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## Interaction between surface water and groundwater in Sbiba, Tunisia

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The purpose of this work is to understand the process of groundwater recharge from the surface water in semi-arid area using the tracer elements and stream flow observation.

The Sbiba basin is semi-arid area located in inland region, northern Tunisia. In the downstream area, there is the drawdown of groundwater and the disappearance of river as the result of the overexploitation for irrigation.

The groundwater flow in Sbiba basin was estimated by dissolved inorganic ion. There is interaction between shallow aquifer and surface water from upstream to downstream. The another aquifer exists in deeper layer which have poor connection with other aquifers. For these reasons, upstream well, midstream river, and dam are estimated to be the end-member of the downstream groundwater. The contribution of the dam to the groundwater is estimated to be 38.4% by end-member mixing analysis.

The ratio of outflow to input flow in the river is also estimated with tracer elements and measured stream flow. The evaporation rate from the river is estimated to be 4.7-11.5% of input flow, groundwater recharge is 30.0%, and artificial withdrawal for irrigation is 53.6%.

Keywords: semi-arid, groundwater recharge, end-member mixing analysis, tracer, Sbiba