

Section Sciences et Ingénierie de l'environnement Design Project 2013 (semestre de printemps)

Proposition n°24

Info4Dourou 2.0: Irrigation Support System for Developing Countries

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Descriptif du projet

Irrigated agriculture is a significant activity in Sahel regions, providing vegetables and fruits that constitute an imperative fraction of the food balance. It also constitutes a vital activity for many small farmers, providing revenues and quality food to the entire family. In Sahel regions, the water management is a fundamental aspect of irrigation success.

The small farmers have however difficulties in evaluating water needs and generally over-irrigate vegetables to avoid yield loss. This results in an excessive water consumption (when water is precious), in unnecessary water pumping costs, and consequently, in the reduction of the irrigated surfaces. This overuse of water concerns all irrigation techniques: gravity flows from reservoirs, watering cans irrigation from groundwater wells, micro- or drip irrigation. This agricultural productivity problem is common in developing countries, where professional advice is scarce.

Objectif

Info4dourou main goal is to improve agriculture in savannah regions by the use of communication technologies. Particularly, the project aims to produce a support system that optimizes agricultural production based on rain and soil humidity continuous measurements. It will couple autonomous monitoring system with agronomic models to provide a simple to use and install irrigation management system.

A first prototype of the measurement system is currently being tested in a drip-irrigated field for onion production in Ouahigouya, Burkina Faso. The system will collect data from three water potential

sensors at six different locations. The final goal is to inform the farmers through a simple interface of the correct amount of water needed by the plants.

Descriptif tâches

The project tasks can be summarized as follows:

- investigate and understand relevant literature regarding irrigation
- get familiar with employed WSN technology
- implement agronomic models to provide simple to use irrigation management information
- test the management information system with the available data

Divers

Work breakdown: 65% theory, 35% programming

Prerequisites: Matlab

Keywords: agricultural monitoring, irrigation management, wireless sensor networks

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