

# AKIS – Agricultural Knowledge and Innovation Systems in Transition

Findings from the EU SCAR collaborative working group

October 2012, Krijn J. Poppe

ICA - Gent



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# Content of the presentation

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- Background of SCAR and the Collaborative Working Group
- Some theoretical notions on Innovation Systems, AKIS and social innovation
- Conclusions from the collaborative working group, illustrated by examples from the member states
- EIP to link CAP and Horizon2020

# Background of SCAR and the CWG

- Standing Committee on Agricultural Research (1974, renewed 2005)
- Representatives of member states that advise the European Commission and Member States on coordination of agricultural research
- Since 2005: coordination in the European Research Area: EU + candidate and associated countries (in total 37 countries)
- 2006, Krems (Austria): “ [SCAR to] include questions of advisory services, education, training and innovation in their discussions”

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# Mandate of the SCAR – CWG on AKIS

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- 2008 Communication: “the Commission intends to make use of SCAR to identify agricultural knowledge structures in each Member State, with a view to eventually creating a corresponding CWG”
- 2009 France and the Netherlands volunteered to set up a CWG
- Chaired by Pascal Bergeret and Krijn Poppe

# The issue

- 1<sup>st</sup> SCAR foresight (2007): the mounting challenges facing the agri-food and rural sectors in Europe calls for a review of the links between knowledge production and its use to foster innovation
- 2<sup>nd</sup> SCAR foresight: rather crude light on the current state of Agricultural Knowledge Systems in Europe:

*"currently unable to absorb and internalise the fundamental structural and systemic shifts that have occurred. The remaining publicly funded AKIS appear to be locked into old paradigms based on linear approaches and conventional assumptions."*

In the mean time a changing policy context: the financial and food crises, EU 2020 strategy: "Smart, sustainable, inclusive growth", European Innovation partnership, CAP-post 2013

# Increased relevance in EU policy:

- Europe 2020 strategy: growth strategy for the coming decade. It wants the EU to become *a smart, sustainable and inclusive economy*.
- The Innovation Union is one of the seven flagship initiatives of the Europe 2020 strategy:
  - turn Europe into a world-class science performer;
  - remove obstacles to innovation
  - revolutionise the way the public and private sectors work together, notably through Innovation Partnerships
  - Within the Innovation Union, Horizon 2020 is the financial instrument 2014 to 2020, proposed budget €80 billion (the EU's new programme for research and innovation)
- CAP post 2013: Reinforce the role of the Farm Advisory Service (FAS) and to create a 'European Innovation Partnership (EIP) for agricultural productivity and sustainability'.



# Working methods of the CWG

- A network of civil servants from the Member States and the European Commission
- No budget, except for some experts to write a methodological state of the art paper (prof. Talis Tissenkopf, Anne-Charlotte Dockes, Bettina Bock)
- Inventory of national issues and structures, reflection, but no research.
- Several working packages
  - reflection paper state of the science
  - AKIS policy
  - Social innovation
  - Country cases

# Activities

- Meetings
  - Dublin, Budapest, Tallinn, Brussels
- Output
  - Conceptual paper on AKIS (reflection paper by the experts)
  - Expert report on social innovation
  - Several country/region case studies
  - Final report
- Dissemination
  - OECD conference on Agriculture Knowledge Systems, Paris, June 2011
  - EURAGRI meeting, Prague, September 2011
  - Conference on AKIS, March 2012, Brussels





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# Part II: Theoretical notions

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- For economists and others: 2 views on innovation policy
- AKIS – concepts from the reflection paper
- Social Innovation – concepts from the reflection paper

## Economics: thinking on equilibrium and dis-eq.

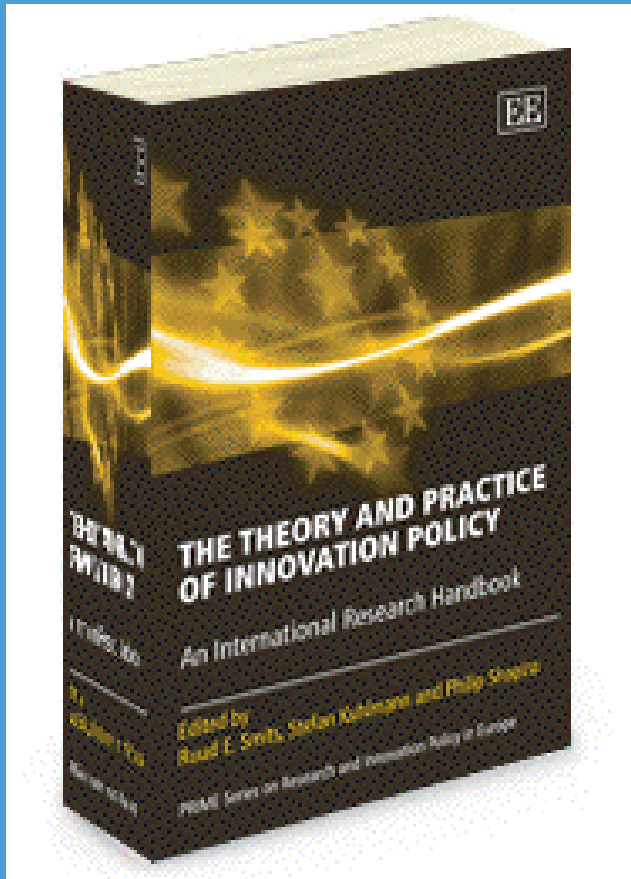
### Adam Smith

- Ricardo
- Marshall
- Walras
- Coase
- Hayek
- Friedman
- Ostrom
- F. List: infant industry
- K. Marx: role of capitalist
- J. Schumpeter: entrepreneur / business cycle
- K. Arrow: market failure
- O. Williamson: Inst. Econ.

# Two views on innovation policy (Smits et al, 2010)

	<b>Mainstream macro-economics</b>	<b>Institutional and evolutionary economics: Systems of Innovation</b>
<b>Main assumptions</b>	Equilibrium Perfect information	Dis-equilibrium Asymmetric information
<b>Focus</b>	Allocation of resources for invention Individuals	Interaction in innovation processes Networks and frame conditions
<b>Main policy</b>	Science / research policy	Innovation policy
<b>Main rationale</b>	Market failure	Systemic problems
<b>Government intervenes to</b>	provide public goods mitigate externalities reduce barriers to entry eliminate inefficient market structures	solve problems in the system facilitate creation new systems facilitate transition and avoid lock-in induce changes in the supporting structure for innovation: create institutions and support networking
<b>main strengths of policies designed under this paradigm</b>	clarity and simplicity analysis based on long term trends of science-based indicators	context specific involvement of all policies related to innovation holistic approach to innovation
<b>main weaknesses of policies designed under this paradigm</b>	linear model of innovation (institutional) framework conditions are not explicitly considered	difficult to implement lack of indicators for analysis and evaluation of policy

# Knowledge & Innovation System: 7 functions



1. Knowledge development and diffusion
2. Influence on direction of search and identification of opportunities
3. Entrepreneurial experimentation and management of risk and uncertainty
4. Market formation
5. Resource mobilisation
6. Legitimation
7. Development of positive externalities

(c) M. Hekkert et al.

# AKIS – terminology

- AKS concept originated in 1960s, driven by an interventionist agricultural policy that sought to coordinate knowledge and innovation transfer in order to accelerate agricultural modernization.
- In many countries: strong integration of public research, education and extension bodies, often under the control of the Ministry of Agriculture
- 1970s: “agricultural knowledge and *information* systems” (AKIS) in policy discourses (OECD, FAO). Later: agricultural knowledge and *innovation* systems

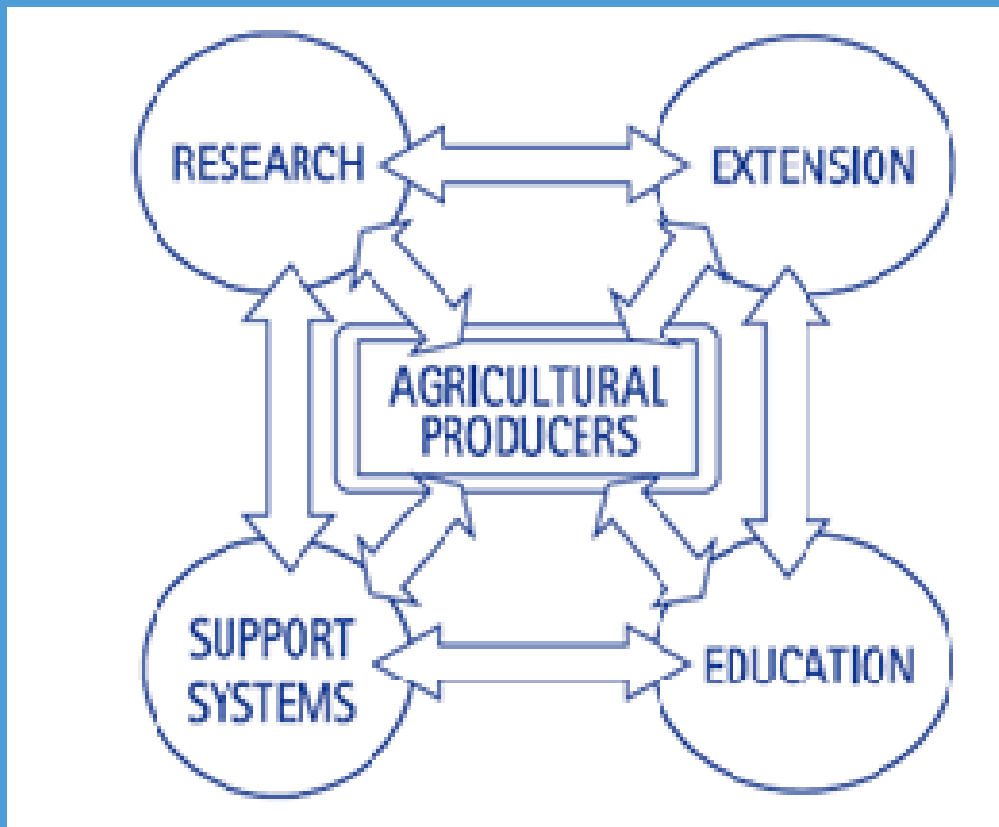
# AKIS – a formal definition

- “a set of agricultural organizations and/or persons, and the links and interactions between them, engaged in the generation, transformation, transmission, storage, retrieval, integration, diffusion and utilization of knowledge and information, with the purpose of working synergistically to support decision making, problem solving and innovation in agriculture” (Röling and Engel, 1991).

# Drivers that eroded AKS / moved to AKIS

- Research, extension and education have undergone a deep restructuring, transformed by the trend towards liberalization
- Policy agenda: increasing concern over the environmental impact of industrial agriculture, the quality of life of rural populations, rural employment and the need to support the positive externalities linked to agricultural production.
- The linear model of innovation has progressively been replaced by a participatory or 'side by side' network approach, in which innovation is 'co-produced' through interactions between all stakeholders in the food chain (and especially for 2<sup>nd</sup> order change)
- The growing disconnection between farmers' knowledge and research and extension systems.

# Agricultural Knowledge and Innovation Systems

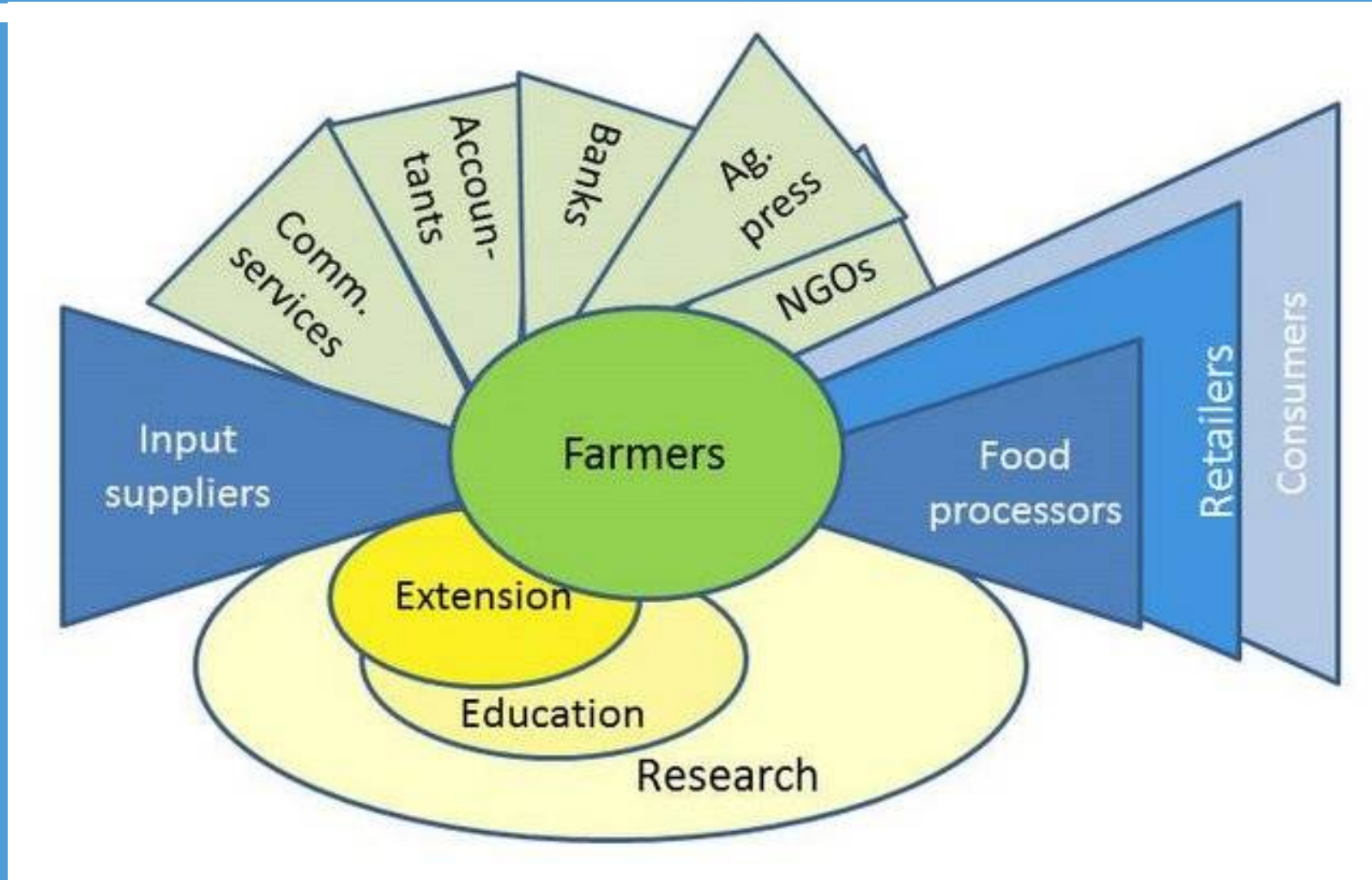


An AKIS should be able to propose and develop practical ideas to support innovation, knowledge transfer and information exchange.

Policy needs to reflect the manner in which innovation actually occurs today: often through diffuse networks of actors who are not necessarily focused on traditional research and development.



# The FOOD CHAIN PLAYS A ROLE TOO



# Learning and Innovation Networks

- Thematically-focused learning networks that are made up of different actors, within and outside the formal AKS.
- Members can include farmers, extension workers, researchers, government representatives and other stakeholders (Rudman, 2010).
- The emphasis is on the process of generating learning and innovation through interactions between the involved actors.
- LINSAs: LIN for Sustainable Agriculture
- The difference between AKS and LINSAs is connected to how knowledge is conceptualized: AKS sees knowledge as a “stock to be transferred”, whereas LINSAs emphasizes the processes needed to make knowledge useful and applicable to other actors.



**SOLINSA**  
Support of Learning and Innovation  
Networks for Sustainable Agriculture

Agriculture Knowledge Systems In Transition :  
Towards a more effective and efficient support of Learning  
and Innovation Networks for Sustainable Agriculture

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### Planned results:

- **Tools and methods** for practitioners that are involved in learning and innovation in agriculture
- Recommendations on **policy instruments and financial arrangements** that support learning and innovation for sustainable agriculture
- **Concepts to reflect** on learning and innovation processes as drivers of transition to sustainable rural development

**More information:** [www.solinsa.net](http://www.solinsa.net); **contact:** [heidrun.moschitz@fibl.org](mailto:heidrun.moschitz@fibl.org)



# Social Innovation

- The concept of social innovation originates in critiques of traditional innovation theory. By calling for social innovation, new theories point at the need to take the social mechanisms of innovation into account (*social mechanisms of innovation*)
- In the context of rural development, social innovation refers to the (social) objectives of innovation – that is those changes in the social fabric of rural societies, that are perceived as necessary and desirable in order to strengthening rural societies and addressing the sustainability challenge (*social inclusion / equity: the innovation of society as well as the social responsibility of innovations*)

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# Part III: Findings and recommendations of the collaborative working group

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AKIS is originally a theoretical concept, that is relevant to describe national or regional AKIS: they exist.

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- CWG are able to describe their national or regional system in AKIS terms
- And find this useful to reflect on their policies.

However:

- There is no *One size fits all formula*
- more scientific work is possible, for instance could typologies of systems (in relation to strategies of regional food chains and policies) help?

# AKIS are quite different between countries / regions / sectors – e.g. extension

- Mainly privatized systems (e.g.: NL, some states in Germany) where the funding mainly comes from direct payments from farmers, but coupled with high state funding for research
- Co-management between farmer organizations and the state (e.g. France, Finland and some states in Germany), with public funding, partial payments by farmers and farmer organizations.
- Semi-state management (e.g. Teagasc in Ireland which has a board with representatives from the state, industry and farmer organizations);
- Management by the state through regional organizations (e.g. Switzerland, Italy and Finland).

# Some countries have restructured their AKIS considerably

- NL: Privatising of state extension service, leading to competition; merge of applied research and university into Wageningen UR (a 'third generation university' with innovation in its mission), learning networks to address systemic coordination issues
- FR: Pole de competitivite – regional clustering with special projects to support consortia
- DK: merged applied research into regional universities.
- Hungary: Farm Advisory System in addition to Farm Information Service (chambers of agriculture) and Network of Village Agronomists (and agri-business)
- Austria: announced increased collaboration between institutes



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# AKIS components are governed by quite different incentives

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- interaction between the elements is crucial
- but elements are driven by different incentives, e.g.
  - research: publications, citations, 'excellence'
  - education: funding based on student numbers
  - extension: payments by farmers / vouchers / subsidized
- Need for multi- / transdisciplinary approach often mentioned
- competition impedes cooperation between actors

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# AKIS are governed by public policy but consistent AKIS policies do not exist

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- Policies for education and for research
- Some countries (e.g. NL) see research / innovation programs as a policy instrument to reach certain public goals (e.g. environment) and combine them with other types of regulation
- Interaction with innovation in private sector often weak
- Questions on relation between agricultural innovation instruments and general innovation policy (e.g. Flanders)

# Monitoring of AKIS (input, system, output) is fragmented

- Data mainly on R&D food industry, patents (CIS), publications of research system
- No monitoring reports for parliament / public
- Sometimes ex-post policy analysis of certain innovation programs

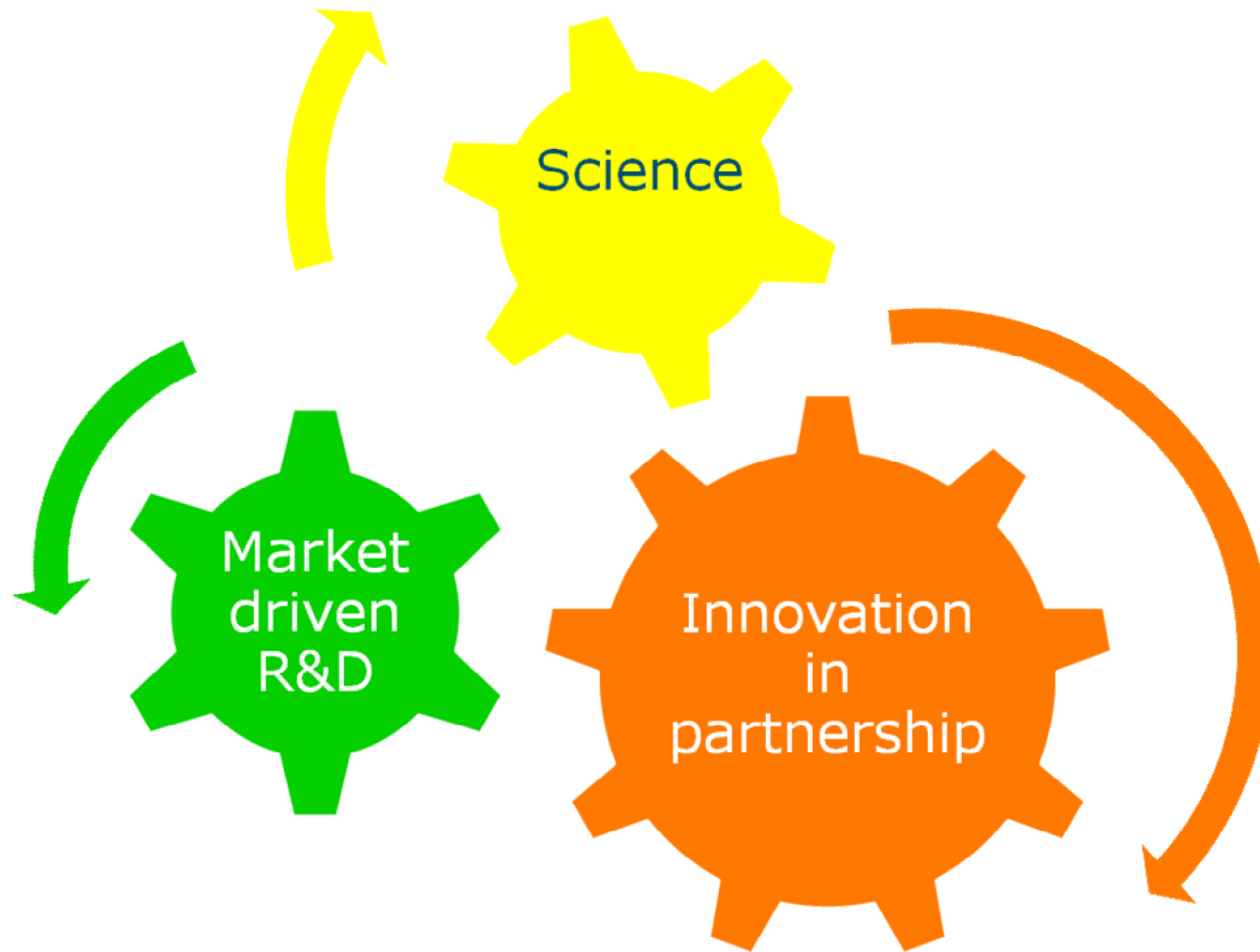
***The high level of attention to “innovation” in the policy domain and the lack of research for evidence-based policy are inconsistent.***

# DIFFERENT MOTIVES NEED TO BE ADDRESSED

Table S.1 Two types of motivation for research

Aspect	Science driven research	Innovation driven research
<b>Incentive to program a topic</b>	Emerging science that can contribute to solving a societal issue (or a scientific question)	An issue / problem in society that can be solved by new research, or a new idea to solve an existing issue
<b>Participation of users</b>	In demonstration phase / via research dissemination	In agenda setting, defining the problem and during the research process
<b>Quality criteria</b>	Scientific quality	Relevance (for the sector or a region)
<b>Focus</b>	Research organisations	Networks of producers and users of knowledge
<b>Diffusion model</b>	Linear model	System (network) approach
<b>Type of government policy</b>	Science / Research Policy	Innovation Policy
<b>Economic line of thinking (see table 2.1)</b>	Macro-economics	Systems of innovation
<b>Finance</b>	To a large extent public money: more speculative and large spill over effects	Public-private partnerships very possible / advantageous
<b>The role of the EU</b>	Efficiency of scale (member states often too small), smart specialisation between member states, create European research market with harmonisation of hard- and soft infrastructures	Stimulate interaction and learning in Europe between national/regional AKIS. Enable in CAP innovation by networks with farmers
<b>Typical EU examples</b>	Horizon 2020, FP7, ERC, some ERAnets, Joint Programming Initiatives	CAP: European Innovation Partnership, LEADER, European Technology Platforms, EIPs, some ERAnets
<b>Type of research</b>	Interdisciplinary with absorption capacity in AKIS (to work with material science, ICT, chemistry etc.).	Transdisciplinary and translational with close interactions.

# Different motivations for research should be recognised – and interaction managed



Not a linear model !

Different objectives,  
methods, and public  
roles

Science

- Science driven knowledge development
  - Basic research
  - Linear model
  - Cross overs sectors
  - Society sets agenda
- PUBLIC TASK**

Market  
driven  
R&D

- Science for competitiveness or social issues
- Business sets agenda, helps to steer, uses results
- **PRIVATE-PUBLIC PARTNERSHIPS**

Innovation  
in  
partnership

- Prototypes // Localisation
- Change business models / finance
- Food chain is co-creator
- (De-)regulation, procurement etc.
- **LEARNING AND INNOVATION NETWORKS**
- **INFORMATION BROKERS**

## Role of EU policy

Science

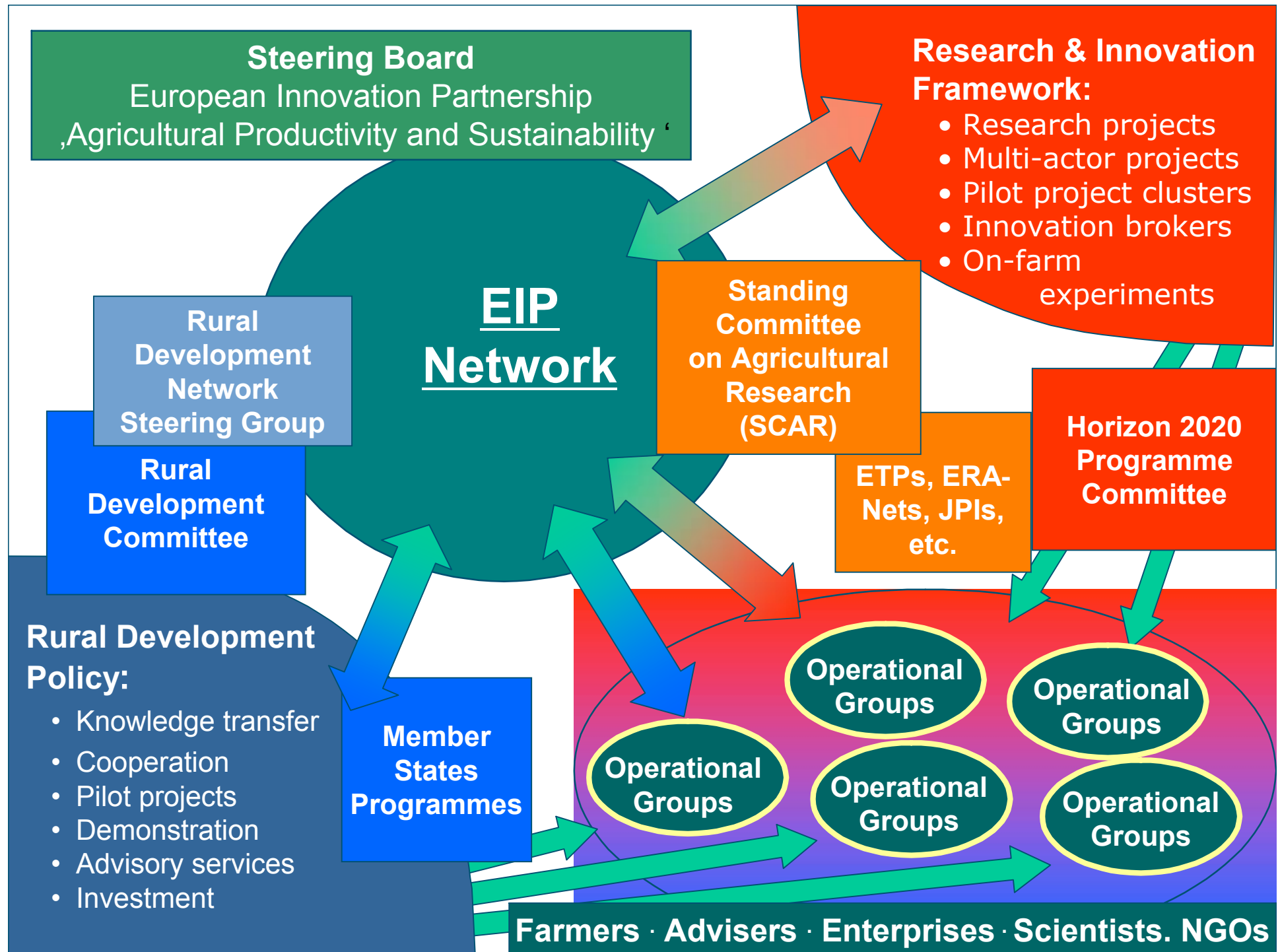
- Countries are too small, large spill overs: pool funds
- Compete and collaborate with US, China, Brazil etc.
- Help re-organisation process in Europe (infrastructures)

Market driven R&D

- Collaborate with business in Food Chain in PPP
- Manage spill overs between EU regions

Innovation in partnership

- AKIS are REGIONAL
- Innovation, not dissemination
- Organise international exchange for spill-overs (farmers, extension)
- Empower innovation groups in CAP
- Don't forget monitoring (learning)





Thank you for  
your attention

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[www.lei.wur.nl](http://www.lei.wur.nl)

See the website of  
SCAR (European  
Commission)

