

A Review of the Application of Constructed Wetlands as Stormwater Treatment Systems

Nash Jett Reyes*, Franz Kevin Geronimo**, Heidi Guerra***, Minsu Jeon****,
Lee-Hyung Kim*****

Abstract

Stormwater management is an essential component of land-use planning and development. Due to the additional challenges posed by climate change and urbanization, various stormwater management schemes have been developed to limit flood damages and ease water quality concerns. Nature-based solutions (NBS) are increasingly used as cost-effective measures to manage stormwater runoff from various land uses. Specifically, constructed wetlands were already considered as socially acceptable green stormwater infrastructures that are widely used in different countries. There is a large collection of published literature regarding the effectiveness or efficiency of constructed wetlands in treating stormwater runoff; however, metadata analyses using bibliographic information are very limited or seldomly explored. This study was conducted to determine the trends of publication regarding stormwater treatment wetlands using a bibliometric analysis approach. Moreover, the research productivity of various countries, authors, and institutions were also identified in the study.

The Web of Science (WoS) database was utilized to retrieve bibliographic information. The keywords ("constructed wetland*" OR "treatment wetland*" OR "engineered wetland*" OR "artificial wetland*") AND ("stormwater*" or "storm water*") were used to retrieve pertinent information on stormwater treatment wetlands-related publication from 1990 up to 2021. The network map of keyword co-occurrence map was generated through the VOSviewer software and the contingency matrices were obtained using the Cortext platform (www.cortext.net). The results obtained from this inquiry revealed the areas of research that have been adequately explored by past studies. Furthermore, the extensive collection of published scientific literature enabled the identification of existing knowledge gaps in the field of stormwater treatment wetlands.

Keywords : Bibliometric analysis, Constructed wetlands, Nature-based solutions, Stormwater

Acknowledgment

This work was supported by Korea Environment Industry & Technology Institute (KEITI) through Intelligent Management Program for Urban Water Resources Project, funded by Korea Ministry of Environment (MOE) (2019002950003).

* Graduate student, Civil and Environmental Engineering Dept., Kongju National University • E-mail : reyesnashjett@gmail.com

** Post-doctoral researcher, Civil and Environmental Engineering Dept., Kongju National University

*** Post-doctoral researcher, Civil and Environmental Engineering Dept., Kongju National University

**** Post-doctoral researcher, Civil and Environmental Engineering Dept., Kongju National University

***** Professor, Civil and Environmental Engineering Dept., Kongju National University