Why agrimonde ?

This year, the world will exceed the 7 billion mark in population terms. In 2050, the planet will have approximately 9 billion inhabitants. Will worldwide agriculture be able to guarantee food supply to this population whilst respecting the principles of sustainable development with the three major dimensions – economic, social and environmental.

In this perspective, INRA and CIRAD took the initiative, at the beginning of 2006, of creating a capacity to analyse different possible equilibriums of world food and agricultural systems in 2050.

Key figures between 1961 and 2003

- World population increased from 3.1 to 6.3 billion.
- Cultivated surfaces increased by 13% and irrigated land doubled.
- The cultivated surface needed to feed one person was halved (from 0.45 to 0.25 hectare).
- World average vegetal food production has more than doubled from 8600 à 19200 kcal/day/hectare ; even though the trend is worldwide, yield gaps between regions have increased – from 1 to 2 in 1961, they are now at 1 to 3.4 today.

What is Agrimonde ?

Agrimonde is a foresight study on the issues that affect food and agriculture on the planet. These issues can be resumed in one phrase : how can we feed around 9 million people in 2050, whilst preserving the ecosystems from which other products and services are also expected (preservation of land and water, protection of biodiversity, carbon storage, flood regulation, production of bio-energies and bio-materials….) ?

The Agrimonde foresight study is innovative in that it associates, within the structure of an interactive and **iterative?** process, quantitative and qualitative analyses:

- **The quantitative analyses** are based around a tool, Agribiom, designed especially for this purpose. Agribiom helps to evaluate,for a country, a group of countries or the world, the production of food biomass and its uses, food based and non-food based. Production, uses and exchanges are expressed in the same unit, the kilocalorie.

- **The qualitative analyses** are based around human structure made up of a project team, a work group and a committee of experts that is consulted for advice.

Who has worked on Agrimonde ?

A PROJECT TEAM made up of INRA and CIRAD Scientists and coordinated by Bernard Hubert (GIP IFRAI) : Maryse Aoudaï (Inra), Jean-Marc Chaumet (Inra), Bruno Dorin (Cirad ; coordinator of the quantitative approach), Tristan Le Cotty (Cirad), Sandrine Paillard (Inra ; coordinator of the foresight unit of this organisation), Tévécia Ronzon (Inra) et Sébastien Treyer (AgroParisTech-Engref ; coordinator of qualitative analyses).

A WORK GROUP made up of experts with different skills, backgrounds and disciplines, in charge of the definition of the scenarios and analyses of results : Bernard Bachelier, Danielle Barret, Pierre-Marie Bosc, Jean-Pierre Butault, Jean-Christophe Debar,Marie de Lattre-Gasquet, Gérard Ghersi, Francis Delpeuch, Fabrice Dreyfus, Michel Griffon, Christian Hoste, Denis Lacroix, Jacques Loyat, Michel Petit et Jean-Louis Rastoin.

A COMMITTEE OF EXPERTS representing around twenty institutions, consulted for advice (discussion of results and their consequences , general orientation of research).

Under the supervision of A STEERING COMMITTEE made up of representatives of INRA and CIRAD managers (Patrick Caron, Catherine Esnouf, Hervé Guyomard, Bernard Hubert et Alain Weil.)

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Two possible scenarios selected by Agrimonde

Both scenarios use the same time scale (2050) and the same hypotheses of demographical growth in each zone, as well as migrations between zones. They differ essentially in the trajectories of the evolution of regional food and agricultural systems from today until 2050, trajectories which show two contrasting visions of the world.

A positive and trend-based scenario, Agrimonde GO

It puts the emphasis on economic growth to feed the world, in a context where the protection of the environment is not a priority.
In this scenario, economic growth is strong in all regions, notably in Asia, in Sub- Sarahan Africa, and in the countries of the ex-Soviet Union, under the double influence of liberal commercial exchanges and of reinforced economic agreements between countries. Investments in research, innovation, education, health and infrastructure, particularly in the developing countries, are high. Technical progress is important and covers the whole of the planet. Poverty is substantially reduced.

A changed–based and normative scenario Agrimonde 1

Its goal is to feed the world whilst preserving its ecosystems.
Following on from the joint effects of climate change and the proliferation of food and energy crises at the beginning of the analysis period (2010 – 2020), the world reacts by creating favorable conditions for the sustainable development of the planet. This scenario explores the trajectories of regional change that can reply to this ambition It pre-supposes a standarisation of food consumption at 3000 kcal/day/ per capital of which 500 would be of animal origin. This implies a substantial diminution of food consumption in some countries, and a large rise in others. On this basis, this scenario explores regional trajectories of durable change in the systems of agricultural production.

Will it be possible to feed the planet in 2050 ?

In both of the scenarios that have been considered, feeding the planet in 2050 appears to be possible. Whilst the trend-based scenario, Agrimonde GO, allows it to happen at the cost of environmental degradation, the change-based scenario, Agrimonde 1, shows that it can be achieved in a sustainable way, if three main conditions are fulfilled :

- **The current food model of industrialized countries must not be generalized**

For example, excessive food consumption should be reduced, as should losses and waste that occur at the distribution stage, and at the time of final consumption (estimated at around 25% in the OECD zone.)

- **Productive and ecological agriculture becomes the chosen priority**

This notably refers to the development of a more productive agriculture, which is simultaneously more economical in fossil energies, and more respectful of the environment. This type of agriculture makes the best of agricultural processes. It stimulates and exploits synergies between plant and animal species. It benefits from scientific progress, whilst exploiting existing knowledge and traditional methods.

- **International exchanges of agricultural and food products need to be more secure**

The necessary and foreseeable growth of agricultural exchanges coming from OECD countries, the ex-Soviet block and Latin America and going towards Africa, Asia and the Middle-East needs to be stabilized and regulated.

Agrimonde, a shared thinking tool

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