



EURAGRI



# Research and Innovation in agriculture: North-South partnership at stake

## What can be the contribution by INRA?

François Houllier



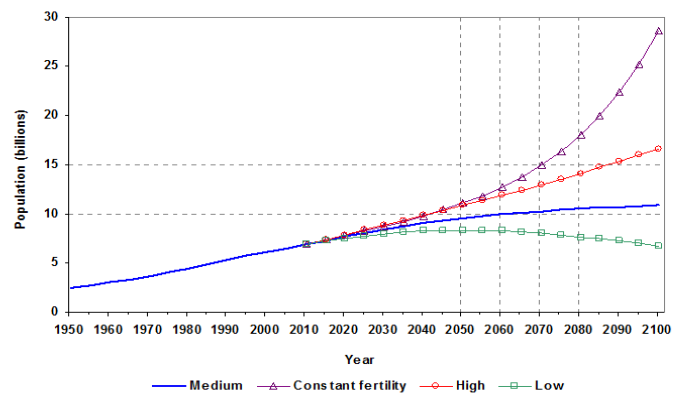
# 1

## **Worldwide challenges for agricultural science and technology**

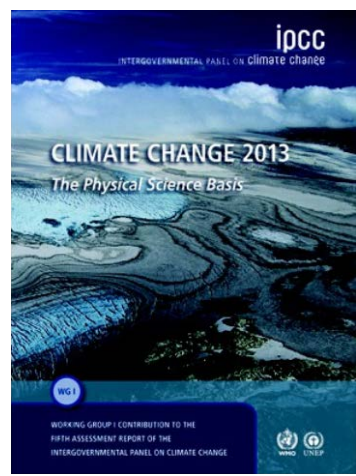
# A major challenge that comes at the crossroads of food, agricultural and environmental sciences

- To ensure sustainable and equitable food security... [FAO 2010]
  - Producing food that is affordable, safe, nutritionally adequate for health, and culturally satisfactory
  - While protecting biodiversity and ecosystems and optimizing the use of natural resources...
  - Creating jobs, generating income and promoting rural development
- ... this, in the context of multiple transitions
  - Growing world population and urbanization
  - Food and nutritional transitions
  - Dwindling natural resources (biodiversity, soil, water...)
  - Increasing energy prices and decreasing availability of fossil carbon and of mineral resources
  - Climate changes

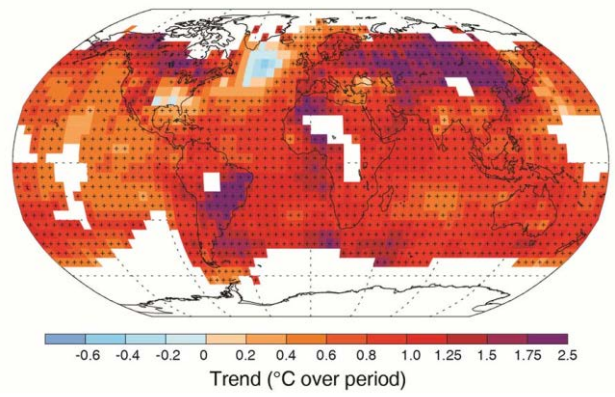
# “A perfect storm scenario in 2030”



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2013). *World Population Prospects: The 2012 Revision*. New York: United Nations.



Observed change in average surface temperature 1901–2012



- Growing world population will cause a "perfect storm" of food, energy and water shortages by 2030
- There's not going to be a complete collapse, but things will start getting really worrying if we don't tackle these problems.

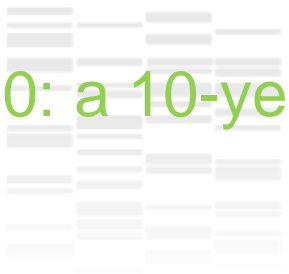
John Beddington, UK Chief Scientist, 2008-2013. Sustainable Development 2009. Fourth International Conference on Sustainable Development and Planning

# 2

## **INRA: how do we ‘tackle these problems’?**

Objectives, partners and resources

# 2010-2020: a 10-year strategy for coupling science and impact



Food



Agriculture



Environment

**Food security & global changes**

Improving the economic, social & environmental performances of agriculture

Reducing greenhouse gases emissions & adapting to climate change

Developing healthy & sustainable food systems

Promoting sustainable uses of biomass for chemistry, energy & bio-based products

**+**

**Predictive approaches in biology**

**Agro-ecology**

**1**  
major challenge

**4**  
transdisciplinary  
research priorities

**2**  
emerging  
interdisciplines

# Overcoming disciplinary boundaries

## 8 'Metaprogrammes' for addressing scientific challenges



### ACCAF

Adaptation of agriculture and forestry to climate change



### GLOFOODS

Transitions to global food security (CIRAD & INRA)



### DIDIT

Determinants and impacts of the diet: interactions and transitions



### M2E

Meta-omics of microbial ecosystems



### ECOSERV

Agriculture and forest ecosystem services



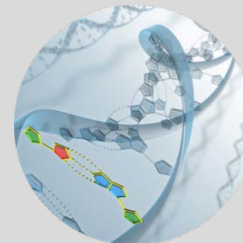
### SMACH

Sustainable management of crop health



### GISA

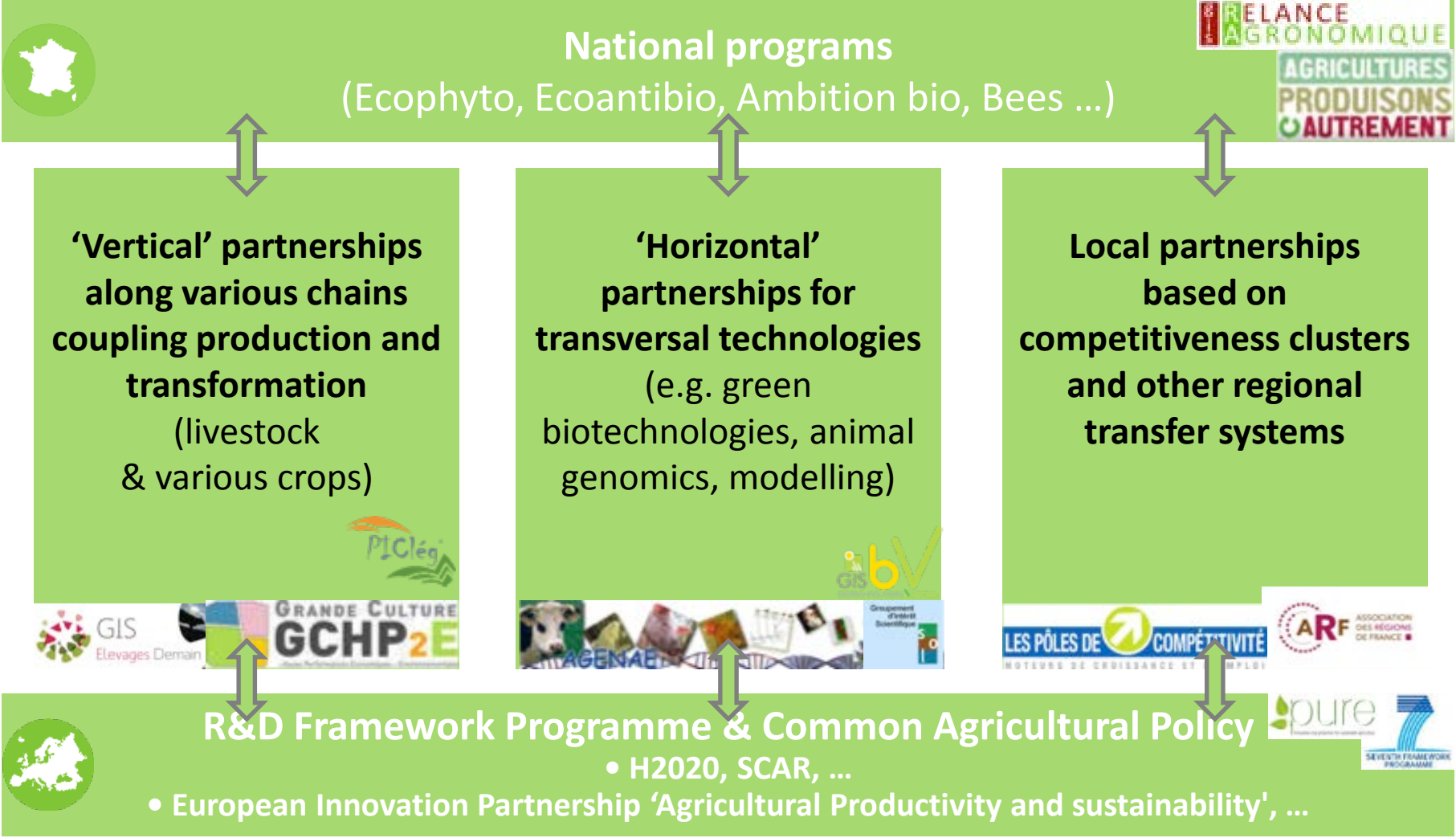
Integrated management of animal health



### SELGEN

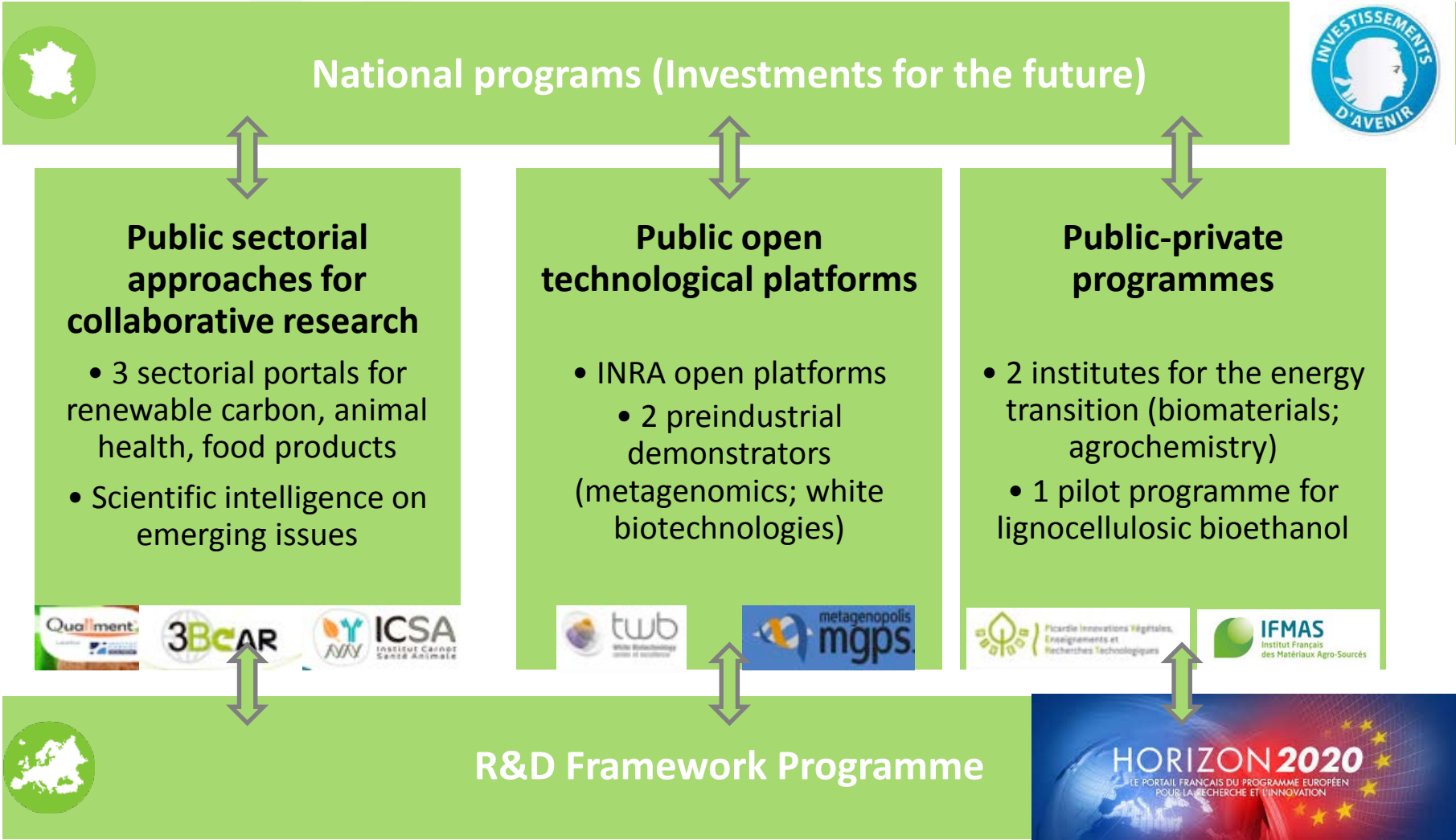
Genomic selection (Bovine, Wheat, others)

# Reviving and structuring the partnerships in/for agriculture





# Raising the technological readiness level: partnerships with industrial and economic actors (beyond agriculture)





# Internationalizing the Institute

- Strengthening the partnerships in Europe
  - **H2020: considering all the instruments including ERC and EIP**
  - **SCAR, Euragri**
  - **Joint programming initiatives: FACCE, HDHL**
  - **KIC: Climate (as of today), Food (in the future)**
- Developing a joint research strategy with CIRAD in the Mediterranean, which is a common priority for international collaboration
- Taking part to international initiatives
  - **Global Research Alliance on agricultural greenhouse gases**
  - **Wheat Initiative**
  - **Climate Smart Agriculture, ...**

# 3

## INRA & CIRAD in the Mediterranean



## CIRAD and INRA, two sister organizations ...

- Two national public targeted research institutes
  - **With a common wide scientific scope**
    - Food, Agriculture, Environment...
      - **also considering the interactions among these three domains**
  - **...and their increasing connections with related fields**
    - Health, Energy, Chemistry, Rural and Urban Development, ICT...
- Under the ministries in charge of
  - **for CIRAD: Research – Foreign Affairs and Development**
  - **for INRA: Research – Agriculture**

# CIRAD and INRA, two sister organizations and two founding members of Agreenium



- A world size agronomic & veterinary consortium with the aim to promote French research & higher education, and to foster international cooperation
  - **Coupling research and higher education**
  - **National mapping of agronomic and veterinary Masters**
  - **A unique French portal for international scientific cooperation and mobility**
    - Agreenskills: an EU co-funded outgoing and incoming mobility programme for young scientists
    - Coordinated proposals for the Brazilian CSF programme (*Ciencias sem fronteiras*)...
  - **EIR-A: a PhD programme open to global issues and international partnerships**
  - **Coordinated research programmes**

# Food security and global change

- CIRAD & INRA have carried out 2 major forward looking studies on food security and food systems...
  - ... and continue with AgriMonde Terra and the WRI
- CIRAD & INRA have set up a common metaprogramme on the study of global food security with the aim
  - To evaluate the consequences of global change on:
    - (dis)equilibria: food availability / food needs
    - governance of food security
  - By mobilizing works & knowledge on:
    - rapid nutritional transitions (causes & consequences)
    - processes & organizations limiting losses & wastage
    - spatial & temporal variability of plant & animal yields
    - potential cropland (land use, quality & changes)
    - links between household access to food & poverty



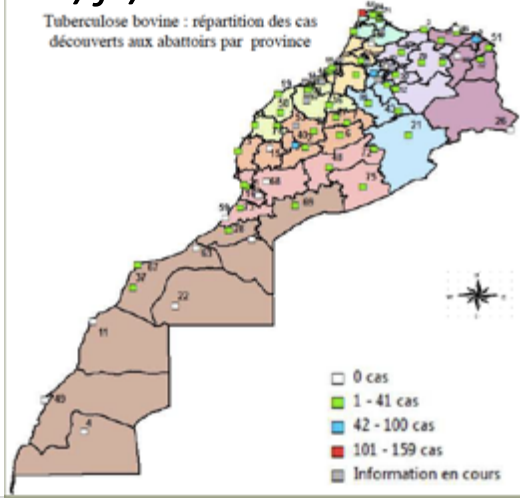
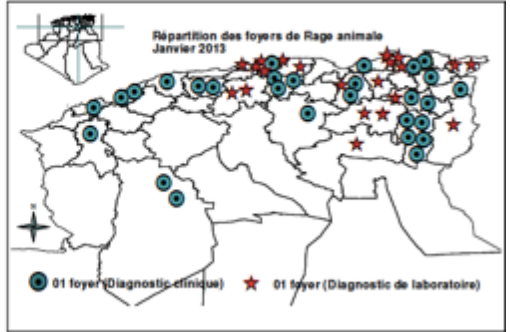


- Mediterranean Network in animal Health (REseau MEditerranéen en Santé Animale) (FAO, OIE, ECTAD)
  - **Creation: 2009**
  - **Members:** 10 countries in the Western Mediterranean region (Algeria, Egypt, Spain, France, Italy, Libya, Mauritania, Morocco, Portugal and Tunisia)
  - **Objective:** common framework and cooperation, with the capacity to supervise and lead the development and implementation of regional projects and programs of animal health [www.remesanetwork.org/remesa/fr/](http://www.remesanetwork.org/remesa/fr/)

*Situation Sanitaire  
Janvier 2013*

*Rage*

Nature du diagnostic	Clinique	Laboratoire
Foyers	28	21
Cas	28	23
Code wilaya	0 2 - 0 4 - 10-18-19- 21-22-24- 27-28-31- 3 2 - 3 5 - 40-41-44.	0 4 - 0 5 - 0 7 - 12-15-16-19- 21 - 2 6 - 3 5 - 43.



# A network research program for Mediterranean agriculture

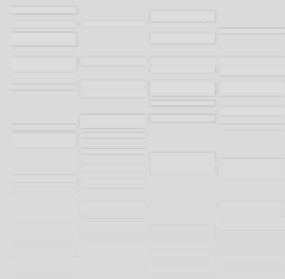


- ARIMNET 1 (2008-2013) and ARIMNET 2 (2013-2017)
  - **bringing together 16 Mediterranean countries with common priorities**
    - Production systems and their components
    - Food chains, from production to marketing
    - Agricultural uses of natural resources
- Other programmes
  - **ARP PARME** (2010-2011: a forward-thinking workshop ‘Which research and partnerships for the Mediterranean?’), **SICMED** (*‘Surfaces et Interfaces Continentales en MEDiterranée’*), **MISTRALS** (Mediterranean Integrated Studies At Regional and Local States), ...
  - **FORESTERRA, ERANETMED**
- A strong basis for PRIMA  
(Partnership in Research and Innovation in the Mediterranean Area)



## Take home messages

- International cooperation, especially European – South cooperation, is needed to ‘tackle these problems’
- French agricultural research is engaged in such cooperation and the Mediterranean is one of our common priorities
- Montpellier is a unique place, strongly anchored in the French and European research and education system and open to international cooperation with Mediterranean and South
  - **Research institutes**
  - **Higher education bodies**
  - **A local coordination system and a Foundation**
  - **International connections**



Wishing you a successful conference

