



Fostering low-cost soil moisture monitoring techniques to improve irrigation efficiency in Burkina Faso

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Irrigated agriculture is a significant activity in water stressed semi-arid (e.g., the Sahel) regions, thereby yield and water management are fundamental aspects of irrigation success. Small farmers have often difficulties in managing crops and in evaluating water needs resulting in low yield with excessive water consumption, elevated pumping costs and soil degradation. In different proportions, this overuse of water concerns all irrigation techniques: gravity flows from reservoirs, watering cans irrigation from groundwater wells, micro- or drip irrigation. Baseline requirements for supporting sustainable technology are low costs, easy installation, minimal maintenance, and local production.

We present and discuss results from the Info4Dourou2.0 explorative project in Burkina Faso, the main goal of which is to improve small-scale agriculture by the use of sensing and communication technologies. In particular, a support system that couples autonomous and continuous measurements of meteorological variables and soil matrix potential as well as soil humidity with agronomic models has been tested in drip-irrigated fields over a three-year period. In particular, the system is collecting data from three water potential sensors at different locations per field and informs the farmers through a simple interface of the correct amount of water needed by the plant. In its simplicity this system provides an easy to use and install irrigation management setup, and is therefore an ideal candidate in favor of sustainability. Info4Dourou2.0 pilot experiments have shown that farmers can obtain significantly higher yields using lower amounts of water. Overall, this methodology allows facing multiple urgent problems such as the use of environmental data to improve agricultural production towards ecosystem conservation, food security issues and adaptation to climatic change scenarios.