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NATURAL RADIATION MONITORING IN THE GOLD MINING, URANIUM, AND THORIUM REGIONS OF CAMEROON: FROM MEASUREMENTS, DOSE ASSESSMENT TO RADIATION PROTECTION

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The present paper summarizes the findings of studies carried out in the gold mining, uranium and thorium bearing regions of Cameroon. It also underlines future prospects to strengthen the radiological protection of members of the public exposed to environmental natural radiation in Cameroon. After soil and foodstuff sampling, α- and γ- spectrometry were used to determine activity concentrations of natural radionuclides in these samples. Moreover Electret Ionization Chambers (EPERM) were deployed in the uranium region of Poli and the thorium region of Lolodorf to measure radon in houses. Passive integrated radon–thoron discriminative detectors (RADUET) were used in the high natural radiation areas of Poli and Lolodorf to measure simultaneously indoor radon (222Rn) and thoron (220Rn). 20% of houses in Poli and 50% in Lolodorf have radon concentrations above the reference level of 300 Bq.m-3. 30% of dwellings have thoron concentrations above 300 Bq.m-3 in the high natural radiation areas of the thorium region of Lolodorf. The contribution of indoor thoron to the total inhalation dose in the thorium region of Lolodorf ranges between 15%- 78.5% with the mean value of 47% showing that thoron cannot be neglected when assessing radiation dose. Radioactivity measurements in soil samples collected in the gold mining region of Eastern Cameroon do not prove any environmental pollution by radioactive materials. Thus soil collected from the mining sites can be used as building materials. A comparison of annual excess risk for radon-induced lung cancer with national lung cancer incidence data allows concluding that the local risks are elevated but not necessarily representative of the country as a whole.
The above results highlight the importance to put in place strong regulation in Cameroon in terms of radiation protection to better manage exposure of the public to natural radiation stemming from NORM, radon and thoron. Only if this action is made, members of the public will be protected in case of future uranium and thorium mining activities in Cameroon.

Country or International Organization

Nuclear Technology Section/ Institute of Geological and Mining Research

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