



Fifth Nile Basin Development Forum
23-25 October 2017, Kigali, Rwanda
Investing in Nile Cooperation for a Water Secure Future



Satellite based ICT for improved crop production in Gezira Scheme

Younis A. Gismalla

24 October 2017

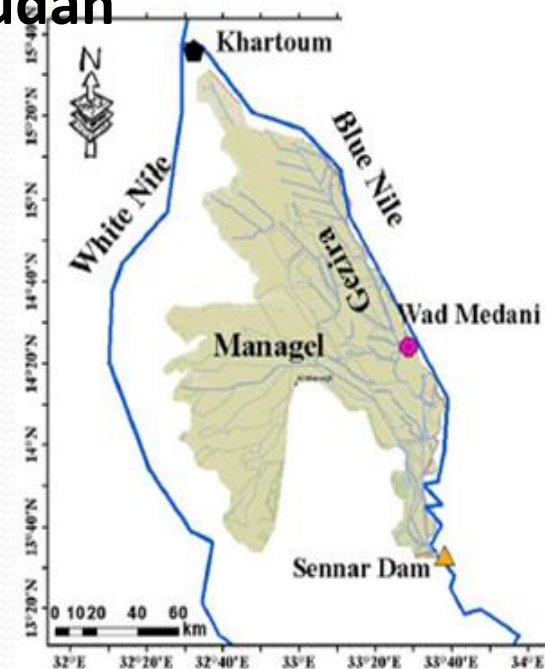
Background

- One year project/ winter 2014/2015,
- Funded by CTA /ICT4Ag
- Piloted in Gezira Scheme (880,000 ha)
- Implemented by eLEAF – Netherlands & HRC -Sudan



Objectives:

To set up an advisory service for the Gezira Irrigation Scheme that conveys satellite based information on crops and irrigation to selected farmers via mobile phone text-messages.



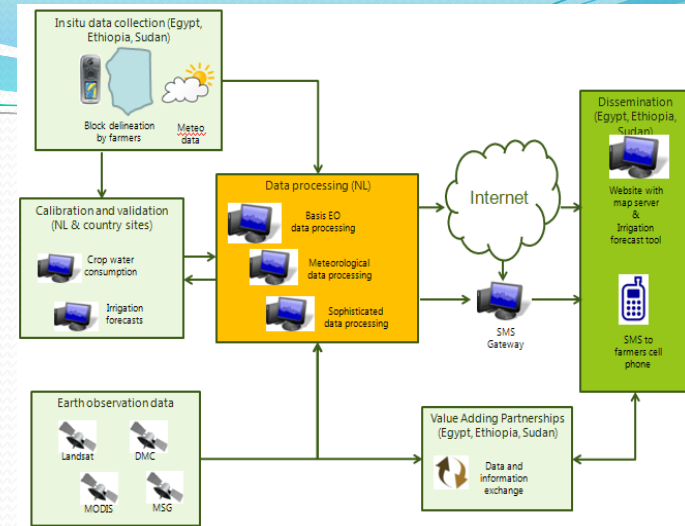
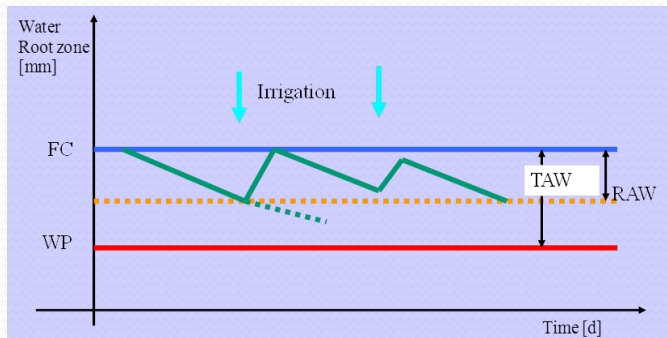
ICT project setup:

- ✓ Innovative project
- ✓ Uses Satellite images to measure 9 parameters (growth, moisture, minerals)
- ✓ ICT technology

☐ mobile SMS & web portal

<http://www.fieldlook.com.sd>

☐ Irrigation planner software



Smart ICT system design



Fieldlook GUI Home

✓ Satellite images

(Landsat8, DMC, MODIS , MSG)

✓ SEBAL measure 9 parameters

Crop growth

- Biomass production BP,
- Leaf area index LAI, and
- Vegetation index NDVI

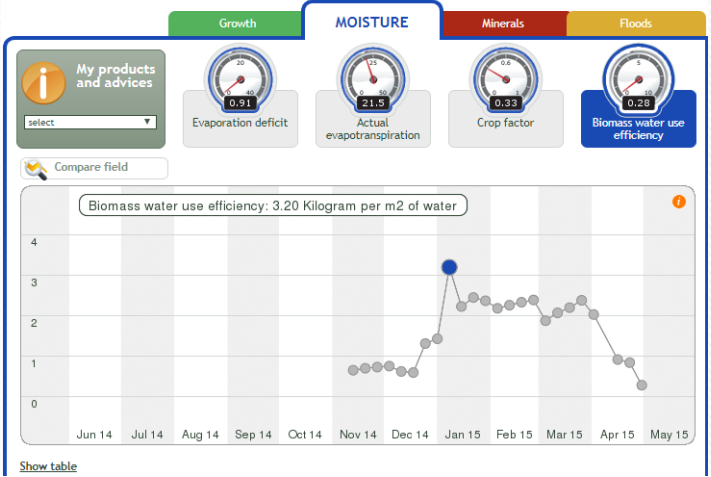
Moisture

- Actual evapotranspiration,
- Evaporation deficit,
- Crop factor, and
- Biomass water use efficiency

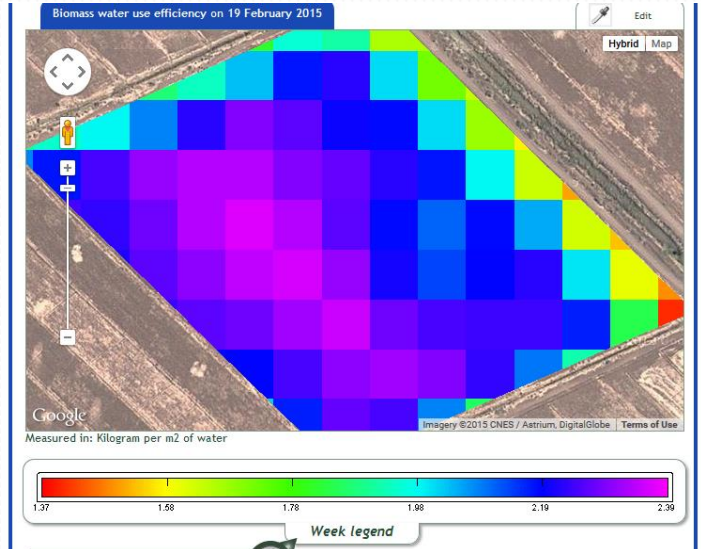
Minerals

- Nitrogen in upper leaf, and
- Total plant nitrogen.

A summary is sent to farmers via SMS



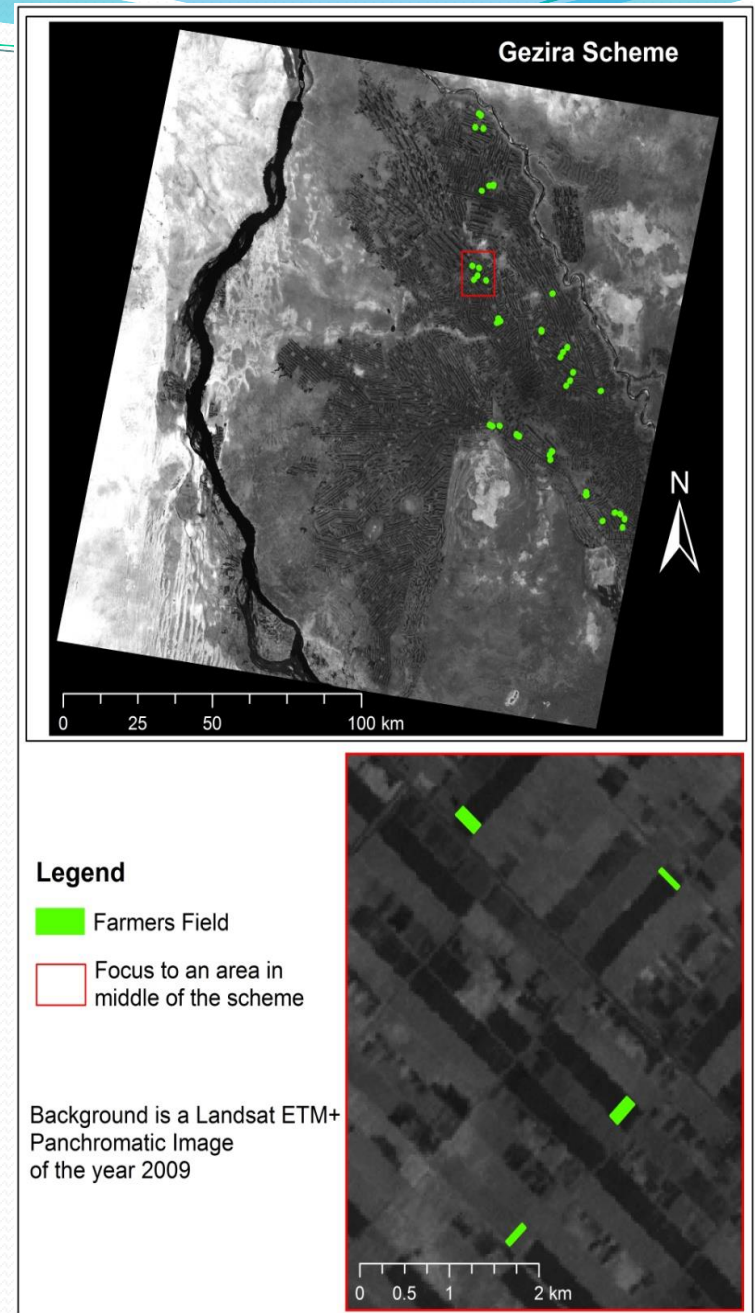
Biomass water use efficiency



Biomass water use efficiency 19 Feb

Project Activities:

- ✓ Selection of farmers
- ✓ User Needs Assessment (UNA)
- ✓ Fix farms locations with GPS/link with mobile number
- ✓ Develop service tools
- ✓ Weekly info. SMS
- ✓ Follow up and Training
 - Daily telephone calls
 - Weekly field visits
 - 3 training workshops
 - Stakeholders meetings





Projects Activities



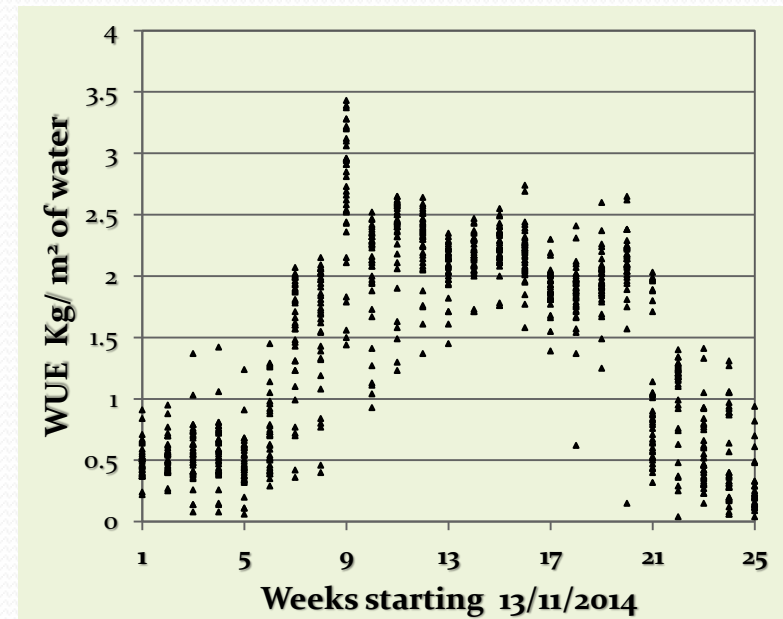
Project Output:

Water Use :

- Shorter irrigation interval (8-17) days compared to (15-20) days
- Irrigated more frequently (7-9) irrigations per season compared to (5-7)
- Used less water per irrigation
- Increased Water Use Efficiency



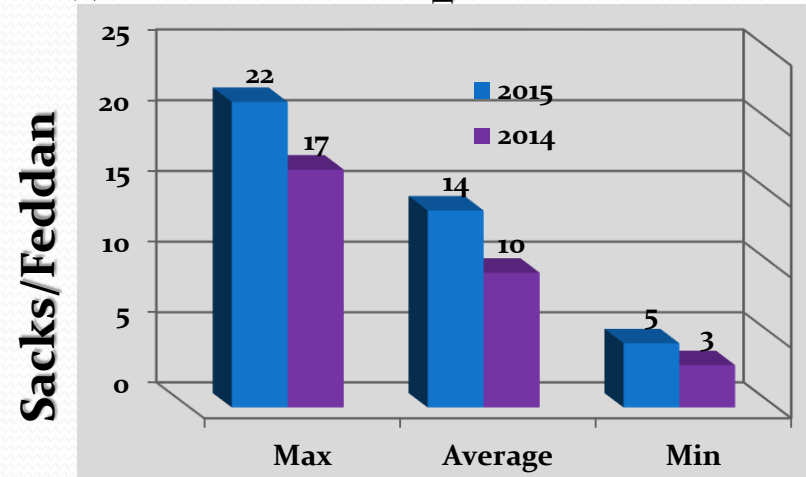
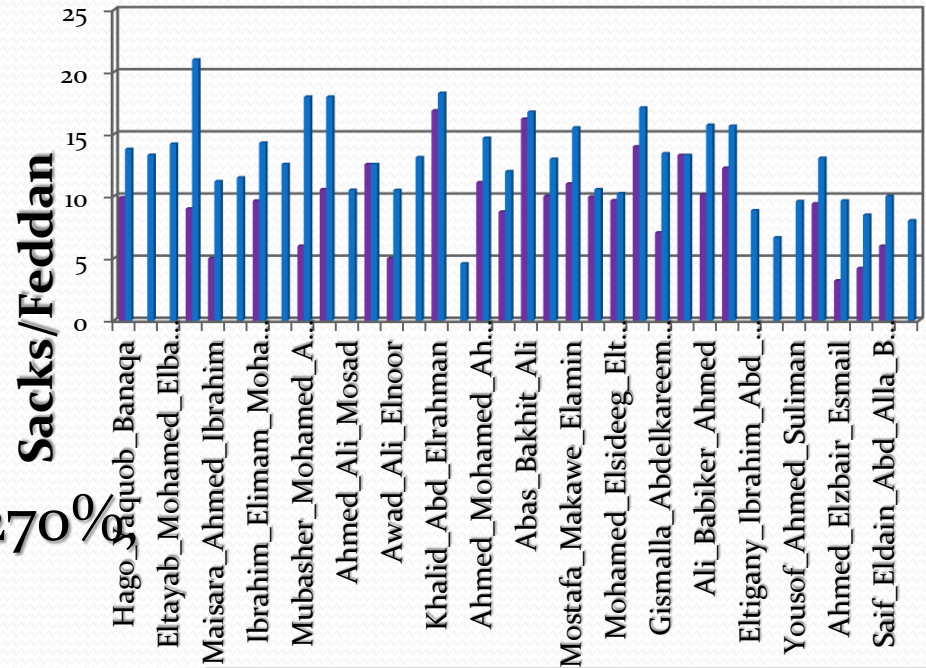
Measuring field irrigation water



Biomass water use Efficiency

Crop Yield:

- Crop yield increased in all pilot farms
- increase in wheat yield 3% to 270%
- Average increase in wheat 67%.



Improved field Management:

- Frequent irrigation advice via SMS messages regardless of farmers' location
- Confirmed accuracy of received info.
- Can retrieve farmers information any time
- Neighbor farmers applying same SMS

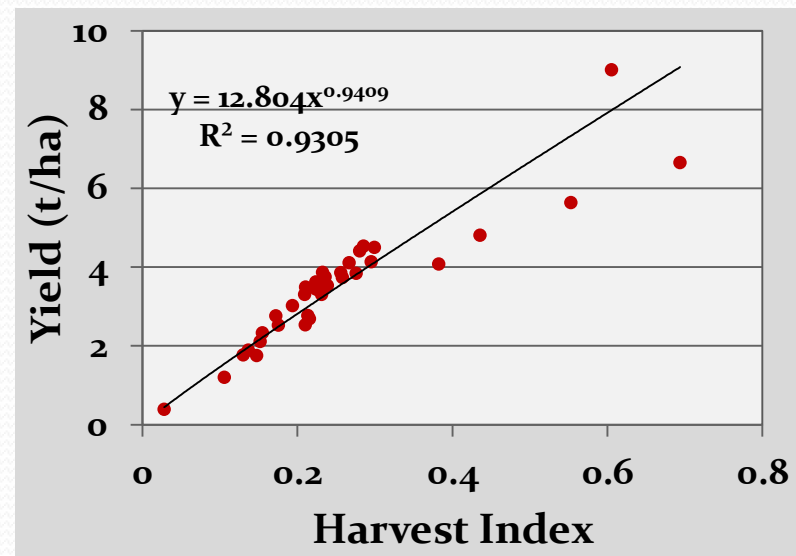
irrigation advice resulted in:

1. an increase in wheat yield in Numbers with pilot farmers;
2. no variations in irrigation in Numbers with pilot farmers;

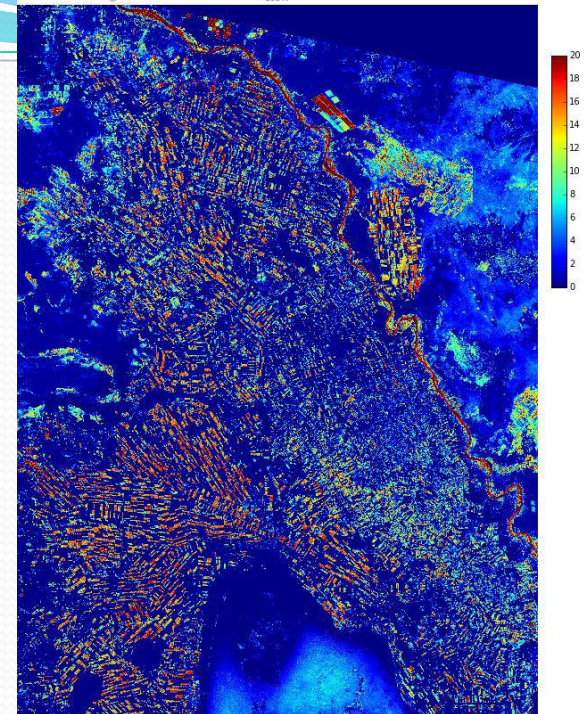


Other benefits:

- A database of Information collected for the first time
- Research institutions/universities can use database.
- Study irrigation efficiency-field level
- Early estimation of crop production (DSS)
- Can benefit Insurance companies

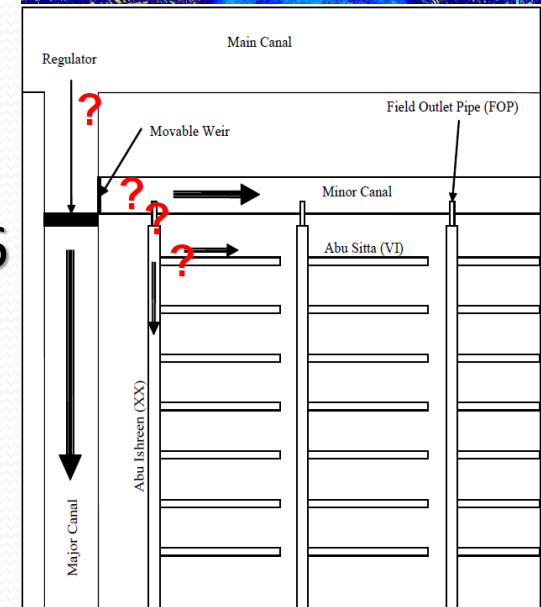


HI / Yield for wheat in Gezira



The way forward

- Replicate in 1 Block (GS 22 B)
 - (i) Water supply /distribution
 - (ii) Water consumption ICT
 - (iii) Institutional aspects (policies, institutions, resources)
 - (iv) Capacity building
- Conducted a workshop in ElMeilig Block on 6 Nov 2017 based on farmers' initiative
- Scaling up to cover the whole scheme





THANK YOU