

Title: A pioneering study of the radiological mapping in the world's largest mangrove forest (the Sundarbans) and implications for the public and environment

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Abstract : Coastal Mangroves are facing growing threats due to the harmful consequences of human activities. This first-ever detailed study of [natural radioactivity](#) in soil samples collected from seven tourist destinations within the Sundarbans, the world's largest mangrove forest, was conducted using HPGe gamma-ray spectrometry. Although the activity levels of ^{226}Ra (11 ± 1 – 44 ± 4 Bq/kg) and ^{232}Th (13 ± 1 – 68 ± 6 Bq/kg) generally align with global averages, the concentration of ^{40}K (250 ± 20 – 630 ± 55 Bq/kg) was observed to surpass the worldwide average primarily due to factors like [salinity](#) intrusion, [fertilizer application](#), [agricultural runoff](#), which suggests the potential existence of potassium-rich mineral resources near the study sites. The assessment of the hazard parameters indicates that the majority of these parameters are within the recommended limits. The soil samples do not pose a significant radiological risk to the nearby population. The results of this study can establish important radiological baseline data before the Rooppur Nuclear Power Plant begins operating in Bangladesh.

Keywords : Coastal mangroves; Sundarbans; Natural radioactivity; HPGe gamma-ray spectrometry; Radionuclides;

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