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SUMMARY

According to various studies, Africa would have 9% of the world's freshwater renewable resources; it is around 4000 km3 of water per year. This misleading abundance masks a huge disparity of resources and serious supply difficulties for at least 25 African countries by 2025. The African continent must turn to the optimization of its groundwater resources, as they are more reliable than surface water and less sensitive to climate variability and pollution. Groundwater is an important part of Morocco's national water heritage. The groundwater potential is estimated at 4 billion m3 and is distributed on about 80 superficial and deep aquifers. Drought and increasing demand for water for human activities increase the stress on these ground waters. Located in an area characterized by an arid climate and high vulnerability to climatic hazards, the plain of Bahira extends over more than 5000km$^2$ is well known by its agriculture and mining activities. Groundwater flows from Ganntour plateau (recharge area) to the basin-fill deposits and Zima Lake and Sed Elmejnoun where water evaporates. The Bahira Groundwater knows an overexploitation as well as problems of salinization and pollution. To this purpose, an approach to identify groundwater vulnerability to pollution, and water balance as well is fundamental. Aware of the Atmosphere-land surface or Soil- Groundwater connection, an essential and crucial elements has been well studied: The soil and the land cover. A pedological study of the Bahira plain was conducted: field trips have enabled us to study soil profiles and take soil samplings from 60 different points of this area. The soil samples have been analyzed for there granulometry, organic matter, Electrical conductivity...A soil map was developed from these data, the bibliographic studies as well as the contribution of remote sensing. This study allowed the permeability of soils and subsequently quantify the infiltration in the plain of Bahira. In addition to that, the land cover and evapotranspiration using remote sensing have been studied, using NDVI and imagery using high resolution "SENTINEL 2". This have allowed us to quantify the pumping of water in the area, as well as the depth of the water table: A piezometric campaign was conducted during the period of low water; the results in 2018 have been compared to those of 2011,

and 1991, and have been justified using remote sensing that shows the proliferation of pumping. This study has once again sounded the alarm about the huge drop that knows the water table.

KEYWORDS
Groundwater, Remote sensing, Plain Bahira, Vegetation, NDVI, vulnerability to pollution, Central Morocco, ENVI, Sentinel 2, water table