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Data Article

Dataset on ground radiometric survey in part of the Eastern Dahomey Basin, SW Nigeria

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ABSTRACT

The dataset for this article contains the measured activity concentration of radionuclides and gamma-radiation dose rate obtained from the radiometric survey in Ota, Ado-Odo Local Government Area, Ogun State, Nigeria. The data were manually collected in fifty (50) locations using the Super SPEC RS-125 spectrometer for about three (3) weeks in January, 2017. The descriptive statistical analysis of the data were equally explored for possible statistical relationships. The field dataset is made available publicly for further extended analyses that can provide insights into the safety status of the study area from radiological health concerns. The dataset could also serve as a significant baseline radiometric data for future epidemiology researches and monitoring initiative in Ota and its environs.

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Specifications Table

Subject area	Earth, Environment and Planetary Science
More specific subject area	Environmental Geophysics
Type of data	Tables and Figures

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How data was acquired	Super SPEC RS-125 Spectrometer with large 2.0×2.0 Sodium-Iodide (NAI) Crystal
Data format	Raw, Analyzed
Experimental factors	The radiometric surveys were conducted with RS-125 spectrometer placed 1.0 metre above the soil covered.
Experimental features	Determination of the activity concentrations of the natural radionuclides such as Uranium-238 (^{238}U), Thorium-232 (^{232}Th) and Potassium-40 (^{40}K). Gamma-radiation dose rate were equally determined.
Data source location	Ota, Ado-Odo Local Government Area (L.G.A.), Ogun State, Nigeria, The study area for the data acquisition is bounded by latitude 6°39'–6°41'N and longitude 3°11'–3°13'
Data accessibility	All the data are in this data article

Value of the data

- The dataset could be used to determine the concentration levels of the primordial naturally occurring radionuclides and evaluate the extent of radiation dose exposure within Ota and its environs.
- The dataset could be used to compute several health radiological hazards parameters such as the annual effective dose, radiation indices, excess lifetime cancer risks and annual gonadal dose equivalent. The health implications of these radiation hazards could also be evaluated by comparing them with the worldwide standard threshold limits.
- The ground radiometric survey can be replicated in other neighboring communities such as Sango, Atan, Owode, Idanyi and Igbesa. Also, the survey can be extended to cover the entire Ado-Odo L.G. A. or the entire Ogun state on a regional scale.
- The dataset could be used for educational purposes in applications of radiometric method, environmental radioactivity and pollution studies, and radiation physics. Similar data articles can be found in [1–7].
- Findings can be extended to other radionuclides not considered in this article

1. Data

The dataset contains the measured activity concentrations of naturally occurring radionuclides and gamma-ray dose rate for fifty (50) locations within Ota community, southwestern Nigeria. The radionuclides considered are Uranium-238 (^{238}U), Thorium-232 (^{232}Th) and Potassium-40 (^{40}K) as shown in Table 1 alongside the geographical coordinates of each measurement station point. When the activity concentration levels of these radionuclides and the radiation dose rate are higher than the minimum permissible limits, prolong exposure of the residents can cause severe health crisis such as sterility, atrophy, lung cancer, anaemia, leucopenia and death. Furthermore, the descriptive analyses as presented in Table 2 were carried out to better understand the statistical distribution of the measured data. The correlation analysis was adopted using three different techniques as shown in Table 3 to reveal the presence of any causative relationships among the measured radiological parameters.

2. Experimental design, materials and methods

Radiation is an inevitable component of any natural environment. The agents producing radiation can be found in air, water, soil, sediments, food and in several other materials in the environment. Exposure of human to radiation varies from one geographical location to another due to the complexity of the earth formations and geology. Several radiogenic components analyses in air, water, soil,

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