



ESA EO AFRICA R&D Facility, in collaboration with the African Union Commission (AUC), announces:

Call for Research Proposals 2022-2023

Related to the themes EO for managing water scarcity and safeguarding food security in Africa

Introduction

[EO AFRICA](#) stands for African Framework for Research, Innovation, Communities and Applications to foster an African-European R&D partnership facilitating the sustainable adoption of Earth Observation and related space technologies in Africa. The ESA initiative has a long-term (>10 years) vision with an African user-driven approach in a collaborative partnership with the [African Union Commission \(AUC\)](#) and its operational [GMES & Africa](#) initiative, taking into account requirements and capacities from African regional centres and programmes.

[EO AFRICA R&D Facility](#) is the flagship of ESA EO AFRICA with overarching goals of enabling an active research community and promoting creative innovation processes for the continuous development of African EO capabilities. The Facility offers a cloud computing infrastructure for the researchers ([Innovation Lab](#)), supports African–European research tandems, and delivers a range of collaborative capacity development activities ([Space Academy](#)) and initiatives between the African and European research communities based on a [comprehensive review](#) of African EO research challenges.

Objective

In collaboration with the AUC, the ESA EO AFRICA R&D Facility launches a call for research proposals to support African–European collaborative efforts to develop innovative, open-source EO algorithms and applications adapted to African solutions to African challenges by leveraging cutting-edge cloud-based data access and computing infrastructure. This is the second and final call of the first phase of the EO AFRICA R&D Facility. More information on the [first call and awarded research projects](#) are available on the [web portal](#).

Call for Research Proposals

The ESA EO AFRICA R&D Facility, in collaboration with AUC, will support up to **16 (sixteen)** research proposals for one-year projects, as follows:

Research Topics

Water scarcity and food security are the main themes of the EO AFRICA R&D Facility's Research Calls. The present call aims at addressing research topics related to the **modelling and monitoring of environmental processes**. Proposals in the following topics are encouraged to apply:

- EO contribution to hydrological forecast
 - Runoff and river discharge
 - Regional evapotranspiration and hydrological stresses
- Irrigation demand
- Crop development and yield forecast
- EO support of precision farming
- Forest and rangeland processes
- Ocean/coastal processes related to food resources



Application Criteria

Project proposals shall meet the following criteria:

- The project must be proposed by **two scientists representing a collaborative partnership of one African and one European research entity** (e.g., institute, laboratory, university). The co-principal investigators should possess a PhD degree relevant to the topics of the call or be in the process of obtaining it as a PhD candidate.
- Project teams may include more researchers.
- Projects should be completed within **12 months**.
- Project proposals should **focus on one or more of the research topics** of the call.
- Each proposal is expected to have a research plan for the scientific cooperation of the African and European partners to develop an **innovative EO algorithm or workflow, preferably as an open-source interactive notebook** (e.g., Jupyter Notebook).
- The proposal should explain how the work will be shared among the partners, including the roles of project team members and their expected contributions.
- The proposed research can be linked to an ongoing (collaborative) project of the partners. Therefore, the proposal can present activities that would aim to expand further ongoing research work.
- Research plan should be accompanied by a detailed budget, including anticipated cost items related to the research project.
- Proposed budget cannot include ICT resources for computing purposes (e.g., servers), as such resources will be provided by the [Network of Resources](#) of the ESA separately.
- Both partners have equal rights on the budget, so its allocation must be decided in a full agreement. Nevertheless, due to the governing regulations, the European partner should administer the budget.
- The **Innovation Lab** of the EO AFRICA R&D Facility **should be used for the development** of the algorithm/workflow, as well as other analyses and computations. Commercial use of the resources is not allowed.
- The developed algorithm/workflow **should utilise EO data from ESA missions**, such as Sentinel. Third-party data can also be utilised. The use of analysis-ready data and EO data services is encouraged.
- The developed algorithm/workflow and its application in the thematic context of the call **shall be published** at least in one international conference proceeding or in a peer-reviewed journal. Open-access publications are encouraged and will be supported by the Facility from an additional fund. Thus open-access publication costs should not be included in the budget.

Funding and Benefits

The EO AFRICA R&D Facility will provide the selected projects with:

- A budget of up to **25,000 EUR** to cover research activities during the project period (max. 12 months), such as personnel costs, fieldwork, data collection, bilateral visits, scientific meetings, training activities, etc.
- **Free access** to cloud-based Virtual Research Environments (VREs) through the [Innovation Lab](#) of the Facility, an **interactive geospatial computing platform** with ready-to-use **EO software**, and facilitated access to **EO data** (e.g., Sentinel and other ESA missions) through the host [DIAS infrastructure](#). See



- Appendix for more information on VREs.
- Dedicated **user and technical support** for using VREs and developing geospatial computing workflows.
- **Scientific support and advice** by senior researchers and experts of the EO AFRICA R&D Facility [consortium](#).
- **Access** to the [EO AFRICA Space Academy](#) and its Digital Campus for capacity and knowledge development activities, such as **online courses, webinars, and face-to-face training events** on topics related to EO, cloud computing, food security, and water scarcity.
- Integration into the **EO AFRICA Network** for international scientific networking, collaboration, and visibility.

Proposal Submission

The call is announced on **20 September 2022** and will be open for submission for **8 (eight) weeks**. The deadline for submitting a full proposal is **15 November 2022, 18:00 CET**.

The proposal submission shall include:

- Research proposal fully completed in all parts according to the provided template ([English](#) or [French](#)), duly signed by the African and the European Co-PIs and authorised representatives of the African and European research institutions,
- Detailed CV of the African co-principal investigator,
- Detailed CV of the European co-principal investigator,
- Short resumes of other researchers in the team.

The following items are optional and will be considered assets:

- Support letter(s) from the beneficiaries,
- Any other relevant document.

Proposals shall be submitted as a single PDF document with all supportive documents (e.g., CVs, support letters) to ESA through the EO AFRICA R&D Facility via e-mail to: proposals@eoafrika-rd.org.

Expected Deliverables

Deliverable	Deadline
Progress report	KO + 6 months
Final report	KO + 12 months
Open-source research code repository	KO + 12 months
Open-access peer-reviewed scientific publication (draft or submitted)	KO + 12 months

Evaluation

An expert committee will evaluate proposals with members delegated by ESA, AUC, and EO AFRICA R&D Facility. The following criteria will be considered:

- Level of innovation of the EO application with relevance to the topics of the call
- Addressing the specific needs in Africa
- Scientific soundness and maturity
- Making innovative use of digital tools
- Impact for fostering the use of EO data and services in Africa
- Balanced cooperation of the partners
- Background of the African and European co-principal investigators
- Geographic representation of Africa



The applicants of the selected projects will be informed by e-mail in **January 2023**.

The scientific content and the budget distribution for each selected project will be finalised in agreement with the EO AFRICA R&D Facility. After authorisation by ESA, a tri-lateral collaboration agreement will be signed between the EO AFRICA R&D Facility and the African and European institutions of each selected project. The applicants are encouraged to review the [example collaboration agreement](#) before submission of their proposals to prevent any potential conflict at a later stage.

The list of awarded projects will be published on the [EO AFRICA R&D website](#) in **February 2023**.

Relevant Links

EO AFRICA website: <https://eo4society.esa.int/eo-africa/>

EO AFRICA R&D website: <https://eoafrika-rd.org/>

EO AFRICA R&D research projects: <https://eoafrika-rd.org/research/eo-africa-rd-research-projects/>

Important Dates

Announcement of the Research Call	20 September 2022
Submission Deadline for Research Proposals	15 November 2022, 18:00 CET
Communication to the Applicants of the Selected Projects	January 2023
Announcement of the Awarded Projects	February 2023

Contact

Any questions relating to the call should be sent by e-mail to proposals@eoafrika-rd.org **no later than 2 (two) working days** before the submission deadline.



Appendix

Virtual Research Environments (VREs)

Each research team will have access to one or more VREs with the following features:

- 4 vCPU with Intel x86-64 architecture
- 32 GB RAM
- 100 GB SSD local storage for temporary storage
- SSD network storage for permanent storage (min. 1 TB)
- Direct network access to EO Data available on the [host DIAS platform](#).
- JupyterLab interface with terminal and remote desktop access
- Pre-installed scientific computing, EO data analysis, and machine learning packages for accessing EO data services, developing EO algorithms and workflows, and visualising results in interactive notebooks (e.g., Python and R packages)
- Pre-installed scientific and EO desktop software for pre-processing and other needs (e.g., SNAP, QGIS, Visual Code, RStudio, etc.)

GPU-enabled VREs with the following features will be available for specific needs, which are explicitly indicated in the proposal and quantified in terms of hours necessary:

- 12 vCPU with Intel x86-64 architecture
- 117 GB RAM
- 128 GB SSD local storage for temporary storage
- SSD network storage for permanent storage (min. 1 TB)
- Direct network access to EO Data available on the [host DIAS platform](#).
- JupyterLab interface with terminal and remote desktop access
- Pre-installed scientific computing, EO data analysis, and machine learning packages for accessing EO data services, developing GPU-accelerated EO algorithms and workflows, and visualising results in interactive notebooks (e.g., Python and R packages)
- Pre-installed scientific and EO desktop software for pre-processing and other needs (e.g., SNAP, QGIS, Visual Code, RStudio, etc.)