Abstract

The radiological characteristics of black construction sand from the Longonot volcanic region of Kenya were investigated using a calibrated NaI(Tl) gamma spectrometer. Activity concentrations of ^{232}Th, ^{238}U, and ^{40}K, together with the associated radiological screening parameters, were evaluated in 56 sand samples. The reported mean activity concentrations exceeded the corresponding global UNSCEAR averages. The absorbed dose rate had a mean value of 222.08 ± 6.51 nGy h^{-1}, corresponding to annual effective doses of 0.82 ± 0.02 mSv y^{-1} indoors and 0.55 ± 0.02 mSv y^{-1} outdoors. The mean radium equivalent activity was 481.38 ± 14.32 Bq kg^{-1}, exceeding the conventional reference value of 370 Bq kg^{-1}. The mean external and internal hazard indices exceeded unity, indicating that the material exceeded the conventional screening criterion for further radiological assessment. Further assessment, including radon exhalation and indoor radon measurements, is recommended to characterize the potential exposure pathways associated with the use of the sand in construction.