



MoSAFS

Modelling Pathways for a Sustainable and Agroecological Transition of Food Systems in Africa



OBJECTIVES

The overall objective of MoSAFS is to support public decision making towards the Green Transition in Africa by providing scientific evidence of the potential of up-scaling agroecology with models at different scales, using three different national case-studies in Africa. The specific objectives are:

- To develop scenarios for the sustainable transition of selected countries in Africa;
- To identify data needs and gaps;
- To develop models at different scales (national and farm-level) to assess the implications of different scenarios, both in terms of biophysical and economic terms;
- To engage with stakeholders and policymakers to ensure the uptake of the project's research output;
- To disseminate the results and contribute to the debate on the potential of an agroecological transition of food systems in Africa, at national and continental level.



LOGIC OF INTERVENTION

MoSAFS aims to contribute to the transformation of agri-food systems in Africa towards increased sustainability and resilience by providing evidence-based arguments on the potential of upscaling agroecology to deliver multiple benefits for food security, nutrition, income, health, environmental sustainability, and local development.

Through participatory processes including a wide range of actors, among them policy makers, the project will identify several scenarios of food systems transition including agroecological scenarios at country level in Africa. These scenarios will be tested by using modelling tools to understand to which extent and under which conditions agroecology could help policy makers achieve several objectives at national level: food security, income and job generation, provision of ecosystem services, achievement of national targets such as GHG emissions, preservation of natural resources, etc. The results will be shared, discussed and improved with the actors and with the national policy makers to contrib-

ute to policy decisions on food systems. The results will be also shared within the DeSIRA+ community and with policy-makers at regional and continental levels to help understand the opportunities and constraints when scaling innovations and contributing to food systems transition based on agroecological principles.

Different modelling tools can be mobilised, depending on needs and scenarios:

- **The Agribiom model** is a quantitative tool that analyses world's production, trade, and use of biomass, reconstructing and simulating physical balances between food biomass resources and their use on various geographical scales. It provides a simple and robust framework for retrospective analysis and scenario-building, collecting and generating data to inform new analyses and models, particularly in areas with limited statistical data.

- **The GlobAgri platform** is a database and modelling tool developed to analyse the global agri-food system, generating consistent databases and biomass balance models using FAOStat data and other sources. The model provides a framework for simulating the equilibrium between resources (production, imports, and exports) and utilisation (food, feed, and other uses) for each region and agri-food product, taking into account constraints such as maximum cultivable land area and global trade coherence. The model can simulate land-use change and adjustments in imports, exports, and domestic production in response to changes in food diets, agricultural production systems, and other variables, allowing for the exploration of scenarios and the assessment of the potential impacts of different policies and strategies on the global agri-food system.

- **FSSIM-Dev** (Farm System Simulator for Developing countries) is a comparative, static economic farm-level model. Calibrated using farm household data, it reproduces the behaviour of small-holder farmers taking into account the main characteristics of these farms. It can be used to report on the impacts of agricultural policies, market conditions and adoption of farming practices on a series of economic indicators at farm level, such as crop allocation, production, income, and poverty level.



MAIN INTERVENTIONS/COMPONENTS

The project consists of several components, including:

- Review of existing scenarios through literature review, discussion with stakeholders (participatory workshops) and, if necessary, development of new scenarios for the sustainable transition of food systems in selected countries in Africa: Senegal, Kenya and Mozambique;
- Identification of data needs and gaps for the selected countries to be able to develop models and simulate the relevant scenarios;

- Development of models at different scales to analyse the potential of agroecology versus other scenarios;

- Engagement with stakeholders at all steps of the project to orient the modelling process and ensure the uptake of the project's findings;

- Develop local capacities to use models and analysis scenario results;

- Dissemination of results with stakeholders and policy makers.



STATE OF PLAY OF THE PROJECT

The first phase of the project started in April 2025 and will finish in March 2026. The selection of the three countries for case studies (Senegal, Kenya, and Mozambique) has been achieved, and launch workshops are being organised in the three countries to review existing scenarios, select the most appropriate ones, and identify data gaps. The second phase of the project (modelling, stakeholder engagement, dissemination) will start in April 2026 and last 24 months.



BASIC INFORMATION

Contracting entity: Joint Research Centre (European Commission)

Implementing partners: UN SDSN (UN Sustainable Development Solutions Network), Cirad (Centre de coopération internationale en recherche agronomique pour le développement), and Alliance Biodiversity International-CIAT. Other partners are Kenya, Senegal and Mozambique-based research organisations.

Countries: Senegal, Kenya, Mozambique.

Start: April 2025.

Duration: 3 years.

Funding: The 500,000€ project is funded by the European Union and internal resources from JRC.