LEVERAGING AI AND MACHINE LEARNING FOR SUSTAINABLE URBAN WETLAND RESOURCE MANAGEMENT: INSIGHT FROM A WETLAND CONSERVATION LENS

G.R. Diwyanjalee[1]*# and B. K. A. Bellanthudawa[2]
[1]*Southern Provincial Office, Central Environmental Authority, Galle, Sri Lanka*
[2]*Faculty of Agriculture, University of Ruhuna, Matara, Sri Lanka*
*Correspondence E-mail: rashmitha.diwya@gmail.com, Phone: +94770567944
#Presenting Author

Abstract: The critical advancements in sustainable water resource management and associated challenges utilize diverse methodologies, including machine learning and innovative approaches, to address the complex dynamics of water resources. The previous studies of sustainable urban wetland resource management examine various regions and water systems, underlining the significance of informed decision-making, sustainable practices, and advanced mathematical paradigms. Hence, a systematic review of primary research was conducted to provide insight from a wetland conservation lens through leveraging AI and machine learning for sustainable urban wetland resource management. The process of article screening was executed by adopting search keywords such as "Machine Learning", "Responsible Governance", "Sustainability", "Sustainable Technology", "Water Resource Management" and "Wetland Conservation" using the Web of Science database. The peer-reviewed articles published in English from 2018 to 2023 were included in content analysis and thematic analysis. The study's findings revealed the potential of machine learning and data-driven insights in enhancing water resource management. A hybrid model accurately predicts daily flow rates, demonstrating the transformative power of technological innovation. Societal involvement in decision-making reinforces the role of responsible governance in sustainable water management. Innovative "soft sensor" approaches for real-time phosphorus removal monitoring promise significant cost savings in wastewater treatment. It explores the crucial connection between technology and sustainability, highlighting societal actors and innovative governance frameworks. In conclusion, informed decision-making, interdisciplinary collaboration, and responsible governance are vital for addressing water management challenges, paving the way for a more sustainable and water-secure future.

Keywords: Machine learning; Sustainable technology; Water resource management; Wetland conservation