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Contribution of Chemical and Isotopic tracers for water resources management and climate in Semi-arid area? Cases from Morocco

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The semi-arid regions experience highly variable rainfall and recurrent droughts. The limited water resources are threatened by increasing demands and accelerated quality degradation. Consequently, projections for future renewable water resources in these regions are bleak and climate change coupled with increasing water overexploitation are likely to exaggerate the water crisis within. The main issues are to understand if the water resources are renewable- how and where? And sustainability impact of climate change. Based on the scientific research for understanding the origin of water and contamination mechanisms, the decision makers aim to develop adequate management plans upon different issues and future predictions. In this talk we present some results about the contribution of a combined Geochemical and isotopic investigation using several chemical and isotopic tracers in order to determine the sources of water recharge to the aquifer, the origin of salinity and the residence time of water in some aquifers in different contexts. The multiple isotopes analysis and chemical tracing of groundwater identify the sources of salinity in groundwater (seawater intrusion, evaporates, fertilizers, wastewater). These techniques are successful in semi-arid regions where a systematic monitoring seems sometimes difficult. The data generated in this study will certainly encourage the revision and improvement of the current hydrological water resources model. In contrast, we argued that the intensively exploited aquifers are more vulnerable given the relatively longer residence time of the water and mineralization processes. The results provide a framework for development of a comprehensive management plan and climate change impacts.

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