

MAPPING AND ASSESSMENT OF VARIATION IN CONTAMINATION LEVEL AND DISTRIBUTION STATUS OF HEAVY METALS IN SOIL OF REGION THAT HAD UNDERGONE DECADES OF INTENSE MINING

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ABSTRACT

Heavy metal pollution in soil has become concerned environmental problem in KGF. Thus an extensive survey has been conducted to determine and map the concentration and distribution status of heavy metals (Cu, Cr, Ni, Pb, Zn, Fe, As, Mn) in the soil samples collected from KGF. A total of 10 soil samples were collected and analyzed for major heavy metals. The presences of heavy metals which are the indicators of pollution in the soil were analyzed by inductively coupled plasma (ICP). Though many varieties are there to represent the soil contamination, a simple direct method is adopted in showing the distribution pattern of heavy metals in soil. The result obtained from the ICP and its direct distribution pattern showed excess presence of heavy metals which exceeded the tolerance limit given by WHO. All the heavy metals were widely spread and showed their presence in soil is mainly because of mining and mine dumpings at the study site. The single pollution factor index (SPFI) analyzed showed the average SPFI values of all the heavy metals (As, Cu, Ni, Pb, Zn, Mn) except Iron and Chromium were much higher than 1 indicating excess pollution and were in the decreasing order of Arsenic > Copper > Nickel > Lead > Zinc > Manganese > Chromium > Iron. The Nemerow pollution indices of heavy metals (PI_N) also varied significantly for the soils of different Stations. Copper, Nickel, Arsenic, lead and Zinc are majority indicators of heavy pollution level having PI_N values as 225.22, 35.87, 21.31, 8.29, 5.47 respectively followed by Magnesium, Chromium and Iron with Nemerow pollution indices as 1.67, 1.12 and 0.148 showing light pollution and clean level respectively. All the heavy metals in soil except Iron do not remain a safe level for human being consumption.

KEYWORDS: Heavy Metals, Distributions, Kolar Gold Field, Mining