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## Joint Research Centre



# Policy impact analysis in Niger using an Individual Farm Level model

Ongoing Capacity Building Activity within PANAP

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# Outline

- Introduction
- Working Group on Agricultural Policies
- Methodology and Scenarios
- Expected results



# Introduction

- The Joint Research Center (JRC) is currently supporting a Working Group of researchers in Niger for the analysis of agricultural policies using FSSIM-Dev
- FSSIM-Dev is an Individual Farm Level model which intends to replicate farmer's behavior and decision
- FSSIM-Dev has been developed to capture the particularities of developing countries:
  - Non-separability of production and consumption decisions
  - Static & non-linear optimization model
  - Heterogeneity of farmers' and farm holdings' characteristics



# Working Group

- Platform of users of FSSIM-Dev in Niger
- Members of the WG from:
  - Ministry of Agriculture and Livestock
  - INRAN – Institut National de la Recherche Agronomique du Niger
  - INS – Institut National de la Statistique
  - CAPEG – Celulle d'Analyse des Politiques Publiques et d'Evaluation de l'Action Gouvernementale
- Several trainings on FSSIM-Dev since March 2017

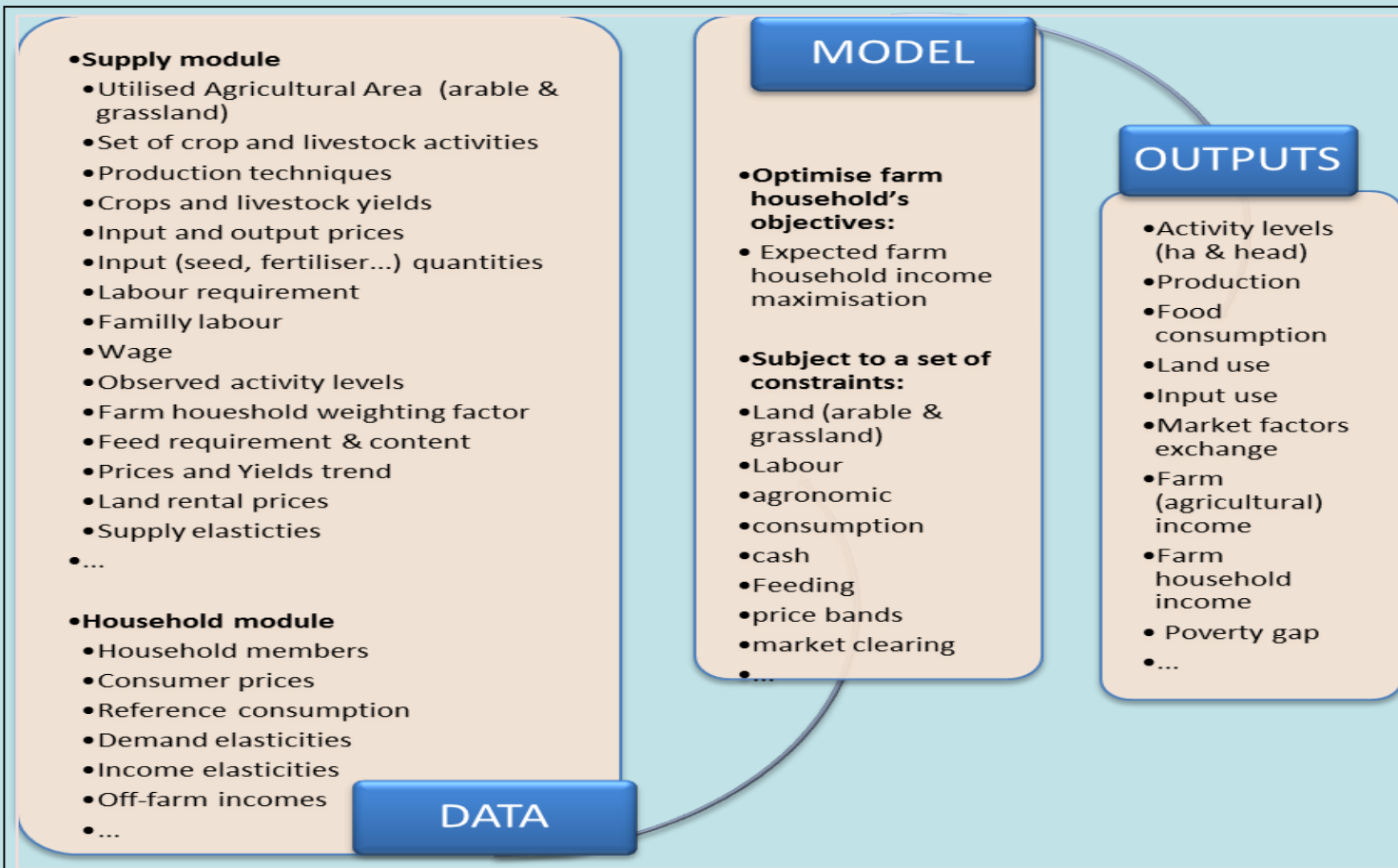


# Objectives of the Working Group

- Analyze the behavior of agricultural production systems, in particular those of (semi) subsistence agricultural households.
- As such, the WG is specifically responsible for simulating scenarios in order to assess and predict the potential effects / impacts of:
  - Agricultural policies and development programs / actions (input subsidies, price or income support policies, public investments, etc.);
  - Adoption of alternative technologies / innovations on the economic performance of agricultural households.



# FSSIM-Dev structure



## FSSIM-Dev Mathematical structure

Maximize Farm HH income  
Subject to:

- Resource constraints
- Consumption (Lineal Expenditure System)
- Price bands

# Scenarios for modelling

- The methodology consists first of listing the priority technologies / innovations in Niger and evaluating them according to certain criteria, namely:
  - Estimated adoption rate
  - Relevance to Niger's agricultural policies
  - Potential impact on production, household income, poverty reduction
  - Ease of implementation of data collection (distance, transport, etc.)
- Data on farmer's practices will come from LSMS-ISA + own data collection if needed for specific technologies





# Scenarios for modelling

- The technologies / innovations selected for modelling are:
  - Improved varieties HPK-mil, Mota Maradi (sorghum), K VX30-309-6G (cowpea), 55-437 (peanuts)
  - Mixed cropping (alternate strip crops)
  - Assisted natural regeneration
  - Rain and moisture recuperation (*demi-lune* & *zai*)
  - Biological recovery of degraded lands
- Implementing the scenarios in FSSIM-Dev will allow to scale up the impacts of technology adoption at national, regional and farm level



# Expected results (mid-2021)

- The modelling of agricultural policies with FSSIM-Dev allows to get insights of impacts on:
  - Crop allocation and production at farm, regional and national level
  - Labor use, worker-equivalent and job creation
  - Input use and agro-environmental proxies
  - Agricultural income for each farm
  - Poverty level for each farm
  - Distributional effects and inequalities at aggregated level
  - Some food security indicators (calories intake)
  - Etc...





# Any questions?

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