**EO MAJI**

**EO Africa explorers**

**Policy Traceability Matrix analysis**

V1.1

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Contract No.

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**Document Release Sheet**

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# Introduction

## 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.

## 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].

## Reference documents

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| --- | --- |
| 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 |

# 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.

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| **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 disaster response | Africa Regional Strategy on Disaster Risk Reduction and the Convention on Cyber Security and Personal Data Protection | Risk and vulnerability data | Urban heat island monitoring  Temperature hot-spot monitoring  Monitoring of water / moisture content and dry biomass accumulation | Temperature 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  Soil carbon storage | Integrated water resources management at regional scale and catchment scale  Monitoring of water use at irrigation system / field scale scales.  Crop yield optimization  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 |
| 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 |
| Water Resources | National Water Policy of Burkina Faso (Politique Nationale de l'Eau du Burkina Faso) | Ensuring equitable and sustainable access to water resources for all users  Promoting the sustainable use of water resources for economic development  Protecting water-related ecosystems, such as wetlands, rivers, and lakes  Improving the efficiency and effectiveness of water resources management | Managing existing irrigation schemes with better insight and monitoring methods  Supporting farmer associations by capacity building | ET at field/farm scale covering Burkina Faso region of interest  Crop yield product for each crop type for Burkina Faso region of interest |
| Water Resources | Botswana National Water Master Plan | Management and development of the country's water resources, including surface water, groundwater, and water-related ecosystems  Balancing competing demands for water resources  Long-term sustainability of these resources for future generations | Support development of irrigation licensing schemes  Map irrigated areas outside the irrigation schemes | ET at field/farm scale covering Botswana region of interest  Crop yield product for each crop type for Botswana region of interest |
| Water Resources | National Water Act, South Africa | Sustainable management of South Africa's water resources | Co-development of algorithms and product evaluation  Improve water crop-yield efficiency for better resolution, especially for dryer years | ET at field/farm scale covering South Africa region of interest  Crop yield product for each crop type for South Africa region of interest |