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# Isotope Hydrogeochemistry of Urban-Zone Groundwater, Central Africa

Mohamed Fahmy Hussein
(fahmy@link.net)

The isotope hydrogeochemistry of Bangui City, Central Africa, is discussed. This small city (∼0.65 million people on ∼20km2) is situated on Oubangui tributary of the Congo River. The urban-zone is highly despoiled and most of its population depends on water supply from the shallow the porous aquifer and/or pumping the deep fractured aquifer. The purpose is to define groundwater chemical and isotope composition in relation to recharge, rock formation and the impact of the awful practices of the indigenous population on groundwater quality.
The hydrochemical data demonstrated reaction with biogenic CO2 gas, weathering, cation- exchange and NO3-pollution of anthropogenic origin. The conjunctive use of the chemical and isotope compositions (18O and 2H) showed the alteration of silicate and carbonate rocks in the zones of dilute and relatively charged groundwater.
The isotopes illustrated the role of evaporation and transpiration in the water-balance, with a fraction of the transpired-vapor recycled. The regional "inverse continental isotope-effect" is attributed to differences in air-temperature, amount and altitude of precipitation, rather than to a claimed movement of humid air masses from Central Africa westward to the Atlantic. Isotope data showed that recharge during the humid-season may not exceed that taking place during the dry-season, and that the overall aquifer-recharge is mediocre. The data helped to distinguish rapid circulation in deep fractured formations northward versus slow one in porous sections southward, and showed that the system is void of evaporites and its carbonates are made-up of Calcite, not Dolomite. Pollution, by nitrate, is noticed downtown, and would extend everywhere in that urban-zone.