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Authors: [Kumar, Rakesh \(/browse?type=author&value=Kumar%2C+Rakesh\)](/browse?type=author&value=Kumar%2C+Rakesh)

Advisor: [Kumar, R. \(/browse?type=author&value=Kumar%2C+R.\)](/browse?type=author&value=Kumar%2C+R.)

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**Abstract:** Surface and profile samples were collected from different locations and toposequences covering three agro-climatic zones of Jharkhand viz. zone-IV (Baliapur, Jharia & Dhanbad), zone-V (Bagru, Pakharpat, Kisko & Lohardaga) and zone-VI (Moshabani, Jadugonda & Chandil). Total number of surface soil samples were 225 and 9 soil profiles, were examined. Analyses of soil pH, organic carbon and calcium carbonate revealed that content of these metals were maximum in lowland soils followed by midland and upland. Soil pH in zone IV, V and VI ranged from 3.9-6.9, 5.0-6.7 and 4.0-6.6; organic carbon varied from 3.6-10.5 g kg<sup>-1</sup>, 1.09-10.2 g kg<sup>-1</sup> and 3.8-10.4 g kg<sup>-1</sup> whereas CaCO<sub>3</sub> 0.1-1.0%, 0.1-1.0% and 0.2-1.0% respectively. DTPA-extractable cobalt, nickel and lead in zone-IV were trace-2.08 mg kg<sup>-1</sup>, 0.06-2.5 mg kg<sup>-1</sup> and 0.02-4.3 mg kg<sup>-1</sup>; in zone-V trace-1.3 mg kg<sup>-1</sup>, 0.06-2.2 mg kg<sup>-1</sup> and 0.62-2.22 mg kg<sup>-1</sup> whereas in zone-VI trace-3.72 mg kg<sup>-1</sup>, 0.06-4.46 mg kg<sup>-1</sup> and 0.48-2.7 mg kg<sup>-1</sup> respectively. Total content of cobalt, nickel and lead in zone-IV were 72-163 mg kg<sup>-1</sup>, 147-472 mg kg<sup>-1</sup> and 229-547 mg kg<sup>-1</sup>; in zone-V 61-141 mg kg<sup>-1</sup>, 122- 486 mg kg<sup>-1</sup> and 177-711 mg kg<sup>-1</sup> whereas in zone-VI 65-155 mg kg<sup>-1</sup>, 93-630 mg kg<sup>-1</sup> and 173-662 mg kg<sup>-1</sup> respectively. Higher amount of DTPA-extractable and total content of cobalt, nickel and lead was observed in lowland against the different topo-sequences. Profile study showed, soil pH and CaCO<sub>3</sub> increased with increasing soil depth of profiles. On contrary, organic carbon of the soils declined with increasing depth. Higher values of CEC in subsurface horizons commensurate with the amount of clay. Comparatively less amount of DTPA-extractable and total content of cobalt, nickel and lead were observed in lower hprizons. DTPA-extractable cobalt, nickel and lead were highly negative and significant correlation with soil pH while positive and significantly correlated with organic carbon and clay content. A highly positive and significant correlation was found between total content of cobalt, nickel and lead with organic carbon. The study of step wise multiple regression equations showed more impact of soil pH, clay and organic carbon on available of cobalt, nickel and lead than other soil parameters whereas in case of total content, organic matter was important determining factor. Application of lime reduced the availability of cobalt, nickel and lead with increasing incubation periods. Hence, lime would be an effective amendment for the soils containing heavy metals (Co, Ni & Pb) in this region.

**Description:** CHARACTERIZATION AND DISTRIBUTION PATTERN OF HEAVY METALS (Co, Ni & Pb) IN SOILS OF JHARKHAND

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