



## Prospective of groundwater overexploitation through participatory approaches: Saiss Plain in Morocco

Fatah ameur (1,2), Caroline Lejars (1,2), Mathieu Dionnet (3), Hassan Quarouch (2), Marcel Kuper (1,2)

(1) IAV Hassan II Madinate Al Irfane 10111 Rabat Maroc, (2) Cirad UMR G-eau TA C-90/15 L'Hortus 73, rue JF Breton 34398 Montpellier cedex 5 France, (3) LISODE (France)

In the Saiss plain, groundwater overexploitation is often explained by two phenomena. The first one is a natural phenomenon (droughts), which seems therefore uncontrollable; the other one is human as groundwater is largely used by the agricultural sector. The main issue of groundwater governance is to find an acceptable balance in the use of the water resource without compromising the socio-economic development generated by this resource. Our study aims to contribute to understanding the differential contribution of different categories of groundwater users and the socio-economic and agrarian dynamics impacted by the overuse of groundwater. We adopted a participatory approach to explore with the different actors involved in the management and use of groundwater to identify the different viewpoints on the issue of overexploitation and to engage prospective and collective thinking of present situation of groundwater overexploitation. We organized multi-stakeholder workshops and designed a role-playing game to identify and qualify the existing links between the water resource, and the economic and social dynamics in order to better understand the human behavior to economic and environmental crises and the adaptive strategies of farmers confronted with an increasingly scarce groundwater resource. Our results showed considerable differences in the viewpoints of different categories of farmers regarding overexploitation. Agricultural investors who arrived over the past 5 years in the area practicing arboriculture consider themselves modern farmers using precise and water-saving irrigation technologies (drip irrigation, especially) who cannot be blamed for overexploitation of groundwater resources. Lessees practicing horticulture put considerable pressure on water resources, but were not interested in debates on overexploitation and the sustainability of groundwater resources. In fact, they did not turn up for the workshops. Finally, the local small-scale farmers who have very limited access to groundwater due to declining groundwater tables were shown to be the most concerned about groundwater overexploitation, especially the youngsters. These results show that not only different categories of users contribute differently to groundwater overexploitation, but also the direct effects of overexploitation are asymmetrically supported by different categories of users. These results can thus provide the basis for a user-oriented debate on groundwater governance involving the different categories of users and public institutions, by making the differential contribution and impacts of groundwater overexploitation visible.

Keywords: Participatory approaches, role-playing game, actors, groundwater, overexploitation, Morocco