



European  
Commission



# Coping with the challenges of sustainable agriculture and food security – the contribution of EU research and innovation

**PARIS**

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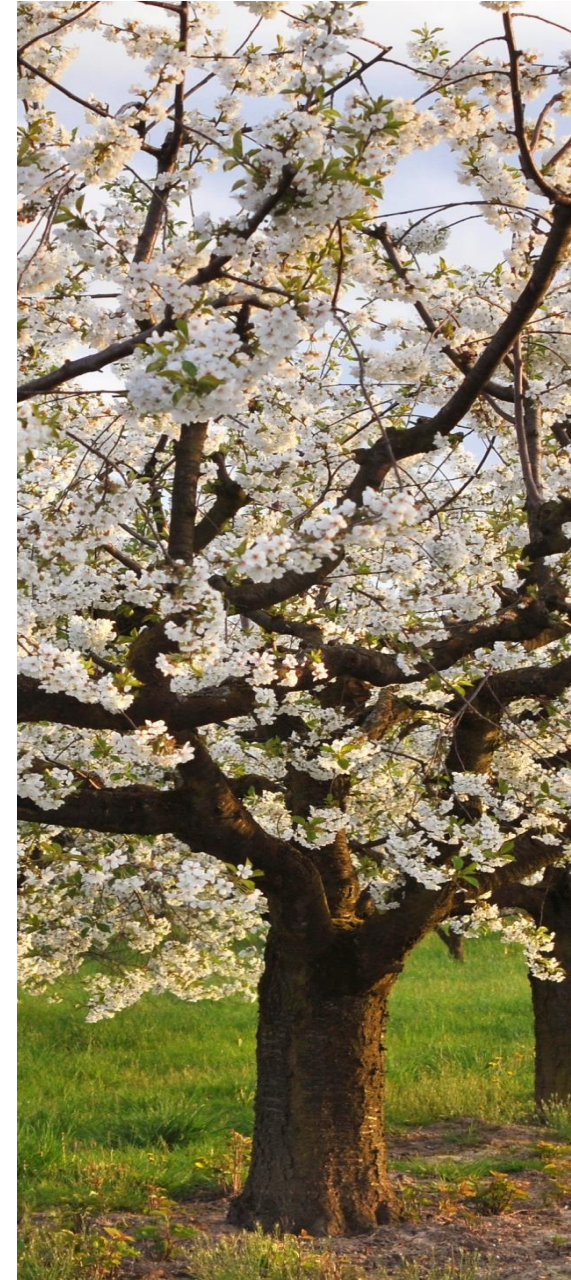


Agriculture  
and Rural  
Development



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1. Agricultural research in Europe – are we up to the challenges?
2. European Commission's strategic approach to research and innovation
3. Going down the road: boosting innovation with the European Innovation Partnership

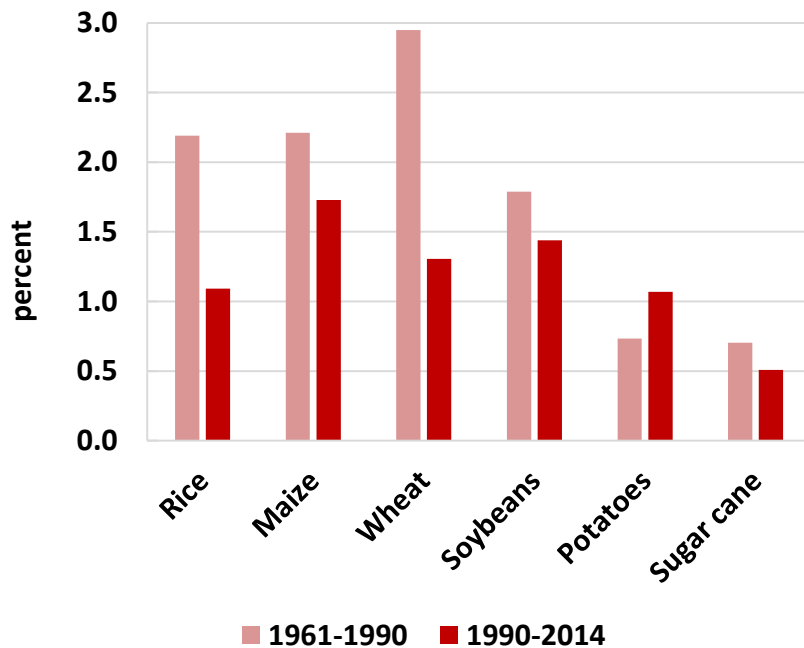


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## No reason for complacency on research ...



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- Climate change
- Biodiversity losses
- Resource scarcities
- Food and nutrition security
- ...

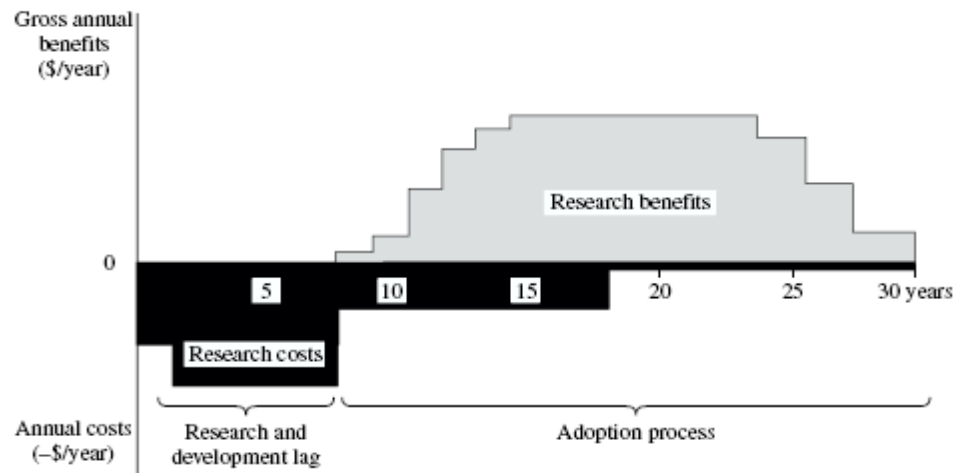
**Average global rate of growth of crop yields**

Source: Pardey (2016) on the basis of FAO data

# High rates of return of agricultural research

## *Cost benefit analysis*

**Figure 1—Flows of resources, benefits, and costs**



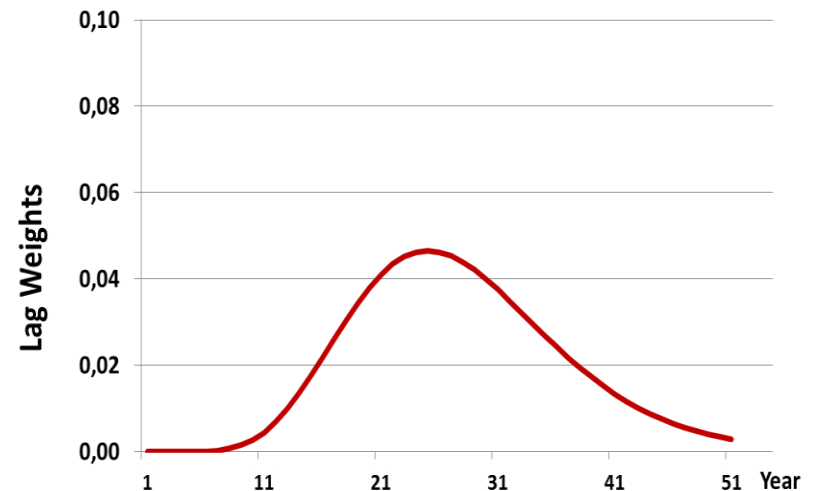
Source: Alston, Norton, and Pardey 1995.

*Internal rates of return (IRR) of research between 20 and 80% (Beitema and Koc, 2009), average around 40%. IRR declining due partly to diversification of research objectives. IRR of 40% = €100 invested today generates an annual stream of benefits of €40 / year in the future.*

# Generating impact takes time

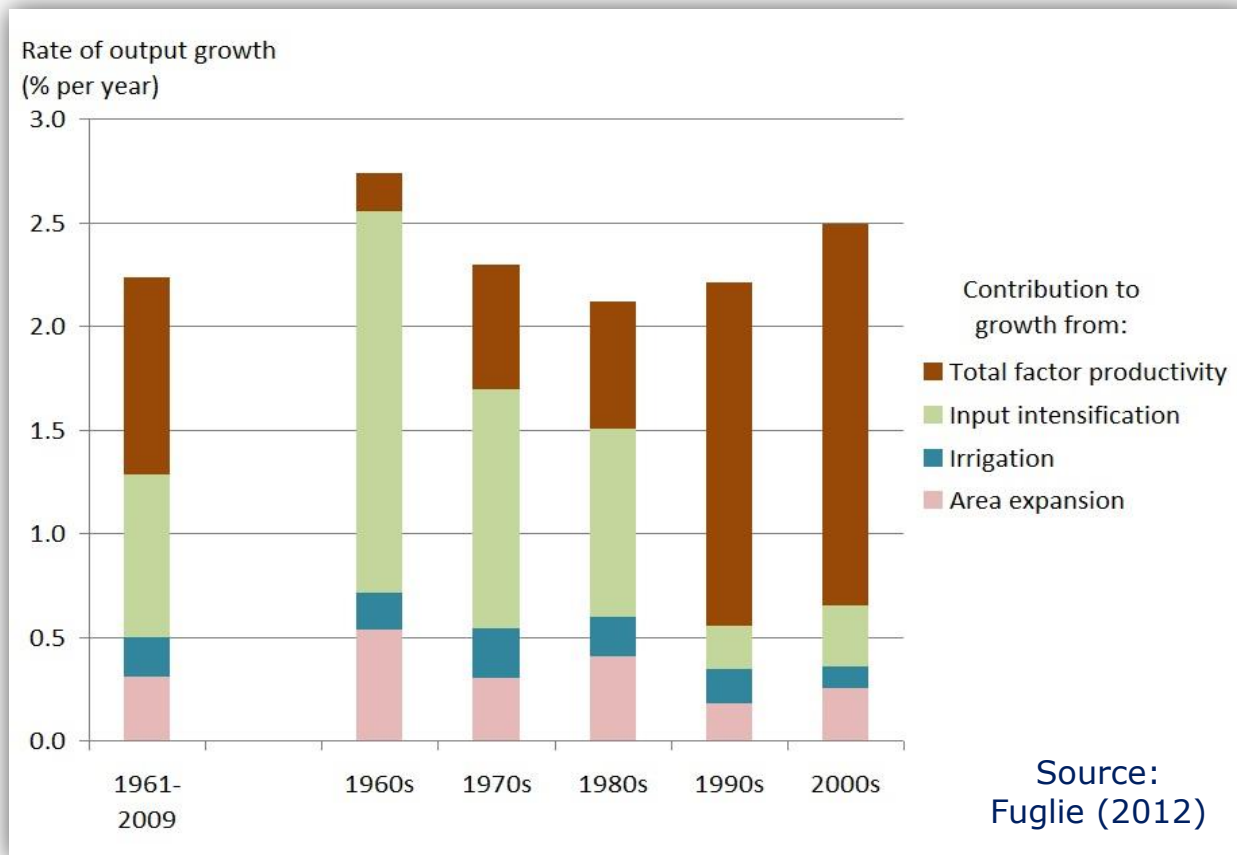
- *Many studies suggest lags of 15-25 years before peak impacts are reached and with continuing effects for decades afterwards.*
- *Hybrid corn:*
  - 1906-1908 corn heterosis (Shull)
  - 1918: double cross hybrid suggested (Jones)
  - 1921: first release hybrid seeds
  - 1930s: seeds widely available
  - 1960s: 85% of US acreage hybrid reached
- *ASIRPA study of INRA (2014): average lag between initiation of research and impact is 19 years.*

**Time lag between research and impact on farm productivity growth**



Source: Alston, Anderson, James and Pardey (2010, 2011)

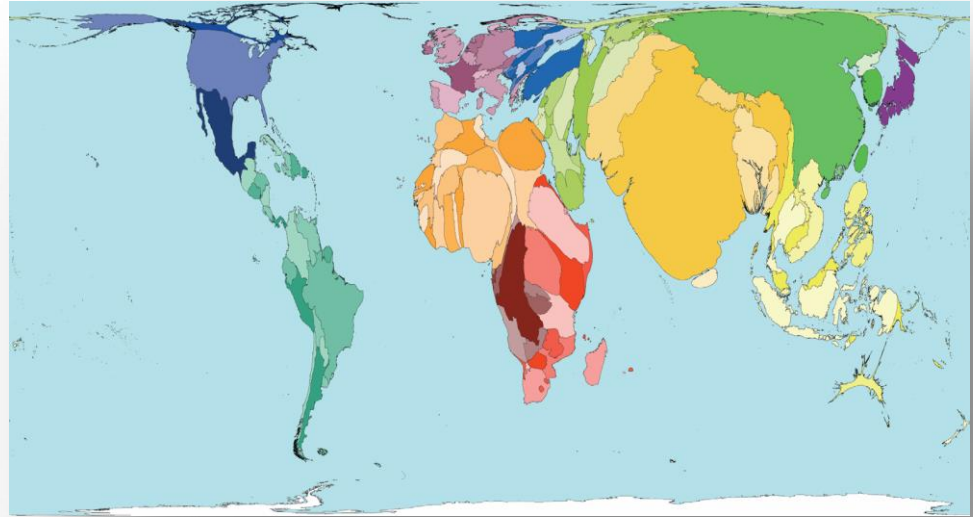
# TFP plays an increasing role in agricultural output growth



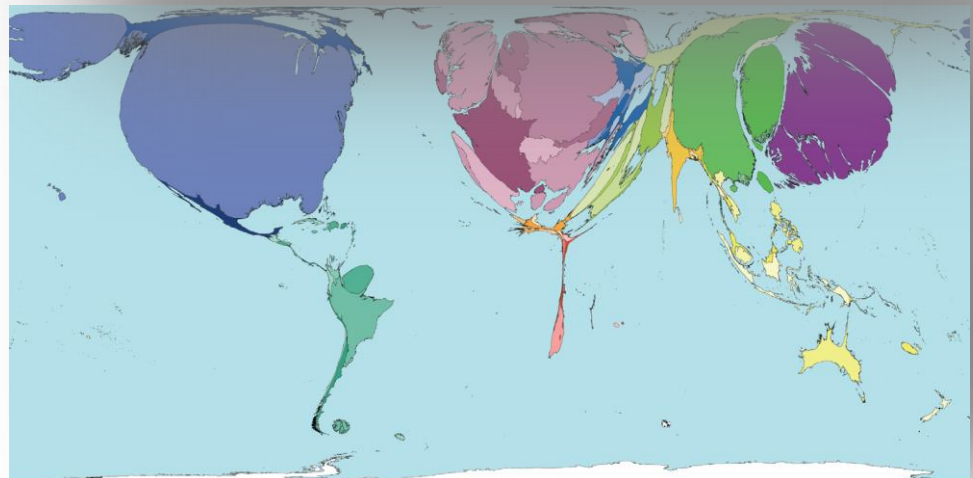
*This reflects the increasing role of research and technologies in output growth*

## Knowledge and population divide (Worldplanner)

**Population in  
2050**

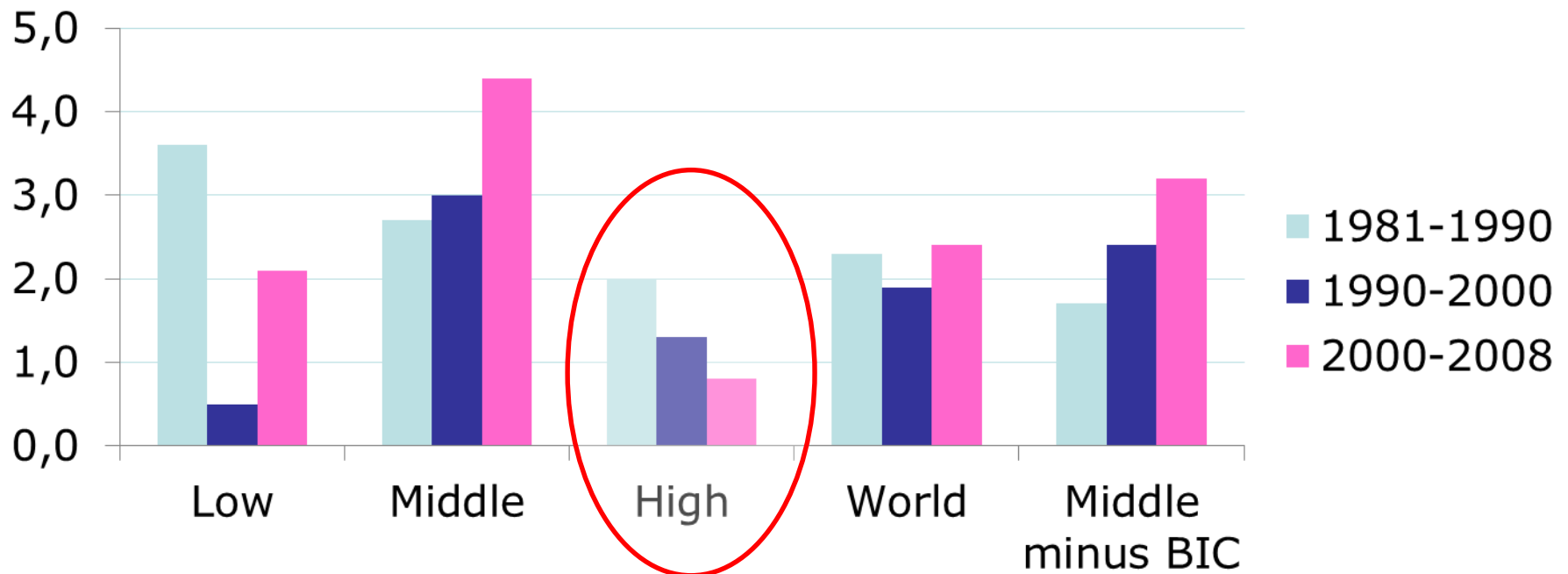


**Research and  
development  
investments**



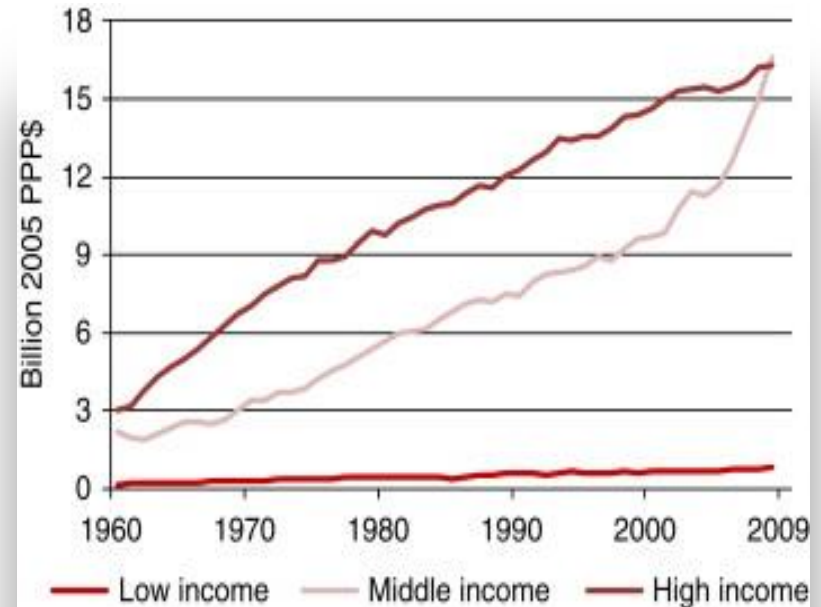
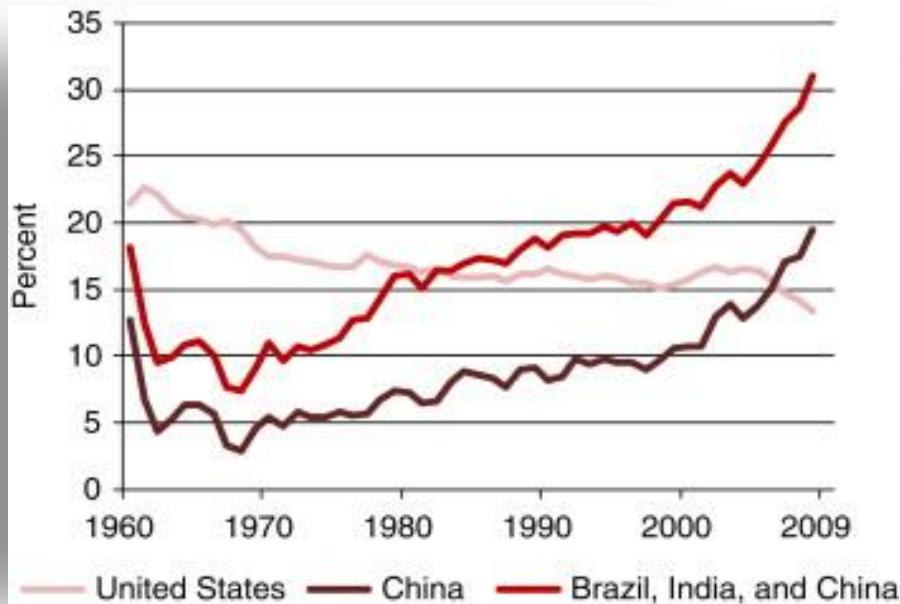


## Average annual agricultural R&D spending growth rates (%) by country income class



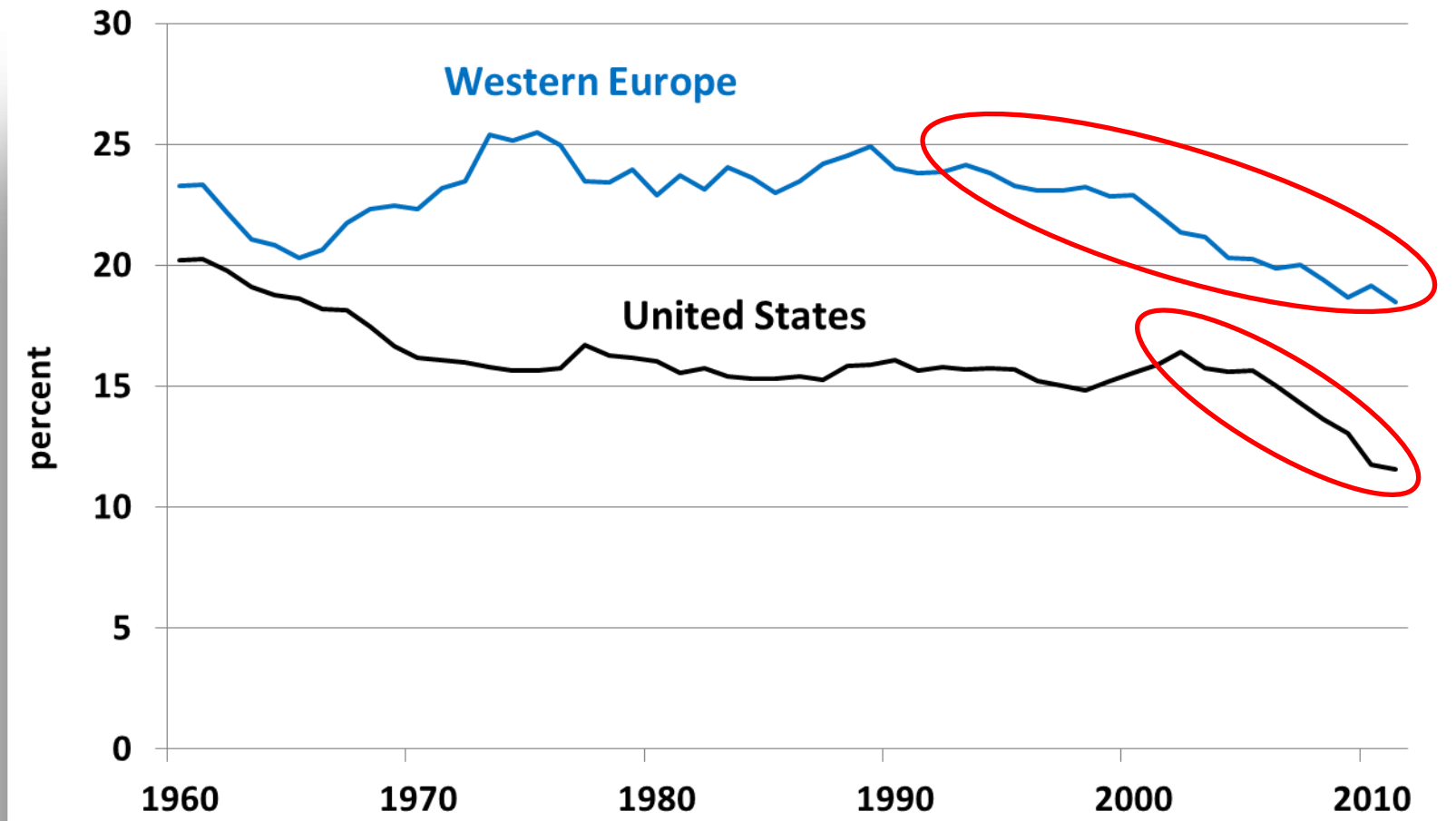
Source: ASTI-IFPRI (2012)

## Shifts in public investments in agricultural research at global level – increasing weight of middle income countries



Source: Pardey et al. 2014

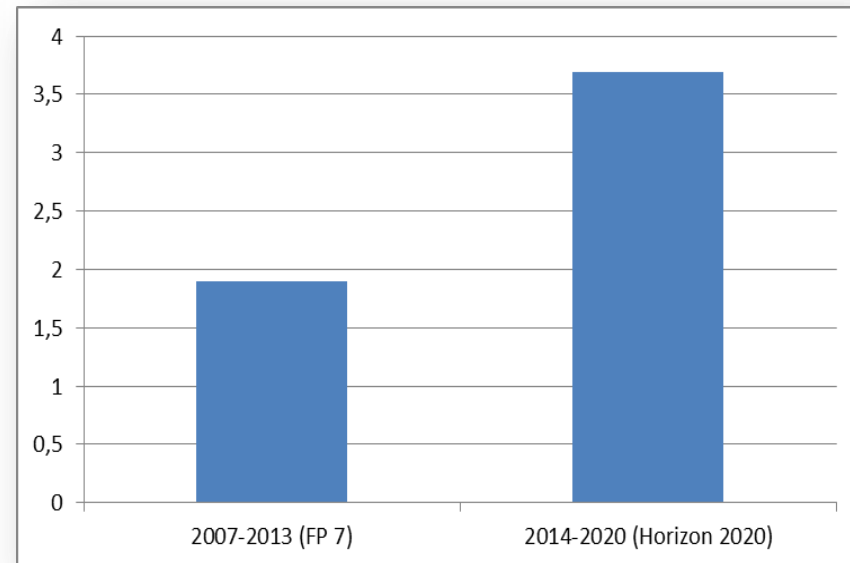
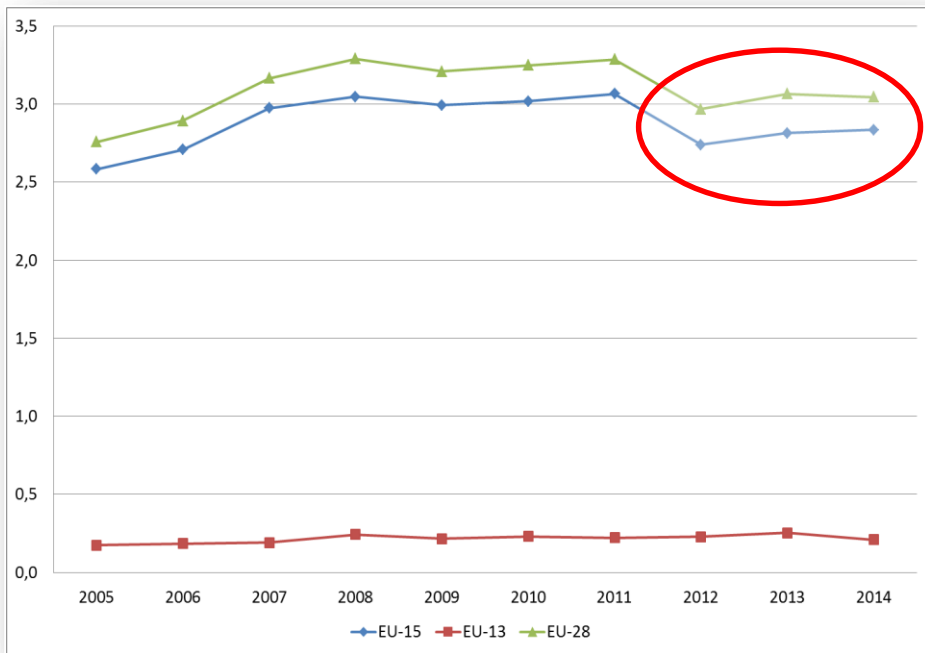
# Shifting Global Shares of Public Food & Ag R&D, 1960-2011 (source: Pardey et al. 2016)



# Recent evolutions in agricultural research public investment

**Decreasing Member State spending (billion €) (GBAORD) - Eurostat**

**... Not compensated by increasing EU spending (billion €) in the Framework Programme (figures for the whole bioeconomy)**

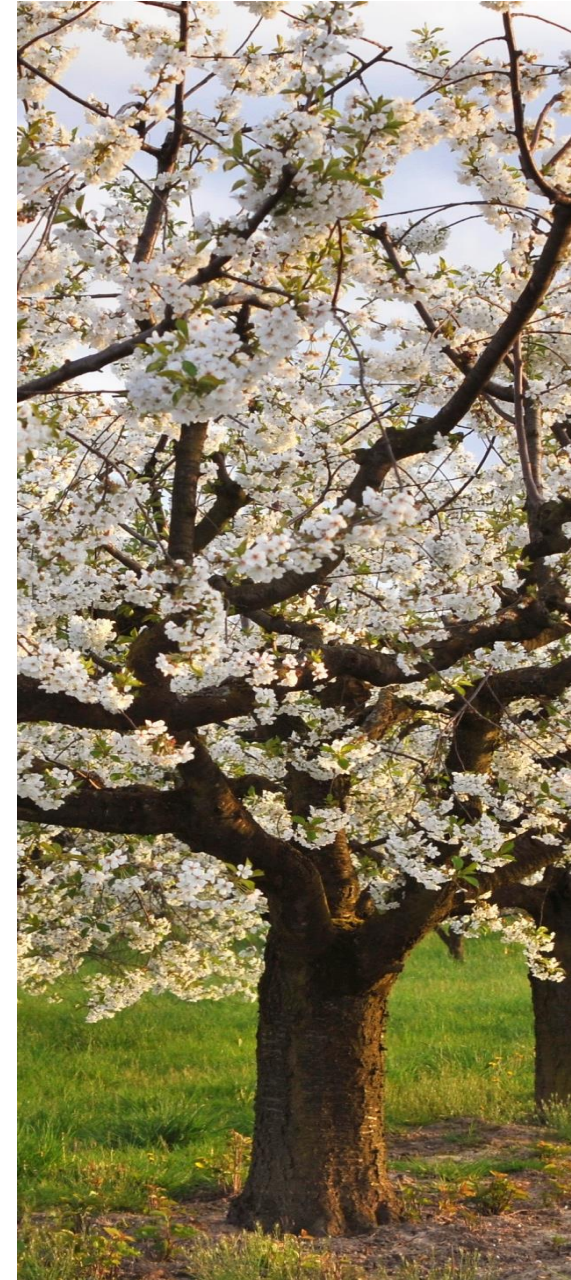


- Budget cuts in several Member States (but increases in some)
- Recurrent down, competitive up

EU Framework programme: **about 10%** of MS investments in research

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# Horizon 2020



1. Health, demographic change and wellbeing

2. Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bio-economy (€3.8 billion 2014-2020)

3. Secure, clean and efficient energy

4. Smart, green and integrated transport

5. Climate action, resource efficiency and raw materials

6. Inclusive, innovative and reflective societies

7. Secure societies

# A strategic approach to EU agricultural research and innovation



**19/06**  
**AGRI**  
**workshop**  
**on the**  
**future of**  
**agriculture**  
**R&I**

**15/10** EU  
**Scient.**  
**committee**  
**event on**  
**Global Food**  
**Security**

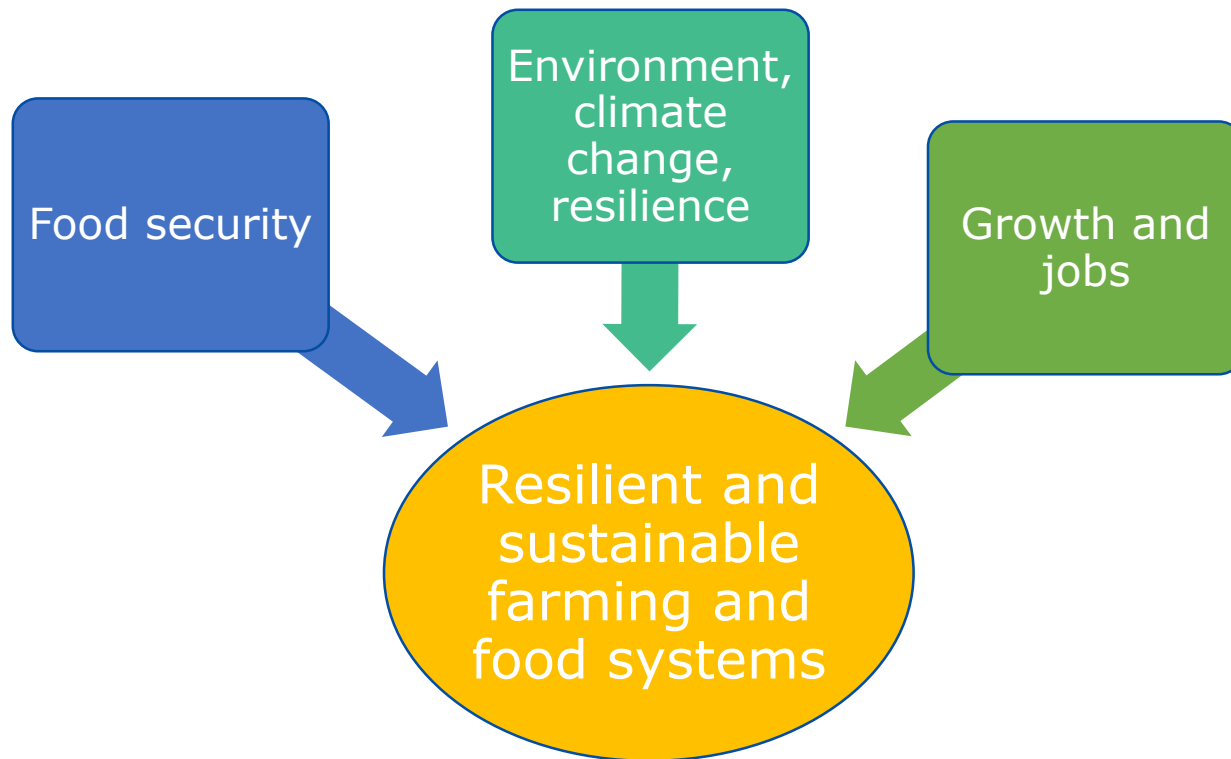
*Strategic  
programming  
2016/2017:  
expert  
workshops*

**08/10**  
**SCAR**  
**Foresight**  
**conference**

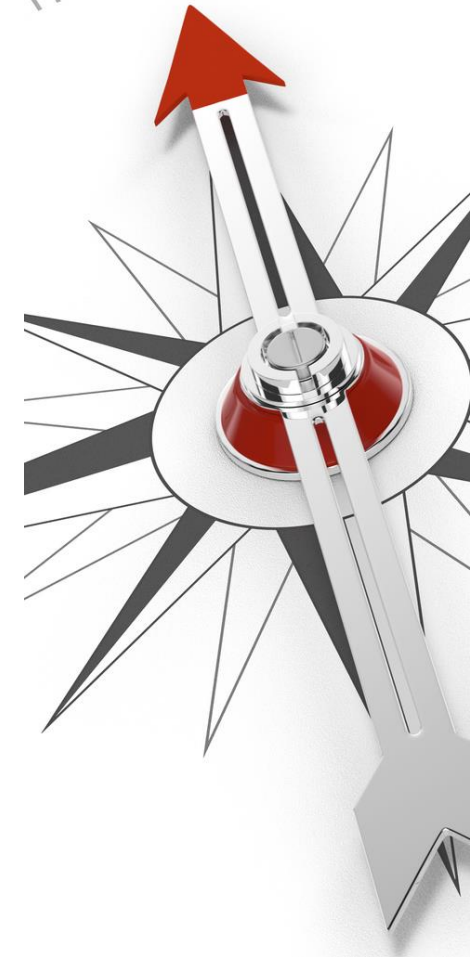
**26-  
28/01/16:**  
**conference**  
**on**  
**agriculture**  
**R&I**



# Challenges are long-term

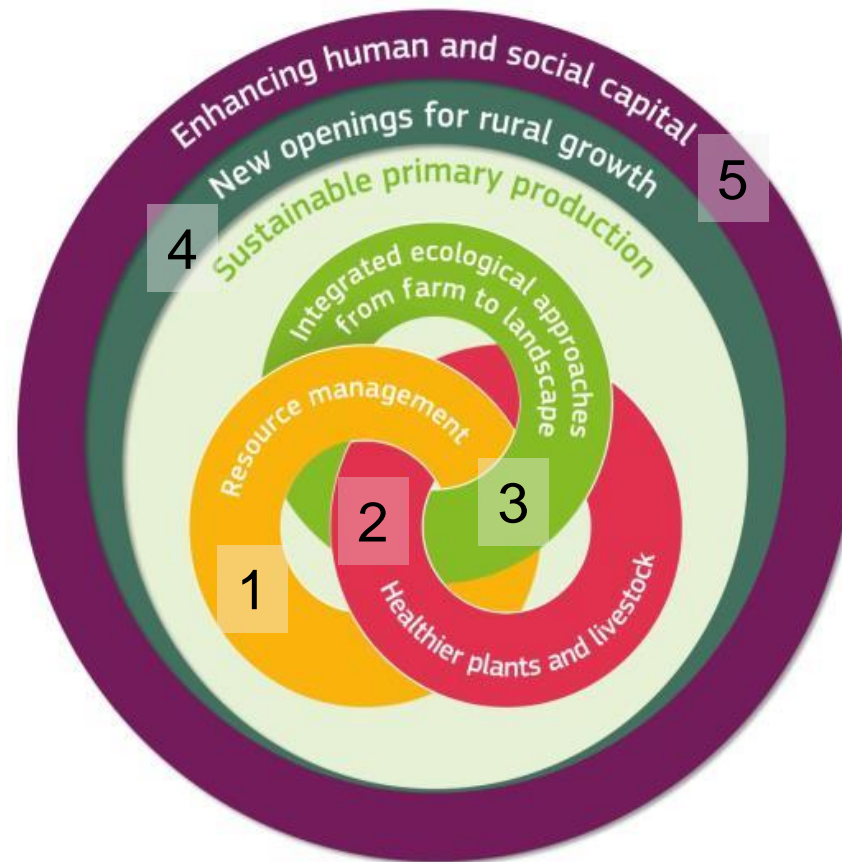


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# Five building blocks



# Cross-cutting issues



Societal  
engagement



Systems-based  
approach,  
interdisciplinarity and  
transdisciplinarity



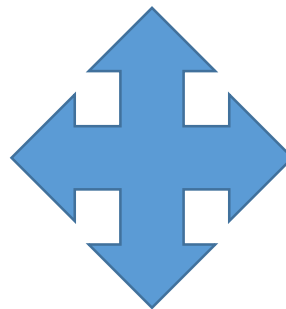
Enabling sciences  
and infrastructures



ICT as an enabling  
technology for  
research and  
innovation

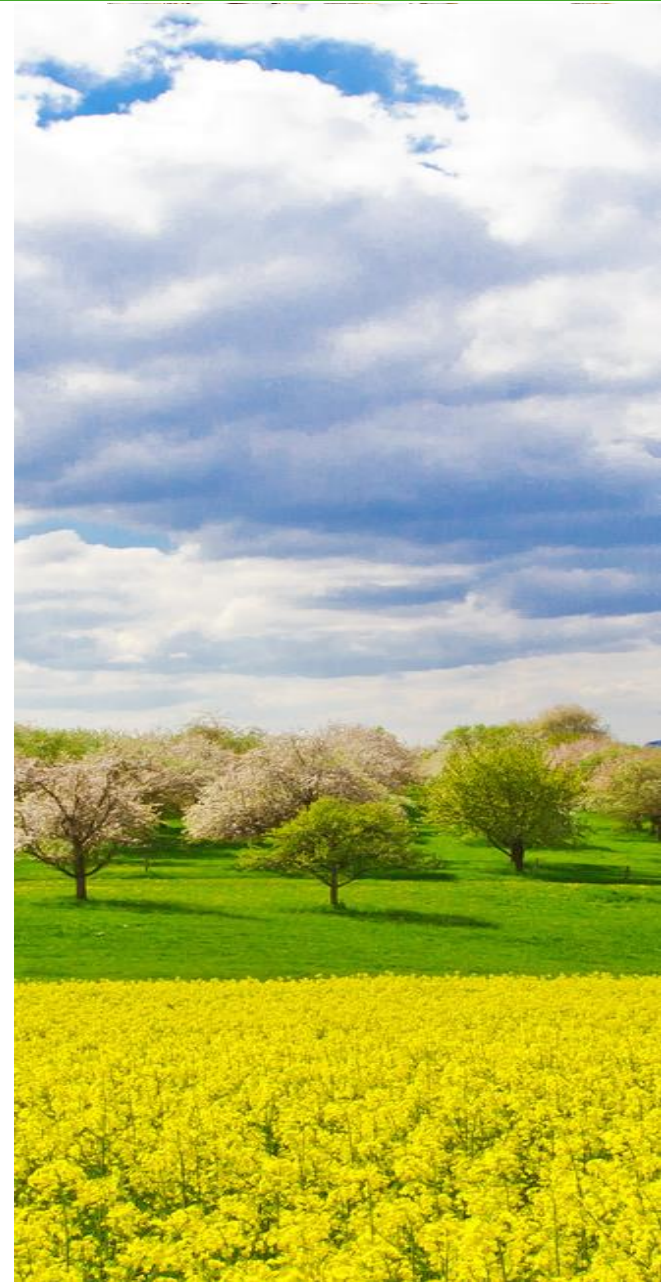


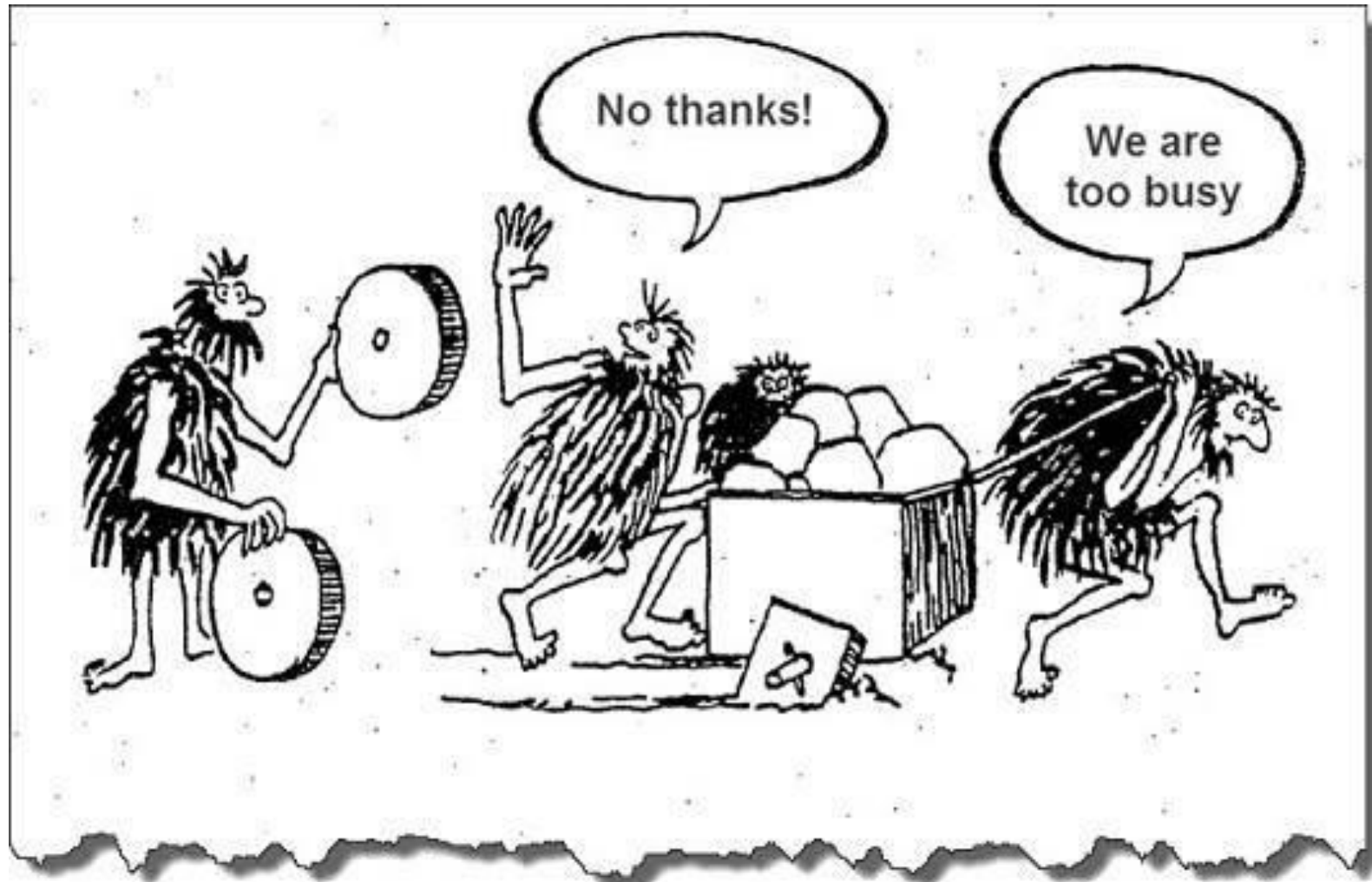
Socioeconomic  
research and  
support for EU  
policies



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# The EIP-AGRI in a nutshell

***Innovation Union Flagship Initiative: five European Innovation Partnerships link existing policies and instruments to speed up innovation***

***Aim: Fostering a competitive and sustainable agriculture and forestry sector that 'achieves more from less'***

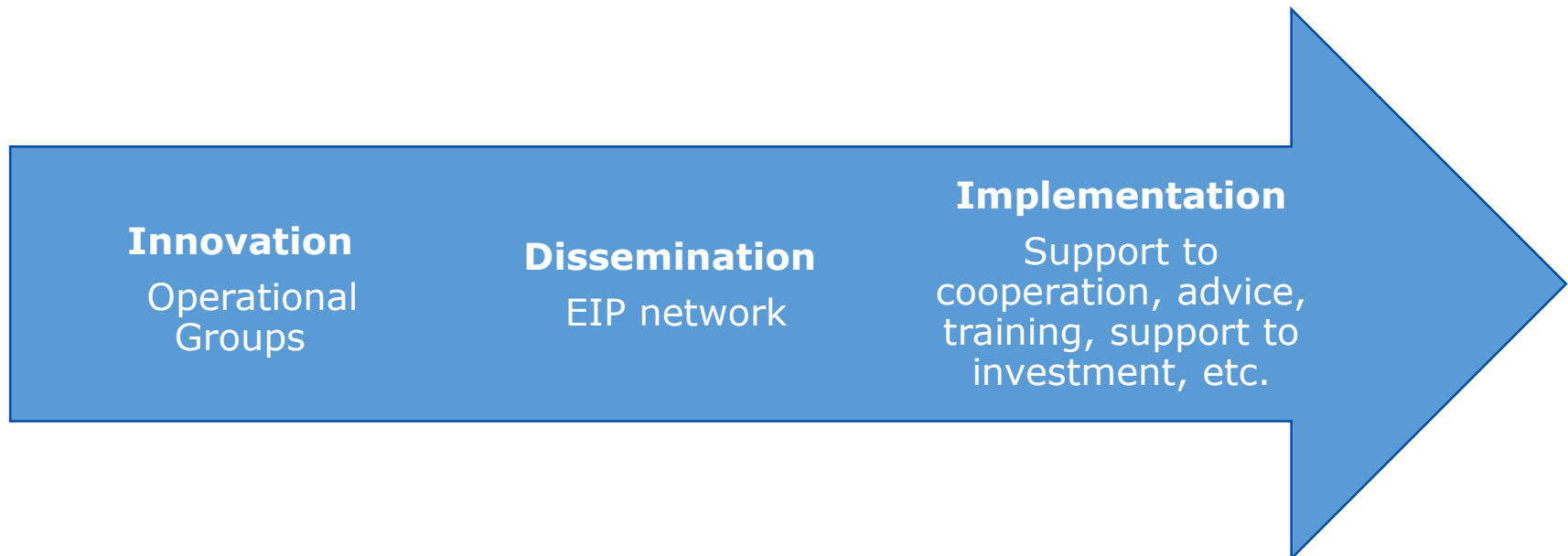
***Approach for the agricultural EIP: Closing the innovation gap between research and practice and forming partnerships by:***

- Using the **interactive innovation approach** which aims to involve complementary actors in a process of co-creation of knowledge
- Linking actors through the EIP-AGRI Network

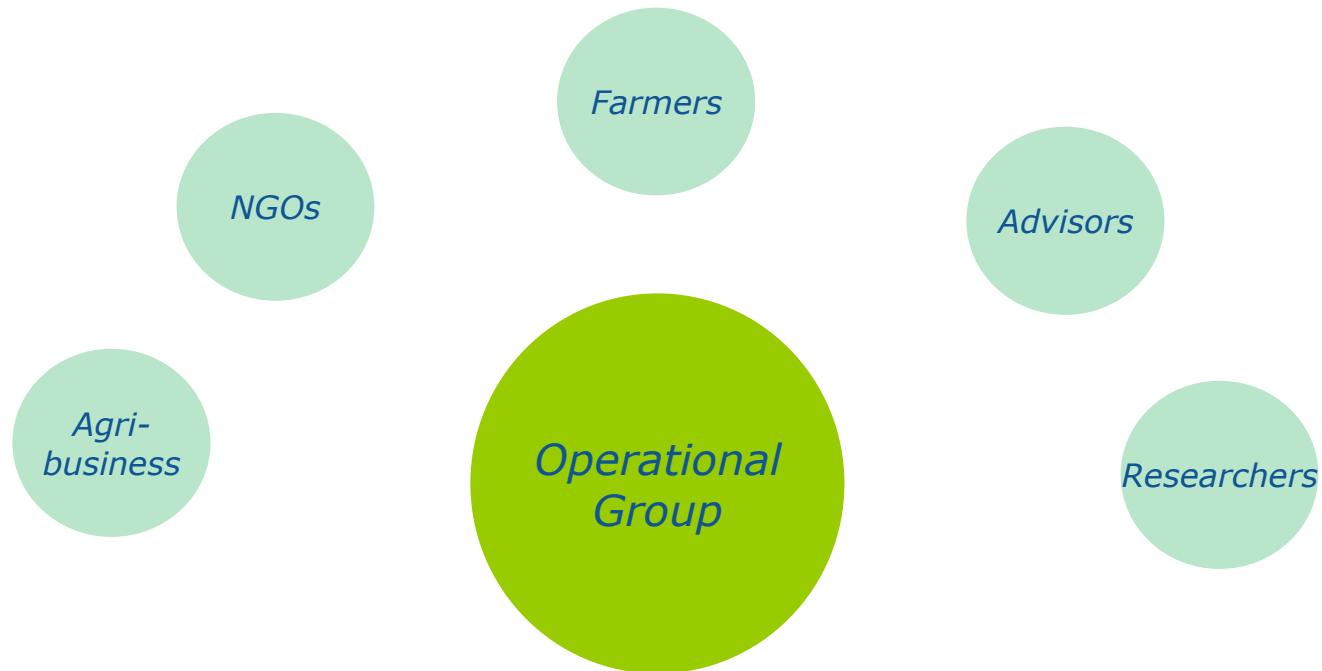
# The EIP-AGRI

- **Rests on two EU policies:** the Common Agricultural Policy (CAP) and Horizon 2020 (the Framework Programme for research and innovation)
- **Contribution of the CAP:** multi-actor innovation projects at local level ("Operational Groups" in Rural Development), support to the AKIS (support to advisory services, etc.)
- **Contribution of Horizon 2020:** multi-national research and innovation projects; networking at EU level on R&I matters, demand-driven innovation

# With the EIP innovation is embedded into the Rural Development pillar of the CAP



# ***Rural Development - Operational Groups -***





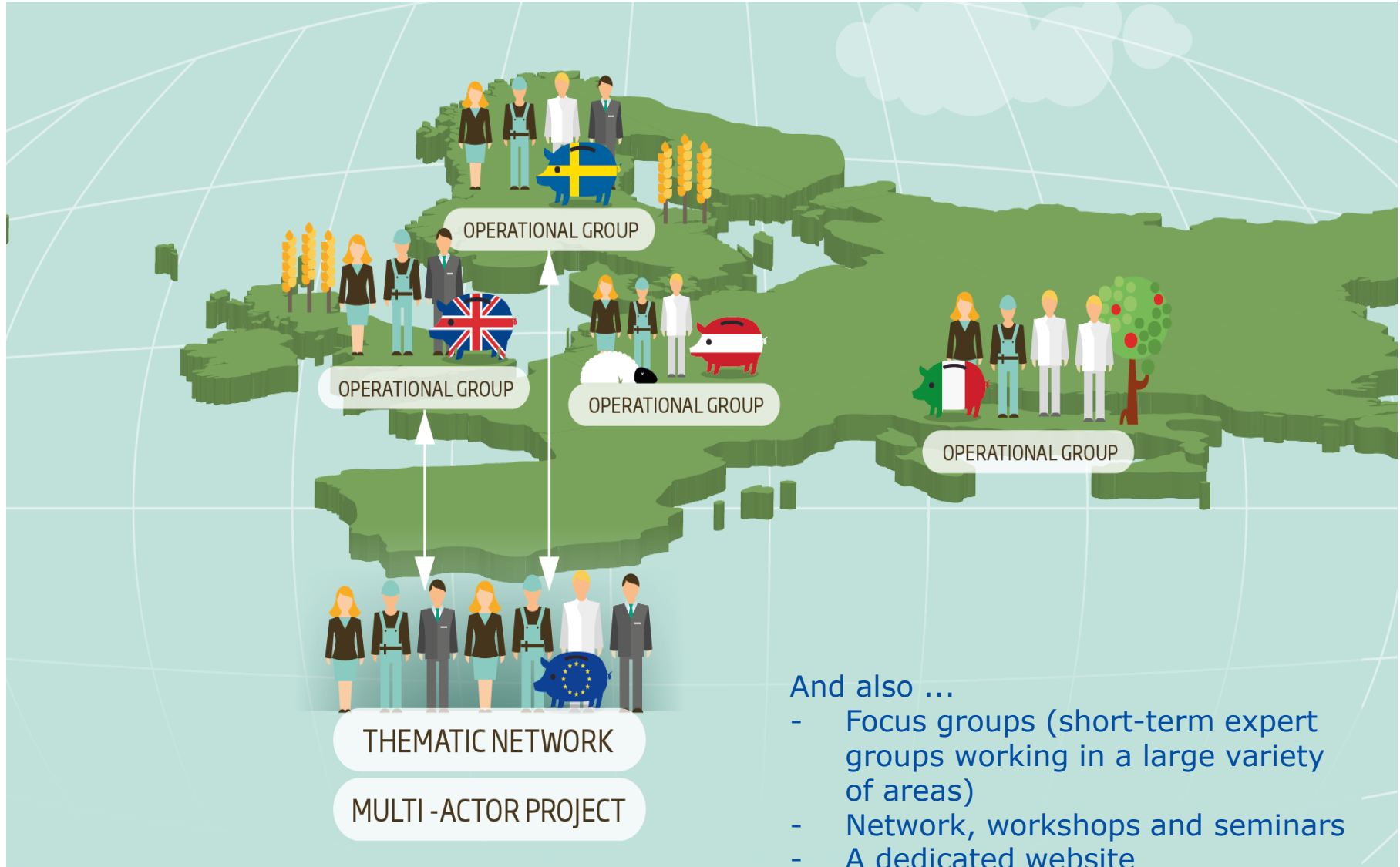
## Operational groups (cont.)

- *Currently 95 Member States / regions will implement the EIP in their rural development programmes 2014-2020*
- *More than 3 200 OGs planned in 2014-2020*
- *Various project sizes ranging from about €30 000 to €1.5 mio*
- *Operational groups have an obligation to report on results so as to make generated knowledge accessible to others and to open up contact possibilities between actors working on similar themes*

## ***Horizon 2020: Commission approach toward innovation in agriculture***

- ***Horizon 2020 projects:*** from €1-2 mio (coordination actions) to ... €45 mio (European joint programme on Zoonoses)
- ***International Cooperation:*** bilateral (e.g. with China) and multilateral (e.g. international research consortium Star-Idaz on animal health)
- ***Multi-actor projects:*** seek involvement of complementary actors in project activities (for all or part of project activities)
- ***Thematic networks*** exploiting existing research and best practice on specific themes chosen bottom-up – to foster knowledge exchange and translation into practice language at the European level

# The European Innovation Partnership Network



And also ...

- Focus groups (short-term expert groups working in a large variety of areas)
- Network, workshops and seminars
- A dedicated website

## Concluding remarks

- *Agricultural research necessary to cope with **long-term challenges** – yet the EU could foster synergies to deliver better - Big challenge for the future will be **to work better together** (research infrastructures...)*
- *Importance of agricultural research policy (research financing) (stability of financing, instruments, etc.)*
- *Important changes at EU level with Horizon 2020 and the EIP-AGRI for 2014-2020 – paving the way for after 2020?*
- *Innovation through **co-creation of knowledge** has huge potential*

*"The best time to plant a tree was 20 years ago.  
The second best time is now."*

*Chinese Proverb*

# Many thanks for your attention!

***Innovation in action***

<http://ec.europa.eu/eip/agriculture/>

