sustainable management of wastewater treatment plants (WWTPs). This paper proposes a management assessment framework based on blue and grey water footprint (WF) to study the treatment and disposal of wastewater in WWTPs and the efficiencies achieved when purifying water resources. The proposed methodology illustrates the beneficial role of WF for optimizing WWTPs. The value of WF is reduced under current operations with respect to the no-treatment scenario. The new indicator "operational grey water footprint" is proposed to assess the improvement of the effluent quality, which is achieved thanks to the WWTP, regarding to the standards imposed by the regulations. This new indicator allows both stakeholder and authorities to estimate which are the quality margins in the WWTP operational activity. After applying this new procedure and indicators to two WWTPs employing activate sludge as a secondary treatment and with similar population equivalents (PE), the plants' efficiencies are highlighted.

Keywords: Water footprint assessment; Wastewater treatment plants; Water Management; Blue water footprint; Grey water footprint.