World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:17, No:01, 2023

Health Risk Assessment and Source Apportionment of Elemental Particulate Contents from a South Asian Future Megacity

Authors : Afifa Aslam, Muhammad Ibrahim, Abid Mahmood, Muhammad Usman Alvi, Fariha Jabeen, Umara Tabassum

Abstract : Many factors cause air pollution in Pakistan, which poses a significant threat to human health. Diesel fuel and gasoline motor vehicles, as well as industrial companies, pollute the air in Pakistan's cities. The study's goal is to determine the level of air pollution in a Pakistani industrial city and to establish risk levels for the health of the population. We measured the intensity of air pollution by chemical characterization and examination of air samples collected at stationary remark sites. The PM10 levels observed at all sampling sites, including residential, commercial, high-traffic, and industrial areas were well above the limits imposed by Pakistan EPA, the United States EPA, and WHO. We assessed the health risk via chemical factors using a methodology approved for risk assessment. All Igeo index values greater than one were considered moderately contaminated or moderately to severely contaminated. Heavy metals have a substantial risk of acute adverse effects. In Faisalabad, Pakistan, there was an enormously high risk of chronic effects produced by a heavy metal acquaintance. Concerning specified toxic metals, intolerable levels of carcinogenic risks have been determined for the entire population. As a result, in most of the investigated areas of Faisalabad, the indices and hazard quotients for chronic and acute exposure exceeded the permissible level of 1.0. In the current study, re-suspended roadside mineral dust, anthropogenic exhaust emissions from traffic and industry, and industrial dust were identified as major emission sources of elemental particulate contents. Because of the unacceptable levels of risk in the research area, it is strongly suggested that a comprehensive study of the population's health status as a result of air pollution should be conducted for policies to be developed against these risks.

Keywords : elemental composition, particulate pollution, Igeo index, health risk assessment, hazard quotient
Conference Title : ICAPS 2023 : International Conference on Air Pollution and Solutions
Conference Location : Zurich, Switzerland
Conference Dates : January 16-17, 2023