



**ASSESSMENT OF MARINE DEBRIS IN SELECTED COASTAL  
ECOSYSTEMS OF SRI LANKA**

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## ABSTRACT

Marine debris in Sri Lanka is increasing at an alarming causing many detrimental on marine ecosystems. Therefore, it is important to assess the abundance of marine debris and the physical damage that can be caused by debris on sensitive coastal and marine ecosystems such as coastal beaches and mangroves. Consequently, we conducted this study to assess the abundance and density of marine debris (both hazardous and non-hazardous) in selected sites. Kallady, Negombo, Kandakuliya, and Balapitiya areas of Sri Lanka were selected based on the coastal and mangrove areas. Marine debris density was used to explore the extent of beach pollution from marine debris. We found 13 types of marine debris, including sub-types. At each site, fragmented marine debris is more abundant than whole of marine debris. According to the Clean Coast Index (CCI), the Kallady Beach site was classified as the “extremely dirty”, while Kandakuliya Beach site, Negombo and Balapitiya Beach sites were classified as “dirty”. As per the Hazardous Items Index (HII), Kallady beach sites were grouped under the category (V) and the other 7 sites under the grouped category (IV). Further, according to Plastic Abundance Index (PAI) categories, Kallady Beach was grouped as having a “high level of plastic contamination”. In contrast, Negombo Beach, Kandakuliya Beach, and Balapitiya Beach were grouped having “high to moderate levels of plastic contamination”. Balapitiya mangrove site “lower abundance level of plastic contamination”. The assessment indicates significant damage to the mangroves' leaves, roots, stems, branches, and litter accumulation at sites. We evaluate the total density (TD), fragmented density (FD), whole density (WD), and physical damage (PD) of marine debris in various mangrove sites. Pearson's correlation analysis depicts the link between debris density and several forms of vegetation damage, such as leaf, root, stem, and branch damage, as well as litter accumulation. The study underscores the critical need for tailored waste management strategies, especially in coastal areas where pollution levels surpass those in mangrove habitats. Unsustainable fishing and poor waste management have impacted species like *Avicennia marina*, necessitating urgent interventions for its protection. The study suggests that more effective environmental protection should focus on innovative waste strategies, stronger laws, and corporate accountability.

Keywords: Clean cost index (CCI), Hazardous marine debris, Hazardous Items Index (HII), Plastic pollution, Physical damages of mangrove

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