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Baseline assessment of radionuclides and heavy metals in groundwater, surface water and soil along with their potential human health risk in the vicinity of Rooppur nuclear power plant, Bangladesh

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The concentrations and distributions of natural and anthropogenic radionuclides and heavy metals in surface water, groundwater, and soil samples of the site of Rooppur Nuclear Power Plant which is being constructed were investigated with the aim of evaluating the environmental radioactivity and radiation hazard and associated health risk assessment. Water and soil samples were collected and analyzed the levels of radionuclides and heavy metals using ICP-MS, Gamma-ray Spectrometry together with AAS. The heavy metal evaluation index (HEI), Nemerow pollution index (NI) were applied to identify how different heavy metals pollute the groundwater in the studied sampling sites. According to USEPA 1999, HQ and HI value for adults through oral exposure pathway in groundwater shows the medium level of chronic risk and in surface water shows a low level of chronic risk. The estimated effective dose, as well as annual effective dose due to intake of different radionuclides, are significantly lower than both the World Health Organization (WHO) and the International Commission on Radiological Protection limits. The concentrations of ^{226}Ra , ^{232}Th , and ^{40}K in soil samples, radium equivalent activity for soil, absorbed dose rates, external hazard (Hex) values were determined. No artificial radioactivity (^{137}Cs) was found in these samples.

Promotional text

One of the objectives of this conference is to identify how scientific developments and cooperation can support national needs and frame policy objectives. Participating in this conference, there is a great chance to share radionuclides from subsurface in Nuclear Power Plant site.

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