Measurement of Radon Concentration in Groundwater and Surface Water in Yangon, Myanmar, Using RAD7 Radon Detector

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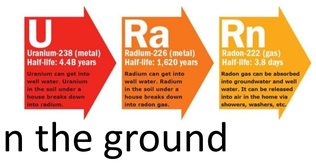
INTRODUCTION



Radon (Rn-222) – a naturally occurring radioactive gas
– released by the natural radioactive decay of uranium in the ground
– can dissolve and build up in water from underground sources
Waterborne radon leads to health risk by two pathways:

1) inhalation of radon and its decay products following the release of radon gas from water into household air
2) direct ingestion of radon in drinking water

– Radon is the most important cause of lung cancer after smoking.

OBJECTIVE

⇨ To investigate the radon concentration in groundwater and surface water from various places and YCDC water supply in **Yangon** on water management

STUDY AREA – YANGON CITY

❖ Yangon - the largest, most populated and urbanized city in Myanmar with about 6 million people

❖ Situated on the south-eastern corner of the Ayeyarwady Delta basin, at the mouth of three rivers: Yangon river, Pazundaung Creek and Bago river.

❖ Groundwater is mostly extracted from **Alluvial**, **Valley filled deposits**, **Ayeyarwady sandstones** and **Pegu aquifers.**

❖ Water supply – Yangon City Development Committee (YCDC)
(1) Reservoir (Hlawga, Gyobyu, Pugyi and Ngameoyeik reservoirs)
(2) YCDC's groundwater tube wells.

❖ Other water resources: Private tube wells, rain water, lakes and ponds.

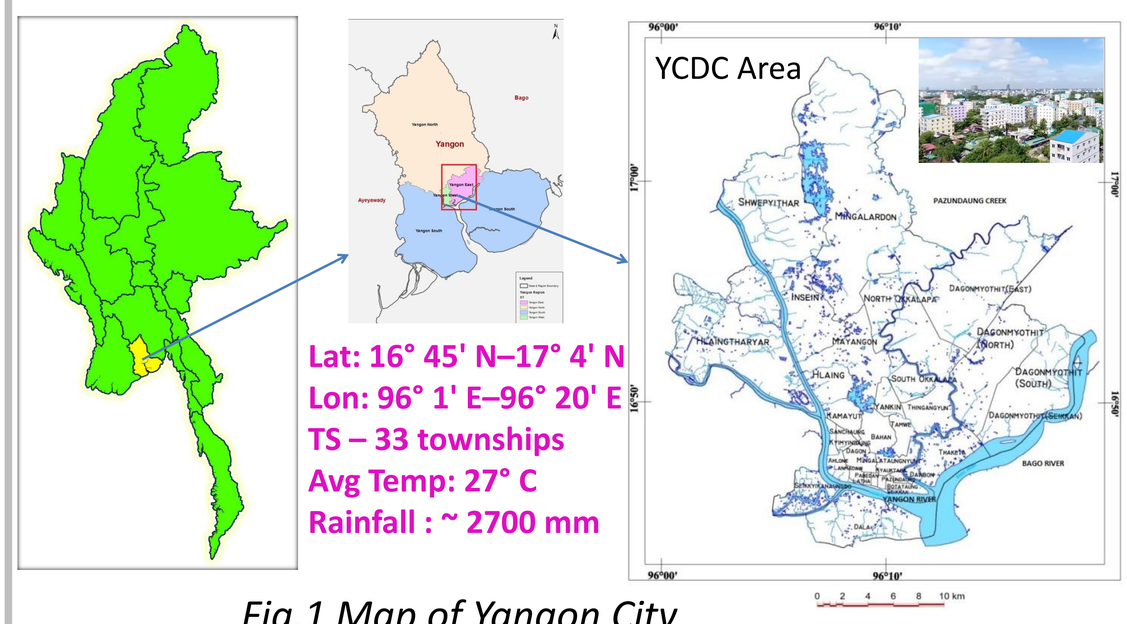


Fig.1 Map of Yangon City

SAMPLING STRATEGY AND MEASUREMENT OF RADON CONCENTRATION

∗ Groundwater and surface water samples were collected in the radon-tight reagent glass bottles of **250 mL** capacity .

∗ **15 samples of groundwater** from private tube wells from 11 selected townships and YCDC's tube wells

∗ **6 samples of surface water** from Yangon River, Pazundaung Creek, Inyar Lake, Kandawgyi Lake and YCDC water supply from Gyophyu and Ngamoeyeik reservoirs.

∗ Radon concentrations were measured with **DURRIDGE RAD7** electronic radon detector connected to a **RAD H_2O** accessory.

∗ Consists of three components in a closed loop in Fig (3);
(a) the RAD7 radon detector, on the left, (b) the 250 mL water vial with aerator and (c) the tube of desiccant (drying tube)

Fig.2 Some Sampling Sites in Study Area and Water Sampling

RESULTS

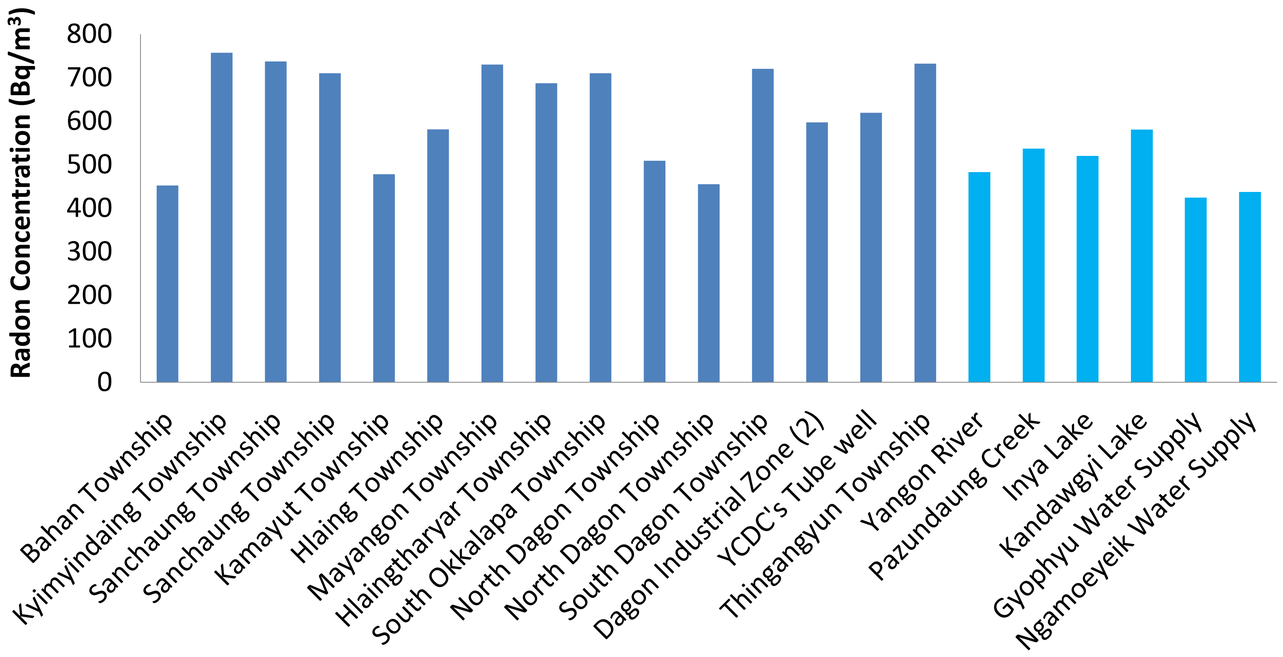


Fig.4 Measured Radon Concentrations in Groundwater and Surface Water in Yangon City

	Radon Concentration (Bq/m³)		
	Minimum	Maximum	Average
Groundwater	452	757	631.6
Surface Water	424	580	503.3

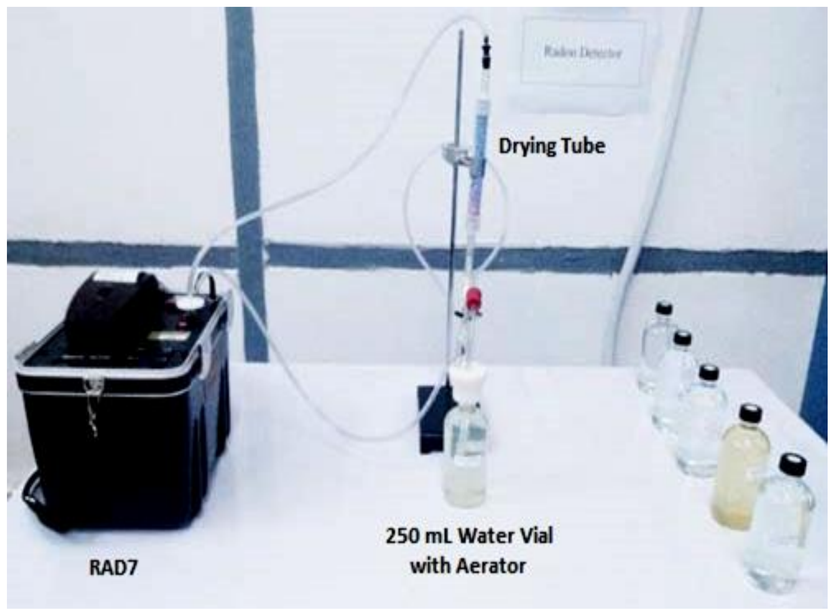


Fig.3 Experimental Setup of RAD7 with RAD H2O Accessory

CONCLUSION

The measured data revealed that the ground-water have higher concentration of radon than the surface water. The measured values are lower than the maximum allowable concentrations in water as recommended by US Environmental Protection Agency EPA and WHO guidelines. Therefore, in the present circumstances any necessary action is not required to reduce the radon concentration in water resources of Yangon City.