

Sustainable Waste Management in Urban Areas: A Case Study in Ratmalana, Sri Lanka

NACJC Jayasinghe^{1#} and HRWP Gunathilake²

¹Department of Information Technology, Faculty of Computing, General Sir John Kotelawala Defence University, Sri Lanka

²Department of Computer Science, Faculty of Computing, General Sir John Kotelawala Defence University, Sri Lanka

cjayasinghe0728@gmail.com

In Ratmalana, Sri Lanka, urbanization has resulted in a significant rise in trash production, overwhelming the infrastructure currently in place for waste disposal and posing threats to public health and the environment. The goal of the study was to create a mobile application that will improve community involvement, recycling procedures, and trash management efficiency. Using a mixed-methods approach, the study combined quantitative data on garbage creation and recycling rates with qualitative information from stakeholder interviews and literature reviews. Features like scheduling waste collection, real-time mapping of waste bins, instructional materials to promote recycling and appropriate waste disposal were included in the prototype of the mobile application. The findings show that Ratmalana's waste management outcomes were considerably enhanced by the usage of the mobile application. Recycling activities in the community increased, and recycling streams became less contaminated. The study also emphasized how mobile technologies may promote improved environmental practices and raise public awareness. Plans for the future include expanding the mobile application to additional cities, improving its features in response to user input, and carrying out additional studies to investigate long-term sustainability. The study highlights the significance of technology in developing sustainable urban environments, offering insightful information to interested organizations, the general public, and urban planners.

Keywords: *waste management, recycling initiatives, mobile application, sustainable cities, community engagement, urban Waste, environmental sustainability, stakeholder collaboration*