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Assessment of Indoor and Outdoor Background Radiation Levels at School of Technology, Kano State Polytechnic, Kano State-Nigeria

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ABSTRACT: A Survey taken by the world health organization (WHO) and the international commission on radiation protection (ICRP) shows that residents of temperate climate spends only about 20% of their time outdoor and about 80% indoors and certain materials use for the construction of such buildings (rocks, soils, tiles etc) are known to be radioactive, and exposure to such radiation results in critical health challenges. Assessment of indoor and outdoor background ionizing radiation level at School of Technology, Kano State Polytechnic, Nigeria was carried out using a digital radiation meter (Radiation Alert Inspector). A total of 49 areas were surveyed and the results obtained showed that the annual indoor reading were highest at Compounding Lab. (2.368±0.35 mSv/yr) and Old Chemistry Lab. (2.169±0.35 mSv/yr), and lowest at New Biology Lab. (1.219±0.21 mSv/yr) and Press Workshop (1.303±0.35 mSv/yr). For the outdoor areas, SOT ring road was found to have the highest value of 0.557±0.17 mSv/yr, while Zoological Garden has the lowest effective value of 0.280±0.05 mSv/yr. For the lecture venues, Auditorium has the highest indoor annual equivalent dose of 2.060±0.49 mSv/yr, while H-Block ND I Textile Class recorded the lowest values of 1.275±0.27 mSv/yr. Base on the aforementioned findings, it was deduced that radiation levels are within the permissible radiation limit as stipulated by the ICRP and UNSCEAR of 2.4 mSv/yr and thus, SOT Kano is radiologically safe.

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Radiation has been found to be beneficial on one hand and harmful on the other hand and is encountered in everyday activities in various forms and different intensities. Some of the harmful effects are: cancer, cataract, gene mutation destruction of bones and blood cells and it can cause the death of an individual (Ogola *et al*., 2016). Materials used for building (soil and rock) are major sources of radiation exposure to the population and also a means of migration for the transfer of radionuclide into the environment. Radon gas from the earth crust is the most abundant source of natural radiation in the environment. The radioactive disintegration of uranium-238 produces ^{222}Rn which in turn decays with a half-life of 3.82 days (Masok *et al.*, 2015). As it is inhaled, it penetrates into the lungs and the continuous deposition and penetration of such high energy particles through the lungs leads to tissue damage and mutation which leads to incidence of lung cancer (Chad-Umoren *et al.,* 2007).The International Commission on Radiation Protection (ICRP) in 1990 set a worldwide annual equivalent dose rate limit of exposure to ionizing radiation to 1mSv/yr for the protection of human beings and wildlife (ICRP, 1990) while the average effective dose rate limit of 2.4mSv/yr was set by the United Nation Scientific Committee on the Effects of Atomic Radiations (UNSCEAR) for most indoor facilities such as research laboratories, conference halls, lecture venues, offices, etc. (UNSCEAR, 2000). Previous studies have shown that areas with high background radiation are found in Yangjiang, China; Kerele, India; and Ramsar, Iran (Ghiassi-nejad *et al*., 2002); as well as in Asia, maximum outdoor measurement was recorded in Malaysia and the maximum indoor measurement was recorded in Hong Kong and Iran (Gholami *et al*., 2011).In Nigeria, outdoor background ionizing radiation profile has received much attention than indoor background ionizing radiation, even though studies have established the presence of dangerous background ionizing radiation within buildings. Indoor background ionizing radiation investigation is also important, because due to changes in lifestyle people spend more time indoors than outdoors. Surveys taken by the World Health Organization (WHO) and the International Commission on Radiological Protection (ICRP) show that residents of temperate climates spend only about 20% of their time outdoors and 80% indoors (their homes, offices, schools and other buildings) (Chad-Umoren *et al*., 2007). The implication of this statistics is obvious; the probability of exposure to dangerous radiation is higher indoors than outdoors. Studies have been conducted in different parts of Nigeria to measure the natural radiation level in the areas. For instance, Farai IP and Vincent UE (2016), reported that the equivalent dose due to outdoor exposure to radiation in Abeokuta, Nigeria ranged from 0.19 to 1.64 mSv /yr with the mean of 0.45 mSv /yr. Sadiq AA and Agba EH (2012)

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investigates the indoor and outdoor radiation level in keffi Nigeria and reported that Some areas were found to have a relatively higher indoor dose, while others had a higher outdoor dose equivalent rate, but they are in good approximation with the internationally approved annual dose limits for members of the public (1mSv/yr). Tikya EV *et al* (2017) assessed the ambient radiation level at the take-off campus of Federal University Dutsin-Ma, Katsina state, Nigeria using a digital radiation meter, the results obtained showed that, the Old Biology laboratory and Biochemistry laboratory were found to have the highest values of indoor annual equivalent dose, and concluded that the ambient indoor and outdoor radiation levels at the take-off site of FUDMA are within the safety limits. James IU *et al.* (2015) carried out measurement of indoor and outdoor ionizing radiation level at Kwali General Hospital, Abuja Nigeria using a well calibrated Geiger Muller counter, their study revealed that the average annual equivalent dose rate is 0.750± 0.020 mSv/yr and 0.189±0.005 mSv/yr for indoor and outdoor measurements respectively. These results were below the 1 mSv/yr maximum permissible limit for the public set by International Commission on Radiological Protection (ICRP). Therefore, Kwali General Hospital is radiologically safe. Felix BM *et al.* (2015), assess the background ionizing radiations at Biochemistry, Chemistry, Microbiology and physics laboratories of Plateau State University Bokkos using Gamma-scout Radiometer. The purpose of the study was to adjust the meter to detect the alpha, beta and gamma types of radiation in µSv/hr. The mean equivalent dose rate per hour for indoor background radiation for the laboratories was found to be 0.256 µSv/hr while the outdoor was 0.249 µSv/hr. The mean annual equivalent dose rate of the laboratories was computed for indoor and outdoor background radiation level to be 1.54 mSv/yr and 0.44 mSv/yr respectively, and are in a good proportion below the world wide average dose of 2.4 mSv/yr.

The objectives of the present work are to measure the background ionizing radiation, assess the level of Annual Indoor and Outdoor Effective Dose Rates of School of Technology, Kano State Polytechnic, and compare the findings with the documented guidelines on radiation protection and safety.

MATERIALS AND METHODS

The indoor and outdoor background radiations of School of Technology, Kano were surveyed using Digital Radiation Meter (Radiation Inspector Alert) and Geographical Positioning System (GPS) to determine the geographical locations of the areas.

The radiation meter was held one meter above the ground to capture the average exposure level (height) of the human body and oriented vertically upward during the measurement of readings so as to expose the window of the device to incoming radiation.

The effective dose readings were taken in milliRöentgen per hour (mR/hr) directly from the display screen of the radiation meter. The results were then converted to micro-Sievert per hour (µSv/hr) and then finally converted to micro-Sievert per year (µSv/yr).

Forty-nine sample areas (A1..., A49) were selected within the study area. Outdoor background radiation readings were taken in open fields that are away from buildings and Indoor measurements were conducted inside the buildings. To account for errors in the data, ten readings were taken, five indoors and five outdoors in each sample area and the standard deviation of each data was obtained.

UNSCEAR (1988) recommended indoor and outdoor occupancy factors of 0.8 and 0.2 respectively. This occupancy factor is the proportion of the total time during which an individual is exposed to a radiation field. Eight thousand seven hundred and sixty hours per year (8760hr/yr) were used. Equation (i) converts radiation in milliRöentgen per hour to micro – Sievert per hour, equation (ii) converts the indoor equivalent dose from micro – Sievert per hour to milliSievert per year, equation (iii) converts the outdoor equivalent dose from micro – Sievert per hour to milliSievert per year, while equation (iv) is used to find the standard deviation. X is the reading displayed directly from the radiation meter, Y and Z are the converted indoor and outdoor meter's readings to micro-Sievert per hour while IAEDR and OAEDR are the Indoor and Outdoor Annual Effective Dose Rates for different places respectively.

$$X(\mu Sv/hr) = Y(\ mR/hr)\ x\ 10 \quad \text{(i)}$$

$$\text{IAEDR (mSv/yr)} = \text{Y } (\mu\text{Sv/hr}) \times 8760 \text{ (hr/yr)} \times 0.8 \div 1000 \quad \text{(ii)}$$

$$\text{OAEDR (mSv/yr)} = \text{Z}(\mu\text{Sv/hr}) \times 8760 \text{ (hr/yr)} \times 0.2 \div 1000 \quad \text{(iii)}$$

$$S.D = \sqrt{\frac{\Sigma(x - \bar{x})^2}{N}} \quad \text{(iv)}$$

*Study Area***:** School of Technology (also known as SOT) is one of the five units of Kano state Polytechnic. Established in 1975 with the main aim of providing trained manpower and strengthening the socio-economic and political development of Kano state and Nigeria in general. SOT is situated at Matan Fada road in Nasarawa Local Government Area of Kano state. Nasarawa LGA lies on latitude $11^0$58'N and longitude $8^0$33'E. It is among the 8 local government areas (LGAs) that made up Kano metropolis with an Area of 34 km square and a population of 596,669 at the 2006 census (NIPOST, 2009).

Data Analysis: The row data gotten under the method were presented in the tables, processed and analysed here using the established mathematical equations described within the context.

RESULT AND DISCUSSION

A total of forty-nine areas were selected for this study, and none of the areas had ionizing radiation above the recommended annual standard of 2.4 mSv/yr. The results are displayed in the table 1

Table 1: Area Code Key to the Sampled Areas in SOT and their Geographical Coordinates

Area code	Location	Geographical Location
A1	New Biology Lab	N 11^{0}59'28.4'', E008^{0}32'27.2''
A2	Old Biology Lab	N 11^{0}59'26.9'', E008^{0}32'28.2''
A3	New Chemistry Lab	N 11^{0}59'28.5'', E008^{0}32'27.3''
A4	Old Chemistry Lab	N 11^{0}59'28.9'', E008^{0}32'28.6''
A5	New Physics Lab	N 11^{0}59'28.9'', E008^{0}32'26.6''
A6	Old Physics Lab	N 11^{0}59'26.6'', E008^{0}32'27.8''
A7	Computer Science Lab I	N 11^{0}59'28.8'', E008^{0}32'22.2''
A8	Computer Science Lab II	N 11^{0}59'28.8'', E008^{0}32'22.6''
A9	Civil Engineering Soil Lab	N 11^{0}59'30.3'', E008^{0}32'22.3''
A10	Civil Engineering Water Lab	N 11^{0}59'30.7'', E008^{0}32'21.6''
A11	Compounding Lab	N 11^{0}59'26.6'', E008^{0}32'29.4''
A12	Instrumentation Lab	N 11^{0}59'28.8'', E008^{0}32'27.9''
A13	Autotronics Lab	N 11^{0}59'31.7'', E008^{0}32'27.9''
A14	Mechatronics/Autocad Lab	N 11^{0}59'28.3'', E008^{0}32'23.4''
A15	Material Science Lab	N 11^{0}59'28.4'', E008^{0}32'24.4''
A16	Control Engineering Lab	N 11^{0}59'27.3'', E008^{0}32'27.3''
A17	Telecommunication Lab	N 11^{0}59'27.3'', E008^{0}32'27.3''
A18	Power Plant Lab	N 11^{0}59'27.3'', E008^{0}32'24.7''
A19	Metrology Lab	N 11^{0}59'26.7'', E008^{0}32'23.7''
A20	Mechanical Workshop	N 11^{0}59'31.8'', E008^{0}32'23.2''
A21	Computer Maintenance Workshop	N 11^{0}59'30.2'', E008^{0}32'28.6''
A22	Automobile Workshop	N 11^{0}59'27.7'', E008^{0}32'27.9''
A23	Press Workshop	N 11^{0}59'32.3'', E008^{0}32'25.3''
A24	Plate Making Workshop	N 11^{0}59'32.3'', E008^{0}32'25.5''
A25	Prof Hafiz Abubakar Studio Hall I	N 11^{0}59'30.0'', E008^{0}32'23.5''
A26	Prof Hafiz Abubakar Studio Hall II	N 11^{0}59'30.5'', E008^{0}32'23.6''
A27	General Drawing Studio	N 11^{0}59'32.3'', E008^{0}32'27.9''
A28	Ceramics Studio	N 11^{0}59'32.6'', E008^{0}32'27.9''
A29	NDI Fashion Class	N 11^{0}59'27.5'', E008^{0}32'28.7''
A30	NDII Textile Class	N 11^{0}59'29.8'', E008^{0}32'21.9''
A31	Auditorium	N 11^{0}59'27.7'', E008^{0}32'27.7''
A32	H-Block ND II Fashion Class	N 11^{0}59'29.2'', E008^{0}32'25.6''
A33	H-Block ND I Textile Class	N 11^{0}59'28.5'', E008^{0}32'25.9''
A34	H-Block ND I C.E.T Class	N 11^{0}59'27.5'', E008^{0}32'25.8''
A35	Civil 001 Lecture Venue	N 11^{0}59'30.1'', E008^{0}32'22.2''
A36	Civil 002 Lecture Venue	N 11^{0}59'30.4'', E008^{0}32'22.2''
A37	ND Mech. Engineering Class	N 11^{0}59'28.3'', E008^{0}32'23.4''
A38	HND Mech. Engineering Class	N 11^{0}59'28.4'', E008^{0}32'24.4''
A39	HND Electrical Eng. Class	N 11^{0}59'27.3'', E008^{0}32'25.8''
A40	F-Block Classes	N 11^{0}59'24.2'', E008^{0}32'27.3''
A41	G-Block Classes	N 11^{0}59'25.5'', E008^{0}32'25.3''
A42	Shehu Abdulwahab Library	N 11^{0}59'36.4'', E008^{0}32'25.5''
A43	MSSN Mosque	N 11^{0}59'27.4'', E008^{0}32'29.4''
A44	Football Field	N 11^{0}59'28.3'', E008^{0}32'25.1''
A45	Botanical Garden	N 11^{0}59'30.8'', E008^{0}32'24.5''
A46	Zoological Garden	N 11^{0}59'32.9'', E008^{0}32'24.6''
A47	Staff Parking Surface	N 11^{0}59'27.8'', E008^{0}32'29.3''
A48	Students Parking Surface	N 11^{0}59'24.7'', E008^{0}32'28.6''
A49	SOT Ring Road	N 11^{0}59'30.0'', E008^{0}32'28.8''

Table 2 presented the results obtained from the measurement of ambient radiation levels at the different laboratories and workshops of the SOT. The mean annual equivalent rate for indoors varies from 1.219±0.21 mSv/yr at A1 (New Biology lab) to 2.368±0.35 mSv/yr at A11 (Compounding lab) with an average value of 1.726±0.35 mSv/yr as presented in the table. From the results A11 (Compounding Lab) and A4 (Old Chemistry Lab) have the highest value of annual equivalent dose rate of 2.368±0.35 mSv/yr and 2.169±0.35 mSv/yr respectively for all indoor. The higher values obtained are possible due to the following reasons; the rocks used for the foundation of the building were mostly igneous rocks which are believed to be rich in minerals like Zircon, Monazite, Uranite, Potassium, Feldspars and Biotite (Solomon *et al*, 2002; Wentz, 1998), higher activity levels in the radio-nuclides in the building materials (e.g Soils, blocks and tiles) used in the construction of the laboratories (UNSCEAR, 1998), and the presence of radon gas in air within the laboratory (Felix *et al*, 2015). The high values obtained in the computer Labs might be due to the radio-nuclide that are present in the building materials and ionizing radiation emitted by the computers, because some of them are operating at the time we took the readings. The annual equivalent dose rate of 1.990±0.35 mSv/yr obtained at the Instrumentation lab could be due to the same reasons as that of computer labs. A1 (New Biology lab) and A23 (Press Workshop) has the lowest values of 1.219±0.21 mSv/yr and 1.303±0.35 mSv/yr respectively, the low values might be due to the less amount of radio-nuclide as they contain less tiles compared with other areas. The outdoor annual equivalent dose shown in the table 2 varies from 0.332±0.07 mSv/yr to 0.497±0.12 mSv/yr with an average value of 0.419±0.08 mSv/yr. It also shows that A11 (Compounding Lab) has the highest value of equivalent dose rate of 0.497±0.12 mSv/yr, while A18 (Power plant lab) has the lowest value of 0.332±0.07 mSv/yr. The average outdoor equivalent dose 0.419±0.08 mSv/yr is low compared with 2.4 mSv/yr limit set by (ICRP, 1990) for worldwide average dose rate for human beings. Table 3 displayed the results obtained from the measurement of the radiation levels in the Studios and lecture venues of the study area.

Table 2: Indoor and Outdoor Ambient Radiation in (µSv/hr) and (mSv/yr) for Laboratories and Workshops

Area Code	Mean Y(µSv/hr)	Mean Z(µSv/hr)	IAEDR (mSv/yr)	OAEDR (mSv/yr)	R =Y/Z
A1	0.174±0.03	0.218±0.03	1.219±0.21	0.381±0.05	0.79
A2	0.228±0.1	0.236±0.06	1.597±0.70	0.413±0.12	0.96
A3	0.232±0.07	0.246±0.06	1.625±0.49	0.430±0.10	0.94
A4	0.301±0.05	0.268±0.04	2.169±0.35	0.469±0.07	1.12
A5	0.192±0.04	0.230±0.03	1.345±0.33	0.402±0.06	0.83
A6	0.278±0.09	0.254±0.07	1.948±0.63	0.445±0.12	1.09
A7	0.300±0.04	0.280±0.05	2.102±0.31	0.434±0.09	1.07
A8	0.292±0.06	0.218±0.06	2.046±0.43	0.381±0.11	1.33
A9	0.228±0.03	0.248±0.05	1.597±0.24	0.434±0.10	0.91
A10	0.224±0.06	0.254±0.02	1.569±0.43	0.445±0.04	0.88
A11	0.338±0.05	0.284±0.07	2.368±0.35	0.497±0.12	1.19
A12	0.284±0.05	0.268±0.04	1.990±0.35	0.469±0.07	1.05
A13	0.248±0.05	0.224±0.06	1.737±0.35	0.392±0.10	1.10
A14	0.232±0.06	0.264±0.06	1.625±0.42	0.462±0.11	0.87
A15	0.198±0.05	0.254±0.06	1.387±0.35	0.445±0.11	0.77
A16	0.244±0.04	0.224±0.06	1.709±0.28	0.392±0.11	1.08
A17	0.250±0.06	0.212±0.07	1.753±0.42	0.371±0.12	1.17
A18	0.248±0.06	0.190±0.04	1.737±0.42	0.332±0.07	1.30
A19	0.264±0.06	0.210±0.07	1.850±0.42	0.367±0.12	1.25
A20	0.240±0.02	0.264±0.07	1.680±0.14	0.462±0.12	0.90
A21	0.278±0.01	0.270±0.05	1.948±0.07	0.473±0.08	1.02
A22	0.236±0.03	0.228±0.04	1.653±0.21	0.399±0.07	1.03
A23	0.186±0.05	0.210±0.04	1.303±0.35	0.367±0.07	0.88
A24	0.212±0.05	0.236±0.03	1.485±0.35	0.413±0.05	0.89
Mean	0.246±0.05	0.241±0.05	1.726±0.35	0.419±0.08	1.02

Table 3: Indoor and Outdoor Ambient Radiation in (µSv/hr) and (mSv/yr) for Studios and Lecture Venues

Area Code	Mean Y(µSv/hr)	Mean Z(µSv/hr)	IAEDR (mSv/yr)	OAEDR (mSv/yr)	R =Y/Z
A25	0.184±0.06	0.276±0.08	1.288±0.42	0.483±0.14	0.66
A26	0.222±0.04	0.286±0.10	1.555±0.28	0.501±0.18	0.77
A27	0.200±0.04	0.186±0.03	1.401±0.28	0.325±0.05	1.07
A28	0.252±0.02	0.234±0.05	1.766±0.14	0.409±0.08	1.07
A29	0.248±0.04	0.218±0.05	1.737±0.29	0.381±0.05	1.13
A30	0.208±0.06	0.242±0.04	1.457±0.42	0.423±0.08	0.85
A31	0.294±0.07	0.264±0.08	2.060±0.49	0.462±0.14	1.11
A32	0.206±0.02	0.186±0.04	1.443±0.10	0.325±0.07	1.10
A33	0.182±0.03	0.222±0.01	1.275±0.27	0.388±0.02	0.81
A34	0.226±0.05	0.232±0.05	1.583±0.39	0.406±0.09	0.97
A35	0.212±0.05	0.206±0.06	1.485±0.36	0.360±0.11	1.02
A36	0.184±0.04	0.260±0.04	1.289±0.32	0.455±0.07	0.70
A37	0.274±0.04	0.246±0.06	1.920±0.28	0.430±0.11	1.11
A38	0.262±0.03	0.242±0.07	1.836±0.21	0.423±0.12	1.08
A39	0.244±0.04	0.230±0.05	1.709±0.28	0.402±0.08	1.06
A40	0.204±0.03	0.202±0.05	1.429±0.21	0.353±0.08	1.00
A41	0.242±0.06	0.194±0.05	1.695±0.42	0.339±0.08	1.24
A42	0.198±0.03	0.240±0.03	1.380±0.22	0.420±0.06	0.82
A43	0.216±0.03	0.258±0.03	1.513±0.21	0.452±0.05	0.83
Mean	0.224±0.04	0.232±0.05	1.427±0.29	0.446±0.08	0.96

The indoor annual equivalent dose rate varies from 1.275±0.27 mSv/yr to 2.060±0.49 mSv/yr with an average value of 1.427±0.29 mSv/yr. The results show that A31 (Auditorium) and A37 (ND Mechanical Engineering Class) has the highest indoor annual equivalent dose rate of 2.060±0.49 mSv/yr and 1.920±0.28 mSv/yr respectively, while A33 (H-block ND I Textile class) and A25 (Prof. Hafiz Abubakar Studio Hall II) recorded the lowest values of 1.275±0.27 mSv/yr and 1.288±0.42 mSv/yr respectively. High levels of indoor radiation recorded at Auditorium and ND Mechanical Engineering class might be attributed to the rocks used for the construction of the buildings were mostly igneous rocks which are believed to be rich in minerals like zircon, monazite, uranite, potassium, feldspars and biotite (Ogola *et al*., 2016) which release ionizing radiation, higher activity levels in the radio-nuclides in the building materials (e.g Soils, blocks and tiles) used in the construction of the laboratories (UNSCEAR, 1998), and the presence of radon gas in air within the laboratory (Felix *et al*, 2015). Furthermore, elevated radiation levels may be due to the way some of the buildings were constructed as part of the roof is made up of concrete (Ogola *et al*., 2016). The Altitude of the area might also be the contributing factor to the radiation levels (Sadiq and Agba, 2012). The high level of radiation obtained at A38 (HND Mechanical Engineering class) could be due to the same reasons as that ND Mechanical Engineering class because they are very close to each other. The low levels of radiation obtained at A33 (H-Block NDI Textile class) and A25 (Prof. Hafiz Abubakar Studio Hall I) might be due to low activity from the foundation rocks used in the buildings and the classes in the areas are not closely built together, therefore there is proper ventilation of air which leads to low accumulation of radon gas inside the respective venues. The outdoor annual equivalent dose rate recorded ranges from 0.325±0.07 mSv/yr to 0.501±0.18mSv/yr with an overall average of 0.446±0.08mSv/yr. A26 (Prof. Hafizu Abubakar Studio Hall II) has the highest value while A32 (H-Block ND II Fashion Class) has the lowest value as can be seen from the table. All the values obtained from these areas were low compare to 2.4 limit set by the ICRP (1990) for human being protection against ionizing radiation.

Table 4: Ambient Radiation in (μSv/hr) and (mSv/yr) for Outdoor Areas

Area code	Location	Mean(μSv/hr)	OAEDR(mSv/yr)
A44	Football Field	0.216±0.08	0.378±0.15
A45	Botanical Garden	0.212±0.03	0.371±0.05
A46	Zoological Garden	0.160±0.03	0.280±0.05
A47	Staff Parking Surface	0.200±0.02	0.350±0.03
A48	Students Parking Surface	0.256±0.07	0.448±0.12
A49	SOT Ring Road	0.318±0.10	0.557±0.17
	Mean	0.227±0.05	0.397±0.09

Table 4 presents the results obtained from the outdoor areas, the annual equivalent dose rate varies from 0.280±0.05 mSv/yr to 0.557±0.17 mSv/yr with an overall average of 0.397±0.09 mSv/yr. The highest value was obtained along A49 (SOT ring road) while the lowest value was recorded at A46 (Zoological Garden). These values were also below 2.4 mSv/yr recommended by International Commission for Radiological Protection (ICRP, 1990). The Indoor-to-Outdoor ratio was also computed for comparison with 1.5 set by UNSCEAR (UNSCEAR, 1993).

*Conclusion***:** The assessment of Indoor and Outdoor background radiation of School of Technology, Kano State Polytechnic was carried out using Digital Radiation Meter. The measurements were carried out in 49 different areas within the school. The results obtained shows that the Staff and Students are exposed to an insignificant health risk of ionizing radiation since the values of the mean indoor and outdoor annual equivalent dose rate recorded are less than the world wide sets limit. Hence regular and periodic monitoring of the background ionising radiation level should be carried out to assess the health risk of inhabitants.

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