

EGU21-9925

<https://doi.org/10.5194/egusphere-egu21-9925>

EGU General Assembly 2021

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## Groundwater sustainability in a semiarid traditional irrigation piedmont supplied by high mountain streamflow

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Piedmont areas are globally important hydrological systems as transitional zones between mountains (headwater basins) where water is produced and adjacent plains (basins floor) where water is consumed. In arid and semiarid areas, the water availability in piedmonts have made them adequate places for rural communities' settlement and irrigation activities. The hydrochemical processes controlling groundwater chemistry in the piedmont areas might be influenced by the interaction with the mountain streamflow, the geology, the climate and the human activities. In this study we investigated the hydrochemistry of the groundwater in the piedmont of Ourika wadi that is coming from the High-Atlas of Marrakech Mountains (central Morocco). The HCO<sub>3</sub>-Ca-Na groundwater type, inherited from the streamflow, is the primary water facies in the area. It has its origin from carbonates dissolution and silicates withering in the High-Atlas mountains. In the irrigated area, the ion exchange processes are responsible of Ca and Mg enrichment. Currently, the groundwater salinity is low and the chemical quality is excellent thanks to the seasonal groundwater recharge from the mountain streamflow and to the practiced traditional agriculture that generally uses high amounts of irrigation and low amounts chemical fertilizers. However, major concerns about groundwater sustainability arise from two parameters. Firstly, the snowmelt-driven runoff supplying the groundwater recharge in piedmonts is in continuous decrease because of the snow cover reduction observed in the last decades and forecasted in the future under climate change, likely putting more pressure on groundwater resources. Secondly, due to the growing anthropogenic activities the traditional agriculture might change to intensive agriculture using more chemicals and inducing pollution.