

HEALTH IMPACTS FROM HEAVY METALS IN GROUND WATER AND RICE IN ANURADHAPURA, SRI LANKA.

S.P.M. Kodituwakku¹, S.K. Weragoda², T. Kawakami³ and Y. Serikawa³

¹National Water Supply and Drainage Board, Sri Lanka

²National Water Supply and Drainage Board, Sri Lanka

³Dept. of Environmental Engineering, Faculty of Engineering, Toyama Prefectural University, 5180, Kurokawa, Imizu-city, Toyama 939-0398 Japan

Various impacts from groundwater pollution due to excessive use of chemicals in agricultural lands of Sri Lanka are increasingly discussed at present because of the increasing death rate due to chronic kidney disease (CKD). Over one thousand people have reportedly died and more than 25,000 patients have registered at renal clinics of several government hospitals in dry zone of the island. Even though, water and food are being suspected as the most reasonable causes of CKD, no definitive causes have been identified up to now. Therefore, this study was carried out to recognize any significant correlation between groundwater contamination and CKD in the Anuradhapura district, Sri Lanka. Puttalam District, which is about 100 km west to Anuradhapura, was chosen as the reference as no CKD cases are reported where the same social, environmental and economical factors exist. Among the total samples of drinking water from Anuradhapura district, 37% represents direct CKD victims and no any case reported from Puttalam..

Sampling was carried out early 2011, jointly by Japanese and Sri Lankan researchers. During this study, samples were collected from dug wells, deep wells and surface of prevalence endemic CKD Anuradapura district. All water samples were filtrated by membrane filters of 0.45 μ m pore size to stabilise the water quality before transferring them to the chemical analytical laboratory at Toyama Prefectural University, Japan. ICP-MS method was employed in investigating heavy metal concentration. Further, 10 rice samples were collected from Millewa gramaniadari division (N 08°32'45.6" E 80°16'16.4") in Anuradhapura district and tested for Cd, Pb, As and Cr.

Among the tested water samples, 7% exceeded the WHO standards of NO₃⁻ and 43 % exceeded the F⁻ levels. Further, 88% samples were found as very hard. Among the 08 heavy metals tested, 02 samples were exceeded the WHO standards of 10 μ g/l¹ for As and the maximum concentration was recorded as 15.3 μ g/l¹. In addition, only one sample was found with high concentration of Al and Cu. As the concentration of many heavy metals it is clear that there is a significant impact on human health only due to the excessive presence of F, NO₃ and hardness. On the other hand, consumption of rice has shown no significant impact due to the heavy metals. Increasing trends in As concentration is questionable and hence an extensive study should have to be done. However, no direct correlation was found with As concentration in groundwater and CKD victims. Therefore, research must be directed towards other hypothesis on cause of this issue.

* sajeewakodithuwakku@yahoo.com