

Location	Egypt
Contractor	Partners for Water
Partners	DACOM, the Soil Company
Period	2008

Scope of the project

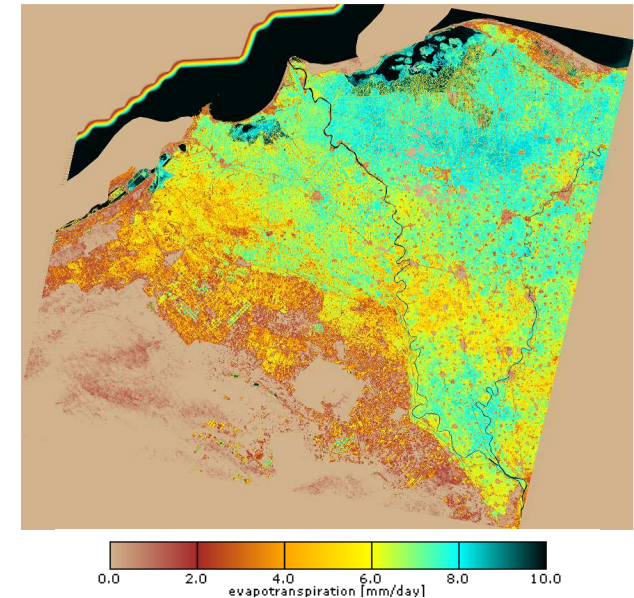
Agricultural water use is of increasing concern in Egypt. In order to make the use of water more sustainable and optimal, the current irrigation management strategies need to be improved. The aim of this pilot project was to improve the water management of several farms in Egypt by means of innovative monitoring methods.

Study approach

The three partners integrated their stand-alone high-tech techniques into one integrated unique system to improve the efficiency of crop water use. The focus was on strawberries, grapes and potatoes on the farms of CHIPSY, MAFA and PICO in the Western Nile delta. Comparisons were made between the traditional irrigation management and the new, improved techniques. The farms have been monitored during three growing seasons in 2007 and 2008 using in-situ measurements of soil moisture, detailed soil mappings and satellite observations. Farm engineers were trained to use the DACOM software for irrigation management, where the information for soil and remote sensing had been integrated using Google Maps. WaterWatch has been responsible for the monitoring of the farms by using satellite observations. Maps of actual and potential evapotranspiration, biomass growth, and soil moisture were created with the SEBAL algorithm. The main inputs for SEBAL were observations from low-resolution (250-m) and high-resolution (30-m) satellite data.

Results

The soil maps were very useful to determine the best location for a soil moisture sensor and to show the farm managers the soil properties and in-field soil variability. Low resolution satellite imagery can be used on regional level. High resolution images provide good information and can detect in-field variability. The map shows a low-resolution SEBAL result. The two branches of the Nile can be clearly seen having a higher evapotranspiration than the surroundings. Within the delta there is a north-south trend visible, with a higher evapotranspiration in the northern part. This pattern could be related to different farm management practices, where farmers sow their crop on different times.



Actual evapotranspiration for the Western Delta, June 25, 2008

Conclusions

The implementation of the improved irrigation management had several positive results as compared to the traditional irrigation management. Potato yield slightly increased with 8%, while soft rot was reduced with 50%. Furthermore the water and fertilizer use in strawberries was reduced with 48% without negative effect on yield and quality. Maps of actual and potential evapotranspiration, biomass growth and soil moisture can be used to assess the state of the crop. High-resolution satellite images are capable of detecting variability of evapotranspiration, biomass growth and soil moisture within a field, but are limited by the low revisit time.