EO Africa Explorers

EO for sustainable water resources management in agriculture:
A case study from Egypt

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Objectives & Outcomes

- To develop an EO technique to estimate crop water stress and evapotranspiration, using the ECOSTRESS and PRISMA data.
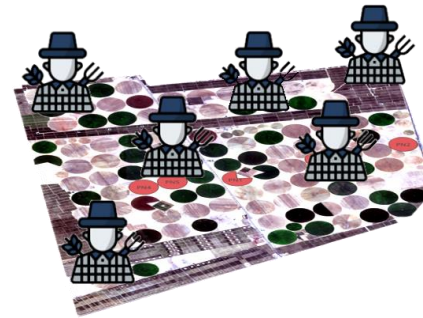- To validate and outreach the developed method.

- An open-source model to estimate actual crop evapotranspiration (ETa).
To be integrated into a web platform designed to support the end-users in managing their irrigation with a productivity perspective.

The project team

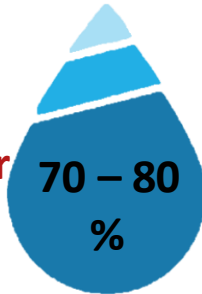National Authority for Remote Sensing & Space Sciences (NARSS)
Egypt

Investors at October Sixth for Agricultural Projects - **Egypt**

WRM in Agriculture
Drivers and Challenges

RS provides a great opportunity for continuous and near-real time for a comprehensive monitoring of crop, soil, water

Agricultural water demand

70 – 80 %

Water scarcity

sparse in-situ monitoring networks

Missing cooperation
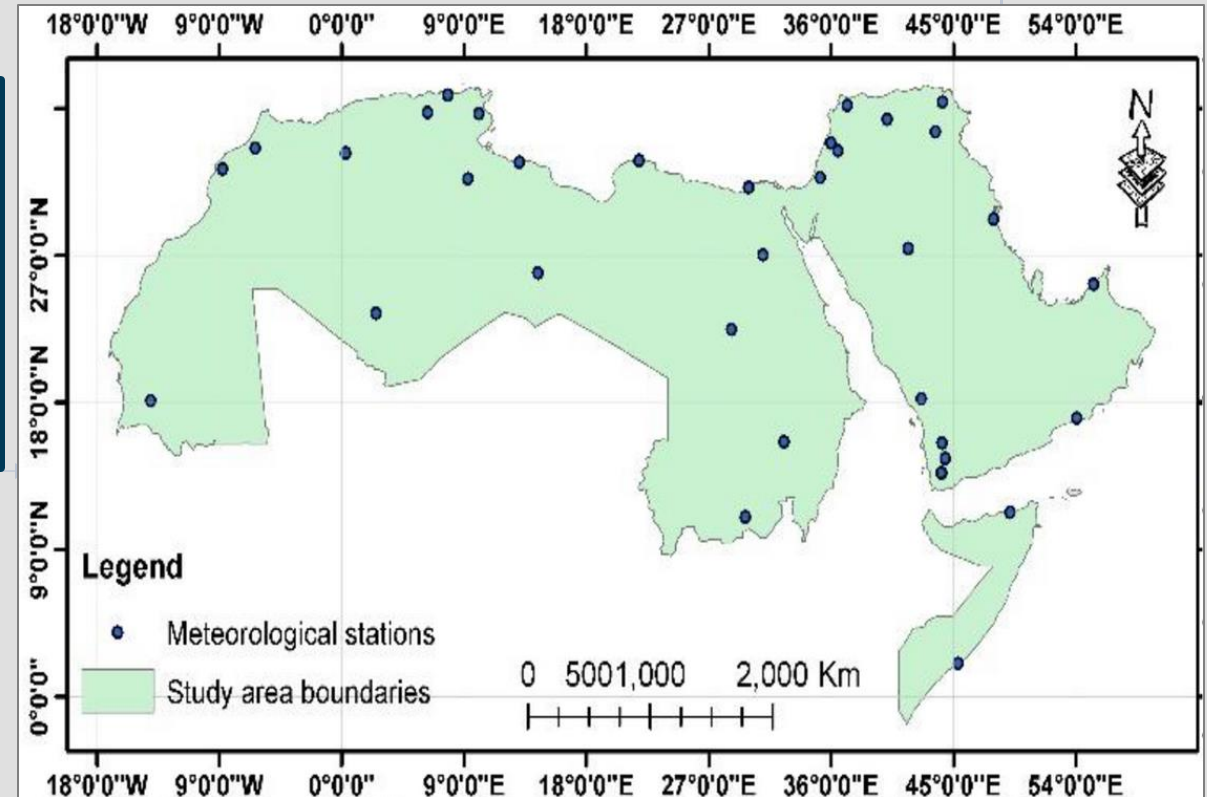
Technically speaking, what are we doing?

Satellite data
(NDVI, DEM, Lat, TB, CWSI)

Ground data

Database

NDVI

CWSI

SARE was proposed as it was developed to work under **Arid/Semi-arid zones, calibrated under the Egyptian conditions** and **validated at regional scale.**
https://link.springer.com/article/10.1007/s41748-022-00320-2

ETa

Actual yield

Crop yield response

Legend

• Meteorological stations

Study area boundaries

0   500 1,000   2,000 Km

On a parallel note –
Policy Traceability Matrix Analysis

Policy Traceability Matrix analysis aims to discuss the **potential of integrating remote sensing** models as a **tool for policy implementation, management, and analysis**, focusing on the Egyptian context.

A **policy framework analysis** approach is presented to **identify the gaps and obstacles hindering** the development of this potential and the achievement of outcomes.

Identifying requirements of EA

Existing policy frameworks analysis

Policy Highlights and recommendations

Why a Policy Traceability Matrix Analysis Tangible Examples

Restricting high water consumption crops: Modifying the cropping pattern policies

From early 90's to 2000, The Egyptian Government:
- Adopted serious programs to develop and distribute certified high yielding rice resistant seeds
- Promoted cultivati
- Adopted a free ma

areas cultivated wi

Up to 583 thousan
1994-1996

In 2021:
To address the problem of limited irrigation water, the new policy defined rice cultivated areas and banned exports.

The developed solution will allow to map ETa and thus the actual water consumption of the cultivated crops. Knowing its ability to distinguish rice cultivations, if coupled with water supply data, it enables to estimate the irrigation efficiency at regional scale and to evaluate the impact of introducing low water consumption rice varieties or innovative irrigation practices.
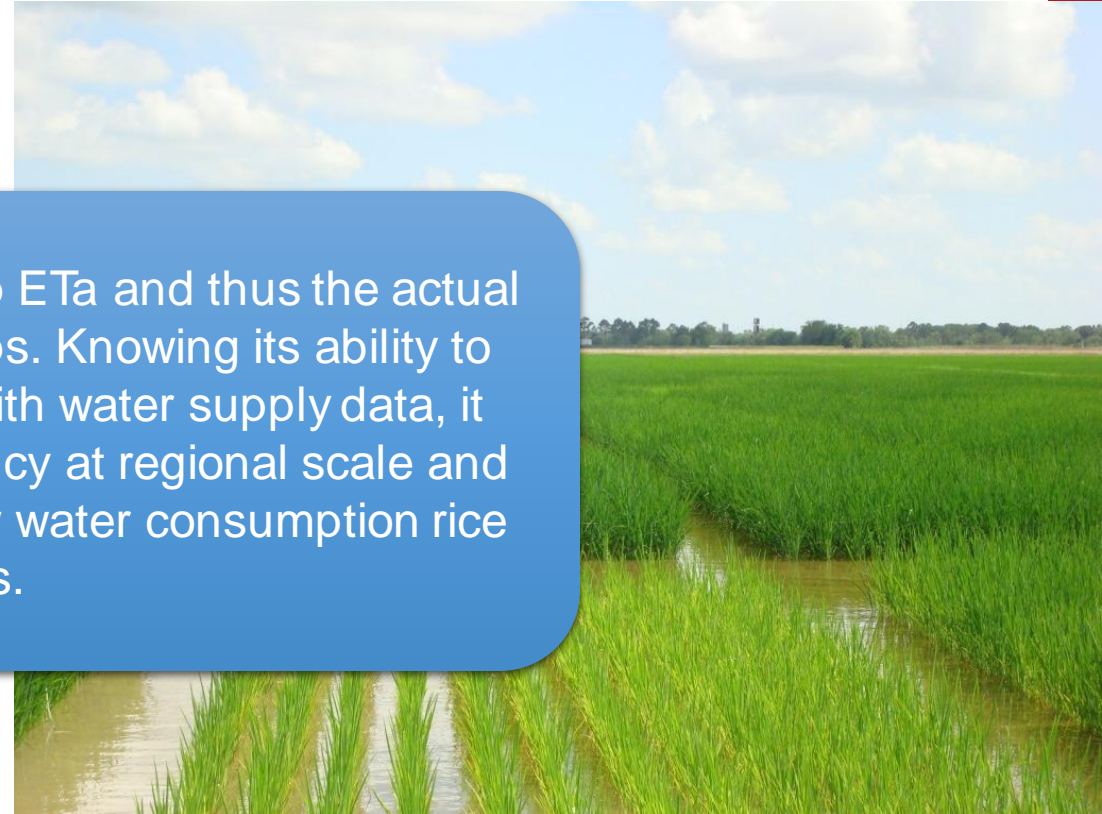
Where are we applying our proposed solution?
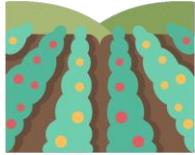
An area of **13.800 hectares.**
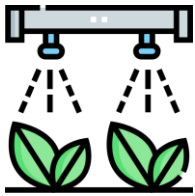
120 irrigation pivots.

Annual water consumption of **140 million m³.**

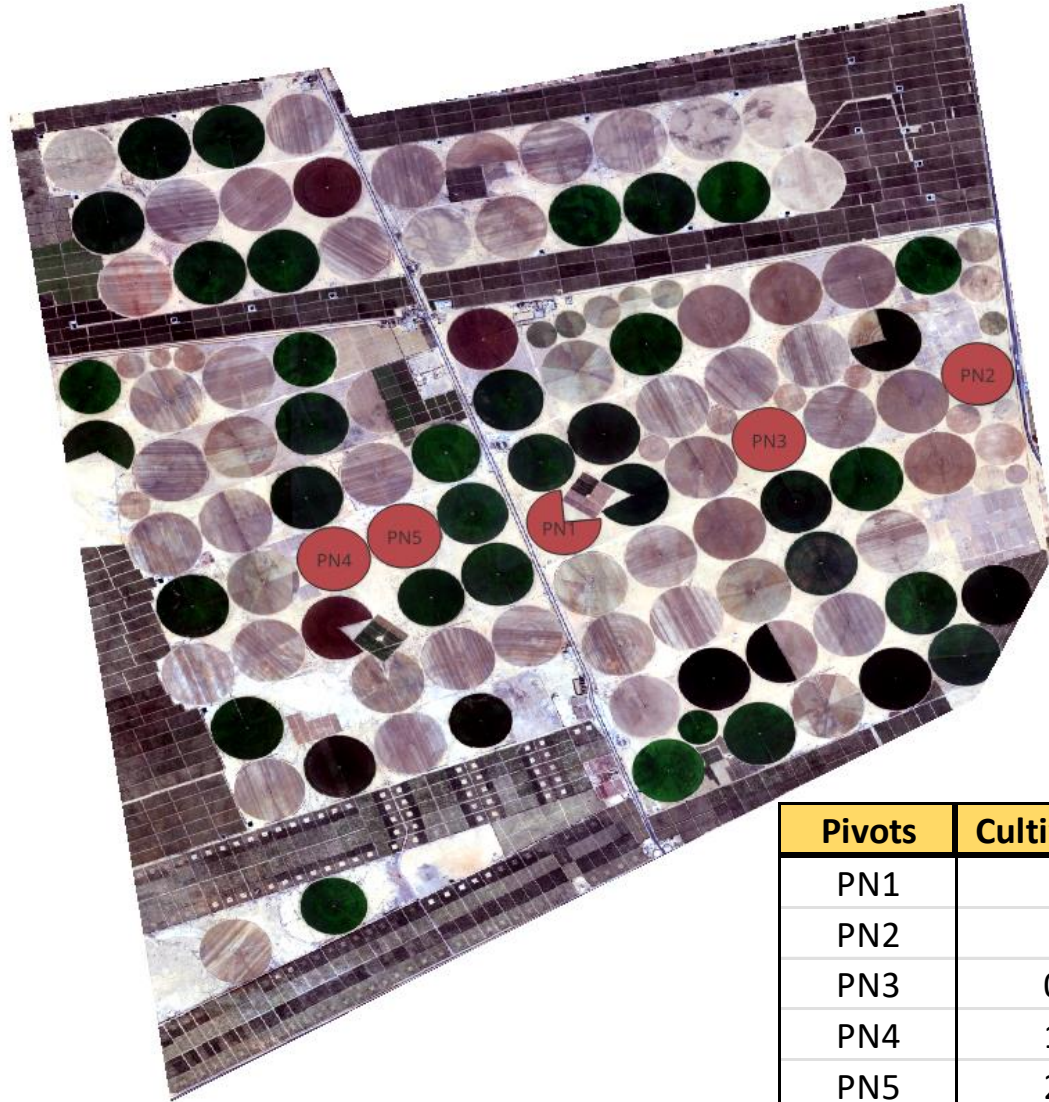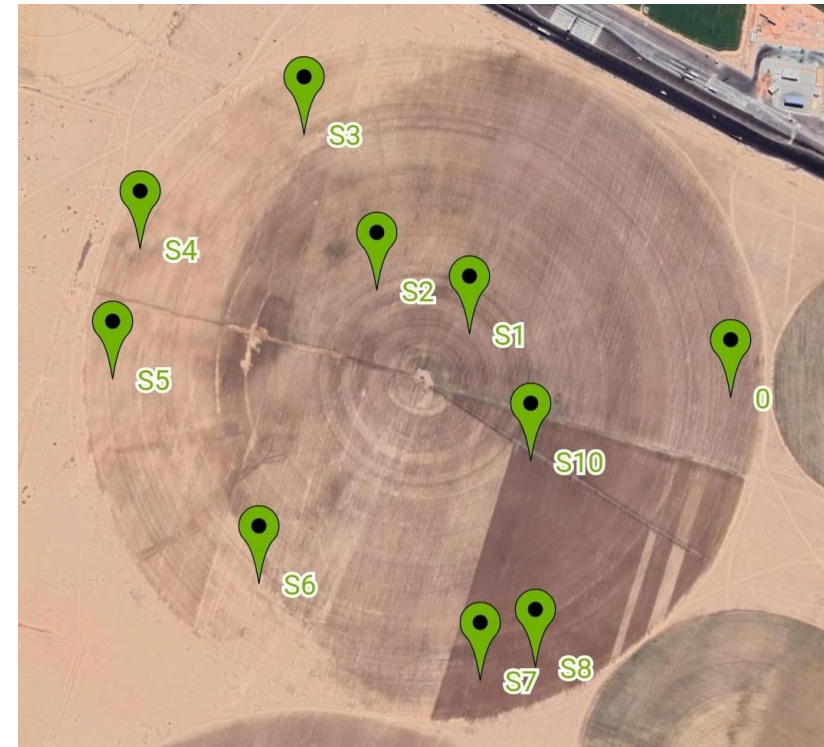**Wheat** and **peanuts** are of the main crops cultivated in the area.

Vegetation cover 2021

Where are we applying our proposed solution?
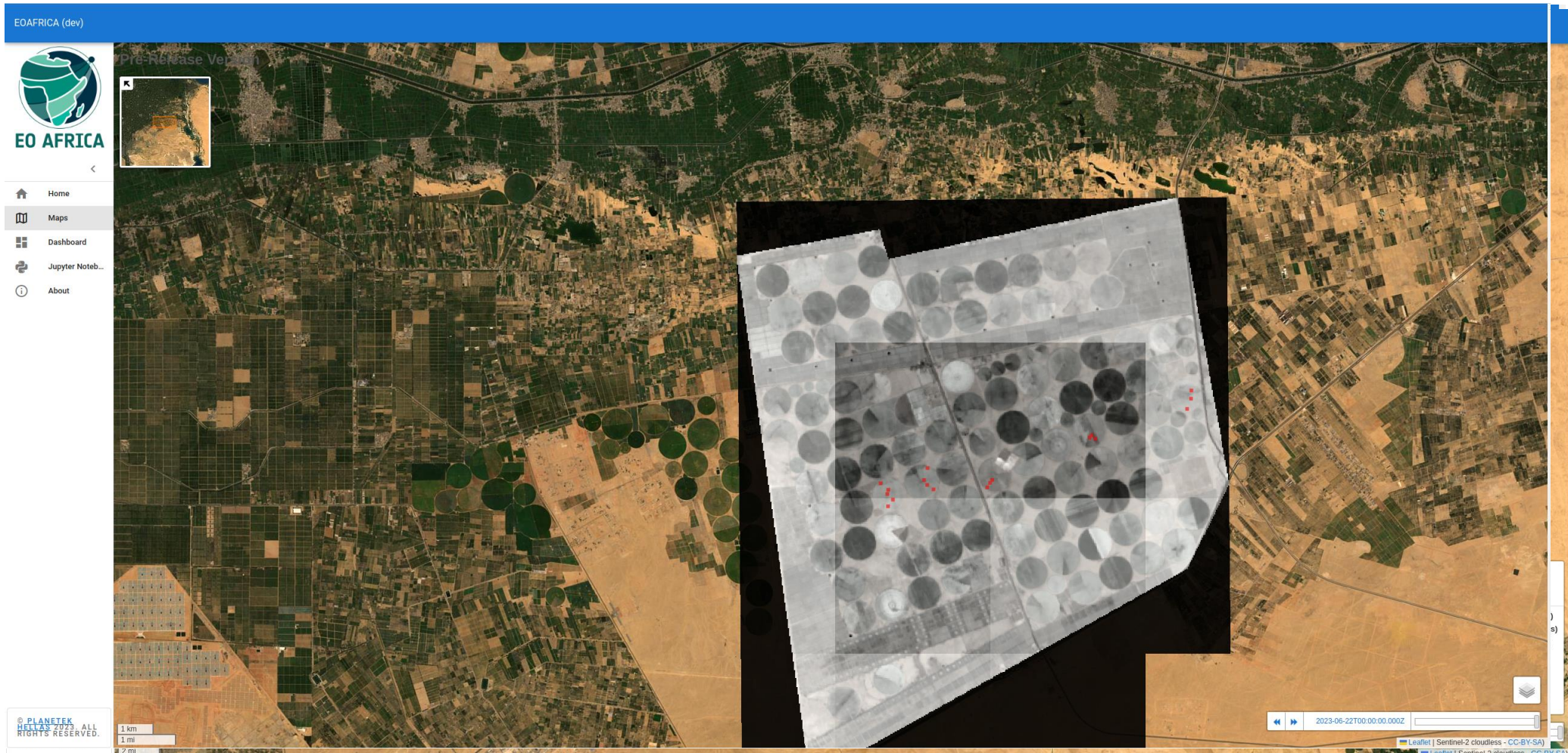
Field measurements (First season - peanuts)

Pivots	Cultivation date
PN1	28-Apr
PN2	30-Apr
PN3	05-May
PN4	15-May
PN5	29-May

Measurement points distribution in PN2.

+ Weather data

Pre-released version of the web platform

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Thank you for your attention