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RESEARCH PAPER

Analyzing soil in Korba district of Chhattisgarh : A study of environmental, physicochemical and heavy metal parameters

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Abstract : Understanding the effects of human activity on the environment and the health hazards connected to contaminants like heavy metals requires the use of soil analysis. The soil of Korba, Chhattisgarh, an area affected by industrial operations such as thermal power plants and coal mining, was the subject of this study. Three distinct locations along the Hasdeo River (SSI-Belakacchar, SSII-Godhi, and SSIII-Surakachhar) provided soil samples for the study. Physical-chemical characteristics and quantities of heavy metals, such as lead (Pb), copper (Cu), manganese (Mn), iron (Fe), and zinc (Zn), were assessed in these samples. The findings revealed that while the concentrations of Zn, Mn, and Fe were within acceptable bounds, the levels of Cu and Pb at certain locations were higher than those recommended by the WHO. Target Hazard Quotient (THQ) investigation showed that while Cu and Pb presented possible health risks, especially the latter, Zn, Mn, and Fe did not represent any major health problems. In order to reduce environmental dangers and guarantee public health safety, this study emphasises the significance of routine soil testing and monitoring in industrial regions.

Key Words : Investigation, Contaminants, Significance

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INTRODUCTION

Soil is a mixture of rock debris and organic materials found on the Earth's surface. It can be defined as the uppermost weathered layer of the Earth, containing living organisms as well as the products of their decay. The formation of soil is influenced by several key factors, including parent material, climate, time, biodiversity, and human activities.[1-2] India, a diverse nation with varying relief patterns, land types, climatic zones, and vegetation, has developed a wide range of soil types. As an agriculturally dominant country, India's farming relies heavily on the extent and quality of its soils, which are shaped by climate, natural vegetation, and underlying rock formations. Soil typically consists of 50–60% minerals, 25–35% water, 5–25% air, and a small percentage of organic matter. Positioned between the atmosphere and