

C
363.7
K 00

PERMANENT REFERENCE
FOR USE IN THE
LIBRARY ONLY

**CADMIUM LEVELS OF PADDY FIELD SOILS AND DRINKING
WATER IN KEBITHIGOLLEWA AREA**

A PROJECT REPORT PRESENTED BY

U.P. KOORAGAMA

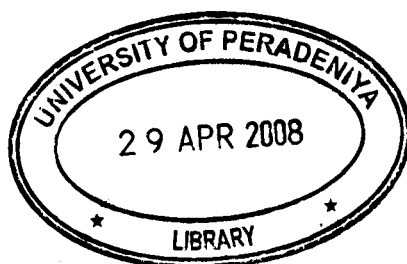
To the Board of Study in Environmental Science of the
POSTGRADUATE INSTITUTE OF SCIENCE

*In partial fulfillment of the requirement
For the award of degree of*

MASTER OF SCIENCE IN ENVIRONMENTAL SCIENCE

Of the

**UNIVERSITY OF PERADENIYA
SRI LANKA
2007**



616273

CADMIUM LEVELS OF PADDY FIELD SOILS AND DRINKING WATER IN KEBITHIGOLLEWA AREA

U.P. Kooragama
Postgraduate Institute of Science
University of Peradeniya
Peradeniya
Sri Lanka

During the past decades environmental quality has been deteriorated world wide, because of industrial activities, increased population and urban growth, increased use of inorganic fertilizer and other agro-chemicals in cultivation and heavy metal contamination. Some heavy metals are essential to maintain the metabolism of the human body but they can lead to poisoning at higher concentrations. Heavy metal poisoning could result from drinking-water contamination, high ambient air concentrations near emission sources, or intake via the food chain. Soil and drinking water pollution by toxic metals is one of the serious problems for the environment. Cadmium derives its toxicological properties from its chemical similarity to zinc as essential micronutrient for plants, animals and humans. Cadmium is biopersistent and, once absorbed by an organism, remains resident for many years (over decades for humans) although it is eventually excreted. In humans, long-term exposure is associated with renal disfunction. High exposure can lead to obstructive lung disease and has been linked to lung cancer, although data concerning the latter are difficult to interpret due to compounding factors. Cadmium can accumulate into soil by weathering minerals in the underlying parent rock, industrial and synthetic fertilizers.

Several deaths from some parts of Anuradhapura and Polonnaruwa districts (over 4000) in the recent past have occurred among villagers who have been suffering from kidney related problems. The actual causes for deaths are inconclusive although various scientific groups are conducting many researches on this matter. This work is mainly concentrated on the study of cadmium levels in paddy soils and water resources at Kabithigollawa area and comparing with the permissible levels of cadmium which is given by the World Health Organization. The total and plant available cadmium levels of soil vary from 0.17-0.37 ppm and 0.04-0.25 ppm respectively, most of which exceed the WHO permissible cadmium level for soil. It can be mainly accumulated in paddy soils with excessive application of triple super phosphate (concentration of Cd is 23.5 ppb). However, cadmium levels of drinking water show less than 5 ppb, which are not exceeded the WHO permissible level. The low mobility of cadmium to the drinking water may have been controlled by the soil pH.

Initial evidence from this study reveals that cadmium levels of soil in Kabithigollewa area are higher than the human tolerable level to some extent. However, it is not exactly known about the accumulation process in human body. Further studies on food chain transportation of cadmium are recommended. Awareness programs on the proper management practices and agro-chemical application to their cultivation for the farmers of the North-central Province are essentially required.