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Sixth Framework Programme
Global Change and Ecosystems

Assessing impacts of EU agri-environmental policies and technical innovations on agricultural systems sustainability:

how to translate policy questions into SEAMLESS-IF compatible scenarios?

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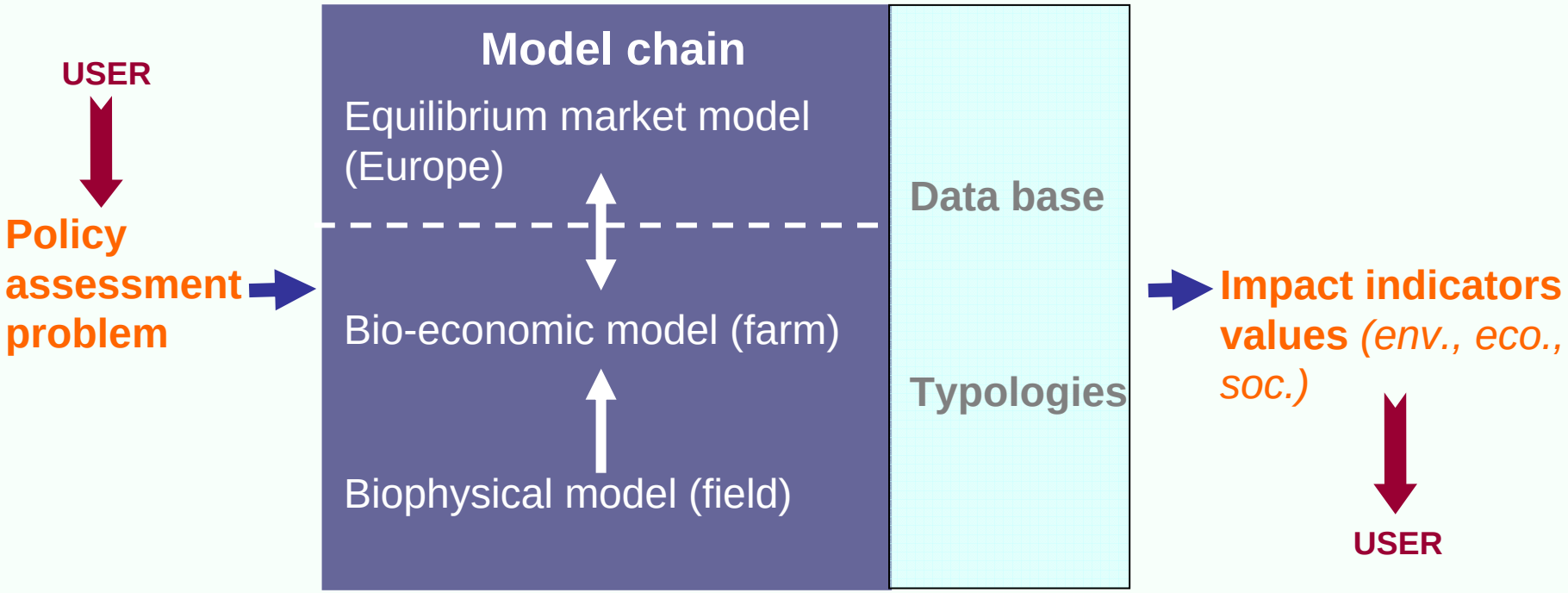
Outline

- The SEAMLESS-Integrated Framework
- The SEAMLESS scenario concepts
- The overall procedure to build and assess scenarios with S-IF
- The specific procedure to translate policy questions into SEAMLESS scenarios
- Some outcomes of the tests of the translation procedure

SEAMLESS-Integrated Framework

A generic, flexible and modular structure



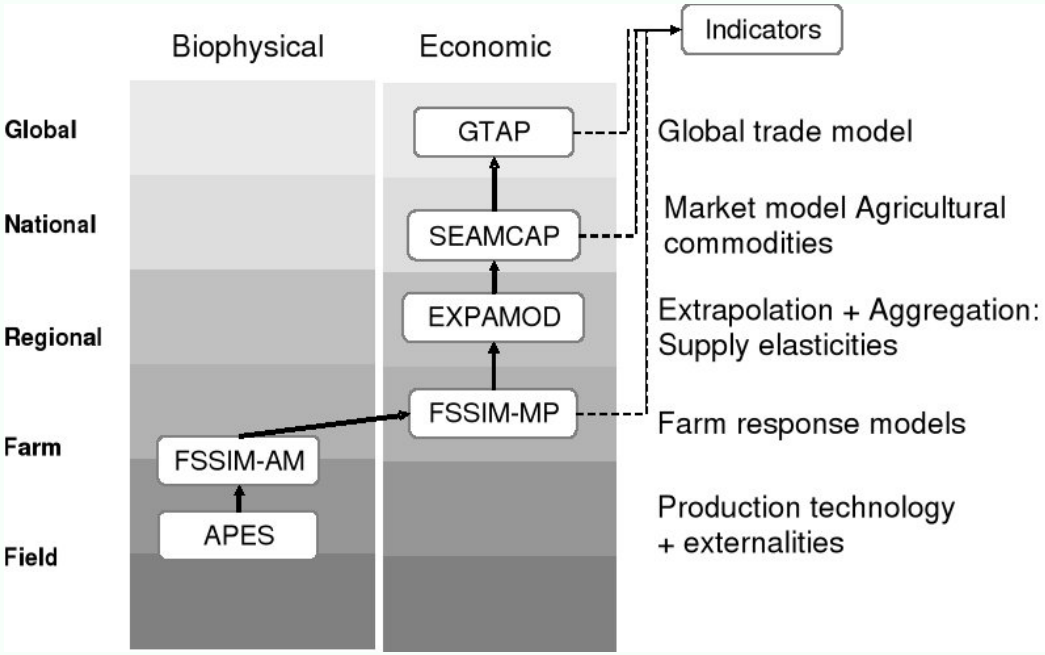
SEAMLESS-Integrated Framework

SEAMLESS-IF will enable to assess a wide range of policy assessment problems.

➔ **development of a generic procedure to build scenarios** that capture the range of drivers of the investigated agricultural systems.

➔ **the scenarios need to be consistent and structured across the different scales** (from field to Europe) represented by different models.

The SEAMLESS modeling chain



(after Jansen et al., 2008)

SEAMLESS scenarios

SEAMLESS scenarios = “future changes of external and internal driving forces that affect agricultural systems in a given geographical area and for a given time horizon”.

- external drivers: **changes in the general conditions surrounding agriculture**, which cannot be controlled by farmers and agricultural or environmental policies (e.g.: population growth, inflation, CO_2 concentration...)

- internal drivers include:
  * **the main agri-environmental policies** that govern the interactions among farmers and between farmers and their socio-economic environment (e.g.: the CAP, the Environmental Directives…)
  * **resources and technologies** available in the farm (e.g.: current activities, conservation agriculture, organic farming)

SEAMLESS scenarios

Within SEAMLESS-IF,

- these driving forces are described through model parameters (i.e. inputs of the modeling chain)

➔ reference scenario and policy scenarios are described through alternative sets of parameter values.

Procedure to build and assess scenarios

Phase 1

Phase 2

Phase 3

Pre-modeling

Modeling

Post-modeling

Problem framing

= Translation of policy and technological ques scenarios and ind ess.

Policies
Impacts

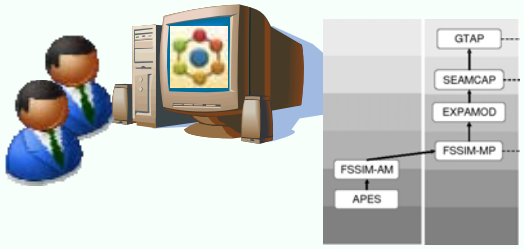
Parameters
Models
Indicators

Policy Experts

Integrative Modelers

Simulations

= Implementation of parameters and quantification of indicators with the modeling chain.



Results analysis

= Visualisation, transparency and analysis of results.

From policy questions to SEAMLESS scenarios

The pre-modeling phase:

I want to assess impacts of such policies at the EU scale on environment and agriculture given that the CAP2003 and WTO will evolve according…

The modeling chain looks adapted to capture these changes in driving forces. S-IF can assess indicators at EU scale. Now we need to specify your problem using a specific guideline

Policy Experts

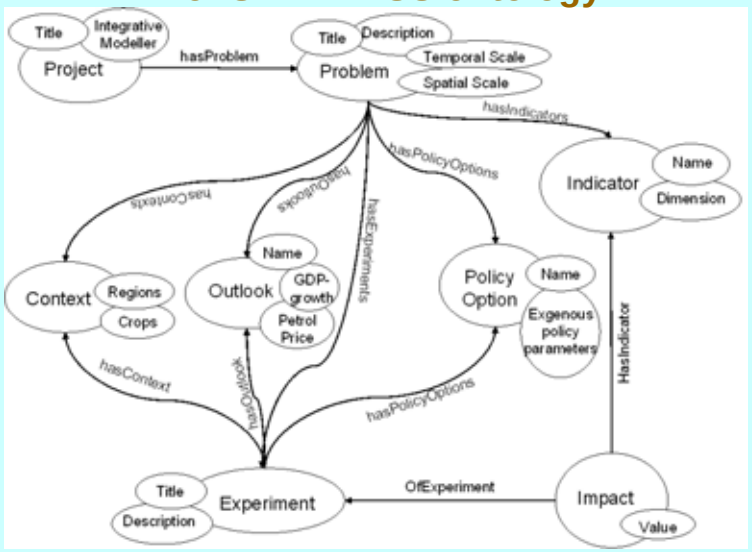
Integrative Modelers

From policy questions to SEAMLESS scenarios

The guideline helps the PE to decompose their policy assessment questions into concepts described in the SEAMLESS ontology:

- **Problem definition**
  - **General description**
  - **Spatial extent**
  - **Temporal horizon (2013 or 2020)**
- **Driving forces-scenarios definition**
- **Impact indicators selection**

The guideline use the concepts of SEAMLESS ontology:



(after Jansen et al., 2008)

From policy questions to SEAMLESS scenarios

Driving forces are split up in:

- **Outlook(s)**: sets of parameter values which describe trends of external driving forces:

  GDP growth, the population growth, the unemployment rate, the inflation, the technological progress and the atmospheric CO2 concentration.

From policy questions to SEAMLESS scenarios

Driving forces are split up in:

- Outlooks: sets of parameters describing different external drivers.
- **Policy options**: set of parameter values depicting agro-environmental policies and allowing:
  - binding (max or min), subsiding and taxing, farm inputs, productions, externalities (e.g.: pesticide use, nitrate leaching) and activities (e.g. set aside, crop activities),
  - penalising farm incomes if farms don't respect investigated regulations,
  - modifying the market-based instruments for example quantity and value limits of export subsidies, tariff rates, intervention schemes…

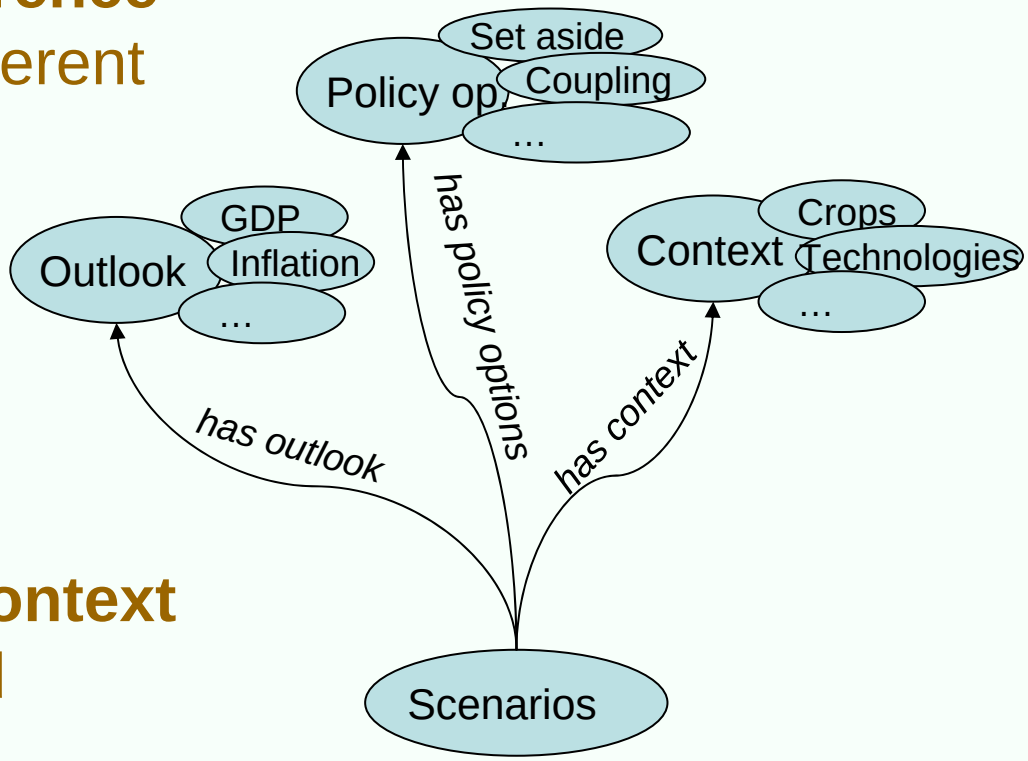
From policy questions to SEAMLESS scenarios

- Driving forces are described through:
  - Outlook(s): sets of parameters describing different external drivers.
  - Policy options: different sets of parameters corresponding to agro-environmental policies.
  - **Agro-management context(s)**: the range of agricultural activities covering cropping, livestock and perennial systems.
    - current activities: regional survey,
    - alternative activities: computed by the modeling chain.

From policy questions to SEAMLESS scenarios

Policy experts define reference and policy scenarios = different combinations of:

- one **outlook**
(the external drivers)
- **policy options**
(the political drivers)
- one **agro-management context**
(the biophysical context and the technological drivers)



➔ **Provide Integrative Modelers with the full set of parameter values of the SEAMLESS modeling chain.**

Tests of policy questions translation

12 tests involving 18 national or regional Policy Experts

- 11 Policy experts accepted to translate their problems into SEAMLESS concepts
  - ➔ enjoyed this exercise “it is interesting to clarify and make a problem explicit, even without simulation results”
  - ➔ did not see particular difficulties

- A wide range of Policy Expert behaviors:

“delegation of policy question translation to Integrative modelers” → “check of modeling”

- **Policy experts questions were often complex** and often lead to the definition of a large number of scenarios

➔ Test outcomes provide specifications for the development of the Graphical User Interface and the documentation of SEAMLESS tools.

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Thank you for your attention

PROTOTYPE 3

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The SEAMLESS modeling chain