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Beach Cleanliness using the Clean Coast Index at a Recreational Beach: A Case Study of Charty Beach, Northern Sri Lanka

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Abstract

Marine litter is a major environmental concern and has a huge impact on the cleanliness of beaches in Sri Lanka. The Clean Coast Index (CCI) is a tool that monitors marine debris as a beach cleanliness indicator and is used to evaluate the actual cleanliness of the coast. The aim of this first investigation is to assess the quantity of marine debris, determine the cleanliness of the beach using CCI and identify the sources of marine debris using the basic assumption method and the matrix scoring technique. A total of ten surveys were conducted between December 2020 and April 2021. Two transects of sampling were carried out, each with a dimension of 100 m in length and 5 m in width, covering an area of 500 m². The marine litter greater than 2.5 cm in the longest dimension was collected, quantified and classified into eight distinct types. The average marine debris density on the beach was 0.106 items m⁻² and 0.574 gm⁻². Plastic (92%) was found to be the most abundant type of marine debris. The highest CCI recorded (13) was in December 2020, while the lowest (CCI=5) was recorded in March 2021. As the first study of actual beach cleanliness at Charty Beach in northern Sri Lanka, the findings show that the average beach cleanliness was moderate, with a CCI of 9. When the matrix scoring technique and the basic assumption method were used to determine the source of marine debris, both methods showed that recreational activities, smoke-related activities, and fishing activities are the main contributors to beach pollution. Quantifying beach cleanliness is an effective method to attract beachgoers and keep them coming back to bathing beaches. Therefore, continuous monitoring of beach cleanliness is important for environmental conservation and the sustainable development of coastal areas.

Keywords: Basic assumption method, Beach cleanliness, Clean Coast Index, Marine debris, Matrix scoring technique