

**GEO-AVAILABILITY ASSESSMENT FOR
HARMFUL TRACE ELEMENTS IN SELECTED
AGRICULTURAL SOIL PROFILES FROM DRY
ZONE IN SRI-LANKA**

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Abstract

Sri Lanka's primary form of agriculture is rice production. Several studies during the past aims to investigate total trace metal abundances in the surface paddy soils. However, only a few studies were carried out aiming on human harmful trace elements in agricultural soils in Sri Lanka and none of those focused on the occurrences and mobility of elements in the environment especially along the paddy soil profile.

This study is aimed to investigate geo-accumulation and mobility of harmful trace metals along the paddy soil profiles with respect to different stages of the paddy cultivation, comparative study of such variations in soil profiles with respect to the climatic conditions in wet, intermediate and dry zones and to study bioavailability, Acid Soluble Fraction and Reducible Fraction of trace metals present in the paddy soil profile to evaluate possible impacts of agrochemicals and fertilizers on living organisms, especially to investigate factors affecting chronic health diseases in rural community.

Core samples were collected from a paddy field located in dry zone. Soil samples were extracted using a standard method and stored at 4 °C cooling box until the analyses. Each sample was used to determine acid-soluble, and reducible fraction of trace metals using Atomic Absorption Spectroscopy.

The research revealed that geo-accumulation and mobility of harmful trace elements increase and enriched along the paddy soil profiles, while the cultivation on process. Clay, loamy soil, silt, RBE soil retain high percentage of harmful trace metals while sandy soil is not. Leaching of heavy metals shows a significant enrichment with the A. Also indicate the heavy metal leaching significantly increased in reducible fraction than Acid Soluble Fraction.

With this results, it can be conclude that there is a high potential to contaminate ground water by the heavy metals leached from agrochemicals and fertilizers especially under reducible and acidic conditions. However, due to lack of knowledge farmers use excessive quantities of fertilizers and agrochemicals than recommended quantities by the agricultural department. This increases the leaching of heavy metals to the ground water, severely. In addition there is a risk of contaminating surface water by heavy

metals washed away from the surface of the paddy field under acidic and reducible conditions.

Key Words - Acid-soluble fraction of trace elements, Reducible fraction of trace elements, Trace elements mobility