



Image: Brian Jimenez

Coop Research Program | Call 5

## Understanding effects of irrigation modernization in water resources management

### Background

In the Valencia region, Eastern Spain, where irrigated citrus is the main crop, irrigated agriculture has been one of the main drivers of socio-economic development for centuries. Since the 1990s, the region has been undertaking an irrigation modernization process, where traditional gravity irrigation is replaced by drip irrigation. This process has not been accompanied by an ex-ante analysis of its hydrologic, environmental and socio-economic implications. Identifying these impacts is necessary for establishing appropriate measures and plans for future actions to maximize the benefits of irrigation modernization while avoiding negative effects on water resources, society and the environment.

### Objective

The main objective of this project is to gain a better understanding of the effects of irrigation modernization on water resources, particularly groundwater, at different levels. The project aims to address the issues on how to make more efficient irrigation compatible with environmental values and the projected climate scenarios, including water scarcity and increased irrigation water needs.

### Research Approach

This project conducts an integrated analysis on water resources management from farm level to the catchment level. It analyzes water conservation policies/measures, in particular the promotion of drip-irrigation technology, for their effects on water quantity used and on water conserved at different levels. The project applies a bottom-up approach, informed by experimental knowledge and stakeholder

information, to develop a numerical agro-hydrological model. Combined effects of future irrigation modernization plans and climate change will then be assessed in a scenario-based framework.

### Relevance and Expected Outcomes

The resulting environmental impact assessment report and eventual policy recommendations will provide scientifically robust information and local knowledge relevant to move towards sustainability in water resources management and food production. The systematic analytical framework provides the flexibility to be applied at different geographical levels in the study area, but also for a similar assessment for other crops and other countries.

### Food System Challenges Addressed

Irrigation modernization, Flood and drip irrigation, Hydrological modelling, Groundwater recharge, Water scarcity, Water resources management.

<https://worldfoodsystem.ethz.ch/research/research-programs/CRP/IRRIWAM.html>

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