MEASUREMENT OF FALLOUT CAESIUM-137 AS A TOOL FOR SOIL CONSERVATION IN SRI LANKA

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Caesium-137 is a radioactive isotope found in the environment as a result of nuclear weapons testing programmes. It was first detected on a global scale in 1954(Cambray, 1977). Once the fallout settles down on soil, it becomes strongly fixed on to the clay and organic parts of soil. All the caesium-137 is confined to the top few cm of soil, as a unique label for the soil movement. The soil loss due to sheet erosion can be estimated by measuring Cs-137 in that soil profile (Ritchie and McHenry, 1972). In Sri Lanka Cs-137 measurements have been carried out in five apparently undisturbed soil profiles from Sinharaja Forest, Peradeniya Gardens, Gannoruwa, Gampaha Gardens and Uda Walawe. The Cs-137 level in the Sinharaja Forest was very high compared to other sites, due to high intensity of rain fall (high input of Cs-137) and the thick forest cover protecting the soil from erosion. The Cs-137 content in this profile was highest in the top 2cm and decreased exponentially down to low levels around 20cm. This is typically the behaviour of Cs-137 at an uneroded forest site. The absence of exponential decrease and relatively low levels of Cs-137 in the soil profiles of the other four sites may be due to erosion of a few centimeters of top soil, low rain fall intensity and mixing of soil within top layers by earth worms, termites etc., resulting in dilution of radioactivity. The migration of Cs-137 deeper than 20cm, compared with about 10cm in forest sites from other countries, must be due to differences in physical properties of soils and high intensity of rain fall.

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References:

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