

Estimating Heavy Metal Leakage and Environmental Damage from Cigarette Butt Disposal in Urban Areas through CBPI Evaluation

Authors : Muhammad Faisal, Zai-Jin You, Muhammad Naeem

Abstract : Concerns about the environment, public health, and the economy are raised by the fact that the world produces around 6 trillion cigarettes annually. Arguably the most pervasive forms of environmental litter, this dangerous trash must be eliminated. The researchers wanted to get an idea of how much pollution is seeping out of cigarette butts in metropolitan areas by studying their distribution and concentration. In order to accomplish this goal, the cigarette butt pollution indicator was applied in 29 different areas. The locations were monitored monthly for a full calendar year. The conditions for conducting the investigation of the venues were the same on both weekends and during the weekdays. By averaging the metal leakage ratio in various climates and the average weight of cigarette butts, we were able to estimate the total amount of heavy metal leakage. The findings revealed that the annual average value of the index for the areas that were investigated ranged from 1.38 to 10.4. According to these numbers, just 27.5% of the areas had a low pollution rating, while 43.5% had a major pollution status or worse. Weekends witnessed the largest fall (31% on average) in all locations' indices, while spring and summer saw the largest increase (26% on average) compared to autumn and winter. It was calculated that the average amount of heavy metals such as Cr, Cu, Cd, Zn, and Pb that seep into the environment from discarded cigarette butts in commercial, residential, and park areas, respectively, is 0.25 $\mu\text{g}/\text{m}^2$, 0.078 $\mu\text{g}/\text{m}^2$, and 0.18 $\mu\text{g}/\text{m}^2$. Butt from cigarettes is one of the most prevalent forms of litter in the area that was examined. This litter is the origin of a wide variety of contaminants, including heavy metals. This toxic garbage poses a significant risk to the city.

Keywords : heavy metal, hazardous waste, waste management, litter

Conference Title : ICEBESE 2024 : International Conference on Environmental, Biological, Ecological Sciences and Engineering

Conference Location : Tokyo, Japan

Conference Dates : January 11-12, 2024