

# REQUEST FOR ADDITIONAL RESOURCES IN THE CURRENT YEAR FOR AN EXISTING SPECIAL PROJECT

Please email the completed form to [special\\_projects@ecmwf.int](mailto:special_projects@ecmwf.int).

**MEMBER STATE:** .....Netherlands.....

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 .....

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**Project title:** Land Management for Climate Mitigation and Adaptation (LAMA CLIMA)

**Project account:** SP\_NLCOUM \_ \_ \_ \_ \_

| Additional computer resources requested for | 2023    |
|---|---------|
| High Performance Computing Facility (units) | 82 MSBU |
| Data storage capacity (total) (Gbytes)      |         |

*Continue overleaf*

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<sup>1</sup> The Principal Investigator is the contact person for this Special Project

## Technical reasons and scientific justifications why additional resources are needed

VU Amsterdam is partner in the new JPI-Climate/AXIS funded project LAMACLIMA (<https://climateanalytics.org/projects/lamaclima/>) that aims at advancing the scientific and public understanding of the coupled climate effects of land cover and land management (LCLM) options. The project aims at elaborating sustainable land-based adaptation and mitigation measures.

### Planned Simulations

In the year 2023 the WP4 simulations of the project LAMACLIMA will take place. In WP4, EC-Earth3-CC will use the land-use scenario data as input to simulate the implications on climate and the carbon cycle. A setup parallel to the CMIP6 emission-driven SSP simulations as used e.g. in C4MIP and LUMIP will be applied. This includes the full climate and carbon cycle implications by coupling land, atmosphere, and ocean, representing interactions between LCLM-altered climate and LCLM biogeophysical and carbon cycle effects. Different from the idealised simulations of WP1, the climate/carbon cycle implications are transient 21-century projections for a LCLM scenario that is optimised for mitigation, adaptation, and socioeconomic benefits. EC-Earth3-CC will also perform an ensemble of three simulations to account for uncertainties related to climate variability.

### Scenario Design

We will perform the following four scenario simulations:

1. Historical control (histCTL)
2. Future control (futCTL)
3. Future Sustainability (futSust)
4. Future Inequality (futIneq)

All simulations within WP4 are defined as emission-driven scenario simulations

1. Historical Control (histCTL)

Simulation period: Total simulation period from year 1980 to 2014

5 years spin-up (1980 to 1984)

30 years (1985 to 2014) time span for analysis

Branch off from three CMIP6 historical emission-driven runs (esm-hist) with initial conditions from the year 1979 in order to generate an ensemble of three model runs.

Constant present day (2014) land-use and land cover (cLULC2014) implemented as an abrupt change during the year 1980

2. Future control (futCTL)

Simulation period from year 2015 to 2100

Branch off from the three ensemble simulations of the histCTL scenario

Constant present day (2014) land-use and land cover (cLULC2014) as in histCTL

Prescribed anthropogenic forcing according to SSP1-19 projections

3. Future sustainability (futSust)

Simulation period from year 2015 to 2100

Branch off from the three ensemble simulations of the histCTL scenario

Global sustainability land-use and land cover scenarios from MAgPIE simulation converted to LUH2-style data. Prescribed anthropogenic forcing according to SSP1-19 projections

#### 4. Future inequality (futIneq)

As in futSust except for:

Global inequality land-use and land cover scenarios from MAgPIE simulation  
454245/5

#### **Computational SBU required**

A 5 years test run with the required and optimized setting used 454245 SBU. This translated to a 90.85 KSBU per year. The setup of the WP4 requires overall 879 simulation years. This is in total about 80 MSBU to complete all the simulations for the year 2023. In the previous requests we did not include the year 2023 because the initial ending of the project LAMACLIMA was planned for the year 2022. The project is now extended for one more year, and therefore we have the chance to realize WP4 simulations.