Heavy metal contamination in soils of a selected mapping unit in dry-zone of Sri Lanka

U.K.P.S. Sanjeevani[1]*, S.P. Indraratne[2], R. Weerasuriya[2], W.A. U. Vitharana[2] and F. Rosemary[1]

[1]*Postgrduate Institute of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka*
[2]*Department of Soil Science, Faculty of Agriculture, University of Peradeniya, Sri Lanka*

Assessing the level of heavy metal pollution in soil is imperative to evaluate the potential risks to human health. This study aimed to assess the level of heavy metal pollution in three land uses of the Madawachchiya, Ranorawa, Elayapattuwa, Hurathgama and Nawagattegama soil association (all soils belongs to Alfisols order) using Geo accumulation Index (*Igeo*) and Pollution Load Index (*PLI*). Soil samples (0-30 cm) were collected from hundred and three geo-referenced locations representing lowland (38), upland (35) and non- agricultural (30) land uses. Samples were digested with 4M HNO_3 and analyzed for total Cu, Pb, Ni, Zn and Cd. Standard reference material (SRM-2586) was used for data validation and quality control. Geo accumulation Index (*Igeo*) and Pollution Load Index (*PLI*) were calculated for different land uses. Satisfactory recoveries were obtained with the SRM-2586 for Cd (87%) and Pb (92%) in 4M acid digestion. Microwave digested SRM sample showed the certified value of 2.7 ± 0.05 mg/kg of Cd and 425.92 ± 39.8 mg/kg of Pb ensuring the validity of the data generated. Concentrations of Cu, Pb, Ni, Zn and Cd were at the range of 1.56-33.51, 2.19-19.22, 1.58-32.17, 6.69-71.32 and 0.13-1.22 mg/Kg respectively. According to the *Igeo* classification, all the soils were classified into uncontaminated class with respect to Cu, Pb, Ni and Zn. *Igeo* index for Cd ranged from moderately to strong (Class 1-Class 4) for lowland and upland while for non-agricultural soils ranging from uncontaminated to moderate (Class 0-Class 3). The *PLI* values also confirmed that majority of the soils were in unpolluted condition in terms of overall heavy metal contamination.

Key words: Dry zone, Geo accumulation index, heavy metal pollution, Pollution Loading Index

*shyamasanjeevani@yahoo.com