

# Monitoring of water drilling exploitation as a tool of rationalization of agricultural irrigation

Pr. Fouad AMRAOUI

Laboratory of Geo-sciences applied to Aménagement Engineering (G.A.I.A). Hassan II University, Ain Chock Faculty of Science, Km 8 route d'El Jadida. BP 5366 Maarif. Casablanca, Morocco. Mail : amraoui\_f@hotmail.com



**Introduction :** This communication aims to show the importance of good monitoring of water drilling exploitation in agricultural use. The case study was done on a 600 hectares area farm with high-density olive trees and fifteen water-operating structures. The monitoring yields to a good control and quantification of water consumption and permits to follow the future evolution of this consumption to guarantee the good operation of the irrigation system and the supply durability.

### Pilot project of high-density olive trees (Arbequina)

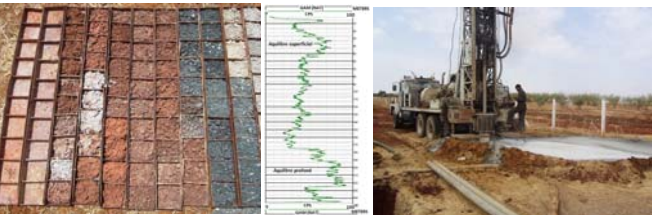
- ❖ Olive (386 Ha) and wine project (144 Ha) developed in the frame of the "Morocco Green Plan" in 3 Agricole SODEA units (about 600 Ha where 530 are irrigated).
- ❖ Situated in Ras Jerry region to the SW of Meknes city.



### Hydrogeological context and hydraulic equipment

Situated in the margin of Sais plain, the free aquifer takes place in a superficial area in Plio-Quaternary sandstones and deeper Budigalien molasse and mainly in Paleozoic sandstone and schists.

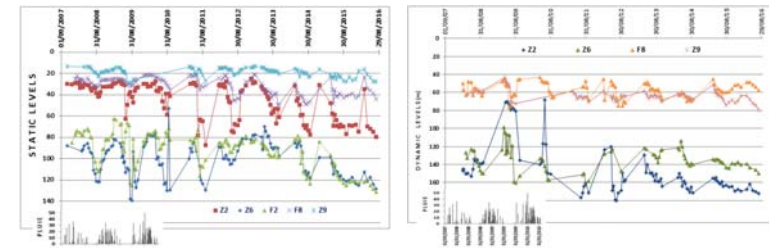
- ❖ fifteen water-operating exploitation structures between 93 to 250 m in depth ensure water supplying of 4 storage basins distributed in the farm.
- ❖ Two water transfer systems between basins are present: from B1 towards B3 (200 m<sup>3</sup>/h) and from B3 towards B4 (230 m<sup>3</sup>/h).
- ❖ All irrigation is done by the drip system.



**Monitoring protocol of water-operating structures :** monitoring done each fifty days allows a good understanding of operating modalities of water-operating structures and then to prevent dysfunction or reduction of amounts collected.



**Static and dynamic levels :** monitoring permits to detect fluctuations in groundwater with and without pumping effect at seasonal scale and also from year to year.



**Rates of drilling, pumping hours, production volumes and the interbasin transfer :** monitoring of production, prior detection of dysfunctional problems and calculation of amounts produced and deposited in different basins



**Conclusion :** This monitoring allows the quantification of the water and energy consumption from an agricultural season to another one; to better constrain the relationship between the rainfall importance and distribution with water production; and to anticipate decisions to guarantee the good operation of the irrigation system.