

A Comparative Study of the Distribution and Abundance of Non-Plastic and Plastic Debris along Clifton Beach of Pakistan

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Plastic waste represents the most significant threat among various forms of marine debris that accumulate along a nation's coastline. Products made from plastic inflict enduring harm on the environment, tourism, and the coastal ecosystem. Commercial enterprises are severely impacted by the pollution stemming from marine litter, particularly non-biodegradable plastic debris in various forms. This research study offers a comparative analysis of the distribution and quantity of plastic versus non-plastic debris along Clifton Beach, located on Karachi's shoreline adjacent to the Arabian Sea. The debris was quantified utilizing the quadrat method. The collection site, Clifton Beach, in the year 2022, involved a total of fifty (50) quadrats, each measuring one square meter, to collect both plastic and non-plastic debris items. Overall, the findings indicated that a substantial amount of debris was identified at Sea View (Clifton) Beach in Karachi, with plastic being the primary contributor due to recreational activities. The most prevalent items included plastic bags, plastic bottles, plastic fishing nets, and cigarette butts. The total weight of the debris collected was 2446.49 grams, of which plastic debris accounted for 1381.79 grams (56.48%), while non-plastic debris comprised 1064.7 grams (43.51%) throughout the study. It is crucial to enforce a ban on all types of waste, particularly plastic, at Clifton Beach (Sea View). All refuse, including plastic bags, plastic bottles, plastic fishing nets, cigarette butts, and food wrappers, should be disposed of in designated trash bins. Efforts should be made to minimize, repurpose, and recycle debris.

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INTRODUCTION

The ocean, which constitutes 70% of the Earth's surface, serves as a significant reservoir of water, food, oxygen, and minerals. Unfortunately, the oceans of today are tainted by pollution resulting from human activities. It is challenging to quantify the extent to which our daily actions disrupt vast marine ecosystems. Various forms of waste and pollutants, including domestic refuse, industrial effluents, and contaminants associated with rainfall, are infiltrating the oceans from multiple sources. Humans are primarily accountable for the majority of these pollutants.

It is a well-established fact that pollution represents a major challenge facing our planet today. There are numerous types of pollution, some of which involve pollutants that are not particularly harmful, as they can be rendered innocuous through degradation and dilution. However, those pollutants that resist degradation by bacteria or are not diluted persist as harmful contaminants in the ocean for thousands of years. Notably, some pollutants, such as plastics, have become valuable to humanity; indeed, our daily lives rely on plastic accessories for 50-60% of our needs.

Currently, there is also growing concern regarding a specific category of pollutants known as plastic pollution. Our seas and oceans are filled with all kinds of litter or debris. The most hazardous debris is plastic present in different forms and sizes. Plastic pollutants are because of not degraded by bacteria that's why plastic when enter into the ocean it persists for over a period of more than 400 years and become the part of ocean in the form of microplastic (Sutkar et al., 2023). Marine debris or plastic harm marine life if it is consumed or even kills if it entangles it.

Plastic has emerged as a significant environmental concern globally over the past twenty years. Scientists, media representatives, and policymakers are increasingly alarmed by the detrimental effects of plastic on the environment. Both terrestrial and aquatic ecosystems, particularly oceans, are grappling with this critical issue. Eastern nations face a more severe plastic pollution problem compared to their Western counterparts (UNEP, 2021). Plastics, in both macro and micro forms, are prevalent in coastal and surface seawater, misleading marine life and birds into mistaking them for food, which leads to their demise. Large plastic bags and various plastic items contribute to the accumulation on the ocean floor.