

## Assessment of radiological risks in agricultural soil in parts of southwestern Nigeria

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Assessment of activity levels of radionuclides in soils acquired from farmland is significant to food security and human health. Studying the distribution of naturally occurring radionuclides in soils is crucial for providing significant information for epidemiological investigations. This study aimed at evaluating the radiological health hazards associated with farmland soils influenced by anthropogenic activities in parts of Southwestern Nigeria. One hundred (100) composite samples were collected at a depth of 20 cm and analyzed for naturally occurring radionuclides using a sodium iodine detector. Four radiological indices were evaluated based on naturally occurring radionuclide activity concentrations in the soils. The mean activity concentrations (standard deviation) of <sup>40</sup>K, <sup>226</sup>Ra, and <sup>232</sup>Th in the soil samples were 122.17 ± 63.99, 23.96 ± 14.29, and 87.01 ± 29.75, respectively in Itaganmodi (Osun State), 113.53 ± 32.35, 52.81 ± 24.97, and 102.38 ± 20.05 in Sagamu (Ogun State), 487.45 ± 330.61, 58.87 ±, and 118.66 ± 72.40, in Olode (Oyo State), 419.65 ±, 42.84 ± 30.03, and 320.24 ± 49.79, in Igbokoda (Ondo State), 75.36 ± 43.29, 18.68 ± 17.90, and 105.56 ± 24.40, in Epe (Lagos State), respectively. The mean activities concentration of <sup>232</sup>Th in the entire study area exceeded the permissive standard of 45 recommended by [1]. The computed value maximum for radium equivalent is significantly higher in Olode and Igbokoda compared to all study areas. The estimate of the rate of absorbed dosage in the air varies from 13.480 (Epe, Lagos State) to 195.639 (Olode, Oyo State). The estimated mean values of D in 88% of sampling locations exceeded the world average level (66 nGy/h). A significant correlation between radionuclide and radiological risk indices is revealed by the statistical analysis. Monitoring the accumulation of these radionuclides in soil samples is essential, and farming land close to mining operations should be prohibited in order to prevent elevated radionuclides.

### Reference

[1] UNSCEAR (2000) Sources and effects of ionizing radiation. United Nations on Scientific Committee on the Effects of Atomic Radiation. *UNSCEAR 2000 Report to the General Assembly with scientific Annexes*; United Nations: NY,USA