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Assessment of Beach Macroplastic Abundance and Distribution Along Western Province Coastline in Sri Lanka

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Abstract

Marine plastic pollution is global concern, which is arising with the exponential increment of plastic manufacturing. Massive amount of land-based and-ocean based plastic wastes enter to the marine environment, acquiring unmeasurable destruction to both marine ecosystems and human health. Sri Lanka is a small island nation with vastly disturbed coasts. The Western Province coastal belt is particularly vulnerable to macroplastic pollution because of its dense population, high level of urbanization, and industrialization. There are many estuaries situated within this belt with increasing above risk of accumulating many inland plastic debris along coastline. This study aims to understand the beach macroplastic sources and distribution patterns along the Western province coastline; and to study the abundance of those macroplastic pollutants. This will make more convenience during decision making and policy making processes in both regional and national levels. The survey was conducted during a 3-month field campaign (from March 13, 2023 to June 5, 2023) in selected 15 beach areas along Western Province coastline in Sri Lanka. Three cross-belt transects, which were lied 100m distances, use for the assessment each with 1m width. The results show that, highest plastic density was recorded in Wellawatta beach (3.09 items/m²) and second most in Crow-Island beach (2.57 items/m²) of Colombo district. The most abundant plastic category was Poly Propylene (PP) with 48.1% composition and then PS-E (foams) with 19.4%, among all. The least was represented by Polyethylene terephthalate (PET) with 2.3% composition. According to the Clean Coast Index (CCI) Moragalla and Kalido beaches are in moderately dirty category and Seththappaduwa beach is under the dirty category. Other all sites are categorized under the extremely dirty category. Relatively highest amount of household plastic wastes was recorded in Modara beach and relatively highest amount of fisheries/aquaculture wastes was recorded in Preethipura beach. In overall fisheries/aquaculture-based plastics represent considerable portion of 24.8% in amount among all and contribute to significant increment of macroplastic pollution. Based on the findings the importance of raising local awareness and changing people attitudes are emphasized. As single-used plastics are playing crucial role in environmental pollution it is necessary to reduce those items from daily human activities and even banning them within Sri Lanka. Other than that, regulating of plastic usage in fisheries sector and related waste disposal activities is also recommended.

Keywords: Beach macroplastic, Abundance, Marine environment, Plastic distribution