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VIRTUAL EVENT

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ASSESSMENT OF BASELINE RADIONUCLIDES IN SOIL AND FOOD CROP SAMPLES AROUND PHOSPHATE DEPOSIT IN OSHOSUN, OGUN-STATE.

Records of the baseline concentrations of radionuclides in relevant environmental matrices such as soil, water, and food materials are required before the commencement of mining operations. Baseline data serves as a guide for future environmental impact monitoring and assessment. Deposits of phosphate mineral have been found in Oshosun, a town in Ifo Local Government Area of Ogun State, Nigeria. An assessment of the radiological exposures in Oshosun was carried out before the commencement of mining. A total of thirty-one soil samples and fourteen foodstuffs were collected. They were oven-dried at 110 °C to constant weight, pulverized and sieved. Quantities of the samples, soil (250 g) and foodstuffs (150 g) were sealed in cylindrical sample holders and kept for about 28 days to attain a secular equilibrium between ^{226}Ra and its decay products before analysis using gamma-ray spectrometry. The energy and efficiency calibrations were carried out using a certified method by IAEA. The radiation dose rate was calculated from the measured activity concentrations of ^{40}K , ^{226}Ra and ^{232}Th using Residual Radioactivity (RESRAD) model. The mean activity concentrations of ^{40}K , ^{226}Ra and ^{232}Th for soil and foodstuffs were 245.4 ± 6.3 , 146.4 ± 14.7 , 68.9 ± 4.5 and 140.4 ± 11.6 , 47.3 ± 7.6 , 28.4 ± 1.9 Bq/kg respectively. The calculated mean annual effective doses due to external exposure to soil and internal exposure to foodstuffs were 0.14 and 0.45 mSv/y respectively. The mean activity concentrations of naturally occurring radionuclides in the samples were below global averages. These baseline values serve as a new set of data and references for monitoring and assessing radiological exposures after the commencement of mining operations in the area.

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