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

Agricultural water demand
70 – 80%

Water scarcity

sparse in-situ monitoring networks

Missing cooperation

RS provides a great opportunity for continuous and near-real time for a comprehensive monitoring of crop, soil, water
Technically speaking, what are we doing?

**SARE** was proposed as it was developed to work under **Arid/Semi-arid zones**, calibrated under the **Egyptian conditions** and validated at **regional scale**.

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
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 cultivation area extension and technology transfer
- Adopted a free market policy

From 1994 to 1996, the cultivated rice areas reached up to 583 thousand hectares (1.4 million feddans).

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

<table>
<thead>
<tr>
<th>Pivots</th>
<th>Cultivation date</th>
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<tbody>
<tr>
<td>PN1</td>
<td>28-Apr</td>
</tr>
<tr>
<td>PN2</td>
<td>30-Apr</td>
</tr>
<tr>
<td>PN3</td>
<td>05-May</td>
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<tr>
<td>PN4</td>
<td>15-May</td>
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<tr>
<td>PN5</td>
<td>29-May</td>
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</tbody>
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Measurement points distribution in PN2.

+ Weather data
Pre-released version of the web platform
Thank you for your attention

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