

# IDENTIFICATION OF GROUNDWATER NATURAL RECHARGE AREAS IN THE PRODUCTIVE THIAROYE URBAN AQUIFER (DAKAR, SENEGAL)

ABSTRACT n° 1737

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Urban groundwater remains a major source (~47%) of the freshwater supply to Dakar, Sénégal despite steadily rising water demand and observed degradation in groundwater quality. We apply hydrochemical and isotopic tracers to characterise groundwater low regimes (i.e. recharge, discharge) in the infrabasaltic and Thiaroye aquifers exploited in Dakar. Our results show a predominance of present day recharge occurring mainly in the Thiaroye watershed coinciding with the peri-urban area with tritium data ranging from 1.1 and 3.5 TU (78% of samples), close to the input signal of 2.2 TU. Low values of 0.8 TU measured in the south-eastern part are considered to indicate older groundwater recharged prior to 1960. Sites with tritium values of between 4 and 5.3 TU (16%) are located in the "niayes" where water tables are shallow and reflect recent groundwater replenished within the last 15 to 20 years. Values are similar to the 3H activities in groundwater from previous studies. These sites in the "niayes" represent rapid discharge zones from the shallow aquifer. The relative ages of the sampled groundwaters and associated recharge zones are in good agreement with their origins given by the  $^{18}\text{O}$  and  $^2\text{H}$  groundwater compositions and hydrochemical zones. This research builds on previous evidence based on stable isotope ratios of O and N in nitrate and mapping of trace elements (B, Br, Sr). These hydrochemical and isotopic studies provide a framework for more detailed site and modelling investigation studies under a new 5-year research project, AfriWatSan that seeks to inform a new adaptive strategy of using polluted urban groundwater for irrigation in peri-urban areas of Dakar.