



Informal PET Collection Networks in Mitigating Marine Plastic Leakage: Evidence from Negombo to Wattala in Western Coastal Sri Lanka

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Informal waste collectors play a critical yet under-recognized role in preventing plastic leakage into marine environments, particularly in developing countries where formal waste management systems remain inadequate. Along the Western coastal belt of Sri Lanka, informal collectors actively collect Polyethylene Terephthalate (PET) waste from beaches, households, hotels, restaurants, and coastal commercial areas, thereby reducing the quantity of plastic entering the ocean. The present study quantified the contribution of informal PET collection within the formal buy-back network along the coastal corridor from Wattala to Negombo and examined the operational and demographic factors influencing recovery patterns. A quantitative longitudinal approach was adopted using monthly PET transaction records obtained from a Material Recovery Facility (MRF) located in Negombo within the period from January to December, 2025, supported by collector interviews conducted with 14 informal collectors and secondary demographic data collected from 14 Grama Niladhari (GN) divisions. Pearson correlation was applied to evaluate relationships between PET recovery patterns and demographic variables. Results showed clear seasonal variations in PET recovery, with reduced collection during the Southwest Monsoon period and increased recovery during inter-monsoon months, with the highest monthly collection reaching 2,703 kg per month. Statistical analysis revealed that neither population density nor household income level significantly influenced PET waste recovery within the community. Further, this indicates that recovery efficiency is governed more by operational capacity, collector mobility, group-based collection systems, and coastal commercial activities. The findings further suggest that transboundary marine debris transported by ocean currents may contribute substantially to coastal PET accumulation along the study area. Overall, the study demonstrates the significant environmental service provided by informal collectors within the formal buy-back network in mitigating marine plastic leakage and emphasizes the need for greater institutional recognition and integration of the informal sector into coastal waste management strategies in Sri Lanka.

Keywords: *Informal waste sector, PET recycling, Marine plastic leakage, Wattala–Negombo*