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Study of radionuclides in the Hambanthota saltern

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Certain human activities have led to the introduction of radioactive pollutants into the marine environment and have created the need for data with which the real impact of these radionuclides to health and environment can be assessed.

As part of an ongoing marine environment study to develop a reference data base, the present study reports the specific activity of ^{40}K, ^{226}Ra, ^{232}Th and ^{137}Cs in samples of water, soil and salt from reservoir, condensers and crystallisers and commercial salt in the saltern of 'Hambanthota Maha Lewaya" measured by gamma ray spectroscopy using a HPGe detector. Specific activities of ^{40}K, ^{226}Ra and ^{232}Th in water samples ranged from 28 - 407 Bq/L, 1.0 - 1.9 Bq/L and 1.2 - 1.5 Bq/L respectively. In the soil samples, specific activities of ^{40}K, ^{226}Ra, ^{232}Th and ^{137}Cs were found to range from 291 - 656 Bq/kg, 15 - 87 Bq/kg, 19 - 184 Bq/kg and 1 - 6 Bq/kg respectively. Specific activity of ^{40}K and ^{232}Th in the salt samples from crystallisers ranged from 82 to 110 Bq/kg and 4 to 6 Bq/kg respectively. In the two commercial salt samples specific activity of ^{40}K and ^{232}Th was an average of 29 and 4.7 Bq/kg respectively. Activity of ^{226}Ra was below minimum detection level of 2.48 Bq/kg . ^{137}Cs was measured only in the soil samples and ranged form 1.3 – 6.3 Bq/kg.

The present investigation indicated that the water and crude salt in the Hambanthota saltern are not contaminated by the anthropogenic radionuclide ^{137}Cs. The effective dose from ^{40}K and ^{232}Th due to consumption of salt was calculated as 2.51×10^{-2} and 3.96 μSv respectively and is insignificant compared to the effective dose reported by National Council for Radiological Protection, 165 and 62 μSv from the studied radionuclides..

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