EO MAJI
EO AFRICA EXPLORERS

POLICY TRACEABILITY MATRIX ANALYSIS

V1

Date: 27 April 2023

Contract No.

4000139395/22/I-DT

Submitted by

CSIC
Consejo Superior de Investigaciones Científicas

In Cooperation with:

DHI

UNIVERSITY OF LEICESTER

esa

DOCUMENT RELEASE SHEET

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Distribution:	ESA and partners	

CHANGE RECORD

Version	*Date*	*Page(s)*	*Change record*	*Release*
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1 Introduction

1.1 Project objective

This project aims to implement a prototype for irrigation mapping and crop yield estimation using inputs from the scientific ECOSTRESS and PRISMA missions. The final aim is to develop workflows, in collaboration with the African Early Adopters and EO partner(s), that support African irrigation and food security management, as well as transferring these R&D learning and results to African end-users and stakeholders. More specifically the project objectives in this project can overall be listed as:

- Exploration of the capabilities for future operational Copernicus missions (LSTM+CHIME) to estimate ET and crop water stress.
- Investigate the potential of PRISMA hyperspectral observations and thermal-based crop stress metrics to improve crop yield/biomass estimations to support agricultural monitoring
- Complement the ET retrievals with crop yield, in order to acquire a better understanding of water use efficiency (WUE) of cultivated landscapes.
- Direct involvement of African Early Adopters, in order to secure the usefulness and applicability of the prototype.
- Publish the findings in a freely available code repository and as scientifically peer-reviewed papers, as well as to promote the codes through other outreach activities such as development of digital notebooks.

All activities are to be carried out within the duration of the project lifetime from 1 December 2022 to 30 November 2024.

1.2 Scope of Document

This document presents the first Policy Traceability Matrix (PTM) analysis for the project “EO MAJI – EO Africa Explorers” (ESA AO/1-11038/21/I-DT). The first version should be seem as the start of a living document that will be updated as new policies and requirements become available. This document forms the Deliverable 4 described in [REF-1].

1.3 Reference documents

REF-1	Statement of Work: ESA-EOP-SD-SOW-0250 – EO AFRICA EXPLORERS
REF-2	EO MAJI proposal dated 18/02/2022
REF-3	Clarification request from ESA dated 06/06/2022
REF-4	Response to clarification dated 22/06/2022
REF-5	Contract No. 4000139395/22/I-DT

1 Policy Traceability Matrix

Here we detail main policy frameworks for Africa relevant to the crop focus of the project. The main information and products are included, as are some key stakeholders, and we also highlight were our products could have an impact.

Societal needs	**Policy framework**	**Information and products**	**Key requirements**	**EO product requirements**
Food security	Comprehensive Africa Agriculture Development Programme (CAADP)	Rainfall Crop yield, production, distribution Soil and land suitability	Monitoring of water requirements at irrigation system / field scale Crop yield optimization at field scale Soil management at field and regional scales	ET at field/farm scale covering African agricultural areas Crop yield product for each crop type for African agricultural systems Land surface emissivity at field/farm scale covering African agricultural areas
Water resources	African Water Vision 2025	Hydrography Aquifers and water bodies Water quality and waste water	Monitoring of water use at irrigation system / field scale Monitoring of water use at ground water reservoir and irrigation system / field scale Integrated water resources management at field scale	ET at catchment, ground water reservoir and irrigation system / field scale covering African agricultural areas Lake surface water temperature retrievals
Environment	NEPAD Environment Action Plan	Ecosystems and biodiversity Vegetation and land cover	Ecosystem health monitoring Land use monitoring at regional and local scales	Land surface temperature maps ET for different land cover types Vegetation health indices from thermal and optical data Vegetation indices (e.g. NDVI)
Weather and climate	Climate for Development in Africa (ClimDev Africa) and the Integrated African Strategy on Meteorology	Rainfall, temperature, wind, and aerosol Climate trends and extremes	Meteorological data acquisitions Monitor climate change trends and extremes	In situ meteorological observations and reanalysis data Land surface temperature maps
Security and	Africa Regional	Risk and vulnerability	Urban heat island	Temperature

disaster response	Strategy on Disaster Risk Reduction and the Convention on Cyber Security and Personal Data Protection	data	monitoring Temperature hot-spot monitoring Monitoring of water / moisture content and dry biomass accumulation	differences at city block scale covering African urbanized areas Land surface temperature at hot-spot scale ET for different land cover types
Health planning	Africa Health Strategy	Disease vectors Environmental factors Population distribution	Monitoring and modelling of disease vectors Monitoring of land and water bodies temperature	Land surface temperature and water surface temperature at landscape feature scale
Innovation	Science, Technology and Innovation Strategy for Africa (STISA)	Food security Disease prevention Communications and security	Monitoring of water requirements at irrigation system / field scale Crop yield optimization at field scale Monitoring and modelling of disease vectors	ET at field/farm scale covering African agricultural areas Crop yield product for each crop type for African agricultural systems Land surface temperature and water surface temperature at landscape feature scale
Sustainable development	UN Sustainable Development Goals	Water use efficiency and management Sustainable food production Improve quality of water and water-related ecosystems	Integrated water resources management at catchment, ground water reservoir and irrigation system / field scale Crop yield optimization at field scale Water body temperature monitoring	ET at catchment, ground water reservoir and irrigation system / field scale covering African agricultural areas Crop yield product for each crop type for African agricultural systems Lake surface water temperature retrievals
Environment	UN Convention to Combat Desertification	Drought monitoring and water security Land degradation – erosion and salinization	Integrated water resources management at regional scale and catchment scale Monitoring of water use	ET at field/farm scale covering African agricultural areas Crop yield product for each crop type for

		Soil carbon storage	at irrigation system / field scale scales. Crop yield optimization Soil management at field and regional scales	African agricultural systems Land surface emissivity at field/farm scale covering African agricultural areas
Climate	UN Framework Convention on Climate Change	Risk management and climate change adaptation	Crop water stress at field/farm scale Assess climate change risk	ET at field/farm scale covering African agricultural areas Ancillary information for crop stress retrieval