

# **Foresight and Research: A Tumultuous Relationship The Example of Agrimonde**

**Sandrine Paillard, INRA**

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- Relationships between foresight and research, within a research institution, may be tense
- Foresight is a science-society interface. This is a strength, but it carries the risk of transforming foresight into a sophisticated tool of communication ... and manipulation
- To face this risk, we have to further root foresight in research activities and consider it **also** as a research tool

***Workshop “Foresight in public research organisations”***

*Foresight as an instrument is for :*

- 1. Strategic planning*
- 2. Identifying research priorities*
- 3. Public policy-building*
- 4. Mediation between science and society*

**The Agrimonde project as an illustration :**

1. Project objectives and methodology
2. Scenarios
3. Main conclusions
4. The project life: reconcile scientific and societal objectives
5. Has the project met its objectives?
6. Survival kit for foresight in research organisations

# I. Project objectives and methodology

## ■ A CIRAD-INRA foresight project, 2006-2008

### ■ Objectives:

- ✓ To explore possible futures of food and farming systems up to 2050. Will the planet be capable of feeding 9 billion people in 2050 in a sustainable way ?
- ✓ To contribute to define research orientation
- ✓ To contribute to the (sustainable) food security debate at national & international levels

### ■ Methodology

#### ✓ Qualitative storylines and quantitative modeling used in an iterative approach:

- A storyline about the main drivers of change guides us to make quantitative assumptions
- These assumptions result in resource-use balances, which in turn enrich the content of the storyline due to a search for improvement in consistency
- This iterative process finally brings a complete scenario

#### ✓ A simple quantification tool

- Past trends
- Assumptions are made at the regional level : ASIA, FSU, LAM, MENA, OECD, SSA
- A model which calculates physical balances between food resources and uses
- No prices, resources and uses are measured in calories

## II. The Agrimonde Scenarios

### ■ Agrimonde GO

- ✓ A “Business-As-Usual” scenario
- ✓ Reprocessing Global Orchestration, one of the Millennium Ecosystem Assessment’s scenarios
- ✓ Fast technological advances and trade liberalisation

### ■ Agrimonde 1

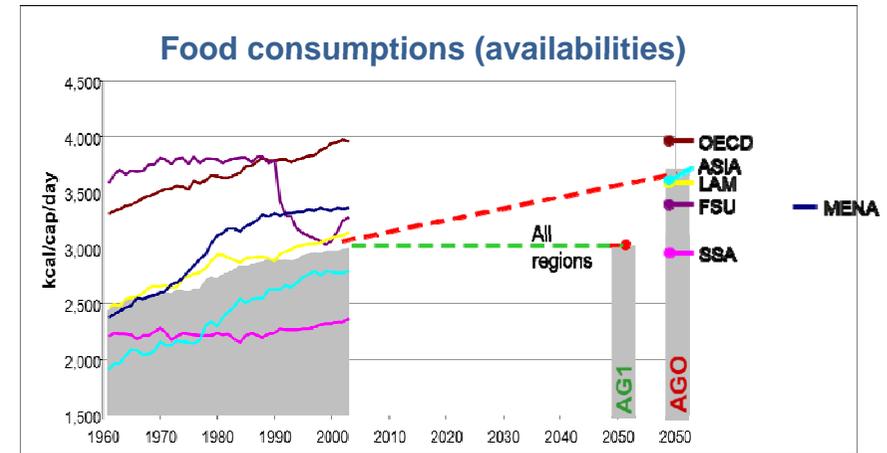
- ✓ A rupture scenario
- ✓ Sustainable development is assumed to be achieved by 2050
  - 1) Under-nourishment and excessive caloric intakes are drastically reduced
  - 2) Agriculture meets growing needs, is a driving force of development, and is respectful of the environment
- ✓ A normative scenario: a heuristic tool to explore sustainable food and agriculture development through analysing the dilemmas, synergies, dynamics & ruptures that such a development entails

## II. The Agrimonde Scenarios

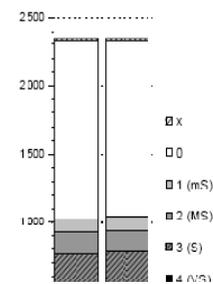
### ■ Agrimonde 1 Assumptions

#### ✓ Strong assumptions for diets in 2050 :

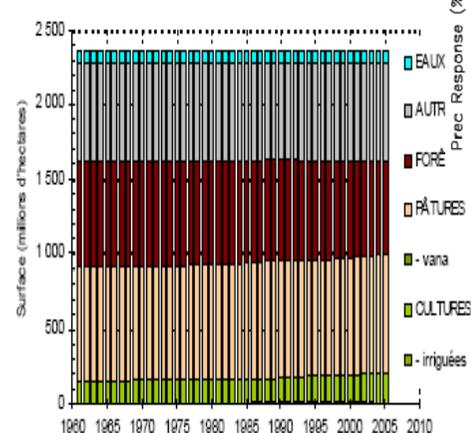
- Per capita food availability at the global level is roughly the same as today but - unlike today - equal in all regions (3,000 kcal/cap/day)
- A low share of animal calories in diets



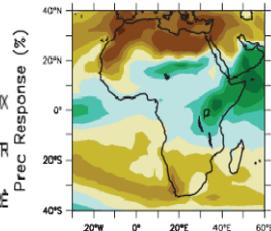
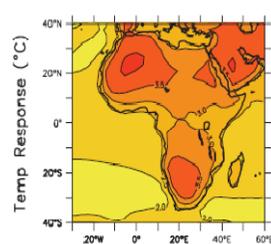
SSA



SSA



Annual



#### ✓ To define our assumptions on food resources in 2050, we analysed what could be the possible evolutions of land use and yield in each region :

% / year	Scenario
2.13	High Variant in IAASTD
1.81	High variant in MA (GO)
1.63	1961-2000 growth rate
1.44	SUS, IFPRI-IWMI
1.40	Agrimonde 1 high variant
1.32	BAU, IFPRI-IWMI
1.22	CRI, IFPRI-IWMI
1.21	Low variant in MA (OS)
1.18	Low variant in IAASTD
0.62	DGR
0.44	Agrimonde 1 low variant

- Given past trends
- Given the goal of preserving ecosystems and natural resources (in particular, of forest areas)
- Given possible impacts of climate change

# III. Conclusions

## The planet can properly feed nine billion people in 2050 :

- But the way it will do it, regarding sustainability criteria, will greatly depend on:
  - ✓ What is on our plates, animal proportion in particular
  - ✓ What is lost before and after reaching our plates
- Even under an assumption of relatively slow yield gains at the global level
- Some regions will face strong limits in their production potential
- Local opportunities for wealth creation must be developed to guarantee access to food

⇒ in 2050 as it is today, the main challenge behind food security won't be a question of lack of production but will remain a problem of access to food by the poorest populations

⇒ Diets (and waste) are key determinants of resource-use balances

⇒ Ecological intensification is an alternative model of agricultural development

⇒ Food trade will be necessary to secure regional food needs

⇒ Investments in agriculture in developing countries is the key to end under-nourishment

## IV. The Project Life

### Reconcile societal and scientific objectives

Stakeholder Committee	Steering Committee	Expert Panel
Stakeholders (incl. research managers)	Members of the institutes' boards	Mainly research managers (difficulties in involving researchers)
Critical analysis	Validation, Communication strategy	Scenario building and critical analysis Scientific support to the project team
<b>Project Team</b>		
Staff of the foresight unit (under the board of directors) Scenario building, debate facilitation, literature review		Researchers Data bases and modelling



## IV. The Project Life

### Reconcile “societal” and scientific objectives

- A strategic project
    - ✓ A high level of resources and visibility
    - ✓ A high degree of “political” pressure
  - Competences
    - ✓ Experts capable of a rather broad and interdisciplinary approach
    - ✓ But a lack of scientific expertise within the expert panel and project team
  - Tensions on the project timing & methodology
    - ✓ The immediacy of decision-making (food riots in 2008) vs the length of time for research (a huge literature to explore, a quantitative tool to design)
    - ✓ Modelling sophistication to improve the model’s explanatory capacity vs transparency to facilitate the collective debate
- 
- The project duration was expected to be 18 months and actually lasted 3 years : a good compromise but a permanent fight
  - The scenarios could have been more robust if more time had been devoted to modelling

## IV. The Project Life

### Reconcile scientific and “societal” objectives

#### ■ Misunderstanding regarding the purpose of scenario-building

- ✓ It proved to be difficult to share a common language.

The choice of a “normative” scenario was understood:

- as a **heuristic** tool by most of the people involved in the scenario development
- as an **illegitimate recommendation** by some stakeholders and policy makers
- as an **unfounded utopia** by some external researchers...

- ✓ The institutional endorsement of the scenarios - which wouldn't have been necessary if the project had been a “normal” research project - took a long time

2 obstacles:

- The “3,000 kcal assumption”
- The planet can properly feed 9 billion people, *even under an assumption of relatively slow yield gains*

Agrimonde 1 became “acceptable” only once the debate on the impact of animal production on the environment was considered a topic of *serious* debate

 That tension was a strong incentive for the project team to improve the robustness of Agrimonde 1 ... but it was a chaotic project, which almost collapsed several times.

## V. Has the project met its objectives ?

- Has Agrimonde contributed to the debate on (sustainable) food security at national and international levels?
  - ✓ A lot of presentations to a wide range of institutions
  - ✓ A large dissemination through various (French) media
  - ✓ The Agrimonde scenarios have proved to be a good means of communication regarding the complex interaction and processes characterising food security issues
  - ✓ Agrimonde has become a landmark foresight study : the scenarios are references, either adopted or rejected, which contribute to structure the debate
  - ✓ A relatively good visibility at an international level : presentations and discussions with the main institutional players: FAO, OECD, World Bank, IFPRI, UK Foresight

## V. Has the project met its objectives ?

### ■ Has Agrimonde contributed to define research orientation?

✓ It shed light on key interactions between dynamics which tend to be studied in isolation:

- Diets & consumption patterns are key determinants on the way agriculture impacts on natural resources
- Technological trajectories and spatial organisation are strongly related

The scenarios relate to 2 contrasting trade-offs between increase in yields and increase in cultivated areas : functional specialisation of territories versus a blurring of the frontiers between urban, farming and natural areas

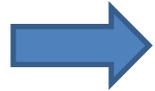
✓ It highlights that we have very limited knowledge about crucial variables for the future

- Waste and consumption patterns
- Agrimonde 1 rests on the availability of large amounts of uncultivated arable lands

Land use data quality? Land availability ? Soil fertility ? Water availability ? Future impacts of climate change and urbanisation? Competition for lands between food and non-food production ? ...

## V. Has the project met its objectives ?

- Has Agrimonde contributed to define research orientation?



- New research programmes on sustainable food, on sustainable animal production, on land use change...
- Agrimonde II : A new foresight study on land use and food security

However, this contribution is not a simple relationship from cause to effect

- ✓ Is Agrimonde the main cause of these new programmes or has Agrimonde contributes to legitimate these new programmes?
- ✓ Agrimonde has been one of the multiple inputs that have led to these new programmes
- ✓ Agrimonde has made an impact by becoming a landmark study
  - to give a general **coherence** of the institutes' research orientation
  - to **legitimate** some research projects proposed by researchers
  - Or to enhance their **visibility**

## V. Has the project met its objectives ?

- Did Agrimonde produce scientific knowledge ?
  - ✓ Possible futures cannot be observed and fully tested against facts (future studies – rupture scenarios)
  - ✓ The use of quantitative models is often a condition for scenarios to be considered as belonging to science
    - The Agrimonde scenarios are not simulations
      - The quantitative tool is used to check scenario consistency in terms of resource-use balance (and not economic equilibrium).
      - Quantitative assumptions for a given scenario are based to a large extent on the chosen storyline
    - However, modelled predictions, such as IPCC scenarios are based on (qualitative) storylines as sets of external assumptions (socio-economic dynamics)
    - When knowledge of the studied system and its drivers of change is very limited given the scope of the system and of its uncertainties, it is not a guarantee that a model-based scenario is more robust than an Agrimonde-type scenario

## V. Has the project met its objectives ?

- Did Agrimonde produce scientific knowledge ?
  - ✓ The potential for knowledge production by foresight derives from :
    - Interdisciplinary approaches which are not easily compatible with the representations we have of scientific excellence
    - The collective critical analysis of the assumptions we make on possible futures (*conjectures*)
      - This necessarily implies ideologies and values while “Science has to remain objective”.
      - For a lot of researchers, this definitely places foresight outside of science
      - For sociologists of science, knowledge creation and institutional & political settings are strongly related

## VI. Survival kit for foresight in research organisations

- Agrimonde has met its societal objectives thanks to its scientific roots and it would have achieved more with deeper scientific roots
- Governance of foresight studies is a crucial issue (independence, no institutional endorsement of scenarios...)
  - ✓ To remain credible in public debate
  - ✓ To be attractive to researchers
- The time schedule of a foresight project within a research body must be settled as for a “normal” research project
- Foresight methodology has to improve in three main directions:
  - ✓ Design of the processes for the critical analysis of scenarios
  - ✓ Design of quantitative tools (avoid black boxes but allow for an improvement in scenario robustness)
  - ✓ Design of approaches and methods that allow for creative interaction between various fields and disciplines of research (a big challenge for all interdisciplinary approaches)

**Thank you very much for your  
attention**