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# MOSAICC

## DEPLOYMENT

**MOSAICC** is designed to be deployed at the national level in different institutions with relevant data and competencies (Ministries of Agriculture or environment, weather services, research centers, universities etc.). A multidisciplinary working group is set up to manage the system and lead impact assessment projects. Training on system utilization and maintenance can be provided.

## APPLICATIONS

Possible applications include: assessing climate change at the local level; monitoring the impact of climate change on water resources, crops and food security; vulnerability analysis; simulations of policy response in agriculture; etc. The system and interfaces can be readily adapted to meet the needs of end-users.

### OUR PARTNERS:



EC/FAO Programme on "Linking information and decision making to improve food security" (GCP/GLO/243/EC).  
[www.foodsec.org](http://www.foodsec.org)

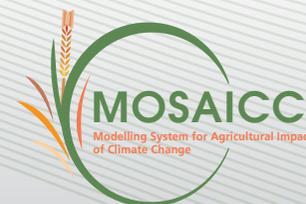
The Modelling System for Agricultural Impacts of Climate Change (MOSAICC) is an integrated package of models for assessing the impact of climate change on agriculture, including the variations in crop yields and their effect on national economies.

MOSAICC has been developed by the Food and Agriculture Organization of the UN in the framework of the EC/FAO Programme on "Linking information and decision making to improve food security".



FAO Modelling System for Agricultural Impacts of Climate Change

[MOSAICC@fao.org](mailto:MOSAICC@fao.org)  
[www.fao.org/climatechange/mosaicc](http://www.fao.org/climatechange/mosaicc)



## FOUR MAIN SYSTEM COMPONENTS

**1 CLIMATE** Supports the preparation of downscaled climate data

**2 HYDROLOGY** Estimates water resources under future climate projections

**3 CROPS** Simulates crop yields under future climate projections and technological progress scenarios

**4 ECONOMY** Evaluates the economic impacts of future crop yields and water resources projections

These components include models and utilities to achieve the successive steps of impact assessment. A set of different user profiles allow users to design studies and manage data flow and production.

## WHY AN INTEGRATED SYSTEM OF MODELS?

The impact of climate change is a growing concern for decision-makers. In agriculture, crop production will be affected by a combination of factors (climatic, physiological, technological, hydrological, economic) with complex interactions between them. In this context, combining different models into a single modelling system offers several advantages:

- Data exchange between models addresses different aspects of the impacts of climate change in a consistent way. In addition, the standardized methods and tools allow users to carry out impact studies in different areas and obtain results that can be compared.
- Data exchange is easier, more efficient and transparent. The processing time necessary for simulations is reduced and information can easily be shared with external users through web interfaces.
- The constitution of an inter-disciplinary working group fosters cooperation between experts.

## SOFTWARE ARCHITECTURE

Models and tools all work on a central server which allows users to communicate through web interfaces. All models are connected to a unique spatial database, which facilitates data exchange. This architecture solves cross platform barriers and enables users to keep track of data flow.

## INTERACTIONS

The study design is carried out by a working group that defines the interactions between each component and the output needed from each model. The working group also interacts with end-users and prepares impact studies tailored to their needs.



## THE MODELS

### STATISTICAL DOWNSCALING PORTAL (SD PORTAL)

Used for downscaling climate data. This tool is an adaptation of the portal developed within the EU ENSEMBLES project.

### AQUACROP

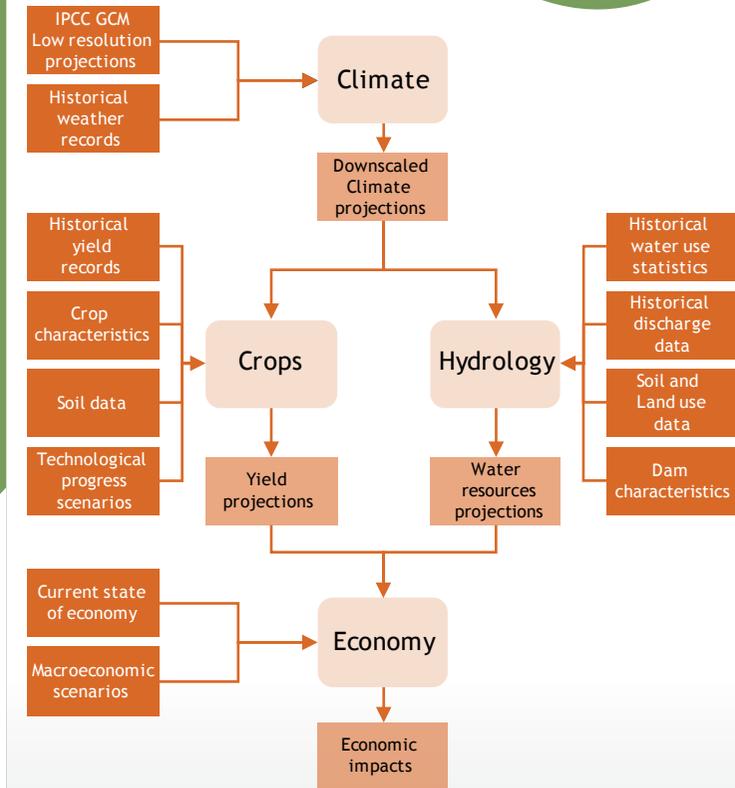
Based on the FAO crop model for estimating crop productivity in relation to water supply and agronomic management. The overall framework is based on plant physiological and soil water budgeting concepts.

### WABAL

A crop specific water balance model derived from AgroMetShell, the FAO crop yield forecasting software.

### STREAM

A grid-based precipitation-runoff model which simulates the discharge rate in large catchment areas.



Data exchange among the four main components of MOSAICC. The dark orange boxes represent the input data and the light orange boxes show output data.

### DYNAMIC CGE MODEL

Designed to model the future evolution of the national economies and how they are affected by variations of crop yields under different climate change projections. Policy response options can also be tested.

### OTHER UTILITIES

These include: data interpolation tools (kriging, AURELHY), reference evapotranspiration, and planting date and growing season length calculation tools.