List of minimum requirements for the deployment of MOSAICC

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Human resources

A working group is constituted at the initial stage of the deployment to organize the deployment and the trainings as well as to manage and to coordinate the utilization of MOSAICC. The working group will serve as a platform for concertation to elaborate integrated climate change impact studies with regard to the needs and constraints of each component (Climate, Hydrology, Crops and Economy), as well as the needs from end-users (decision-makers, adaptation practitioners etc). This includes the post simulation analyses necessary to provide the users with relevant information. The working group gathers experts from the institutions involved in the project. It should include at least one IT specialist, one climatologist (or meteorologist), one agronomist, one hydrologist and one economist. Their roles and skills are described further below.

IT specialist (system administrator)

Role:	The IT specialist will help out with the installation of the system in the host institution and be in charge of the maintenance of the system (server, database, software, interfaces). The IT specialist will come from the host institution.
Background:	Experience with hardware/software system administration (see document on module integration requirements and skills for complete description)
Others:	The IT specialist will come from the host institution. Training will be provided for the maintenance of the system.

Climatologist

Role:	The climatologist will run the climate data processing tools (downscaling, interpolation) to provide the other modellers (hydrologist, agronomist and economist) with relevant climate data. The climatologist will advise other modellers on the choice of GCM, SRES scenarios, spatial resolution and time horizons among others for the elaboration of integrated impact studies on agriculture
Background:	Degree in climatology, meteorology, or related fields Experience with climate change impacts studies, statistical downscaling, data interpolation methods, GIS Good knowledge of the national climate and basic knowledge in agriculture and hydrology
Other:	Training will be provided to run the climate data processing tools

Agronomist

Role:	The agronomist will perform crop simulations to produce crop yield projections based on the climate data available in the database. These crop projections will be made available for economic modelling, upon concertation with the economist.

Background: Degree in agriculture engineering, agrometeorology or related fields
Experience with crop forecasting, statistics, climate change impacts studies, GIS
Good knowledge of the national agriculture and basic knowledge in climatology and hydrology

Other: Training will be provided to run the crop models on data produced by the Climate component and the statistical operations

Hydrologist

Role: The hydrologist will perform hydrological simulations to produce water resources projections based on the climate data available in the database. These water resources projections will be made available for economic modelling, upon concertation with the economist.

Background: Degree in hydraulics engineering, hydrology or related fields
Experience with hydrological modelling (precipitation-runoff models), statistics, climate change impacts studies, GIS
Good knowledge of the regional hydrology and basic knowledge in climatology and agriculture

Other: Training will be provided to run the crop models on data produced by the Climate component and the statistical operations

Economist

Role: The economist will perform economic simulations to assess the impacts of shocks due to the crop yields and water resources projections on the national economies and the effects of potential policy responses. These water resources projections will be made available for economic modelling, upon concertation with the economist.

Background: Degree in economics or related fields
Experience with economic modelling (CGE models), statistics, climate change impacts studies, GIS
Good knowledge of the national economy and basic knowledge in agriculture
Knowledge of Dynare and Octave (Matlab)

Other: Training will be provided to design the CGE model and to upload it and to run it on the server with the data produced by the Hydrology and Crop components

Data

MOSAICC has been designed to limit the exchange of heavy datasets between the clients and the server. However a number of datasets must be provided by the users, mainly historical time series to calibrate the models. These datasets are listed below by components.

Climate

1. GCM data (provided with the system)
2. Daily time series of precipitations, minimum temperature and maximum temperature observations for a period covering at least 30 years and for stations covering the

countries and the neighbouring areas contributing to the hydrology of the country, in ASCII files
3. Digital elevation map (DEM) sufficiently large to the country considered and the upstream areas contributing to the hydrology of the country. The DEM should be free of pits and uploaded in an ArcInfo ASCII format, lon-lat WGS1984 projection. The SRTM DEM 1km can be used as default.
4. Administrative boundaries of the country considered (GAUL) (provided with the system)
5. Optional: observations of crop phenology to validate the growing season onset and length calculations

Hydrology

1. Daily/10-daily/Monthly time series of discharges at various locations of the relevant river networks
2. Dam characteristics: location, capacity, use (amount of water that does not return to the river)
3. Soil map: water holding capacity, should be uploaded in an ArcInfo ASCII format, lon-lat WGS1984 projection (the Harmonised World Soil Database can be used as default)
4. Land use/ land cover map: classes as globcover classification, should be uploaded in an ArcInfo ASCII format, lon-lat WGS1984 projection
5. Various statistics on water allocation, water consumption, irrigation schemes etc. covering the period of baseline simulation to build scenarios on water resources

6. *Generated by the Climate component: mean temperature, potential evapotranspiration and precipitation gridded time series in ArcInfo ASCII format, lon-lat WGS1984 projection*

Crops

1. Crop yield statistics at the lowest administrative level available, for at least 10-15 years, covering the whole region of interest (country or cultivated areas)

   Crops available in AQUACROP: Wheat, Maize, Rice, Sugarbeet, Soybean, Cotton, Potato, Quinoa, Sunflower, Bambara groundnut, Sugarcane, Tomato, Teff, Barley, Sorghum

2. Soil map: shapefile of the country with the following attributes (Curve Number, readily evaporable water from top layer in mm, number of soil horizons, depth in m of restrictive soil layer inhibiting root zone expansion if any plus for each soil horizons, thickness in m, soil water content at saturation, field capacity and wilting point, saturated hydraulic conductivity in mm/day)
3. Optional: cultivated area, in a raster (ArcInfo ASCII format) or vector format (shapefile), lon-lat WGS1984 projection
4. Optional: agro-ecological zones or any layers relevant for crop simulations and spatial aggregation, in a raster (ArcInfo ASCII format) or vector format (shapefile), lon-lat WGS1984 projection

Generated by the Climate component: minimum and maximum temperature, potential evapotranspiration and precipitation gridded time series in ArcInfo ASCII format, lon-lat WGS1984 projection

Economics

1. Benchmark data: a social accounting matrix (SAM) with the relevant level of aggregation for the experiments wanted, for the country and for a recent year
2. Initial values for free coefficients (substitution elasticity between primary factors, substitution elasticity between sales to domestic and export markets, substitution elasticity between demand for imports and domestic production, parameter of the LES function for the private demand for goods)
3. Growth rate for exogenous variables
4. Optional: agro-ecological zones or any layers relevant for economic simulations and spatial aggregation, in a raster (ArcInfo ASCII format) or vector format (shapefile), lon-lat WGS1984 projection

5. *Generated by the Crop component: yield projections for relevant crops, periods of time and administrative units*
6. *(Optional) Generated by the Hydrology component: water resources projections for relevant periods of time and administrative units*

Infrastructure, hardware and software

For more details see the document on module integration requirements and skills.