

# Experimenting Groundwater Governance

## Assessing Policy Performance through Lab-in-the-field Experiments in Kebili Oases (Tunisia)\*

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## Abstract

We use laboratory and lab-in-the-field experiments to evaluate policy interventions aimed at preventing the overexploitation of a common-pool resource (CPR), focusing on groundwater users in the oases of southern Tunisia. We designed a framed field experiment to investigate governance challenges related to the management of the Kebili aquifer. The experimental setup is based on a dynamic model of CPR extraction that incorporates both static and dynamic externalities: extraction costs increase with current total use (static externality) and with past cumulative extractions (dynamic externality). This combination intensifies rivalry among users, as each anticipates over-extraction by others, ultimately leading to a "tragedy of the commons." The experimental treatments (policy tools) were identified through discussions with local authorities and experts, who highlighted constraints such as limited coercive power, conflicts of interest, budget restrictions, and past policy failures. Given the limited scope for intervention, we tested two governance tools considered feasible for field implementation: Stakeholder Communication and Expert Advice. These treatments were compared against a control group representing a "laissez-faire" situation. Both treatments incorporated a simulator, a device providing participants with real-time information about future payoffs based on their own and others' extraction decisions. The simulator was also tested independently in a separate treatment. Our results show that Expert Advice was the most effective tool for reducing extractions, outperforming Communication. The significant effect of the Expert treatment, particularly pronounced in the field, highlights the potential of governance strategies based on informed advice provided by credible sources external to the farmers' associations.

**Keywords:** Groundwater governance, Lab-in-the-field experiments, Oases, Tunisia, Policy tools performance, Dynamic CPR model.

**JEL Codes:** C92, C93, Q25, Q58, C61.